

Faculty of Human Sciences
Doctoral Thesis in Sociology

Dynamics of a Risk Regulation Regime – the Case of Head Injuries in Swedish Ice Hockey

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Dynamics of a Risk Regulation Regime – the Case of Head Injuries in Swedish Ice Hockey

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Dynamics of a Risk Regulation Regime – the Case of Head Injuries in Swedish Ice Hockey

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Abstract

This thesis explores the risk regulation regime related to head injuries in Swedish ice hockey, primarily by utilizing a corpus linguistic methodology. More specifically, three empirical studies were conducted. The first one aimed to cover the media narrative regarding head trauma and its potential long-term effects on the game of ice hockey, including whether and how this has changed over time. The method used a corpus-assisted discourse study, based on the media coverage of concussions in ice hockey from the Swedish media archive. The second study aimed to map information from the Swedish ice hockey community regarding long-term effects on athletes' health related to head trauma, including possible changes over time. For this study, activity reports from the Swedish ice hockey association were analyzed using traditional quantitative content analysis. The third empirical study aimed to map the contexts surrounding municipal political records that explicitly mention the game of ice hockey. This was achieved through collocation network analysis, where linguistic networks drawn from municipal political records relevant to sports and leisure activities were analyzed.

The thesis aims to make a methodological contribution by applying corpus linguistics to a given risk regulation regime, as well as a theoretical contribution by adding to the studies of these types of regimes.

The results from the three empirical studies were analyzed using a theoretical framework, in which risk regulation regimes were the central analytical concept. Additionally, the concept of organizational legitimacy, as used in the general assumptions of neo-institutional theory, was used as a supporting framework. This was due to the nature of the risk, which could be assumed to be not only to lacking regulation, but even encouraged by public entities.

The findings included increased coverage of the risk in Swedish media and an increased tendency to promote the positive societal effects of ice hockey among the ice hockey community. Additionally, the political contexts in

which the game of ice hockey was mentioned were mostly related to economics. It was also found to be a crucial part of the general context of sports and other leisure activities for which the benefits are emphasized. This was thoroughly analyzed by applying the theoretical framework and focusing on the dynamics of the risk regulation regime. The applied methodology, mainly corpus-based methods, was deemed as working satisfactorily in relation to the specific research problem as well as for studying risk regulation regimes in general.

Summary in Swedish

Denna avhandlings övergripande syfte är att kartlägga och analysera den riskregleringsregim som kopplas till huvudskador inom svensk ishockey. Den övergripande problembilden grundar sig i flera parallella utvecklingar, vilka gemensamt bedöms göra frågan intressant ur ett sociologiskt perspektiv. Dessa inkluderar det faktum att antalet hjärnskakningar inom sporten ökat under de senaste decennierna, samtidigt som ny medicinsk kunskap på området gör gällande att de långsiktiga effekterna av dylika skador sannolikt är mer omfattande än den allmänna uppfattningen tidigare förefaller ha utgått ifrån. Samtidigt satsas stora mängder resurser från det offentliga på att möjliggöra utövandet av sporten, vilket också är en förutsättning för dennas storskaliga karaktär.

Det teoretiska ramverket består av två huvudsakliga delar. Dels riskregleringsregimer, med utgångspunkt i hur sådana beskrivs av Hood, Rothstein, & Baldwin (2001). Kärnan i deras definition och analytiska koncept bygger till stor del på variationer i riskreglering och vilka faktorer som kan förklara sådan. Som kompletterande teoretiskt ramverk används också organisatorisk legitimitet utifrån ett ny-institutionellt perspektiv (se Meyer & Scott, 1983; Powell & DiMaggio, 1991b; W. R. Scott, 2014). Detta främst med hänsyn till att den risk som berörs i avhandlingen inte kan antas begränsa sig till att bli föremål för utebliven reglering, utan i vissa fall dessutom uppmuntras av det offentliga genom resursallokering och dylikt.

Avhandlingens empiriska del är byggd runt tre studier, var och en med syftet att kartlägga en given del av aktuell riskregleringsregim. Samtliga empiriska studier bygger på kvantitativ innehållsanalys, där majoriteten grundar sig i så kallad korpuslingvistik. I korthet används den sistnämnda typen av metoder för att, med hjälp av omfattande textmängder som analyseras maskinellt, urskilja språkliga mönster och innehåll som ej är praktiskt möjliga att skönja genom manuell texthantering (se Baker, 2006; Brezina, 2018; Brezina, McEnery, & Wattam, 2015). Utöver att dessa bedöms vara lämpliga metoder i förhållande till den typ av konstruktioner som riskregleringsregimer förutsätts vara står därtill en viktig del av

avhandlingens forskningsbidrag att finna just i tillämpningen av dessa. Korpuslingvistik, mer specifikt den typ som fokuserar på urskiljandet av diskurs, har förvisso under senare år börjat användas vid så väl sociologisk forskning i allmänhet som risk-relaterade samhällsvetenskapliga studier specifikt (e.g. Boholm, 2012; Hamilton, Adolphs, & Nerlich, 2007; Zinn, 2018). De har emellertid ännu inte förekommit vid mer omfattande studier relaterade till just riskregleringsregimer, trots att dylika metoder kan antas lämpa sig väl för just den typ av teoretiska koncept som dylika regimer i grunden är, främst utifrån den möjlighet dessa ger att på ett systematiskt vis kartlägga latent innehåll.

Den första delstudiens syfte var att kartlägga medienarrativen gällande huvudskador inom svensk ishockey. Detta genomfördes med hjälp av en korpusassisterad diskursanalys (CADS), där en omfattande mängd text från svensk media analyserades med statistiska metoder se Baker (2006). För empirin svarade 33,033 texter erhållna genom databasen *mediearkivet*, vilket genererade ett korpus omfattande strax under 13,4 miljoner ord (varav 197 978 unika sådana). Resultaten innefattade bland annat en observerbar kvantitativ ökning av mediabevakningen gällande hjärnskakningar inom ishockey, samt ett lingvistiskt skifte över tid gällande hur tacklingar mot huvudet refererades till språkligt.

Syftet med delstudie två var att kartlägga vilken typ av information som kommuniceras av Svenska ishockeyförbundet (inklusive dess regionala underavdelningar) i fråga om aktivas hälsa relaterad till huvudtrauma. Detta inkluderade om, och i så fall hur, denna förändrats över tid, samt hur informationens natur kan relateras till den befintliga riskregleringsregimen. Metodologin byggde på kvantitativ innehållsanalys av (i förhållande till delstudie 1 respektive 3) mer traditionellt slag, där verksamhetsplaner respektive -berättelser från olika delar av Svenska ishockeyförbundet användes som empiri. Urvalet omfattade samtliga regionala förbund, samt ishockeyförbundet i sin helhet och sträckte sig tidsmässigt från säsongen 2006/2007 till och med 2017/2018. Resultaten inkluderade en ökad tendens över tid gällande förbundens tendens att framhäva sportens positiva samhällseffekter.

Den tredje delstudiens syfte var att kartlägga i vilka kontexter sporten ishockey diskuterades i lokalpolitiska sammanhang. För ändamålet användes en så kallad *collocation network analysis*, där ett lingvistiskt nätverk av termer byggs upp med hjälp av storskalig kvantitativ innehållsanalys av ett korpus, vilket därefter analyseras teoretiskt (se Brezina et al., 2015). Empirin bestod av ett korpus omfattande drygt 34,7 miljoner ord och 586 000 unika ord, vilket byggdes genom insamling av samtliga tillgängliga handlingar från kultur- och fritidsnämnder (eller motsvarande) i Sveriges 50 största kommuner (tidsperiod: 2015 till och med 2019). Det nätverk som erhöles antydde att sporten ishockey främst nämndes i sammanhang rörande ekonomi, så som finansiering av ishallar. Resultatet påvisade även att ishockey i dessa sammanhang föreföll vara en del av en bredare kontext där idrottens och andra typer av fritidsaktiviteters positiva effekter framhålls.

Resultaten och implikationerna från var och en av studierna analyserades utifrån det teoretiska ramverket i två omgångar. Först fristående från varandra i direkt anslutning till de individuella studiernas resultat, för att sedan i sista avsnittet sammanvävas genom enhetlig analys grundad i aktuellt ramverk. Tidigare nämnda resultat låg huvudsakligen i linje med befintlig teoribildning, vilket kan antas indikera god koppling mellan teori och empiri.

De korpus-baserade metoderna bedömdes falla tämligen väl ut i förhållande till den specifika problembilden så väl som riskregleringsregimer generellt. Användningen av organisatorisk legitimitet som komplement till konceptet riskregleringsregimer bedömdes också fungera tämligen väl och torde öppna för framtida studier av risker där implicit uppmuntran från de offentliga inrättningar som annars kan anta utgöra en del av en regims reglerande sida. Som en följd av detta argumenteras också för en policy-implikation där framför allt kommuner bör bygga vissa typer av resursallokering mer på hårda data än axiomatiska antaganden, exempelvis gällande fritidsaktiviteter som förutsätts vara hälsofrämjande.

Preface and Acknowledgments

“The reason many people are lost in thought is because it’s unfamiliar territory.” (Mad magazine, issue 326).

Although starting the preface of a doctoral thesis by quoting *Mad* magazine could be a very effective way of losing all credibility before trying to make any scientific arguments, this one is obviously too appropriate to ignore. More precisely, its appropriateness is due to its accurate description of a feeling that was my close companion throughout much of my work! Even though this is probably common to any PhD student, there may well be an extra dose of this feeling for anyone foolish (or brave) enough to engage in methodology quite removed from the comfort zone of what is considered mainstream in the discipline. Add a pandemic to this mix and you will occasionally experience a perfect storm of delusion!

The decision to engage in novel methods is likely to be hit or miss in every sense of the metaphor. Therefore, I am very glad that it not only worked out well for the thesis, but also made me enthusiastic – to the extent that I am now hoping to pursue corpus-related research throughout my career. With this in my mind, my first personal thank you goes to Professor Jens Zinn, co-supervisor! Our contact may have been sporadic over the latter half of the process, but your encouragement in pursuing CADS and similar methods for work on this thesis, as well as further engagement in all that followed, has been invaluable. It is hard to imagine what might have been otherwise!

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For Professor Anna Olofsson, my supervisor during my first year: I'm not sure whether it would be common practice to hold some kind of grudge about being abandoned one year in. Should that be the case, I'm choosing to ignore said practice and give you my sincere thanks anyway! Your input about my theoretical choices was crucial to many pieces of the thesis puzzle (and besides, given the other PhD students I had to compete with to make the cut, anyone in their right mind would have made the same choice).

Furthermore, I would like to thank a couple of people who, on different occasions, offered valuable input and/or assistance along the way. These include Professor Ragnar Lofstedt, for comments and feedback at my mid-way seminar and Associate Professor Patrick Brown, for a very thorough review at my final seminar. Additionally, sincere thanks to Professor Roine Johansson, who offered to do an additional reading and provide subsequent comments!

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So far, all the people I have mentioned have contributed to the thesis in a very direct manner. Aside from that kind of support, however, merely being a part of the Department of Sociology at Mid Sweden University, as well as the Risk and Crisis Research Center, has also been crucial to the process – not only intellectually but, and perhaps equally importantly, for occasional laughter and enjoyment. The working environment in which I have now participated for more than a decade rarely, if ever, has a dull day. Whether you need company at shady bars in various European cities, a critical evaluation of your left-hand driving skills, someone to hold your belongings while you're on a roller coaster, or just someone to ventilate frustration with over a cup of coffee – there always seem to be a few people up for the task. A big thanks to all of you, let's continue to embrace intellectual exchange and silliness alike!

Finally, I would like to thank my family for the necessary support over these years. To mom and dad: thank you for invaluable help with various logistical challenges (babysitting, etc.)!

To my wife Lina and my children, Sally and Ebbe, thank you for everything - literally!

Olov Hemmingsson
Östersund, March 2023

1 Introduction

*"Ice hockey is a fast, fluid and exciting team sport. It draws big crowds at the Olympic games thanks to the drama and tension of the matches."
(International Olympic committee, 2018)*

Drama and tension. Fast, fluid and exciting. With these words in mind, the long-standing popularity of ice hockey should be quite self-explanatory. Despite being popular in only a few countries, the sport takes eleventh place among world sports when measured by media coverage adjusted for relevant demographic factors (M. Brown, 2015). Superlatives and shares aside, the sport might even take a poetic twist for some:

"Consider the goal. As the play unfolds, I am transported to another level of contemplating the game. In an instant, my day-to-day worries have evaporated and my hopes of victory for my team become secondary. In beholding this play, I adopt an aesthetic, disinterested attitude. And I am utterly ravished. I feel the beauty of the game (...) In my opinion, these moments aren't all that rare. I'd even say they're part of what makes hockey worth watching." (Irving, 2009, p. 162)

It would seem like the sport of ice hockey has a lot of things going for it, even in terms of societal recognition. As of late, however, the game has become a target of health-related concern. This is due to the increased awareness related to a quite specific risk – head injuries and their potential long-term effects.

The term *risk* is, by the most basic definition, characterized by a given situation where one action is chosen at the expense of one or several others, in order to achieve something. This may be true for individuals and for large corporations or even societies (Renn, 2017). For sociology in particular, a knowledge and understanding of the social context in which risks occur is considered necessary, underlining the relevance of risk in relation to the field, due to obvious social aspects (Lidskog & Sundqvist, 2012). Several aspects of risk may be of interest in sociology, one of which is its regulation.

Given the premise that a society, in various respects, seeks to control existing risks within its domains, the question of responsibility and the actions of the establishments assumed to control such issues is likely to be raised eventually. For certain risks, such as smoking and alcohol consumption, this is expressed through explicit regulation by the government. Such regulation might take the form of legislation and government-funded health campaigns. However, in other contexts, such as sports injuries, the state or government tends to have a more remote role, even if risks are actually present at quite high levels, as regards their frequency and severity. Hood et al. (2001) use the term *risk regulation regime* as an umbrella term for various kinds of public interventions aimed at controlling potentially harmful activities, either through the intervention of market mechanisms or different types of social systems (this theoretical concept will be described thoroughly in 4.2). The arguably most interesting part is not primarily the existence or non-existence of such regulation, but the fact that it tends to vary between risks that are quite similar in a quantitative sense. The fact that the complexities of the degree of regulation is not limited to the measurable potential effects of a risk is well reflected in the following quote:

"In some domains of risk regulation – for instance, drinking water quality, distance vision requirements, or maximum permitted blood-alcohol levels for drivers – relatively formal and heavy quantified standards have been applied, while in others, like most other aspects of driver fitness, standards are much vaguer and more general." (Hood et al., 2001, pp. 6-7)

Hence, you could get behind the wheel of a car after a week of no sleep without being subject to regulatory action, such as the risk of being arrested. At the same time, anyone driving with a blood-alcohol level just above the legal threshold is subject to regulation accomplished through legal means. This even though the reaction time of a severely sleep-deprived individual potentially being slower than that of someone who has had one beer too many.

Risk regulation regimes are, then, the actual systems through which such regulation occurs (Hood et al., 2001). The specific factors that characterize such a regime are thoroughly described in 4.2.1 but, in short, they are theoretical and delimited systems with a significant degree of durability over time, within which risk regulation occurs. The fact that such systems – regardless of whether they are geographically conditioned or distinguished by other factors – result in risks being unevenly regulated is significant in the basic premise of their existence. Additionally, they appear to be quite uncontroversial in contexts similar to the one in the above quote. More complex, however, is a context where a risk regulation regime not only allows risk-taking, but also tends to encourage it on an institutional basis. Such encouragement could be the allocation of public resources which, from an institutional perspective, can be considered as a sign of obtained *legitimacy*, something any given organization needs to be able to pursue its activities (W. R. Scott, 1991a, p. 169).

This thesis will mainly focus on Sweden, including the factors that make civil society and public resource allocation unique in this context. However, to properly introduce the risk and its associated problems, a brief look overseas could be helpful.

In 2013, a wave of negative publicity aimed at the American football league (NFL) culminated with the release of the book *League of Denial* (Fainaru-Wada & Fainaru, 2013) and an associated television documentary. These are the results of a comprehensive journalistic investigation into the impact the sport may have on active and ex-athletes, in the form of long-term effects on the brain (specifically the diagnosis of chronic traumatic encephalopathy, CTE), and how the league, actively and passively, withheld indications of this from those affected. CTE was previously known by the medical name *Dementia Pugilistica*, which specifically relates to boxing. This is because the disease was historically associated with the head trauma to which boxers are continuously exposed. In recent years, however, CTE has also been found in athletes from other contact sports, such as soccer, American football and ice hockey (Gavett, Stern, & McKee, 2011). The symptoms of CTE include (but are not limited to) depression, aggression, lack of impulse control, suicidal

tendencies and, in its later stages, dementia (Stern et al., 2011). The relationship between contact sports and CTE is not only a result of the risk of actual concussions, but has also been attributed to the cumulative effect of less severe blows to the head, known as *sub-concussive hits* (Bailes, Petraglia, Omalu, Nauman, & Talavage, 2013; Baugh et al., 2012). The latter is obviously problematic for most established contact sports, because their rules and the way they are played de facto allow such collisions. In American football at college or high school levels, the total number of collisions may exceed 1000 for an individual athlete in a single season (Bailes et al., 2013).

In the NFL, the criticism later resulted in a civil lawsuit from over 5,000 former players (United states court of appeals, 2016), which ended in a settlement between the parties. However, NFL commissioner Roger Goddell personally stated that the settlement did not include or imply any admission of guilt on the matter (CBS News, 2013).

While the understanding of CTE in contact sports is still at the early stages as regards clear causal relationships (e.g. Joseph et al.) more robust data is available for other brain-related complications from contact sports, such as *post-concussion syndrome*, PCS (e.g. Benson, Meeuwisse, Rizos, Kang, & Burke, 2011; Erlanger, Kutner, Barth, & Barnes, 1999; Iverson, Gaetz, Lovell, & Collins, 2004), which also involves long-term problems due to head trauma. Combined with the increasing number of concussions in various contact sports over time (e.g. Pauelsen, Nyberg, Tegner, & Tegner, 2017) an apparent problem has emerged; there are two worrying and apparently co-occurring trends, where each one makes the other one more severe.

Although the emerging seriousness of the long-term effects of concussions is not by definition limited to sports, sports and non-sports-related concussions actually tend to be the two main categories in concussion-related research (Sojka, 2011), indicating that such injuries are highly intertwined with sports. This, together with the increased incidence referred to above, makes apparent the extent of the problem in organizations whose core activities are sport related.

Like any risk, this one is likely to have sociological implications at the macro- and micro-levels. When the problem is broken down to an individual level, which in this context means the athletes who are the actual risk takers, another problem emerges – specifically, the large degree of uncertainty associated with brain injuries and the problem of understanding them among ordinary athletes. In terms of risk perception, the nature of the risk plays a significant role, in terms of being abstract, hidden or unknown (Slovic, 1987). Despite rapid scientific advances, injuries related to head trauma are unlikely ever to be comprehensible for a risk-taking individual as a torn hamstring or a broken bone, in terms of the immediate or long-term consequences alike. Additionally, while long-term effects that are not easy for the public to connect to a given incident in comprehensible manner may be an issue for many injuries, the abstract nature of head injuries is likely to lead to less comprehension. This is likely to be reflected in the risk assessment of athletes in different, not always very concrete ways. For the close acquaintances of someone affected by consequences of head trauma, the group that Beck (1992) describes as *the voices of side effects*, this is obviously quite relevant.

“On their side of the fence, ‘side effects’ have voices, faces eyes and tears. And yet they must soon learn that their own statements and experiences are worth nothing so long as they collide with the established scientific naiveté. (...) Therefore people themselves become small, private alternative experts in risks of modernization.” (Beck, 1992, p. 61)

This quote is based on examples that directly relate to modernity and industrial society, with side effects in the form of human suffering and disease, which is a macro perspective related to Beck’s (1992) risk society. However, the principle that these side effects only have a “face” for those who confront them at a personal level should be theoretically valid in other contexts with relatively large-scale risks. In this context, risk regulation regimes are thought to be a useful theoretical complement for bridging the gap between micro- and macro-levels in terms of risk regulation (Hood et al., 2001, pp. 14-16), so making the concept beneficial in the sense that any

researcher who wants to understand a given risk with implications that potentially cover such theoretically diverse parties as Slovic (1987) and Beck (1992).

Based on current epidemiology, the number of practitioners and public interest, ice hockey should be the most interesting sport from a Swedish perspective. This due to its second place in terms of audience numbers and ninth place for the number of active athletes (Swedish Sports Confederation, 2012). Among the top ten sports in the latter rankings, between 1988 and 2004 ice hockey had the highest “concussions per exposure” ratio in studies of American college and high school athletes (Daneshvar, Nowinski, McKee, & Cantu, 2011). For Swedish ice hockey specifically, the incidence of concussions has increased significantly over time (Pauelsen et al., 2017).

In terms of scientific relevance, the occurrence of major injuries in sport, at least at first sight, may be of interest primarily from a medical/epidemiological perspective, which is reflected in the scientific publications available in the field. However, the societal relevance and status of sport has many unique aspects, perhaps even more so from a Scandinavian perspective, so it is very relevant for the social sciences in general and sociology in particular. One way this is reflected is how its positive connotations are sanctioned through governmental institutions.

“Even though sports associations have seen a decline in the number of members during the 1990s and that, in some cases, their activities have become commercialized (such as through company formation), the sports movement is an example of a popular movement that has been relatively successful in retaining an important social function. Through sports clubs, citizens meet and cooperate on equal terms, regardless of social background. Within these, a sense of community and inclusion grows beyond class boundaries.” (SOU 2000:1).

The above (translated) quote illustrates, mainly in its two final sentences, why the societal position of sports can be of interest in the social sciences. The explicit mention of structural factors, such as social background, further underline the sociological relevance. In addition to the soft values

highlighted in the above quotes, the government also largely recognize the positive health effects of sports (e.g. Swedish Government, 2017a). This is reflected in the acknowledged importance of sports and health as a school subject (e.g. Swedish Schools Inspectorate, 2012).

The assumption that the government does not, to any greater extent, currently regulate the kind of risks that occur in Swedish contact sports should, in accordance with Hood et al. (2001), benefit from analysis according to the factors that constitute a *risk regulation regime*. Of the dynamic aspects they focus on, the pressure of public opinion as well as interest and expert groups should be of considerable interest in explaining this lack of regulation. Of equal interest, however, is how the above authors compare different types of these regimes, due to Sweden's uniqueness in regarding sports organizations as part of a popular/civil movement, as shown by in the above quote. The question of whether this has an impact on a specific risk regulation regime should therefore provide a basis for further discussion of those risks and the government's possible waiver of them.

1.1 Research problem

Given that society uses various forms of public sanctions to regulate the different types of risks in its domains, it is sociologically interesting to study whether and, if so, how such regulation differs between various risks. In the case of risks within sports, the picture is complicated by insufficient regulation. This is not only lack of action from the state or government but, in some cases, also due to the encouragement of these activities through public funding. This further underlines the issue's sociological dimensions, since the dynamics of a society that allows public funding of a potentially risky activity can be assumed to be structural in an inherently sociological manner. The concept of *legitimacy*, long established in this field, becomes essential for further understanding here. Simply put, there are structural factors that allow risky activities to gain public recognition; understanding of these in a sociological sense may be gained through the concept of legitimacy.

In addition to the aspects of risk and risk regulation, studying sports comes with additional sociological relevancy. The sports movement is, in many aspects, a substantial societal actor. Its positive connotations are manifested both through the actual number of people who consume its product, as well as through its favorable position in terms of resources. As an acknowledged positive social agent, the sports movement and its major actors are obviously dependent on its active athletes, without whom they would almost certainly cease to exist. The fact that some activities in many of the most popular public sports are associated with certain injury risks has long been known. However, the risk of long-term health effects related to head trauma have become apparent only during the last decade, and they bring up new questions about the governmental or municipal enabling of these activities and thus new issues about the regulation society is expected to conduct when such risks are present. As the long-term effects of the injuries become clear, the issue of risk regulation is bound to appear on the agenda eventually.

In addition to sporting organizations, the risk issue will also inevitably affect the governmental or municipal agencies that finance and thereby legitimize the organizations' activities. In more instrumental terms, the problem arises as a cross-sectoral balance between risk and earnings, where individual athletes bear the risk while society carries the long-term benefits of sporting activities. Figure 1 illustrates this balance, including the fact that risks and benefits depend on each other, even from an overall social perspective. According to a widely cited study by Starr (1969), risks that enable societal benefit are a lot more likely to be tolerated by the public when they are considered to be *voluntary risks*. While sports in general should undoubtedly be perceived as a voluntary activity, there is a good reason to believe that the risk of permanent brain damage is not considered when deciding to participate in a given sport. This thus questions the idea that the voluntary aspect makes the risk acceptable, as medical knowledge improves over time. This is further complicated by the fact that the long-term effects of head injuries may be associated with a delay between cause and effect, because in many cases the effects are not fully apparent until a substantial amount of time has passed. The figure also shows the main benefit of the analytical

concept of *risk regulation regimes*, where these dynamics of risk and benefit may be studied from top to bottom (Hood et al., 2001). The authors responsible for the concept emphasize that their own model is appropriate for studying phenomena that exist between the macro perspective implied by the concept of risk society and the concrete grassroots risk-taking that, in this case, is manifested through the long-term effects of head trauma in individual athletes.

Using the concept of regulation or non-regulation as a tool for understanding this will be of some help, but likely not enough. Quite simply, the risks in sports are not merely subject to what could be perceived as a lack of regulation. Rather, they are in many cases granted the benefit of their legitimacy on the grounds that they receive public funding (see W. R. Scott, 1991a, p. 169). Overall, there should be increased demand for theoretical developments that bridge this gap, intertwining the concept based on regulation and the more general sociological concept of legitimacy. Using this combination, studies of risk regulation would no longer have to be limited to regulation versus non-regulation, which is generally the case today, but could be extended to include emphasizing risk on behalf of otherwise regulating institutions or similar.

Considering the number of people associated with arguably risk-prone sports and the current statistics/epidemiology for head injuries, ice hockey can be assumed to be the most likely sport to eventually deal with this problem in Sweden. Accumulated effects aside, the number of concussions in Swedish ice hockey is also showing a steady upward trend.

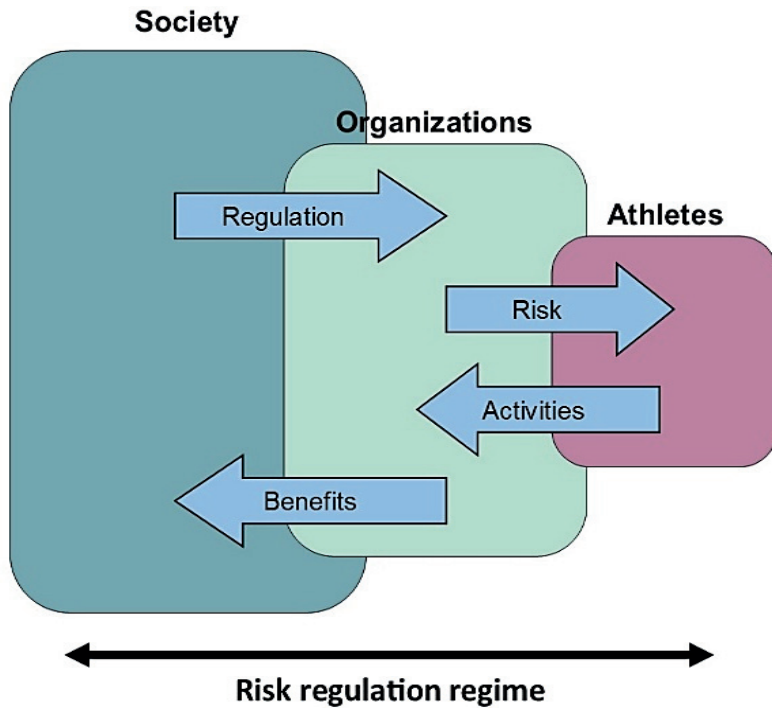


Figure 1. Conceptual framework of the thesis research problem. The notion of a *risk regulation regime* and its associated analytical concept is from Hood et al. (2001).

1.2 Overall aim and research questions

This thesis uses methodological and theoretical development (see 1.4) to advance knowledge and understanding regarding the risk regulation of head injuries in Swedish ice hockey, thereby making an overall contribution to the field of risk regulation. This is accomplished through a research process related to a conceptual risk regulation regime, relying on empirical studies that mainly relate to large scale quantitative text analysis. The subsequent results are subjected to theoretical analysis, with organizational legitimacy being considered in relation to the given regime throughout the study as a supporting framework.

Through the work in this thesis, including the empirical studies defined under the method section, the following research questions are answered:

- What is the media narrative about head trauma in ice hockey and its potential long-term effects, and how has it changed over time?
- What kind of information is communicated by the Swedish ice hockey communities about head trauma's long-term effects on athletes' health, how has this changed over time and how can the nature of this information be related to the current risk regulation regime?
- In what contexts in municipal political records is the game of ice hockey explicitly mentioned?

As the questions show, change over time plays a crucial role in the advancement of knowledge, primarily due to its significance in the applied theoretical framework (see 4.2). This can be accomplished through the reliance on quantitative and systematic large scale text analysis.

1.3 Delimitations

Regarding the area of the Swedish sports movement that is studied, this thesis focuses solely on the sport of ice hockey. The main arguments for such a delimitation are:

- The number of concussions in Swedish elite ice hockey increased significantly between the 1984/85 and 2012/13 seasons (Pauelsen et al., 2017).
- The concussion statistics, number of active athletes and the level of interest from the public make ice hockey a highly appropriate choice (se Daneshvar et al., 2011; Swedish Sports Confederation, 2016).

From an international perspective, this limitation could be questioned because the problem is relevant to several sports; and narrowing it down to ice hockey may result in missing other factors. As previously mentioned, the negative discourse related to sports and head injuries started with American football and has, at least internationally, largely been dominated this sport.

Indeed, no spectacular "game changer" similar to *League of Denial* (Fainaru-Wada & Fainaru, 2013) exists in for ice hockey. From May to August 2011, however, the NHL came under another kind of pressure due to negative publicity. This followed the deaths of three players, two active and one recently retired (two by suicide, one due to combining alcohol and strong analgesics), within just those few months. All three had a reputation as "enforcers", a traditional role in ice hockey that involves hard physical play and even, in many cases, fist fighting. This role does not exist in the same way in Swedish ice hockey, but the place of fighting in the game is and has been a debated issue in Sweden (e.g. Wernerholm, 2004). Despite this, the increasing risk of head trauma associated with ice hockey, as well as the fact that American football is a rather marginal sport in Sweden due to the low number of active athletes, justifies this delimitation. The disadvantage is, of course, that much of the information and previous research that exists in the field of head trauma in contact sports concerns American football, which means that a number of such references will be cited in the thesis. This may generate certain issues regarding its overall relevance, but as long as such information is used correctly, which in this context means that it is used primarily as background information related to the overall research problem, this should not constitute a significant problem.

This thesis focuses on the macro-level, in terms of the method, the theoretical framework and research problem. Hence, the individuals who participate in relevant sports are not the main subject of interest, other than in some aspects covered by the sections on previous research. While this could result in issues regarding the perspectives covered in the thesis, participant perspectives have already largely been mapped in previous studies (see 3.1.3). It would, of course, be interesting to see more studies of this kind, specifically in the Swedish context. However, such aspects are more appropriate for a study with a qualitative basis.

Regarding the injuries and their consequences, the absolute focus will be on those related to head trauma. In several cases, the main hypotheses for studies of risk regulation regimes presented by Hood et al. (2001) (for further description, see 4.2) include factors that relate to the difficulties

associated with the risk victim's ability to stay informed about the nature of the risk, in some cases expressed in terms of costs. As regards the injuries, those related to the brain are problematic for several reasons. This is, to some extent, made evident by how limited the public's existing knowledge is when it comes to such injuries (McKinlay, Bishop, & McLellan, 2011), but also because medical knowledge is still in the early stages of mapping the relationship between sports and brain damage (Tator, 2014). The latter is mainly challenging due to problems with determining causal relationships, due to the current impossibility of diagnosing CTE in living individuals, for example. As medical research in the area progresses, the issue will likely gain traction. From a risk theoretic perspective, head injuries are an attractive research subject because their effects, in many respects, are hidden; this creates increased complexity regarding risk communication (Lyytimäki, Assmuth, & Hildén, 2011). Because the long-term effects from impacts to the head are not visible in the same way as broken bones, for example, understanding relates to the rather complicated area of neurology. With this in mind, the perception of the current risk is reasonably linked to what Slovic (1987) calls unknown risks. While his reasoning is undoubtedly based on more of a macro perspective, the issue of risk perception is highly relevant.

As previously mentioned, there may be some reasons to include information about sports other than ice hockey (e.g., in relation to previous research). That said, the thesis does not, apart from some parts in the section on previous research about medical factors, cover risks in sports such as boxing, mixed martial arts (MMA) and various types of extreme sports. These could certainly be included on the basis of a purely risk-related perspective, since the risk of significant injuries in these sports is relatively well-documented (e.g. Hutchison, Lawrence, Cusimano, & Schweizer, 2014; Sharma, Rango, Connaughton, Lombardo, & Sabesan, 2015; Shin et al., 2014). However, the main reason for this exclusion is that such sports, from a societal perspective, can be placed in a different category in terms of public opinion. For example, professional boxing was prohibited in Sweden between 1969 and 2007 (Swedish Boxing Federation, 2017). In the political bill that led to a repealed ban, the right to self-determination as regards risk assessment was given

substantial space (Motion 2005/06:Kr237, 2005). However, this does not mean that participation in such sports is explicitly encouraged or sanctioned from any governmental level – at least not on the same magnitude as ice hockey. Other factors that speak for this delimitation include the quite limited number of athletes, compared to ice hockey (see Swedish Sports Confederation, 2016). Additionally, boxing and MMA differ from other contact sports in that substantial hits against the head occurs according to the rules, so they cannot be considered accidental in the same way as the equivalent situations in ice hockey and similar sports. In such a context, the occurrence of head injuries can still be characterized as a risk, but not in the same way as for ice hockey.

Finally, the gender perspective needs to be addressed through delimitation. The Swedish ice hockey community is male-dominated, which applies active athletes (Swedish Sports Confederation, 2016) and general association memberships (Centrum för idrottsforskning, 2022). There should thus be an opening for discussion about social structures related to gender in any sociological study that involves ice hockey. Additionally, there should be interesting research gaps to fill, regarding how a heavily gendered environment could affect the regulation of risk in general, as well as attitudes toward injury on an individual level. However, such an approach would probably demand a total focus on these perspectives if it were to be relevant, so combining these with the other theoretical ambitions of this thesis is not feasible. Therefore, gender perspectives are not an essential element of this thesis in a theoretical sense.

For reference, the issue of risks in male-dominated working environments in general has been covered in various studies. Examples include mining (Fitzpatrick, 1980), fish harvesting (N. G. Power, 2008) and firefighting (Perrott, 2019).

When it comes to the empirical material, no distinction has been made in the sampling processes when it comes to gender or similar (see 6.1.1, 7.1.1 and 8.1.1). Thus, the material as such should also be considered gender neutral.

1.4 Current research possibilities and intended contribution

While research on the increasing number of head injuries in sports in general, specifically CTE, has increased significantly over the past decade, the prevalence of studies within the social sciences related to the phenomenon remains modest. In Sweden's case, the unique character of its popular movements, among which the sports movement is considered important (SOU 2000:1), means that applying any international research about the field in this context may be complicated. Indeed, such attempts will consequently be open to arguments about knowledge gaps, even in the hypothetical case of almost identical research in another national context. The claim that related research has not been done previously should, of course, always be considered with reasonable skepticism in most research fields in the social sciences. However, in a field that concerns a relatively recently discovered medical problem, one still at an early stage of research, the rare possibility to present an issue that can make this claim feasible arises. This should, at least, partially be the case here.

In terms of theory, Hood et al. (2001, pp. 172-173) emphasize that further studies related to specific risk regimes are necessary for the concept's development, which in itself should motivate individual studies of this kind. It should thus be possible to contribute to this theoretical concept by doing so. From a perspective more specifically linked to risk research, it can also be noted that research related to the concept of risk regulation regimes according to the principles of Hood et al. (2001) is relatively limited in Sweden.

Additionally, this thesis aims to apply the theoretical concept of *organizational legitimacy* in a way that has not been done explicitly in previous studies of risk regulation regimes. Given that it works well, this merging of risk regulation regimes and organizational legitimacy could potentially help to widen the concept of risk regulation regimes, perhaps

making it suitable for numerous risks that may appear irrelevant in relation to its current form.

While the potential contributions mentioned above can be considered important for the field in themselves, they may also be deemed quite broad as none of them perhaps achieve the required level of uniqueness. What should be quite unique in this case, however, is the way these contributions are achieved methodologically. An in-depth discussion of what these methods are and their unique character in terms of the kind of information they are able to obtain is provided in section 5, as well as in the method section for each empirical study. In short, however, the risk regulation regime being studied is assessed using corpus linguistics, more specifically *corpus-assisted discourse analysis (CADS)*. This is a collection of methods that are suitable for obtaining linguistic patterns and latent content from large amounts of text in a way that is impossible using more traditional methods (Baker, 2006). While studies of this kind have been published in the general field of risk (e.g. Boholm, 2012; Hamilton et al., 2007; Zinn, 2018), the specific concept of risk regulation regimes is yet to undergo such analysis. This is despite the basic features of such regimes being quite abstract, in the sense that they do not exist on paper or similar (see 2.3), which should make them especially appropriate for an analysis that focuses on large amounts of latent content. The analytical application in this study, means that the presumed good fit of such methods for analyzing a given risk regulation regime can be highlighted to further benefit the research field.

To summarize, by using field-unique corpus-based methods, this thesis should be able to contribute to:

- Introducing this issue in the social sciences (currently at an early stage).
- Furthering our understanding of why the regulation of head injuries in Swedish ice hockey is currently as it is.
- Overall theoretical development associated with risk regulation regimes as a concept, where its devisers emphasize studies of this kind.

- Introducing organizational legitimacy as a complement to further expansion of the theoretical concept of risk regulation regimes, in the sense that it allows problems beyond a lack of regulation to be covered.

Each of these points are made possible by applying quantitative text analysis that focuses on latent content, mainly corpus-based methods. This is probably unique and will hopefully contribute to the development of how risk regulation regimes are studied.

Aside from any theoretical and methodological advantages, the research problem also opens up for a discussion about the policy implications of the results.

1.5 Discussion of the research problem

Medical/epidemiological research about CTE and other long-term health issues related to head trauma is still at a relatively early stage, which understandably creates some uncertainty about the overall situation for all research in which this disease is an important factor. Significant progress will probably have been made over the five years of work on this thesis, which may also impact its contents' relevance. One medical breakthrough with the potential to rapidly increase the understanding of causal effects, as well as the general scientific understanding of CTE, is the promising results in diagnosing the disease in living people (see Almond, 2017). The consequences of this from a social science perspective are, for various reasons, difficult to predict. However, under no circumstances would it be appropriate for all research in the social sciences on this issue to simply be put on hold for whatever time it may take for medical science. One possible outcome of any possible tests could be that ice hockey turns out to have little or no significance for the likelihood of developing CTE. While the development of this knowledge would certainly mean that most delimitations within this thesis are open to criticism, the problem of head injuries is not only associated with CTE. For example, the prevalence of post-concussion syndrome among athletes is well documented (as previously described under 1.0). This condition is in itself serious enough to question

the legitimacy of exposing athletes to the current risk (e.g. Hutchison et al., 2014; Sharma et al., 2015; Shin et al., 2014). Interestingly enough, Beck (1992, p. 63) actually emphasizes how, in some respects, studies of risk are poorly adapted to the need for proven causality. Once again, Beck's point certainly considers global and macro-sociological risks rather than ones more directly relevant to this thesis. In this case, his thoughts concern the difficulty of empirically linking grassroot problems, such as a disease affecting a particular individual, to polluting factories, for example. Although the proposed problem of this thesis, again, differs from Beck as regards the extent of the risk and the relevant societal level, only a simple deduction is required to apply similar issues regarding causality requirements in this context. Even though the co-variation between ice hockey and CTE or other long-term effects has shown some progress during work on this thesis, the clarification of causality associated with all potential confounding variables is still far ahead in time. In fact, it may never be fully clarified.

1.6 Format of the thesis

The thesis is written as a monograph, using three empirical studies as the basis for further theoretical analysis and subsequent conclusions. The analysis of the results has been conducted in two steps. First, each study focuses entirely on the implications of the specific results of that case. Second, a coherent analysis focuses on the overall results from the three studies.

While the concept of *risk regulation regimes* mainly serves as a theoretical framework, its applied function and relevance for the problem means that it recurs in several parts of the thesis, including the background, previous research and method.

2 Background

This section starts broadly, by briefly introducing the role of sports in society in general and the sociological relevance of sports. Further on, it moves closer to the thesis' specific research problem by introducing descriptive

information related to the regime, centered mainly on actors deemed central to have some knowledge about in relation to the same.

2.1 Sport as a societal actor

At first glance, sporting activities, regardless of whether they take place as non-organized exercise or professional training, appear to be rather uncomplicated phenomena, primarily affecting individuals who engage in them in some way. Athletes and the organizations associated with them do, however, fulfill social functions that, in many respects, go beyond the sport itself. Involvement in sport-related organizations has been proven to lead to increased interpersonal trust at a society level (K. M. Brown, Hoye, & Nicholson, 2014), as well as general participation in community activities (Perks, 2007) and social cohesion (Hoye, Nicholson, & Brown, 2015). These facts considered, public efforts to promote such organizations may be reasonable, which makes agents such as the state and municipalities relevant. As an example of how the social significance of sport is recognized and premiered from a political point of view, in addition to the above quoted SOU 2000:1, the Swedish Government's budget proposition from 2017 can be mentioned. It stated that a total of SEK 34 million will be invested in sports, using an integration-promoting perspective (Swedish Government, 2017b).

From an international perspective, Swedish sports associations retain much of the character of a popular movement/civil society movement (Peterson, 2003). Activities are still primarily based on the existence of voluntary and non-profit work (Ringuet-Riot, Cuskelly, Auld, & Zakus, 2013), which should reinforce the need to emphasize its positive social impact. In Sweden, just over one-fifth of all organized non-profit involvement occurs in sports organizations (Svedberg, von Essen, & Jegermalm, 2010). Beside labor unions, these are also the non-profit associations that gather the most members (Vogel, Amnå, Munch, & Häll, 2003). Breaking the numbers down into active membership, the sports movement surpasses even the trades unions (Vogel et al., 2003), further emphasizing the social function of these organizations. Since such functions move from being essentially described as

unequivocally positive to a significant assumption of risk, a need for a more critical analysis arises. The risk area as such is a well-founded sociological concept, to the extent that most phenomena that can be associated with it should be of interest (e.g. Beck, Giddens, & Lash, 1994).

Generally, participation in sports has a discursively solid positive position in society, despite the fact that data supporting this are, in many cases, anecdotal or otherwise questionable (Coakley, 2011).

2.2 The sociological relevance of sports

Even though many sociologists, some of canonical status, have explicitly mentioned sports as relevant to the discipline, Bourdieu (1988) provides what could probably be considered the best sociological starting point for examining sport. According to Bourdieu, the processes that relate to the concept of the division of labor, as defined by Durkheim (2014), also apply to the groups involved in sports. Bourdieu emphasizes the importance of not studying individual sports without taking a holistic approach to sports as a social phenomenon:

“In order to be able to constitute a sociology of sport, one must first realize that a particular sport cannot be analyzed independently of the totality of sporting practices; one must conceptualize the space of sporting practices as a system within which each element receives its distinctive value. In other words, to understand a sport, whatever it may be, one must locate its position in the space of sports.” (Bourdieu, 1988, p. 1)

Thus, with the above quotation as a starting point, a specific sport, in this case ice hockey, should always be studied based on an overall structural context that considers other sports within a society and, in turn, the structures between them. In Sweden’s case, any sociological analysis of ice hockey would specifically depend on the dynamics of the sports movement in general and bilateral relationships within its domains, as well as the surrounding community. At a descriptive level, statistics from Swedish Sports Confederation (2016) and similar documents should therefore be

included in more sociological theorizations regarding the nature of the sport. This is because they make evident the relationship between different sports, at least in descriptive terms. Consequently, as an understanding of such dynamics is built, highlighting studies about different social factors within each sport should be relevant (e.g. Sarna, Sahi, Koskenvuo, & Kaprio, 1993; Wankel & Kreisel, 1985; Wilson, 2002).

Among the more prominent sociological theorists associated with sport, Elias & Dunning (2008) should be mentioned, due to the number of citations and their excellent ability to illustrate the relevance of sports for anyone trying to understand broader social structures. The idea they argue for, based on the notion of a *civilizing process* (see Elias & Jephcott, 1982) is essentially that sports have shown a similar development to general social processes in terms of history. As a basic premise, they state that general developments, as regards codes of conduct and similar, correspond to a similar process within sports (Elias & Dunning, 2008, pp. 5-6). The description of sports, such as wrestling and boxing, where the development of more systematic rule frameworks makes rampant violence obscure or inadequate (Elias & Dunning, 2008, pp. 116-118), is fairly accurate as regards the analogy between a specific societal phenomenon, such as sports, and society in general. For example, it becomes apparent how these macro and micro processes interact through the title of the work – *the Quest for Excitement*. The basic assumption seems to be that *excitement*, in the context of the social world, is something that has become increasingly harder to achieve, due to the ongoing *civilizing process* mentioned above. However, due to types of activity that include sports, it may still be achievable, to some extent (Elias & Dunning, 2008, p. 45).

Sport, however, is not merely described as a specific example among many societal phenomena that show this kind of parallel to general societal development. On the contrary, the authors emphasize how not many such phenomena would endure that kind of change and come out of it, in an altered manner that remains true to its roots (Elias & Dunning, 2008, p. 137). They even go as far as describing the transformation of sport from its

original form to something that could even be considered an institution (Elias & Dunning, 2008, pp. 203-204).

2.3 Descriptive aspects of risk regulation regimes

Although the main discussion of risk regulation regimes is found in the theory section, under 4.2, additional information is crucial for understanding the relevance of the background information presented under 2.4.1. Hence, this section deals with some aspects of the concept that are arguably more on the descriptive side.

Although Hood et al. (2001) emphasize that risk regulation regimes as concepts are difficult to define and characterize, they present a number of basic assumptions that characterize of such regimes. Firstly, these are considered to be *systems*, as opposed to individual or disconnected entities. As a result, all levels are of interest, from the more grassroots-oriented actors to those who make actual decisions (Hood et al., 2001, p. 9). Secondly, risk regulation regimes are also expected, at least to some extent, to have *continuity over time*. This in no way means that they are static in their nature, since adjustments of policies and the like are a natural part of a regime's actual function. However, such adjustments should not be confused with a scenario in which the total concept or system that a risk regulation regime constitutes is replaced by a new regime each time any adjustment or change occurs, although one regime is sometimes replaced by another (Hood et al., 2001, pp. 9-10). Thirdly, risk regulation regimes are to some extent characterized by a *boundary* between individual regimes as systems. Several risk regulation regimes may be simultaneously involved in the regulation of risks within the framework of a particular social function or similar, but these can also be considered as a comprehensive risk regime in its entirety. Therefore, when the concept is applied in an analytical or explanatory sense, it is important to specify exactly what regime is being studied, due to the basic assumption of delimitation (Hood et al., 2001, p. 10). This is achieved by the description of relevant actors, under 2.4. However, all such information comes with the reservation that additional actors of interest may

be derived from the results of the empirical material, if they become apparent.

While all three assumptions mentioned above have consequences for this thesis, the assumption of persistence is of particular interest in respect to the nature of the problem being assessed. This is because the specific risk regulation regime being studied is likely, in different ways, to be exposed to pressure from rapidly growing knowledge about the long-term health effects of head trauma.

2.4 The specific risk regulation regime

This section presents background information of relevance for the content of the risk-regulation regime studied in this thesis, based on that specified in the aim and questions, and related issues. The main components of such a regime are explained in more detail under 4.2.1. At this point, the regime mapping is mainly descriptive due to its place in the research process. Once it is merged with the conclusions of the associated empirical studies, knowledge gains are expected.

2.4.1 Regulations regarding head trauma in ice hockey

The Swedish Ice Hockey Association's disciplinary committee, whose rules and procedures can be found in the document *Arbetsordning för disciplinnämnden* (Swedish Ice Hockey Association, 2018a), is responsible for the internal review of matters linked to players' actions during games. Disciplinary action conducted by the association is delegated to the disciplinary board on behalf of the central board. This, in turn, is based on the national sports association's guidelines (Swedish Sports Confederation, 2017), as follows:

"Punishment may be assessed (...) the person who, within organized sporting activities, engages in damage of property, assault, threats against another person or in other ways seriously offends someone."
(Swedish Sports Confederation, 2017, p. 28) (author's translation)

The presence of such a disciplinary committee, as specified in its mission statement, implies that the types of offenses that are ordinarily managed by the state's legal system are generally handled within the framework of the organization. However, there are a few exceptional cases in which offenses on the ice did lead to prosecution and court rulings, despite a separate review by this committee. One recent example is the court case against a player, following a crosscheck (illegal check with the stick) that aimed at the neck of an opposing player. Following an appeal of the District Court's ruling in 2017, which issued a criminal order of 40 daily fines of SEK 650 and a conditional verdict (Malmö tingsrätt, Målnummer: B 1177-16), the verdict was later upheld by the Court of Appeal without change (Tidningarnas telegrambyå - TT, 2017). The verdict was appealed to the Swedish Supreme Court, which confirmed the ruling (Högsta domstolen, Målnummer: B 4888-17). Without going beyond the appropriate level of legal technicalities, the legal principle that allows the exercise of contact sports is called *social adekvans* (social adequacy) (Svensson, 2016). This principle allows for certain types of organized activities to work through an internal setting of rules, that may render otherwise illegal actions acceptable. Without such a principle, every single body check that takes place in ice hockey would be unlawful when put in the context of ordinary society. Svensson (2016) explicitly mentions sports as the kind of setting where consent for such activities is acknowledged through the legal system. This principle considered, it is in no way surprising that the verdict mentioned above explicitly mentions this legal principle, as well as arguments regarding what an ice hockey player may be assumed to agree to through their participation in a hockey match. The following statement regarding a previous decision by the Hockey Association's disciplinary committee should also be of great interest as regards risk regulation:

"The usual punishment for a similar case of assault is a conditional verdict and community service. However, in the case of [player name], two circumstances are particularly important in determining the penalty. (...) Secondly, [player name] has already been sentenced through a disciplinary ruling by the Swedish Ice Hockey Association's disciplinary committee on March 7, 2015 where he was suspended for

*ten games (four of these games were converted to a fine of SEK 12,000).
(Malmö tingsrätt, Målnummer: B 1177-16) (author's translation)*

It is difficult to interpret such an acknowledgment other than that the Swedish penal system assigns legitimacy to the work of the disciplinary committee. Additionally, the explicit mentioning of risk-taking in association with the legal principle of social adequacy should be considered particularly interesting.

*"Sporting consent, however, is considered to extend slightly beyond the physical engagements that fall within the rules of the current sport, in this case the rules of ice hockey. Consent is considered to extend even to those admittedly illegal according to the ice hockey rules, but do not contradict the game's idea. The permitted act is further considered, in accordance with the teaching of social adequacy, as referring to such acts as considering the rules and ideas of the game, to be considered as permitted risk takings " (Malmö tingsrätt, Målnummer: B 1177-16)
(author's translation)*

The legal principle of social adequacy thus appears to be applicable in the exercise of ice hockey, both in terms of the risks involved and the possible violations of law that the game would involve from a strictly legal interpretation. A verdict of this kind is therefore largely about what can be assumed to be within the boundaries of what an active player has or has not agreed to, which does not seem to be limited to what is specified by the sport's rulebook. In this case, the legal outcome stated that this limit had been exceeded, which has been criticized because similar or worse situations have previously been addressed without interference by the legal system (e.g. Lindström, 2017; Renberg, 2017; Wennerholm, 2017). Malcolm (2021) argues that the *concussion crisis* in sports may very well be the issue that, in the long run, makes self-governance of the sporting community impossible.

2.4.2 Non-violence-related regulation of head trauma

Contrary to what is discussed under 2.4.1, injuries during ice hockey games may also occur in ways that do not involve rule violations or deliberate

violence. The game itself, which is played at high speeds with a substantial amount of physical contact, is naturally associated with risk. A clear example of this is that 15% of the reported concussions covered by Pauelsen et al. (2017) occurred during regular practice.

For practical reasons, many of the documents cited in this section include both accidental injuries and those caused by deliberate violence. However, the information included is considered relevant due to the perceived purpose of its existence. For example, the report cited below includes all injuries regardless of whether they were accidental or not. The arguments made in the document in relation to injury prevention, however, do make it clear that deliberate violence is not the main reason that is considered.

From a general perspective on injuries in organized sports, around 112,000 Swedes are injured annually during participation in such activities, including in the school system (Myndigheten för samhällsskydd och beredskap & Statens folkhälsoinstitut, 2010). 9,200 of these injuries occur in ice hockey, with 7% of these being concussions (Myndigheten för samhällsskydd och beredskap & Statens folkhälsoinstitut, 2010). The cited report, jointly published by the Swedish Civil Contingencies Agency as well as the Public Health Agency of Sweden, gives some hints as to how injuries within sports are perceived by governmental authorities in terms of the actors involved in associated regulatory action:

“In order to promote physical activity and at the same time prevent injuries, a cross-sectional approach with many actors involved is sufficient. This should obviously include the athletes themselves, as well as non-profit organizations (including the sports movement), local municipalities, county councils and even the state.” (Myndigheten för samhällsskydd och beredskap & Statens folkhälsoinstitut, 2010, p. 74) (author’s translation)

This could be perceived as an acknowledgement of the present discrepancy, which is that sports generally have positive health effects, but that they have a downside in the sense that there is a risk of injury. The mere existence of such a public report clearly shows that there is indeed a downside to such

activities. With the continuous promotion of these activities taking place, for example through public resources used to build ice hockey rinks, the initial implicit interpretation of the individual citizen may well be that this discrepancy has in some way been ruled as favoring the activity.

Additionally, the report explicitly mentions ice hockey as particularly risky in terms of a ratio based on the number of injuries in relation to the number of active athletes, along with alpine skiing and motorsports (Myndigheten för samhällsskydd och beredskap & Statens folkhälsoinstitut, 2010).

2.4.3 Organizations of interest

While the organizations involved in the risk regulation regime being studied will not be adequately mapped until after the associated empirical studies, there should still be good reason to describe those that are obviously associated with the activity, in this case ice hockey, that is subject to eventual regulation. After an initial description of these actors, there is a sub-section about the kind of public information the organizations provide regarding head injuries.

First and foremost, the *Swedish Ice Hockey Association* plays a prominent role in relation to the sport in general, as well as any questions about such activities. To understand its position within Swedish civil society, it is important to mention the *Swedish Sports Confederation*, to which the Ice Hockey Association is affiliated.

The organizational relationship between the two is briefly illustrated in Figure 2.

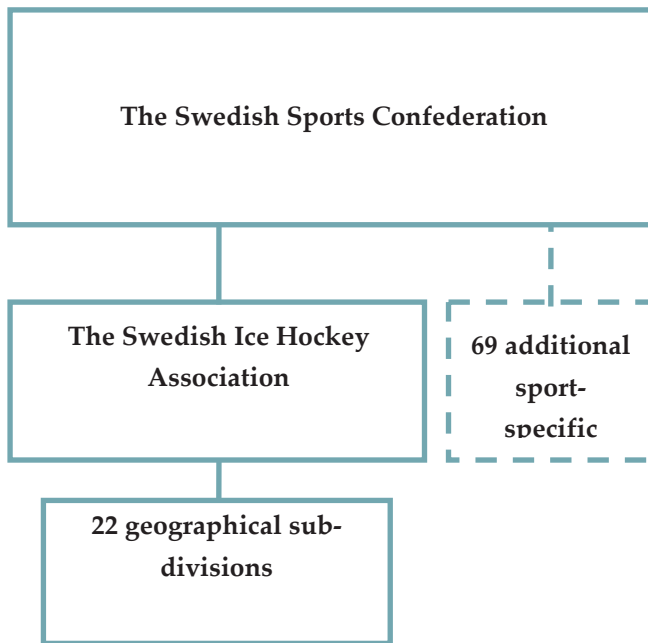


Figure 2. The basic organizational structure of Swedish ice hockey within the sports movement. Information obtained from Swedish Ice Hockey Association (2018c).

Now the overall picture of the Ice Hockey Association's place within the organized sports movement of Sweden has been established, a more detailed description of the association itself is presented in Figure 3.

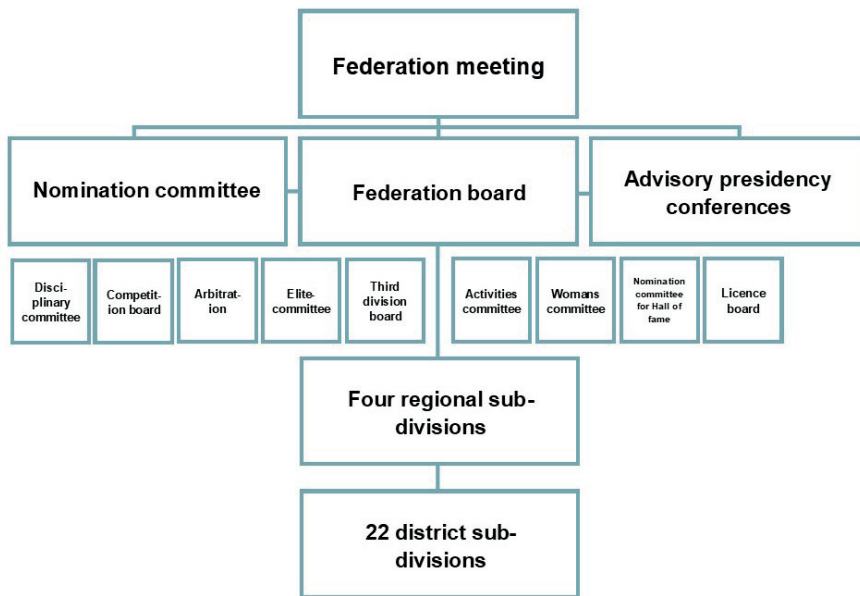


Figure 3. Detailed organizational structure of the Swedish Ice Hockey Association. Information obtained from Swedish Ice Hockey Association (2018c).

Additionally, the facts below should contribute to an overall understanding of the association in terms of its extent and possible societal impact:

- The association has 399 attached clubs
- Within the clubs, there are totally 2,246
- The number of players and referees within the association total about 90,000, of which 70,400 are approved by official license.
- These 70,400 can be broken down into the following categories:
 - 14,142 senior players
 - 42,081 junior players
 - 2,173 veteran players
 - 5,438 referees
 - 5,321 men
 - 117 women
- The number of indoor rinks is 357, with 136 outdoor rinks.

(Swedish Ice Hockey Association, 2018b)

In some cases, ice hockey clubs are organized as joint-stock companies, more commonly so at elite level. However, the *51 %-regeln* (the 51% rule) states that club members must hold at least 51% of the votes (Swedish Sports Confederation, 2017). Hence, unlike many other leagues and countries, individuals or businesses cannot acquire majority ownership of any club, even at the top level.

For individual hockey clubs, there is reason to problematize their nature as organizational entities in relation to the research problem. More specifically, this involves the double nature of certain hockey clubs as both being voluntary organizations and employers, although only a fraction of the licensed players in the Swedish ice hockey are committed to their team through a contract that could be considered to make them an employee. The top league in Swedish men's ice hockey, *SHL*, consists of 14 teams (see Swedish Hockey League, 2022), as does the second tier, *Hockeyallsvenskan* (see Hockeyallsvenskan, 2022). These are the only two leagues in Sweden in which the player rosters are dominated by full-time professionals, although players in the third tier, *Hockeyettan*, do include a smaller number (see Hockeyettan, 2022). By sheer numbers, ice hockey clubs are accordingly mainly to be viewed as voluntary organizations that are part of the civil movement, and their responsibility towards players in their organizations should be perceived accordingly. However, when studying a sport such as ice hockey through media monitoring, as is the case in parts of the empirical material (see 6.1.1), there is a good reason to presume that a large part of this coverage concerns the professional part of the sport (more specifically the top tiers). Hence, this double nature should have some relevance and needs to be addressed in relation to the thesis' research problem.

Once an employment relationship is presumed between an individual player and an ice hockey club, the question of liability regarding head injuries entirely changes, since responsibility towards an employee is extensively regulated in Swedish labor law (3 kap. 2a §, 2022 ,Arbetsmiljölagen). With that in mind, any increase in head injuries in the game and subsequent discussion about the appropriateness of public financing for activities such as ice hockey might be accompanied by

questions about whether the clubs, as employers, should mitigate these risks.

With the Ice Hockey Association as the obvious main actor, some other organizations that may be of interest to the research problem are briefly described below.

The Swedish Ice Hockey Players Union – Sico. Founded in 1977, the organization is one of the negotiating parties (*Unionen* being the other one) responsible for the collective bargaining agreement that regulates the contractual terms for elite ice hockey players in Sweden (SICO, 2018c). While it is plausible to consider SICO as the main and coherent voice representing many ice hockey players, the association is limited to elite players only. In this case, elite means players who are active on at least the second level (*hockeyallsvenskan*) of the Swedish competition system. Accordingly, any statement made by the union should primarily be considered to be on behalf of elite players rather than Swedish ice hockey players in general.

As regards the medical aspects, **the association for Swedish doctors working with ice hockey players** (organized through the main Ice Hockey Association), is arguably the most substantial actor. With the association's web page existing only in archived versions, any information is quite inaccessible at the time of writing. However, the organization's statutes from February 12, 2000 specify the following criteria:

“The Swedish ice hockey doctors’ association consists of licensed medical doctors and dentists in Sweden who have an interest in medical issues relating to the game of ice hockey” (Svenska ishockeyläkarförbundet, 2000) (author’s translation).

Swedish municipalities, of which there are 290, are the main geographical administrative and political units in the country and make decisions at a local level. They employ over 760,000 people, making them a substantial actor on the national labor market. Political roles, approximately 46,000 positions in total, are appointed through elections held every four years. This coincides with the elections of the national government, as well as the

county councils (Swedish Municipalities and Regions, 2018b). Municipal legal and contractual responsibilities include, but are not limited to, schools, pre-schools, care of the elderly and disabled, infrastructure and public transport. Additionally, municipalities may, on a voluntary basis, engage in other commitments such as housing, culture services and leisure activities (Swedish Municipalities and Regions, 2018a).

In relation to the risk regulation regime specified in this study, the commitment to leisure activities is naturally the main area of interest. When it comes to the roughly 300 indoor ice rinks in Sweden, municipalities dominate their ownership, with only a few exceptions (Swedish Municipalities and Regions, 2014). Consequently, it can be assumed that the Swedish municipalities are essential to organized ice hockey in Sweden.

2.4.4 Publicly available information on risks related to head trauma

Regarding the Swedish Ice Hockey Association, it is difficult to find any structured and/or coherent information on head trauma policies on the organization's website, with some exceptions. One is a recently published chronicle by the organization's president, which addresses the issue at a quite personal level, referring to a recent letter from a parent who wonders whether or not her children should be allowed to play ice hockey due to the risks related to violence to the head from fighting and body checks (A. Larsson, 2018).

The players' association, SICO, provides some accessible information on the subject. On the organization's website, a section titled *Concussions and mental health* very briefly (95 words) addresses problems related to head injuries. Additionally, the section provides contact information for players who need a sports psychologist (SICO, 2018b). Furthermore, the organization highlights a campaign called *Athletes' Minds*, promoting an active cooperation on research for *Hjärnfonden* (direct translation: the Swedish Brain Foundation) that intends to advance knowledge about concussions in the game and their potential effect on players, together with general medical

information for players (SICO, 2018a). In the latter section, the problem of pressure upon players is acknowledged:

“Nowadays, concussions constitute one of the most common injuries among elite level hockey players. Most people are now aware that concussions may have serious consequences. Many of us know someone affected, but supplying a diagnosis or seeing how this person feels or is affected is hard. A considerable lack of knowledge and a great deal of pressure upon the players are two factors. This pressure from others, in addition to the personal wish to perform and be ready to play as quickly as possible after a severe head hit, increases the risk of long-term effects.” (SICO, 2018a) (author’s translation)

None of the claims quoted above are backed through citations or other relevant references to contemporary science. The same goes for some purely medical information supplied in the section, for example:

“Single concussions are not as severe as repeated trauma to the head. Multiple concussions might render the brain vulnerable, resulting in a situation where even minor impacts may result in severe consequences.” (SICO, 2018a) (author’s translation)

This information should mainly be considered from an elite player perspective.

2.4.5 Sub-regimes?

Although not extensively, Hood et al. (2001) do occasionally discuss the possibility of sub-regimes when it comes to risk regulation. For example, they mention the regime related to fighting dogs, where specific sets of regulatory principles may apply to guard dogs and other niched cases (Hood et al., 2001, p. 40). When it comes to the regulation regime associated with Swedish ice hockey, there are possible sub-regimes that need to be reflected upon. A potential one is found under 2.4.3, more specifically in the double nature of hockey associations, in the sense that they come in the shape of voluntary organizations as well as employers. Indeed, an employment relationship will formally set a different standard for ice

hockey clubs when it comes to the potential risk of injury in an activity, opening up for a discussion of whether or not to consider this side of the regulation in the context of a sub-regime.

However, this information is arguably not enough to make such presuppositions, in the sense that the regime can be perceived as having any obvious sub-regimes. For one, the presence of employment contracts with individual players does not mean that they are protected from extensive injury risk. Hence, the regulation of head injuries in ice hockey will essentially be viewed in the context of one risk regulation regime.

2.5 Other perspectives on risk regulation and governance

While this thesis mainly emphasizes the concept of risk regulation regimes as defined by Hood et al. (2001), there are other perspectives related to regulation that are relevant to mention.

Hutter (2006, pp. 202-221) discerns a number of distinct trends in relation to research in the field and the results of current studies. First, one closely related to the theoretical framework of this thesis is focused on explaining variations. There is a great deal of focus on Hood et al. (2001) regarding this aspect. Second, the perspective concerning public debate on risk and its effect on public trust and participation, as regards regulation. For results related to this trend, Hutter (2006, pp. 212-214) emphasizes the process of *democratization*, where risk regulation tends to happen through the public demand for responsibility in relation to relevant actors. Hutter mentions accountability and openness as important factors in such a process, mainly relevant to governmental bodies. Third, a business-related perspective focusing on the organizational handling of public regulation, largely from a seemingly bilateral relationship. Once again, Hood et al. (2001) is cited, this time in relation to the position of organizations in a regulatory regime. Further, Hutter (2006, pp. 212-214) dedicates a great deal of attention to internal organizational systems related to everyday life, including some

perspectives on potential tension as a result of such systems. Fourth, Hutter (2006) directs some attention towards the regulatory related issues of cross-border risks and the decreasing relevance of the national state and associated governmental structures when it comes to such issues.

Using the medical profession as a background, Lloyd-Bostock & Hutter (2008) further advance the acknowledgement of the inherent complexity associated with risk regulation, by highlighting increasing pressures for regulating actors to adopt risk-based approaches, as well as the complexity and non-neutrality of risk information.

For risk regulation regimes in particular, Hutter (2008) has also focused greatly on organizations and their response to such regimes. More specifically, she argues that organizations, in addition to responding to a given regime, may create risk regulation regimes of their own (Hutter, 2008, p. 2).

Additionally, Hutter & Power (2005) describe the conceptual hardships that manifest when large organizations are to be considered actors in an entity such as a given regime, mostly due to the internal complexity associated with such actors. This complexity is, among other factors, described by (Hutter, 2005) as being due to the different understanding of risks that may arise depending on the differing position of any given individual in an organization.

Rothstein, Huber, & Gaskell (2006) introduce the theory of *risk colonization*. This process relies on a distinction between two categories of risk. First, *societal risks*, which is a term that could be used for any risk that is a threat to a given society and its members. Second, *institutional risks*, that specifically refer to risks that are a threat to the organizations involved in the regulation of societal risks, including threats to the legitimacy of any means used in the process (Rothstein et al., 2006, pp. 92-93). The phenomenon of *risk colonization* manifests through the reflexivity present when a governing or regulating actor is subjected to increasing demands when it comes to handling institutional risks, a process that might be self-reinforcing if discrepancies in the handling of societal and institutional risks result in

further actions. Hence, governance as a whole might be increasingly defined by risk (Rothstein et al., 2006, p. 93). Rothstein (2006, pp. 216-218) further clarifies, using a number of examples, that such colonization is not driven by a quantitative increase of actual threats in society. Rather, the phenomenon arises when such threats are distributed in a new .

M. Power (2007) uses the term *organized uncertainty* to describe a perspective on risk regulation that focuses on analyzing the social and economic institutions involved in framing risk. The approach is built around the assumption of current ideas regarding *risk manageability*, which has spawned a number of frameworks for risk management that respond to a demand for risk governance (see M. Power, 2007, p. 6). It is of some interest in relation to the overall theoretical framework of this thesis, that perceptions among the public regarding risks are described as a potential risk in themselves, as the perception of legitimacy might be jeopardized by this process (M. Power, 2007, p. 21). This and other factors stemming from ideas of manageability and changes in public risk perception are described by M. Power (2007) as a driving force in a shift towards that expectation of *risk governance*, as opposed to the formerly more prominent idea of rationally based *risk analysis*. While also built around some inclinations towards rationality, *risk governance* revolves around notions of risk management processes rather than the measurability of the risk itself, as presumed by the described risk analysis perspective (M. Power, 2007, pp. 18-19). The presence of uncertainty is even described as an available “space”, in a free market sense, where there is room for organizations, private or public, to thrive by means of organizing (M. Power, 2007, pp. 30-31). Additionally, the intrinsic importance of risk as a category for further organization in this process is emphasized, further fulfilling the shift towards risk governance at the expense of risk analysis (M. Power, 2007, pp. 156-157).

In relation to risk regulation regimes and legitimacy, M. Power (2005, pp. 132-148) has also used the *chief risk officer* a prime point to explain how organizations respond to cultural and legislative pressures. These positions are described as “...*internal organizational representations of externally encountered norms and rules*” M. Power (2005, p. 137). This may seem like a

responsible move by an organization, but M. Power (2005, p. 138) suggests that the increasing number of such positions can actually work to strip other parts of the organization of responsibility, working through the process of what he calls *the politics of doing something*.

3 Previous research

This section initially deals with the topic of risk in relation to sports. This is covered broadly, in relation to risk in general, and more specifically, in relation to risk regulation and governance.

In many cases, despite the delimitation that made ice hockey the sport of choice, this section will include research relating to sports in general. This is because many studies that are relevant due to their overall argument or findings are based on empirical evidence from sports (sometimes ice hockey), whether or not that sport plays any role in the scientific argument being made in the study.

The second part deals with previous studies where the concept of risk regulation regimes is directly or indirectly used as an analytical tool. It will present general studies built around the concept, as well as a few that are more explicitly related to the thesis' research problem.

For legitimacy, there will be one sub-section covering studies where legitimacy is assigned importance in risk regulation or governance, as well as one that covers studies where legitimacy and sports are theoretically or empirically intertwined.

3.1 Sports and risk

This section covers the topic of risk and sport, as regards general studies, public awareness of head injury, the athlete's awareness, attitudes and risk perception, and the management of injury risk by sports associations.

3.1.1 General studies of risk in sports

Sociological or cultural studies of injury risk in sports, rather than the previously purely medical ones, mainly date back to the early 1990s, in

terms of a somewhat delineated field of study (e.g. Curry, 1993; Frey, 1991; Hughes & Coakley, 1991; Nixon, 1992; Young, 1993).

Examining what he calls *the social basis of risk, pain and injury* in relation to sports, Young (2019, pp. 101-105) states that the field of sociology overall seems to focus largely on the context, macro and micro, in which sports injuries occur. Thus, in sociological terms, injury and risk of these may be considered a result of the social phenomena of sport itself (Young, 2019, p. 102). This, combined with the lack of specified risk thresholds (see Fuller & Drawer, 2004) opens up a complex environment for anyone with the ambition to cover the field theoretically or empirically.

Additionally, whether risks in sports are discussed using class-based escapism, tokens of culture or otherwise arguably relevant broad sociological factors, studies appear to be largely be related to high-risk sports such as mountain climbing or skydiving (e.g. Fletcher, 2008). They thus generally focus on active risk taking through intrinsic value rather than risk as the potential downside of a decision to participate in a given activity. Although there have been some studies that contradict this premise (e.g. Brymer, 2010), the presence of inherently risky activities, such as extreme sports, seems logical in these contexts. There are, however, a number of exceptions in which mainstream team sports are significant (e.g. Forsdyke, Smith, Jones, & Gledhill, 2016; Malcom, 2006; Shrier, Charland, Mohtadi, Meeuwisse, & Matheson, 2010)

For CTE and head injuries, epidemiological studies dominate the field (e.g. Thurman, Branche, & Sniezek, 1998). Such research should primarily be of indirect interest in sociological contexts. However, for the social sciences in general there are a few noteworthy studies, despite the field's relative novelty. Ventresca (2019) analyzes the issue of CTE and focuses on the problems that different actors, such as journalists and athletes, seem to have in representing it as a social phenomenon. The scientific uncertainty plays a crucial role in his argument, especially when combined with the desire to present CTE as an urgent threat to public health on emotional grounds. As regards uncertainty, he largely emphasizes the impossibility of diagnosing

the disease in living people (Ventresca, 2019, pp. 140-141), something that is often contrasted with the dramatic stories in the media related to the fates of athletes or former athletes (Ventresca, 2019, pp. 141-143).

3.1.2 Knowledge among the public regarding head injuries in sport

Gouvier, Prestholdt, & Warner (1988) are often cited as regards the public's knowledge of concussions and their effects. Their study illustrated a significant gap between the facts and public belief on the matter. More recent studies (McKinlay et al., 2011; Mareen Weber & Edwards, 2012) indicate that the public's knowledge is quite limited, despite advances in neurology and medicine related to the field. However, there are few studies that focus on the public, especially concerning the knowledge and attitudes of the groups related to sport. Given the classification of concussions in sports and non-sports-related ones presented by Sojka (2011), this should not be a surprise.

For parents, there are a couple of studies covering their specific knowledge. Sullivan et al. (2009) concludes that parents of high school rugby players do seem to have some basic knowledge about concussion, including severity. They additionally state that parents are crucial in monitoring such injuries in the sport. For parents and children alike, the overall fear of injury has been deemed as associated with the overall tendency to engage in physical activity (Telford, Finch, Barnett, Abbott, & Salmon, 2012).

In relation to the media, which is considered a reliable source for public attitudes in this context (see Hood et al., 2001), a number of studies that draw empirically from related narratives have been published. McGannon, Cunningham, & Schinke (2013) aim to understand a specific socio-cultural context, namely by examining the media coverage of a specific ice hockey star's concussion problems. They conclude that there is a connection between the narratives and the physical risk, in the sense that the former raises awareness of the latter.

3.1.3 Injury awareness, attitudes and risk perception among athletes

Including the practitioners as a group in this section may appear quite contradictory, due to the thesis' delimitations and use of a macro-sociological approach where individual athletes are not the main point of focus (see 1.3). However, excluding them from the research problem itself does not automatically mean that their perspective should be excluded in the case of previous research. On the contrary, such an exclusion could create unnecessary questions in relation to the delimitations, as they are partly based on the assumption that the athlete's perspective is reasonably clear when it comes to previous research.

Starting with general risk perception and prevalence among athletes, previous studies cover a broad spectrum of topics from eating disorders and weight perception (e.g. Haase, 2011; Thiemann et al., 2015) to sleep quality (e.g. Swinbourne, Gill, Vaile, & Smart, 2016). Such risk prone studies can roughly be divided into two categories. First, the type that concerns risk behaviors and/or attitudes among athletes and uses comparisons or similar based on background factors, sub-groups, etc. Such factors may, for example, include the type of sport (e.g. Brenner & Swanik, 2007) or level of education (e.g. Karatas, 2016). Second, the type that focuses comparisons on athletes versus non-athletes (e.g. Yusko, Buckman, White, & Pandina, 2008).

In one of the more widely cited empirical studies on the topic of sport injuries from a social perspective, Roderick, Waddington, & Parker (2000) use their findings from semi-structured interviews with players, team doctors and medical team personal to conclude that the pressure on players to keep playing has substantial consequences. More specifically, they mention pain, injury and even long-term disability.

The increased level of medical/epidemiological knowledge regarding long-term health problems related to head-on collisions seems to have resulted in increased research interest in the attitudes of people who pursue risky sports activities. For concussions in particular, the conclusions show that professional athletes in ice hockey and American football are largely

unwilling to report concussion symptoms in line with the protocol (e.g. Baugh, Meehan III, Kroshus, McGuire, & Hatfield, 2019; Delaney, Caron, Correa, & Bloom, 2018). This unwillingness has, in turn, been attributed to pressure from a number of groups such as coaches, fans, teammates and parents (Kroshus, Garnett, Hawrilenko, Baugh, & Calzo, 2015). This, as well as other attitudes that hinder the reporting of symptoms for immediate evaluation, may come with a risk of longer recovery compared to immediate removal from a game (Asken et al., 2016).

However, Anderson & Kian (2012) argue that a change in athletes' attitudes, in this case in American football, may be underway. The authors mention increased knowledge about the effects of head trauma as a possible cause, but also a possible change of culture in the changing view of masculinity. Educational efforts about the effects of head trauma have proven helpful in increasing knowledge among athletes, but have not yet proven effective in achieving actual behavioral change (Mrazik et al., 2015).

For more in-depth knowledge about professional hockey players' experiences of concussion and its associated problems in everyday life, Caron, Bloom, Johnston, & Sabiston (2013) present a comprehensive, hermeneutic interview study with five former NHL professionals, all of whom retired due to concussions. Topics include the impact on personal relations and overall quality of life. From a somewhat flipped perspective empirics-wise, Law & Bloyce (2019) conducted a qualitative analysis, drawing on interviews with team managers. Despite the conclusion that there is pressure on players to return to play, they highlight how some managers empathize with player issues because many of them have a history as active athletes.

When it comes to risk-related studies that are specifically related to injury and sports and which focus on the athletes, there again seems to be a basic division into two main categories, although this time mainly related to sampling. First, there is a category in which the professional population are the main point of interest. Second, there is a category that focuses on youth-level sports, such as college or high school. The latter seems to be more

prominent when it comes to sheer numbers, a fact that may be partly explained by the accessibility of data. Injury related studies in general include descriptive studies of an epidemiological type (e.g. Hootman, Dick, & Agel, 2007), as well as interventional studies that aim to determine causal effects regarding prevention (e.g. Junge, Rösch, Peterson, Graf-Baumann, & Dvorak, 2002).

Among younger sportspeople, in this case high school students, the inclination to report symptoms after head trauma has been associated with gender and age differences (Kurowski, Pomerantz, Schaiper, & Gittelman, 2014).

Of interest in relation to the research problem of this thesis, research among high school students in particular indicates that participation in sports is associated with lower total risk scores overall, as well as bringing both mental and physical health benefits, but there is an increase in injury risk (Steiner, McQuivey, Pavelski, Pitts, & Kraemer, 2000).

3.1.4 Injury risk management in sports associations

The management of injury-related risk in sports, is in many respects, related to organizational structure, which does not appear to have generated any extensive social science research interest. In the case of injury prevention, which is of interest to all the actors concerned, studies are often conducted using a socio-economic point of view, considering purely monetary costs as well as socio-economic ones (e.g. Micheli, Glassman, & Klein, 2000; van Mechelen, 1997). Other, essentially medical or psychological orientations, in studies that may be assumed to have sociological relevance, include those related to specific risk groups (e.g. Schneider, Seither, Tönges, & Schmitt, 2006) and violence based on normative factors (e.g. Young, 1993) and stress (Davis, 1991).

Occupational groups, doctors and other medical professions linked to different types of sports organizations inevitably play a role in risk management, primarily as experts. Accordingly, many studies in which

representatives of the sport organizations are involved in discussions on injury risk highlight team doctors and similar positions. One research aspect that is considered of particular interest for this thesis is the conflict of interest surrounding these occupational groups, as described by Partridge (2014), among others. In short, this considers how medical ethics may, in many cases, conflict with pressure from team leaders to allow athletes to return to play after suffering a hit to the head, for example. This pressure and its potential effects on medical staff is also discussed by Goldberg (2008), who suggests that professional ethics among medical doctors or similar can in no circumstances be assumed to make the profession immune to that type of pressure. Overall, such conflicts of interest have been deemed more complex than just the interest of clubs and owners on one side and player health on the other. Ethical discussions have also included the aspect of time, namely the short-term perspective of success versus long-term perspective of player health, in which pressure to prioritize success might not be limited to team staff (e.g. Testoni, Hornik, Smith, Benjamin Jr, & McKinney Jr, 2013). On a similar topic, Polsky (1997) suggests that although the biggest pressure for team doctors to focus their work on players returning to the game rather than general health could be expected to come from team management and associated staff, that is not necessarily the case. Rather, the players themselves are equally and perhaps even more likely to put pressure on doctors to allow them to return to play.

Safai (2003) describes the conflict of interest between clinicians and the athletes, in this case students, as a negotiation of cultures. Namely, one culture of risk and one culture of precaution.

For concussions specifically, the overall research picture seems to suggest a similar situation to injuries in general (Kroshus, Baugh, et al., 2015). An athlete's problems in comprehending the severity of such injuries can, however, be perceived as making this particularly problematic ethics-wise. In one of the more critical publications on the matter, King & Robeson (2013) argue that this means the conflict of interest is widely underestimated. This is mainly a response to Testoni et al. (2013), who they claim do not give

enough attention to the problems of individual choice among athletes (among other criticisms).

3.2 Previous studies of risk regulation regimes

This section deals with previous studies of risk regulation regimes, and similar approaches to risk regulation that may use different terminology. Structurally, the section starts broadly, presenting studies related to a more general take on the concept. Further on, the field is narrowed down to studies that are especially interesting in relation to the actual risk accessed through this thesis.

Based on the recognized applications and benefits of risk regulation regimes, as specified by Hood et al. (2001), it could be expected that most research, explicitly or implicitly, applies the concept in contexts where this is assumed to lead to further understanding of a reasoning around facts, such as institutional differences, as well as the relationships between components in a given system. In addition to the cases in which the concept is applied in its entirety, studies that add great theoretical emphasis to Hood et al. (2001) are also included. The classification is based on a thematic layout related to this thesis' aim and content.

3.2.1 General studies based on or related to the concept

For straightforward case studies which, in this context, means that the study aims to cover risk regulation in a broad matter, frequently cited or otherwise prominent examples include such diverse subjects as the management of climate change (e.g. Heyvaert, 2011; Pidgeon & Butler, 2009), drinking water (e.g. Holme, 2003; Tikkanen, 2006), child protection (e.g. Munro, 2005; Munro, 2010) and medicine (e.g. Dixon-Woods, Yeung, & Bosk, 2011; McGivern & Fischer, 2012).

In contrast to merely studying why a one type of risk may be regulated differently to another, the concept sometimes appears to be used in a way where regulation of the same risk appears to differ between contexts, such as

geographical ones. For example, for explaining regulatory differences between different national states, risk regulation regimes, as a theoretical explanation model, have been applied to traffic accidents (Delorme & Lassarre, 2014). In this case, the study compares Britain and France, where the different outcomes of these regulatory regimes are studied.

The study of a given regime is not always limited to its dynamics, since in some cases the analysis involves the argument of one or more involved regimes. Dodds & Kodate (2011) apply the latter perspective when studying risks related to patient safety, arguing that it might be regulated by two separate risk regimes, as well as a single one containing different and sometime conflicting interests.

Additionally, the perspective of regulatory regimes has also been debated regarding spatiality. Levi-Faur (2011), for instance, emphasizes the blurring of current distinctions between the national and the global for the purpose of keeping the social sciences relevant in relation to regulation.

3.2.2 Institutional studies

As regards cultural components within fundamentally institutional environments, risk regulation regimes have been applied by Spira & Page (2003) to differences between the public and private sectors, as well as blame avoidance (referred to by the authors as *blame prevention re-engineering*). Additionally, they have examined the separation of current regimes based on risk regulation directed at the private sector by the public one which, in the latter case, is mainly when it comes to profit-driven companies.

Institutional factors, such as non-rational factors in existing structures, have also been found to have unpredictable effects on key positions within regulatory regimes. Rothstein (2003a) describes this phenomenon as *institutional attenuation*, which occurs when an essentially powerful force with the potential for substantial impact is “absorbed” by an organization and thereby attenuates. According to Rothstein (2003a), this phenomenon is more apparent in larger organizations with extensive bureaucratic systems.

Partly related to this, increased transparency and the inclusion of various stakeholders as an instrument for institutional environments to manage risk regulation does not necessarily result in the regulation itself becoming more consistent with public opinion or an ambition of democracy (Rothstein, 2004).

In some sense, the risk-regulation process can also be inverse in relation to the approach mentioned above, forming the basis of a process of institutionalization (Rothstein et al., 2006). These authors use this as the foundation of a further argument that results in a complementary model called *risk colonization* (more about this under 2.5).

May (2007) further expands the already prevalent accountability status, arguing that this is crucial for any regime with the ambition of reaching its defined regulation goals. He builds this primarily around institutional arguments of design, which are further clarified through defined levels of accountability and similar structures. Examples of regimes include nuclear safety and fire, with each discussed in relation to the issue of accountability shortfall.

3.2.3 Studies related to abstract, previously unknown or novel risks

Since the nature of the risk studied in this thesis is based on new medical knowledge that puts its severity in a new light, it is relevant to look more deeply at studies that have similar conditions. Rothstein (2003b), the co-author of the original concept, builds on this by studying the regulation of health risks through *self-regulatory regimes*. The study maps the risk regulation of plastics intended to be in contact with food. Rothstein primarily explains why stakeholder self-regulation appears to be the norm in this area as due to the regime's historical development, with current scientifically identified risks associated with plastics in food handling were not previously known. Consequently, public awareness of this risk has, according to Rothstein (2003b), been relatively low. This is contrary to pesticides' food-related risks, which are one of nine example regimes in Hood et al. (2001). The pressure from the forces Rothstein and others define

as important in Hood et al. (2001) was, accordingly, relatively low. This meant that the incentives for governmental risk regulation were low as well. Rothstein (2003b) identifies public unwillingness to regulate the current risk through legislation or related regulation, from relevant inspection authority, partly based on how the public can avoid blame according to the model in Hood et al. (2001). Recommendations rather than regulation, which in the long run become part of a regime based on self-regulation, became a way of dealing with this. In addition, Rothstein (2003b) sees the complexity of a high-tech industry under constant development as a potential barrier to the importance of self-regulation as a possible “way out” for governments, municipalities, and so on. The conclusions of Rothstein (2003b) include the inability of self-regulatory regimes to respond to public needs based on *market failure* issues (see 5.1.2), the ability of such regimes to maintain themselves due to long periods without external pressure, and public unwillingness to break down self-regulatory regimes due to the potential avoidance of accountability.

In summary, the actual regime studied by Rothstein (2003b) is found to have higher relevance for analyzing the risk area in this thesis than any of the nine regimes given as examples in Hood et al. (2001).

Rothstein et al. (2006), previously mentioned in 3.2.2., also sees the regulation of recently exposed risks as particularly relevant. These are highlighted as a complement to recently emerging risks, which seem to result in the same kind of response as regards regulatory mechanisms and their actions or responses. Rothstein et al. (2006) argues that the general emergence of risks through modernity should not be considered as an effect of the increase in societal risks (defined as risks associated with specific individuals), through which institutional risks (defined as risks with consequences clearly linked to organizations) occur. Instead, the regulatory processes can be regarded as a mechanism in this context, followed by a proposed division of common social and institutional issues for analytical purposes (Rothstein et al., 2006, pp. 8-9). The relationship between these two types of risks generates the phenomenon that the authors describe as *risk*

colonization. This arises within the spiral that occurs when regulatory systems, in their ambition to regulate existing social risks, create institutional risks through the effects of the actual regulatory systems. For example, the emerging institutional risk that arises when potential accountability for an initial risk emerges due to the regulatory systems that a regime designs in relation to the regulation of this risk.

There are a handful of noteworthy studies for the case of a new risk regulation regime being established and the dynamics of such a process. In some cases, the demand for this is due to new technology that creates previously non-existent risks. Kent, Faulkner, Geesink, & FitzPatrick (2006), for instance, use the case of engineered human tissue-technology to evaluate contemporary theory on risk and its applicability. Arguably, the most exciting conclusion from the article in relation to this thesis would be the emphasis on public trust in such technologies.

In other cases, the risk itself is not new, but circumstances have changed in a way that puts a current regime in a new light. Huber (2004) discusses the potential issues when existing regimes are put under increasing pressure, more specifically flood management regimes in the light of climate change and its consequences. Comparing two regulation regimes in England, one for compensation and one for protection, the issue of insurability and other questions regarding the intertwined relationship of the two are analyzed thoroughly. The general issue of climate change is also studied by Bartle (2009), who makes a major point about the market failure hypothesis presented by Hood et al. (2001) (see 5.2.1.2), and essentially concludes that public interest needs to be closer to the center of attention for such regimes.

3.2.4 Risk regulation regimes and sports

Studies explicitly dedicated to regulative regimes in sports are not too numerous, and those that do exist are often related to extreme sports and similar activities, rather than the more mainstream ones, such as in this thesis. Ball-King, Watt, & Ball (2013) describe the regime related to adventure sport in the United Kingdom, which rose to prominence after a high-profile kayaking accident and is now practically defunct. Overall, they

question the applicability of certain risk-assessment theories in these cases, partly because of the voluntary aspect of the risk involved. Williams & Odin (2016) on the other hand, study a risk related to what is arguably perceived as more of a conventional sport: board diving. The paper concerns attitudes among active athletes about regulation, where more experience is associated with favoring less regulation.

For head injuries in particular, and with high sociological relevance, Hards (2017) uses the previously mentioned lawsuit (see 1.0) against the NFL in an argument that carefully analyzes risk discourse. As she claims, the complexity and uncertainty of neurological knowledge are underestimated in the regulatory discourse that deems this to be fairly general knowledge in a societal sense. One concern, she argues, may be that this process will in the long run reduce human behavior simply to being perceived as *"the reduction in human experience to the brain"* (Hards, 2017, p. 291).

One area of risk related to sports is that of sporting events, which need risk regulation in order to function. Prominent publications that reference the concept of risk regulation regimes include Jennings (2010); Jennings & Lodge (2011), while the overall issue of risk governance is covered in an interdisciplinary sense by Giulianotti & Klauser (2010). If research on safety and risk management related to these events is included, there is more research that of general risk management (Parent, 2010) and the more niched field of terrorism (e.g. Taylor & Toohey, 2005, 2007; Toohey & Taylor, 2008)

A fascinating publication in a sociological sense is the empirical study of sports fans using survey data conducted by Cleland (2019), which was theoretically framed by (Beck, 1992) Among the latter's results, the majority of fans surveyed did not perceive attending sports events as risky. However, 29% perceived it as either risky to some extent or very risky. From the data, the author also concludes that sports fans do seem to reflect on risks they encounter, with individual fans constructing risks differently. On a related topic, Ali, Hashim, Wan-Ismail, Isnin, & Mohd-Nazeri (2011) present survey

data from audiences at Malaysian outdoor stadiums which suggests that safety awareness is generally high.

3.3 Legitimacy

Although this thesis aims to use organizational legitimacy in a partially novel way, the concurrent use of this perspective and risk regulation does feature in the field of social sciences as well as other areas. Usually, studies that implement both concepts in a partially or fully cohesive way examine regulatory structures through the lens of legitimacy, often presuming that the legitimacy of one or several actors active within a regime is crucial. In some cases, this is co-referenced with the related term *accountability*. This section includes publications related to legitimacy in the context of risk regulation and other topics relevant to the thesis.

3.3.1 Legitimacy and risk regulation or governance

In one of the most thorough and widely cited articles on the topic of risk regulation in relation to legitimacy, Black (2008) uses contemporaneous criticism of polycentric regulation regimes as a rationale for mapping the dynamics of the regime's actors in relation to legitimacy and accountability. In a conclusion that is interesting in this context, she states that awareness of how the regime's actors may respond to claims of accountability and legitimacy is crucial for further understanding; this might be overlooked if the analysis is limited to an overall understanding that covers the regime as a whole.

Majone (1999) makes a similar argument regarding the importance of an accountability structure, with the premise that decentralizing regulation through delegation to independent institutions may cause a lack of legitimacy, by democratic definitions, if such structures are not in place. By definition, he argues, power can be delegated from democratic institutions to non-elected ones when it comes to regulation among for issues. However, democratic institutions are not able to delegate their legitimacy. The consequence may be that legitimacy, on their behalf, is at best indirect (Majone, 1999, p. 21). Greater accountability, then, would be the way to overcome this problem.

Overdevest & Zeitlin (2014) further evaluate the problems of a polycentric regulation regime, using the case of Forest Law Enforcement governance in the EU as an example. The conclusions are optimistic, as they emphasize the possibility of transnational regulation with local diversity. However, they also point out that a lack of central authority with intrinsic legitimacy in this kind of system places demands, perhaps most prominently through systematic benchmarking for further evaluation. Somewhat related, through its focus on legitimacy and regulation within the EU, Tiberghien (2009) discusses the struggle for legitimacy within the EU associated with genetically modified organisms. He focuses mainly on the dynamics between the member states and the union council, and their tendencies to build legitimacy through this regulation. Further, C. Scott (2010) covers global regulation in the context of increasing interdependence among nations. The legitimacy and effectiveness of these kinds of regimes are questioned thoroughly, with the overall argument that the diverse ways in which different actors seek legitimacy primarily contributes to this process.

For private or non-state regulatory features specifically, Grabosky (2013) emphasizes the potential lack of accountability as a possible consequence when this “wiki-regulation” emerges.

3.3.2 Legitimacy and sports

Focusing sports in particular, a few studies are worth mentioning in this section. Sam (2011) studies Canada’s federal sports agency to examine its striving towards legitimacy. Relying on qualitative data, he discusses actions to emphasize the benefits of sports and other positive values such as ethics. He concludes that a nationally funded sports system comes with the need to justify the value of sports for those who receive the resources. However, he also states that efforts to achieve legitimacy by emphasizing public benefit may eventually lead to credibility issues. Later, this issue further developed through examinations of accountability systems related to sports in order to achieve legitimacy (see Sam & Tore Ronglan, 2018).

For the Scandinavian context in particular, Ronglan (2015) presents a thorough analysis of the legitimacy for elite sports on the premise that this is

necessary for public support. He highlights some of the problems, or as he calls them, paradoxes, that arise when the sports movement moves towards professionalization while a many of the components of its legitimacy remain related to civil society ideals surrounding voluntary work. He makes an interesting distinction between organizational and social legitimacy in this regard, where the former is achieved through medals and titles while the latter is obtained more by soft values (Ronglan, 2015, p. 359). Some discrepancies between these are highlighted and discussed in a manner that is interesting for anyone aiming to understand the position of the sports movement, as well as how this may potentially change due to current trends.

Focusing on Finland, Lehtonen (2017) argues that legitimacy on behalf of the government comes from a given sporting organization and depends on its ability to act as a link between the government and the sports movement. Strittmatter, Stenling, Fahlén, & Skille (2018) have a similar focus, as that they study legitimacy in sports policy through the chain of acts looking to achieve this legitimacy. They identify six intersecting elements in this process, which they argue are crucial to future sport policy.

3.4 Concluding comments

Over the last few decades, as the topic of risk has risen to prominence in sociology (see 5.1), so has the field's diversification of study objects and topics. Sports is one of the more specialized ones to have arisen during this process although, due to sheer numbers, the sub-disciplinary field of related studies are currently more likely to be located in the *sociology of sports*. However, given that the interest in risk and sports as a cohesive study object continues to grow, it might eventually find a niche. The kind of research conducted in this thesis should fit that potential sub-interest well. Presently however, it is arguably equally likely to find its place among the sociology of sport or risk sociology.

4 Theory

This section has two main parts. Initially, it offers a broad account of the overall theory of risk that is relevant to the field of sociology in particular, and the social sciences in general, followed by the theoretical framework used in this thesis. Finally, it will cover some aspects that are not included in the framework, but which are still relevant to the broad understanding of it for contextual reasons.

4.1 General theory

This section includes interesting theory that is not a direct element of the theoretical framework, but is crucial to get a proper overview of the field and the necessary tools for fully understanding the relevance of the theoretical framework.

4.1.1 Risk

This section deals with sociologically relevant perspectives on risk, starting off broadly, with some definitions, before moving to a brief description of established theoretical perspectives. While it focuses on the sociological aspects of risk, it will occasionally refer to perspectives drawn from other disciplines within the social sciences. In addition to such broad approaches, there is a sub-section on the more specific field of voluntary risk taking and associated theory.

Throughout the section, the theoretical aspects presented will be related to the thesis' research problem to provide proper context.

In general terms, as a concept within the social sciences, *risk* differs somewhat between different disciplines. Additionally, the somewhat similar terms of danger, crisis and catastrophe seems to add to the confusion when coherent definitions need to be made (Olofsson & Rashid, 2009, p. 21). However, the element of *action* is fundamental in any definition of or concept relating to risk, more specifically in the sense that any society will eventually be subject to action or lack thereof with potential positive and negative outcomes (Renn, 2017). This is true regardless of whether the

standpoint is that of an individual, organization or society (Renn, 2017, p. 1). For societies, it should be unsurprising that the concept of risk has broad relevance for social sciences, especially sociology. The basic assumption of risk as something unavoidable, in that our social institutions do not make it fully preventable, questions of acceptability make its relevance obvious (Taylor-Gooby & Zinn, 2006a). Indeed, understanding or analyzing the societal context of any given risk is necessary to move past the simplified perspective of risk-reward, based on probabilities that are unlikely to solely frame the magnitude (Kasperson et al., 1988).

In addition to *risk*, a theoretical understanding of the term *uncertainty* and how it is distinct from risk should be equally important. As a term, risk is generally considered prospective in the sense that it contemplates some kind of activity that may have unwanted consequences, thus the two often-associated terms of risk and crisis form an explicit difference between possibility and reality. Simply put, the existence of a risk does not require that an associated accident or crisis occurs; the presence of *uncertainty* is enough (Olofsson & Rashid, 2009, p. 22). In the context of modernity, uncertainty was essentially used as an alternative to risk, since the latter was associated with measurability and the possibility of estimation that was not considered possible in the context (Lupton, 2013, pp. 8-9). Gradually, as Lupton (2013, pp. 9-10) argues, this line has become increasingly blurred in more contemporary discussions on risk, meaning that risk and *danger* are now intertwined terms in the sense that risk essentially equals danger. As Pettersen (2016, p. 40) puts it, the previously taken for granted separation of risk and uncertainty has lost its precision to the degree that a broad framework is crucial to further understanding. The importance of including uncertainty as a complement to the initial risk term has, additionally, been argued for as being crucial for keeping the sociological perspectives on risk relevant in contemporary debate (e.g. Zinn, 2009). To sum up, the meaning of uncertainty in relation to risk seems likely to benefit from necessary clarification in any instance where risk plays an essential theoretical role.

In the case of ice hockey and head injuries, the *risk* would then consist of the possibility that repetitive head trauma that occurs through participation in

the sport may eventually result in long term health effects. Although it is unlikely that every player suffers these consequences, the uncertainty for each individual player has an important role when stating the risk associated with the activity. Additionally, (Olofsson & Rashid, 2009, p. 22) use a definition where the potential consequences, or perceived potential consequences, of an unwanted event need to include something that is valued by people for it to be considered a risk. For the specific risk studied in this thesis, there should be little doubt whether such consequences include something of value, considering that the long-term effects of head trauma and its potential effects, as defined in the introduction, could have severe effects on the life of anyone affected and even lead to suicide.

Regarding the specific risk's relation to the term uncertainty, the complexity of the brain and the public's probable difficulty in making sense of the available knowledge should add an extra dimension to this type of injury. While any injury is arguably associated with a degree of uncertainty, those that include the brain should undoubtedly be considered more abstract for the general population than other injuries. This is further complicated when it comes to long-term effects, where the connection between cause and effect can be less explicit. This degree of uncertainty should then, in accordance with the definition used by Olofsson & Rashid (2009), be more substantial in the case of brain injuries when compared to other health problems. As stated earlier, a relevant comparison is the general knowledge about broken bones and the accessibility of information on the topic, which makes it clear that the degree of uncertainty is likely to vary greatly between quite concrete injuries and those that concern the brain. Additionally, the inability to diagnose diseases such as CTE among living persons may further contribute to the level of uncertainty involved in those kinds of injuries.

With the factors mentioned above under consideration, along with the cited definitions of the term, there should be little doubt that the aim of this thesis is relevant in relation to the sociological concept of risk.

To further clarify the theoretical relevance of the risk concept, at least four factors related to the actual sociological term can be emphasized. The first

three could be considered in line with the distinctions made by Lupton (1999b, pp. 1-7), which are frequently cited in sociological occurrences of the term risk. The fourth is mainly interdisciplinary and primarily relevant to the overall field of social sciences, but can be considered appropriate due to the nature of the risk studied in this thesis.

The first factor is the perspective defined by Ulrich Beck (1992) as *risk society*, whose dynamics can largely be explained by the many types of risks which industrial society has contributed to creating. In many respects, Beck's argument that we live in such a society is at more of a macro level, but it also places a lot of emphasis on how the risk society is reflected in everyday situations, such as changed interpersonal relationships. The risks involved in contact sports may not be directly applicable to Beck's risk society, but a form of circular reasoning emerges when the link between reflexivity and risk society, which is explained in Beck et al. (1994), is considered.

Reflexiveness as a term regards individual human social existence and knowledge as intimately intertwined, with the information asset of the individual as an important component (Giddens, 2013). Without taking a conspiratorial approach, the actions of the NFL, i.e., the suggested withholding of information regarding the effects of head injuries, could be perceived as quite rational when considered from such this perspective. The establishment of a discourse where sports and related movements are considered a positive force should also have a clear function in a society where reflexivity is prominent.

Second, the macro-sociological approach to the sociological phenomena of risk, as expressed through the theoretical concept of *governmentality*, could provide a more critical approach to a particular risk being studied. The essence of the concept lies in the assumption of a movement within contemporary societies, mainly neo-liberal ones, where the public state apparatus seeks to exercise control in relation to its inhabitants through the use of self-discipline rather than actual systems of control (Foucault, 1991). The relevance of the sociological term of risk emerges once this process is made possible through the use of a risk when it comes to the strategy of a government that seeks to achieve such self-discipline (Lupton, 1999b, p. 4).

The risk considered in this thesis, the regulation of head trauma within ice hockey, or any contact sport for that matter, would arguably have to have been considered in the context of other potential disciplinary effects of the existence and societal toleration for the occurrence of such activities. The occasional explicit acknowledgement of the sports movement as a promotor of good values and associated recognition (e.g. Swedish Government, 2017b) could therefore be highly relevant when studying the regulation of a risk from the perspective of governmentality.

Third, risk as a sociological term may be considered a *forensic resource*, as stated by Douglas (1990). This phrase basically means that the phenomena of risk and its associated problems might be used as a secular equivalent of the historically relevant phenomena of *taboo* and *sin* in relation to establishing a coherent societal agreement on what could be considered appropriate behavior. Considered as a forensic resource, risk then becomes highly relevant due to the term's alleged neutrality from a scientific point of view (Lupton, 1999b, p. 3). Accordingly, where cultural conditions may no longer be maintained by factors related to religious abstractions and related factors, the concept of risk, based on its more perceived impartiality, may in some respects serve the same role. Douglas (1990, pp. 7-8) demonstrates how alleged care about the health of the individual may have this effect, which is primarily expressed in how this could be a way to win sympathy for an issue beyond its purely political aspects. In this way, the concept of risk, as logically coherent, could be assumed to fill a function in a structure-reproducing sense.

In relation to the risk studied in this thesis, the eventual discourse change regarding the argumentation of regulation or non-regulation could well be related to a transition from a morally based argument to a purported argument related to risk. Simply put, this would be expressed through a shift in the discussion on regulation or non-regulation, where the timeline's starting point would largely apply to moral reasoning, likely related to the violence occurring within ice hockey. Moving on, the shift in* societal discourse regarding acceptable behavior mentioned by Douglas (1990) would likely lead the argument away from the moral aspects of violence to

supposedly neutral and hence more scientific risk-based reasoning, with health risks serving as the main motivator of any regulation.

In addition to discourse shifts on a macro-level, the risk being studied could amplify this process due to ongoing advances in medical knowledge about the risks and associated long-term effects of head trauma, where any increased demand in science-based reasoning could be met with the alleged neutrality that the term of risk, according to Douglas (1990), could carry in a sociological sense.

Fourth, the concept of risk is occasionally used in a decision-making context, which in classical rational decision-making theory (e.g. Simon, 1955) is considered from a calculation of potential benefit. Figure 1 illustrates how this, from an overall societal perspective, has the potential to become a problem as risks and benefits are spread across different actors in different ways. Although this type of use in terms of the concept of risk is not necessarily considered sociological, the thought of the unequal distribution of profit and required effort is essential in some major classical sociological theories. This is mainly in the case of Marx (1969) and his philosophical statements about how access value created within the domains of industry had its foundation in the work of proletarians as well as capitalists, while the actual profits were ultimately only awarded to the latter. To transfer such a breakdown of risk and potential earnings to a more global level, the uneven spread of certain global risks, where countries with a good financial position largely create these while the countries on the other side of the international prosperity spectrum bear the consequences (Beck, 1999). It should therefore be possible to argue for such use of the concept of risk not only in a general sociological context but also in a more specific risk-sociological way.

While the four concepts described above are all quite general and macro-prone, the context of risk in sport opens up for an additional perspective of risk: the one that considers voluntary risk taking and intrinsic value. In line with the research problem and the cited study by Starr (1969), the acceptance of risky activities in a society is, additionally, far more likely in a case where involvement can be considered voluntary. In addition to the problem

specified under 1.1, the voluntary aspect and active engagement in risk should make room for additional theoretical development of this.

With the already specified rationally based assumption regarding risk and risk taking, any intentional human engagement in risk should automatically stem from a conviction about the potential benefit (e.g. Simon, 1955). On this basis, the historic tendency to perceive any person taking risks with seemingly small odds of gain as acting irrationally or even foolishly (Lupton & Tulloch, 2002) should be of little surprise. However, the concept of *voluntary risk taking*, as defined by Lupton & Tulloch (2002) emphasizes how individuals may very well partake in risky activities where they are aware of the risk, but still choose to do so because they are driven by far more complex motives. Lupton & Tulloch (2002) cite numerous studies of risky activities, from crime to skydiving, in their argument for a view in which the risk itself may play an important role when it comes to excitement, personal agency and other relevant socio-cultural factors that complicate the picture far beyond any simple rational choice-based view on risk. The actual study in the paper unfolds through three theoretical discourses: First, one related to self-improvement, which is an identity-based discourse where certain risky activities may contribute to the process of construction through testing one's limits and other factors. Second, a discourse related to emotional engagement, where a desired set of emotions can potentially be triggered through risk taking. Third, the discourse of control, in which taking a risk contributes to experienced control of the body.

Using the term *edgework*, Lyng (1990) constitutes a certain category of voluntary risk taking which considers the delicate balancing act between, for example, danger and safety that engaging in risky activities may represent. Seeing the relevance of hockey and other contact sports in this regard is quite easy, not only because Lyng (1990) uses high risk sports as an example in many cases, but also due to the fact that his description of the typical "edgeworker" indeed seems very much in line with a given ice hockey player evolving their game:

“Indeed, edgeworkers regard the opportunity for the development and use of skills as the most valuable aspect of the experience.(...) This unique skill, which appear to all types of edgework, is the ability to maintain control over a situation that verges on complete chaos, a situation most people would regard as entirely uncontrollable.” (Lyng, 1990, p. 859)

With no doubt, any player entering the game of ice hockey should, to some extent know that severe injury could potentially occur at any time. Taking this risk, however, obviously cannot be considered just as gambling for potential profit (even though the health of an individual is obviously at stake). Being “fearless”, or possessing the quite unspecific trait of “toughness” in terms of playing style is likely to be considered a positive personal trait for an athlete within ice hockey (e.g. Weinstein, Smith, & Wiesenthal, 1995). Considering the words of Lyng (1990), especially in relation to the specific risk defined in the aim of this thesis, edgework should constitute an appropriate way of building an identity as a hockey player, putting the risk of injury in a context that is far from a simple matter of risk versus potential gain. Such a process could, from a broader perspective, be considered a kind of *normalization* of the risk (Zinn, 2017).

Additionally, the use of high-risk sports as an example of voluntary risk taking and/or edgework (e.g. Fletcher, 2008; Guskowska & Bołdak, 2010; Lyng, 1990) further highlights its relevance. Indeed, in a basic sense, sports are considered a form of recreation, thereby making them convenient to use whenever non-necessary risks are needed for theoretical considerations. The development towards a more professional sporting landscape may somewhat lessen this status, but among the public its primary form is quite likely to be consistent over time.

As a final note on this topic, there are reasons to problematize the dichotomy of risks as either voluntary or non-voluntary when considering the kind of risk in this study. After all, contact sports are present in gym classes for children, which may shed some different light on the issue due to compulsory education.

4.2.1 will commence with a brief discussion of the connection between broad sociological risk theory and the concept used in this thesis.

4.1.1.1 Head injuries – risk or uncertainty?

One relevant question that needs to be addressed in relation to the topic of risk theory is how the issue of head injuries, generally and in relation to contact sports, should be positioned in relation to the concept of risk. More specifically, has this issue even reached the status of being deemed a *risk*, or if it is more relevant to discuss it in terms of *uncertainty*. Given the nature of head injuries, as invisible, abstract, and hard to understand in comparison to other injuries or health issues, the status of *risk* could indeed be questioned. Additionally, the long-term effects that are important for the research problem of the thesis are at an early stage in terms of causal relationships.

While these facts might speak in favor of the term *uncertainty*, the connection between the concepts previously discussed under 4.1.1. should clarify that this is not to be considered a theoretical issue per se. For one, the blurring of the concepts mentioned by Pettersen (2016, p. 40) should make the ambiguity mentioned above less of an issue, since it could arguably now be considered an inherent part of the theoretical field.

4.2 Theoretical framework of the thesis

Due to the nature of the theoretical framework, this section will be divided into two main parts: first, a thorough review and summary of the concept of *risk regulation regimes*, as described and used by Hood et al. (2001); second, a review of the concept of *organizational legitimacy*, based on a neo-institutional approach. There is a concluding section that clarifies the coherence of the theoretical framework.

4.2.1 Risk regulation regimes as an analytical tool

The following sections describe the concept of risk regulation regimes, focusing on the aspects that Hood et al. (2001) declare relevant when applying the concept analytically.

Before the description of the concept and its main components, the position of risk regulation regimes should be briefly described in the context of the general risk theory accounted for in 4.1.

As previously mentioned, one important function of the concept is its ability to effectively bridge the seemingly overwhelming gap between macro prone theories such as *risk society* (Beck, 1992) and the individual situations where risk occurs (Hood et al., 2001, pp. 14-16). A hockey rink could be one arena for this. To further understand this connection, it is helpful to look at how the authors have described the theoretical demand for risk regulation regimes. Hood, Rothstein, Baldwin, Rees, & Spackman (1999) describe this demand as a product of various theoretical circumstances. For one, they emphasize the assumption of a risk society as a place where contemporary theory places us all, combined with the assumption that the regulatory state is always present in society. Further, they describe the theoretical need for risk regulation regimes as a consequence of a lack of *risk bureaucracy*, in the sense that the first premise is not necessarily, as expected, always reflected in a corresponding bureaucracy (Hood et al., 1999, p. 22). Hence, the theoretical demand to which risk regulation regimes are a response is described as reflecting the institutional complexity that is present when regulation occurs, as opposed to the systematic, bureaucratic entities one might expect when studying risk through the lens of other more macro-prone theories.

Broadening the perspectives further, the theory built around risk regulation regimes has been categorized as one of several that are useful for describing how risk management is organized, with the consideration of multiple societal actors, institutions and entities deemed a strong point in this concept (Sparf, 2009).

4.2.1.1 Context and content

Hood et al. (2001, pp. 28-32) base their analytical concept on key factors that define the nature of a risk regulation regime and, thus, how such a regime can be understood on a theoretical basis. Initially, the distinction between a

regime's *context* and *content* is emphasized. These two are, in turn, defined by an additional number of elements, summarized in Table 2.

Table 2. Based on Hood et al. (2001, pp. 28-32)

Regime context	Type of risk
	Public preferences and attitudes
	Organized interests
Regime content	Size
	Structure
	Style

In terms of context, the *type of risk* is initially described. This is a qualitative element associated with factors such as timeframe, severity of possible consequences, possibility of quantification and whether the risk is known or unknown.

Public preferences and attitudes is largely self-explanatory as an element, but may also be broken down into public opinion within the context of the dichotomy of high anxiety and deep apathy, as well as the state of current media surveillance. In the latter case, the dichotomy is found somewhere in-between hot and cold.

Organized interest groups primarily concerns the dynamics of the conditions that exist between different groups. Relevant examples of this could be cyclists versus motorists or market exploiters versus current property owners.

When it comes to regime *content*, *size* may be divided into *aggression*, which in this context means risk tolerance and how far the regime is prepared to go for the sake of information gathering, as well as investment levels in terms of taxation, and publicly demanded expenses related to business activities and the like. *Structure*, which to some extent overlaps, concerns the organization of current regulation based on, for example, resource allocation. This can be

divided into two further subcategories. First, to what extent the private and public sector are mixed within the framework of current risk regulation. Second, how many different systems of regulation overlap in the process. To some extent, the element of *style* does overlap the other two, given that it concerns the operative conditions and attitudes of the individuals that somehow participate in the regulation. This comes down to a question of discretion and degree of freedom in relation to rules, as well as relevant attitudes and beliefs of those involved.

However, in order to understand the actions, or in some cases non-action, which takes place within a given risk regulation regime, it is also necessary to understand the components described by Hood et al. (2001, pp. 23-27) as *control components*, which can be described as the actual tools through which the regime actually regulates. The authors mention three specific ones that must be applied when seeking theoretical understanding: *standard-setting*, *information gathering* and *behavior modification*.

The first one, *standard-setting*, focuses on the rules of a regime in terms of, for example, risk distribution and risk taking. These are expressed through management and policy documents, business goals and other relevant factors. Such a standard may be the result of a purely technical process, as well as negotiations between different stakeholders.

Information gathering is fundamental to all forms of risk regulation, as such regulation usually requires some form of empirical evidence about, for example, potential consequences and associated probabilities. The process can be active, as in the case of ongoing environmental monitoring related to the risk that is subject to regulation. It may also be reactive, which means that regulatory regimes rely on others to convey information. Finally, interactive information gathering is somewhere between active and passive information gathering, for example by demanding reports at specific points in time, which the regime then may act upon.

Behavior modification naturally occurs in any risk regime, as it is a straightforward, hands-on tool when it comes to the actual regulation. The mandated change may be aimed at individuals or organizations and is

considered quite complex due to the difficulties associated with the ambition of anticipating the final result. Those whose lives are regulated may ultimately, due to their attitudes and values, act in a way that does not achieve the desired effect in terms of risk regulation. Restrictions on a particular type of product considered to be risky could, for example, unexpectedly lead to a situation where the people affected instead move to another one that is associated with an even higher degree of risk.

The above components of risk regulation regimes are thus assumed to be the foundation of theoretically based analysis of the nature of the regime that this thesis aims to describe and study.

4.2.1.2 Explanatory hypotheses

Hood et al. (2001) mention a number of hypotheses that are expected to explain the nature of different regimes and why they vary in appearance. Through the nine examples of regimes used in the book, the authors stress that none of them offer a comprehensive outcome in the sense that all the components of a regime look exactly as predicted. However, they are more interesting as complementary approaches, meaning that their use in relation to a given theoretical framework should logically include the application of each one, even if the regime being studied in this thesis seemingly makes some of them irrelevant.

Initially, Hood et al. (2001) present three different explanatory models/theoretical hypotheses and try to explain how the context of the regime could to shape its content. First and foremost, *the market failure hypothesis*, based on a kind of liberal market premise where risk regulation as a governmental activity is primarily aimed at managing risks, when market mechanisms fail to handle them without public interference. The next explanation model, *opinion-responsive government*, assumes that risk regulation is largely based on public opinion. The last explanation model, *interests, lobbies and experts*, assumes that risk regulation is based on the dynamics of the “pressure” of different interest groups on the public. Each explanatory model is given a more thorough description below.

The basic premise of a market-liberal approach, in this case, referred to as *the market failure hypothesis*, on risk regulation regimes is a fundamental dislike of public interference in influencing market dynamics. This is also reflected in the field of risk regulation (Hood et al., 2001, p. 70). In many cases the market, basically defined as the sphere within which goods and services change ownership, is assumed to manage risks without interference from the public. This could be expressed through the various services offered by insurance companies, but also by providing private individuals with other types of services created for the purpose of risk avoidance. Examples of the latter could be alarm systems for managing burglary risk, assault alarms for managing personal risk, or measuring equipment for managing any hazardous substances present in the home environment.

When the public, for example, through a state or municipality, choose to intervene through regulation, this happens as a result of the failure of the market, typically in a situation where the free exchange of goods and services is deemed not to have been able to adequately address a certain risk (Hood et al., 2001, pp. 70-71).

This principle carries two underlying dimensions: *information cost* and *opt-out cost* Hood et al. (2001, pp. 71-74). The former, *information cost*, is based on the problem the individual citizen faces when they must obtain adequate information regarding a specific risk, which is ultimately expressed in monetary terms. In some cases, such as the presence of asbestos in the home, the information is likely to be available for most citizens, at least those with an average income. For example, a professional could be hired at a one-time cost to measure current levels. In other cases, for example, how risky it is to live close to an acidified lake, it is difficult even for the wealthy to obtain adequate information. The second dimension, *opt-out cost*, describes how costly it is for individuals in a society to avoid exposure to a certain risk using existing market mechanisms. For an individual who wants to avoid exposure to high levels of a detected hazardous substance in his food, in some cases it may be enough to simply stop buying groceries from a certain part of the world, which appears to be manageable. In other situations, however, it could be about avoiding all forms of food that are not produced

in a way that the person has full knowledge of, which in its extreme form results in the individual growing all the necessary food. Such an arrangement is, without doubt, associated with monetary costs and lifestyle restrictions; this indicates that current market mechanisms have failed to provide the means necessary to manage the risk. Thus, in such a situation, according to the market failure hypothesis, the public domain would regulate the current risk.

The explanatory hypothesis that Hood et al. (2001, pp. 90-111) call *opinion responsive government*, states that general public opinion, which the authors initially express using the quite idealistic democratic form of public desire advocated by George Gallup, should be able to explain variations in risk regulation. The overall picture, based on the authors' examples, claims that risk regulation underlying that type of accessed public opinion seems to constitute the exception rather than the rule. Instead, Hood et al. (2001, pp. 90-111) present a number of alternative factors that are important for explaining differences in risk regulation through current societal opinion. Media coverage of any risk-related phenomena is granted significant importance in understanding the impact of public opinion. Hood et al. (2001, pp. 91-97) refer to a thorough study of newspaper texts from 1987 to 1998 and distinguish three profiles regarding the nature of media surveillance. In cases perceived as *low profile*, media coverage is at stable and low levels over time. A typical example consists of widespread risks where, occasionally, some form of journalistic investigation or documentary may be published, but not in a way that causes public outrage or spreads to other medial actors. Health risks associated with declining physical activity among children and adolescents could be an example of this; the subject is sometimes discussed in the media, but rarely in any coherent way. Medial articles are not likely to be related to a certain event, such as an accident, because the effects of such a risk do not manifest in such a way. However, small increases in the coverage of a topic may still be seen, for example when research about it is published.

High profile in the field of media risk surveillance is characterized by coverage is of a fairly extensive nature, but also that occasional peaks are

associated with events related to the area. One relevant example at the time of writing is the risks associated with communicating personal information through social media. While such risks have been reported ever since these platforms were originally launched, the accusations of unethical conduct aimed at one of the largest actors as regards sharing user data with third parties have created a considerable increase in media coverage. Given the impact of social media on society, it is likely that more such events will follow. In this category, there are also two sub-categories, in which the above example is divided into the more problem-driven cases characterized by periodic increases in intermediate monitoring, or an exponential increase in media surveillance, where the increase rises steadily over time.

The *intermediate profile* is located between the high and low ones, and includes the type of coverage which typically has a relatively even character, but occasionally increases slightly due to agenda-setting journalistic investigations and similar. The latter do not necessarily happen in accordance with certain events, as in the above case with the major actor in social media.

Regarding public attitudes, Hood et al. (2001, pp. 94-97), presents six main patterns, with the distinctions relying on survey material. These are summarized in Table 3.

Table 3. Summary of public attitude patterns that relate to risk (Hood et al., 2001, pp. 94-97).

Attitude pattern	Character
'Don't know, don't care'	Low interest and knowledge about the current risk. High stability over time.
Conflicting attitude	Non-uniform, in some cases polarized attitude to the risk.
Complex and dynamic attitudes	Public attitude difficult to map. Low stability in opinion. High conflict level (for example, between different geographic regions).

Issue-attention cycle	The attitude shifts considerably in relation to factors such as publicity about the risk's potential consequences. Low stability over time.
General and consistent concern	High level of concern, stable over time.
High but little examined concern	High level of concern. Low awareness of the public's true attitudes, partly due to low conflict levels.

However, understanding the way a risk-regulating regime relates to public attitudes is equally important. Hood et al. (2001, pp. 97-109) present some overall strategies through which relevant actors can adapt the content of a risk-regulating regime in relation to public opinion, as well as approaches that aim to manage the occasional gaps between opinion and practice. For the former strategies, coordination between the public and the regime can be either active or passive. Active coordination takes place when representatives of a certain regime systematically map public preferences and then control the content of the regime accordingly (as defined in 5.1.1). This could be done, for example, by investigating local attitudes when producing an exploitation plan for a new industrial area. Passive coordination regarding public preferences occurs without any mapping from actors associated with the regime. In the previous example, the proposal may never actually be presented if the public's negative attitudes had previously been reflected in other ways, for example through media coverage.

In cases where, for various reasons, risk regulation does not correspond to public opinion, there are, according to Hood et al. (2001, pp. 103-109), five main strategies a regime can apply to address this. To begin with, public opinion can simply be ignored or disregarded in situations where it is an inconvenience to the regime. One method of doing this is simply to actively omit to collect sufficient information.

The second strategy concerns situations when the regime selectively pays attention to selected elements of opinion. Such an approach allows the regime to show a willingness to adhere public opinion, despite its actions

potentially only taking the elements deemed to be manageable into consideration.

In the third case, the regime can engage in opinion formation through information campaigns and the like. The purpose of this is often to create a situation where public preferences are based on systematically acquired knowledge in the relevant area, rather than, for example, information supplied by the local newspapers.

The fourth strategy is based on a form of balance, where public opinion is one (and just one) of the factors that is considered in the regulation process. For example, if opinion calls for regulation of a risk beyond what deemed economically manageable according to the relevant experts, the amount of economic stability that may be jeopardized to satisfy public opinion and vice versa must be considered.

The fifth and last strategy is a hybrid one, such as selective attention combined with balancing.

The last of the three explanatory hypotheses regarding the relationship between context and content, *interests, lobbies and experts*, looks for explanations within organized interests that may be important for risk regulation Hood et al. (2001, p. 112). First, how different types of *business interests* may be reflected when public authorities regulate risks. In this regard, the authors discern three main patterns of business interests within the field that a risk regulation regime intends to deal with. The first pattern comprises situations where the interests and activities of profit-driven organizations are low, limited or purely non-existent. In some cases, this non-interest is reflected in a lack of interest from other types of interest groups, giving the regulators a relatively free space in which to act. For example, in dealing with risks related to drowning accidents in Swedish bathing facilities, there are no major market-driven forces, as most of these facilities are publicly run. There are certainly other types of interest groups, such as sports clubs related to swimming sports. However, these be assumed to take a low profile regarding that risk, as drowning accidents rarely occur during their activities. This gives the current risk-regulating

regime wide opportunities for action. In other contexts, the lack of profit-driven actors does not constitute such a gap, as other groups exert pressure. In this sense, risk regulation related to public sector work should, for example, be characterized by the absence of business interests, at least in industries that are not yet under competition from private actors. However, other interests than those associated with the regime, such as labor organizations, are likely to have strong interests. There may also, according to Hood et al. (2001, p. 114) be strong interest groups in the public sector that are not part of the regulatory regime.

The second pattern of business interests exists in cases where there are various different stakeholders, in some cases fragmented ones. Such conditions are often characterized by a dynamic where one party's profit represents a potential loss for another. For example, if the risks of home burglaries were firmly regulated so that more comprehensive insurance against such a risk became practically mandatory for homeowners, in the same way that car insurance is mandatory, insurance companies would be likely to profit from this. On the other hand, security companies in the private sector should arguably be more skeptical, depending on how this could affect their potential customers. The effect of this dynamic on the regulation of risks depends on how well the stakeholders succeed in influencing actors in the regime.

The third pattern, somewhat melodramatically called *defeated Goliaths* by Hood et al. (2001, pp. 116-117) concerns the contexts in which business-based stakeholders with seemingly good opportunities for influencing regime actors fail to control regulation in a desirable direction. The authors mention tobacco companies and their many attempts to influence the legislation of their products, especially during the latter part of the twentieth century as an example of this, which illustrates the kind of situations this pattern concerns.

Beside these three patterns, Hood et al. (2001, pp. 117-121) also mention *business-friendly* risk regulation, where important private actors in the regime's regulatory area are considered. Without introducing individual

examples, the Swedish model, with its close cooperation between private companies, the state and labor unions, can be used as an example for the general principle.

4.2.2 Organizational legitimacy

“Beginning with Parsons (1960) who early emphasized that the correspondence of the values pursued by the organizations must be congruent with wider societal values if the organization is to receive legitimation and hence have an acknowledged claim on societal resources, legitimacy has been largely interpreted as pertaining to societal evaluations of organizational goals.” (W. R. Scott, 1991a, p. 169)

While the quote does a great deal to illustrate the applied relevance of legitimacy in this thesis, the term itself requires additional introduction from a broad sociological perspective. The interest in organizational legitimacy, or non-legitimacy, was originally introduced in the discipline of sociology through the work of Max Weber (Ruef & Scott, 1998). While Weber’s thoughts were largely based on public and, in many cases, governmental organizations, with bureaucracy as the major organizational fundament of legitimacy (e.g. Weber, 2009), at that time the idea that organizations created and maintained legitimacy other than through a functionalist-based position was rather innovative in a sociological sense.

Weber’s most fundamental point regarding legitimacy was essentially based on what he called *domination*, successively founded on the legitimacy and function through which authority was exercised from a particular position over a given group. Consequently, authority is not based solely on instrumental factors, such as a personal gain from following orders, but it also requires the formal establishment of legitimacy (Weber, 1978). Parsons (1960), obviously strongly influenced by Weber, emphasized organizational values and how they must respond appropriately to values in the social context within which the organization intends to work and thus needs to obtain legitimacy.

While Weber's canonical status clarifies the sociological relevance of the concept of legitimacy, his main theoretical legacy is arguably less suited to a theoretical framework where the organization being studied is of a mainly non-profit nature. However, a neo-institutional perspective should be able to study the actions of an organization based on a context in which its maintenance of legitimacy is a main point of theoretical focus. The following sections aim to build this framework based on an inclusion criterion, focusing on organizational legitimacy relevant to non-profit-driven organizations, in this case the Swedish Ice Hockey Association and the activities conducted in this context.

Even though the abovementioned organization is the obvious point of interest when considering legitimacy, or the lack of it, other actors in the risk regulation regime being studied may also have to consider their legitimacy. First and foremost, the government, which will undoubtedly have to consider any impact on its legitimacy regarding risk regulation. This is explicitly stated in relation to risk regulation regimes by Wegrich & Jann (2006), emphasizing another point of relevance in relation to the overall theoretical framework of this thesis.

4.2.2.1 Legitimacy from a neo-institutional perspective

The focus on legitimacy is core to the neo-institutional perspective overall, as opposed to more classical perspective. Legitimacy is defined as a general assumption, stating that the actions of an actor are considered appropriate within a given system of norms, values, assumptions and definitions (W. R. Scott, 2014, p. 71). Expressed differently, an organization's legitimacy can be used as a measurement of the level of cultural support it receives, with the consequence that cultural factors may explain the very existence of an organization (W. R. Scott, 1991b, p. 170). The latter implication, which relies on a definition originally presented by Meyer & Scott (1983), clarifies why legitimacy is so central to this theoretical field through its emphasis on culture. Simply, it would be unlikely for these factors to be given sufficient attention within the rational choice-based models of organizations, which institutional theory overall argues against (see Powell & DiMaggio, 1991b, p. 12).

The consequences of legitimacy, or perhaps more prominently lack thereof, are likely to be profound for an organization. The previously mentioned conditions of existence show the extreme consequence of a lack of legitimacy, but there could also be potential consequences that are severe without necessarily jeopardizing existence (although this may be the long-term consequence). For example, Deephouse, Bundy, Tost, & Suchman (2017, p. 31) emphasize how an organization with legitimacy generally remains unquestioned and hence has the freedom to pursue its activities. Together with the assumption that legitimacy is necessary to receive public resources (W. R. Scott, 1991b, p. 169), the requirement of legitimacy for any organization aiming for long-term survival is apparent.

This is also where the core relevance of this theoretical approach for the thesis becomes clear. In terms of risk regulation, the study of any organization or an entire organizational field (more below) is limited, in that it only covers regulation or lack thereof. Simply, if the level of regulation of a specific risk was illustrated through a continuum, the bottom level of this would likely mean no regulation whatsoever, while the top would indicate full regulation. Obviously, such a continuum fails to show how some activities that could be called risks are not only subject to a lack of regulation (and hence at the bottom regulation-wise) but are also given public emphasis. As previously stated, Swedish ice hockey could not exist in its current form without public recognition through resources. Legitimacy should thus play an important role in understanding the game's place in society and how the regulation of risk within its domains is managed.

With legitimacy defined and its presence deemed important, a look at the context in which legitimacy is gained, produced, or even lost, should also be important. This all happens within an *organization field*, which plays a key role in neo-institutional theory (Wooten & Hoffman, 2017, pp. 55-56). A short definition is hard to come by, but the following quote goes a long way to understanding the basic premise:

"By organizational field we mean those organizations that, in the aggregate, constitute a recognized area of institutional life: key

suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products.” (Powell & DiMaggio, 1991a, pp. 64-65)

Hence, the environments that “surround” organizations are themselves organized in a way that has consequences for the structure and function of each organization that is active in a given field (W. R. Scott, 2014, p. 222).

The organization of Swedish ice hockey should be happening within such a field. Although it may be hard to determine exactly what actors are included and how the field is organized, the idea of a field and actors fits well with the concept of a risk regulation regime, which is largely built upon similar premises.

4.2.2.2 Organizational similarities due to isomorphism

As well as organization legitimacy in general, the analysis will also examine some of the more notable consequences of the search for legitimacy. The most notable is institutional isomorphism, as used by Powell & DiMaggio (1991). In their systematization of the concept, they initially distinguish two types of isomorphism:

- Competitive isomorphism
- Institutional isomorphism

(Powell & DiMaggio, 1991a, p. 66)

Both these may, according to Powell & DiMaggio (1991a), explain the tendency for organizations to show many similarities. Competitive isomorphism deals primarily with rationality-related factors for the nature of organizations and tends to rest on principles related to market economy-related forces. Powell & DiMaggio (1991a) emphasize that many of its explanatory features correspond to Weber’s principles of bureaucracy and its relationship to different types of organizational resources, as well as how, as an explanatory model, it is best applied to organizations in essentially profit-driven environments. However, the authors argue that institutional isomorphism can play an important role in complementing this, largely

because the actions of organizations in other contexts than those above are difficult to analyze by solely using the abovementioned kind of isomorphism. Within the framework of institutional isomorphism, Powell & DiMaggio (1991a) identify three relevant sub-categories:

- Coercive isomorphism
- Mimetic isomorphism
- Normative isomorphism

(Powell & DiMaggio, 1991a, pp. 67-74)

Coercive isomorphism concerns, in general terms, the dependence of an organization on other organizations, and the “pressure” that such organizations may exert, formally or informally. The most explicit form of this occurs when the state exercises its formal position through legal procedures, such as when adopting new laws on the working environment that require the appropriate adaptation of all relevant organizations. However, it may also, in the case of non-profit organizations, involve organizational actions that aim to avoid dissatisfaction regarding external financiers or the like.

Mimetic isomorphism often occurs in contexts where uncertainty prevails, which creates incentives for organizations to apply established and already used solutions. These are, in turn, retrieved from other organizations, although those do not necessarily know or sanction their model. For non-profit organizations, business models or similar arrangements may not be of primary relevance, instead this may be models of organizational structure including communication within and outside the organization.

Normative isomorphism is based mainly on the professionalization that in many ways characterizes modern organizations. This form is partly linked to Weber’s ideal-type bureaucracy model, with established competence as a criterion for its officials. Ideal-type bureaucracy aside, the similarities are largely present in the educational backgrounds and occupational groups, even though Powell & DiMaggio (1991a) emphasize that the most explicit form is expressed through officially licensed professions, such as in

medicine. Additionally, they highlight the growing trend for network-related organizations in specific professions, which are unlikely to be less extensive now than when their work was published.

Through theoretically grounded reasoning based on the above three concepts and how the Swedish Ice Hockey Association relates to other relevant actors, including the public, it should be possible to relate an explanation model for the organization's actions to these types of dependencies and pressures.

4.2.3 Coherence of the theoretical framework

Since the thesis' framework is built around two main parts, risk regulation regimes in line with the principles of Hood et al. (2001) and the institutional approach of organizational legitimacy, a brief argumentation regarding their coherence should suffice as a conclusion.

For risk regulation regimes in general, Hood et al. (2001) emphasize their usefulness in various types of institutional analyses, which in this context involves risk management, where public bodies and other types of organizations determine the dynamics of a certain regime. *Risk regulation regimes* are the basis of the thesis' conceptual framework, so the parts that are suitable for the overall theoretical understanding of a given risk regime will be used for this. The possibility of variation when it comes to a regime's aggregation level, as stressed by Hood et al. (2001), also means that this concept fits quite well as an overall theoretical framework. However, risk regulation regimes as a concept and the overall model of theoretical understanding presented by Hood et al. (2001) is obviously fairly general and does not, on its own, offer a sufficient tool for studying the actors within a risk regime. This is especially true when it comes to the kind of extensive study required to produce a doctoral thesis. Therefore, any specific risk regulation regime being studied should be supplemented with additional theoretical approaches that aim at to build theoretical understanding of the factors that the regime may contain. Considering the points above, institutional theory with a focus on organizational legitimacy is eminently suitable. The new medical knowledge that has emerged over the past decade

regarding the long-term consequences of head injuries should, sooner or later, lead to the questions about the legitimacy of organizations whose core business requires such risks.

In addition to the inherent and general delimitations of risk regulation regimes as the sole theoretical framework for the study of a risk, this one has a specific feature for public management that underlines the need for a supporting framework: emphasis on behalf of the public. Sports organizations enjoy positive connotations, which are largely publicly sanctioned through governmental organizations or similar, and the spending of public resources (see 2.4.3) on sports such as ice hockey makes it clear that the management of risk is not only subject to a potential lack of regulation. Rather, these activities may potentially be encouraged. While Hood et al. (2001) offer a good theoretical concept through which to study regulation, extending it to potential encouragement or emphasis is arguably not covered by the theory's inherent features. Luckily, the previous encouragement to use complementary theory opens up to expanding the continuum of non-regulation versus regulation for this specific case. This is illustrated in Figure 4.

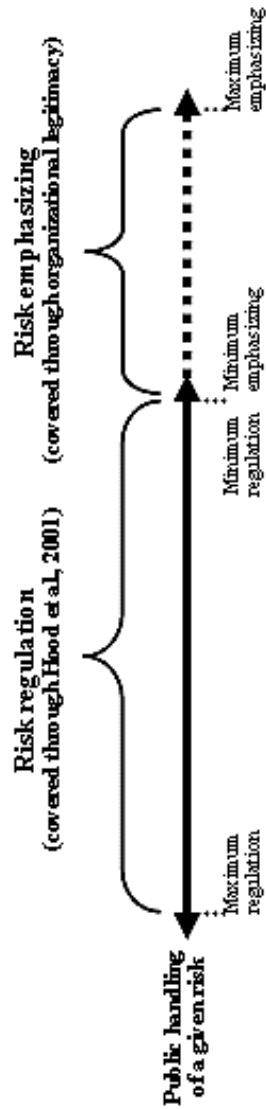


Figure 4. Visualization of how the two parts of the theoretical framework are intended to supplement each other.

For the sake of a coherent theoretical framework, the following three points should facilitate the overall argument:

1. Risk regulation regimes as a theoretical concept mainly concerns the regulation or non-regulation of risks (Hood et al., 2001).
2. The risks covered in this thesis are located at the Swedish Ice Hockey Association, an organization that benefits from public resources. This favorable position cannot be explained solely by a lack of regulation, since the presence of public approval is not sufficiently covered by Hood et al. (2001).
3. The combination of risk regulation regimes and organizational legitimacy should be able to bridge the theoretical gap specified in point 2.

To avoid conceptual confusion, one potential issue when using these two concepts together should be addressed. More specifically, the potential confusion of the terms *risk regulation regime* and *organizational field* respectively. As stated under 4.2.2.1, it is essentially positive that the two concepts are built around the same premises, as they exist for the purpose of better understanding of non-explicit spaces “around” organizations and their interactions (see Hood et al., 2001; Powell & DiMaggio, 1991a). However, it would be too far-fetched to assume that risk regulation regimes are to be theoretically viewed *as* organization fields. For one, the authors of the concept make no such claims. Rather, these should be considered as concepts built using the same premises and thereby arguably work well together.

Finally, is relevant to consider the two main parts of the framework independently of the thesis’ research problem. To achieve this, risk regulation regimes and organizational legitimacy must be considered as working together for a non-defined analysis, meaning that the previously described way they work together, with one starting where the other one ends, in terms of risk regulation versus encouragement, is no longer valid. However, when risk is considered in general, another order of the two parts completing each other emerges.

“Our approach is ‘institutional’ in a broad sense, in that our point of departure is a comparative focus on rules, conventions and

organizations. However, to describe and compare risk regulation regimes properly we need to go beyond the characterization of institutional geography and formal rules, (...) For instance, we need to explore a range of risk-assessment techniques and policy-making approaches to distinguish the different scientific and bureaucratic practices, techniques, and cultures embodied in different fields of risk regulation.” (Hood et al., 2001, p. 8)

The quote above illustrates a great deal of theoretical coherence between the two main parts of the framework, independently from the actual research problem of the thesis. As it happens, the way they complete each other in a general sense is somewhat the reverse of how they are used to access the problem here. Once again, in this thesis, organizational legitimacy is used to overcome the limitation of a risk regulation regimes that stems from it being restricted to regulation or the lack of it. Conversely, Hood et al. (2001, p. 8), acknowledge that the institutional approach, of which organizational legitimacy should be considered a crucial part (see 4.2.2), goes some way when it comes to understanding risk regulation regimes, although not all the way. This should provide a good example of how these theoretical concepts are partly intertwined in a way that is likely to be beneficial.

4.3 Alternative perspectives

This section covers theoretical aspects that are not part of the theoretical framework per se, but should be interesting for context and reference. Arguably, the position of the main theoretical framework cannot be fully understood without these frames of reference.

4.3.1 Alternative perspectives on risk regulation and governance

While this thesis uses the concept of risk regulation regimes, as defined by Hood et al. (2001), as a theoretical framework, there are other perspectives related to regulation in this field. While these will not be used to further theoretical analysis of the findings, they are relevant to mention for knowledge purposes. This section is dedicated to theory related to risk

regulation and governance that is not used for the theoretical framework of this thesis.

Hutter (2006, pp. 202-221) discerns several distinct trends in research in the field and the results of current studies. First, one closely related to the theoretical framework of this thesis, focuses on explaining variation. There is a great deal of focus on Hood et al. (2001) regarding this. Second, the perspective concerning public debate on risk and its effects in public trust and participation on the matter of regulation. As for results related to this trend, Hutter (2006, pp. 212-214) emphasizes the process of *democratization*, where risk regulation tends to happen through public demand for responsibility in relation to relevant actors. Hutter mentions accountability and openness as important factors in such a process, which is mainly relevant for governmental instances. Third is a business-related perspective focusing on the organizational management of public regulation, largely from a seemingly bilateral relationship between the two. Once again, Hood et al. (2001) is cited, this time in relation to the position of organizations in a regulatory regime. Further, Hutter (2006, pp. 212-214) dedicates a great deal of attention to internal organizational systems related to everyday life, including some perspectives on potential tension as a result of such systems. Fourth, Hutter (2006) directs some attention towards the regulatory related issues of cross-border risks and the decreasing relevance of the national state and associated governmental structures for such issues.

Using the medical profession as their background, Lloyd-Bostock & Hutter (2008) further advance the acknowledgement of the inherent complexity associated with risk regulation, by highlighting increasing pressures for regulating actors to adopt risk-based approaches, as well as the complexity and non-neutrality of risk information.

For risk regulation regimes in particular, Hutter (2008) has also focused greatly on organizations and their response to such regimes. More specifically, she argues that organizations may, in addition to responding to a given regime, may create risk regulation regimes of their own (Hutter, 2008, p. 2).

Additionally, Hutter & Power (2005) describe the conceptual difficulties that are manifested when large organizations are considered as actors in an entity such as a given regime, mostly due to the internal complexity associated with actors that are organizations. This complexity is described by (Hutter, 2005) as dependent on the different understanding of risks that may occur due to the different positions any given individual may have in an organization.

Rothstein et al. (2006) introduce the theory of *risk colonization*. This process relies on the distinction between two categories of risk. First, *societal risks*, which is a term that could be used for any risk that is a threat to a society and its members. Second, *institutional risks*, which specifically refers to risks that are a threat to the organizations involved in regulating societal risks, including threats against the legitimacy of any means used in the process (Rothstein et al., 2006, pp. 92-93). The phenomenon of *risk colonization* is manifested through the reflexivity that arises when a governing or regulating actor is subjected to increasing demands to manage institutional risks, a process that might be self-reinforcing if discrepancies in the management of societal and institutional risks result in further action. Hence, governance as a whole might be increasingly defined by risk (Rothstein et al., 2006, p. 93). Using several examples, Rothstein (2006, pp. 216-218) clarifies how this colonization is not driven by a quantitative increase in actual threats in society. Rather, the phenomenon occurs when these threats are distributed in a new way regarding governance.

M. Power (2007) uses the term *organized uncertainty* to describe a perspective on risk regulation which focuses on the analysis of the social and economic institutions involved in framing risk. The approach is built around the assumption of ideas regarding *risk manageability*, which has generated frameworks for risk management and similar that responding to a demand for risk governance (see M. Power, 2007, p. 6). Of some interest in relation to the overall theoretical framework of this thesis, public perceptions about risks are described as a potential risk in themselves, since the perception of legitimacy might be jeopardized through this process (M. Power, 2007, p. 21). This and other factors stemming from ideas of manageability and

changes in public risk perception are described by M. Power (2007) as a driving force in a shift towards the expectance of *risk governance*, as opposed to the formerly more prominent idea of rationally based *risk analysis*. While also built around some inclinations of rationality, *risk governance* revolves around notions of risk management processes rather than the measurability of the risk itself, as presumed by the described perspective of risk analysis (M. Power, 2007, pp. 18-19). The presence of uncertainty is even described as an available “space”, in a free market kind of sense, where there is room for organizations, private or public, to thrive by means of organizing (M. Power, 2007, pp. 30-31). Additionally, the intrinsic importance of risk as a category for further organization in this process is emphasized, further fulfilling the shift towards risk governance at the expense of risk analysis (M. Power, 2007, pp. 156-157).

In a way related to risk regulation regimes as well as legitimacy, M. Power (2005, pp. 132-148) has also used the *chief risk officer* as a primary explanation of how organizations respond to cultural and legislative pressure. These positions are described as “...*internal organizational representations of externally encountered norms and rules*” M. Power (2005, p. 137). This may seem like a responsible move by an organization, but M. Power (2005, p. 138) suggests that the rising incidence of such positions may actually work to strip other parts of the organization of responsibility, all working through the process of what he calls *the politics of doing something*.

4.3.2 Alternative perspectives on legitimacy

This section has the same purpose of the preceding one, except that it deals with alternative aspects of legitimacy rather than risk regulation. It will thus offer a brief overlook of theory that may be interesting in relation to the research problem but is not actually part of the defined theoretical framework.

For developing the concept of organizational legitimacy further in terms of typology, beyond what is basically defined using institutional theory (see 4.2.2), Suchman (1995) remains one of the most frequently cited. He suggests a sub-set of three types of legitimacy: *pragmatic*, *moral* and *cognitive*. Each

type has sub-categories that might be interesting in a general sense, but which will not be further described here. However, the types are briefly described below:

Pragmatic legitimacy is gained by focusing on the demands of the closest audiences of an organization, often through comparatively close contact with these (Suchman, 1995, pp. 578-579).

Moral legitimacy is achieved when an organization and its activities become associated with positive normative evaluation. This divides into beliefs about intrinsic good in relation to ideas about societal welfare and similar (Suchman (1995, pp. 579-582).

Cognitive legitimacy is retained when an organization is taken for granted, due to it being considered culturally necessary or inevitable (Suchman (1995, pp. 579-582).

One of the most relevant publications on the matter (in relation to the thesis' research problem) is Dart (2004), mostly due to its ambition to apply institutional theory to parts of the non-profit sector. More specifically, it focuses on the term *social enterprise*, which is defined loosely as an organizational form where business-related models are applied in a way that focuses on community or social reasons remain. However, the author stresses that it is difficult to find a single coherent definition (Dart, 2004, pp. 413-415). Using the definitions of Suchman (1995) described in the previous section, Dart (2004) further develops the concept of organizational legitimacy by examining how the three types of legitimacy work as explanatory models for social enterprises. He argues that moral legitimacy is quite profitable here, in the sense that the social enterprise model may have been subjected to a shift in norms and values in a way that makes it more conventional than the standard non-profit organization. The strength of moral legitimacy in this case, he argues, stems from the immunity against criticism, regarding the value production of social enterprise-based organizations, which they gain on the grounds of being morally legitimate (Dart, 2004, pp. 419-421). He deems the other two types interesting to some degree, although overall unsuitable as they do not add enough beyond the

rational-choice concept that organizational legitimacy seeks to overcome using institutional means (Dart, 2004).

These extensions of organizational legitimacy may well have some relevance in relation to the research problem. However, to make them more relevant, an approach with more focus on sports associations' transformation from non-profit organizations to more business-like models (see 3.3.2) would be preferable. At this stage, a broader perspective on organizational legitimacy still seems most appropriate, although more in-depth theoretical frameworks may very well be beneficial in further studies.

5 Design and overall method

This section mainly consists of an overview of the different parts of the current risk regulation regime are to be studied. The use of such a plan is mainly motivated by the explanatory hypotheses (see 9.1) applied in accordance with Hood et al. (2001), with the addition of organizational legitimacy. The thesis' overall study design is provided in Table 4.

Table 4. Overview of the thesis' study design. The concept of risk regulation regimes and the associated subdivisions are based on Hood et al. (2001)

Risk regulation regimes								Legitimacy
Component	Context		Content		Explanatory hypotheses			
	Type of risk	Public preferences	Organized interests	Size	Structure	Market failure	Opinion responsive	
Mapping	Background	1 st empirical study	2 nd empirical study	Background	Background	Previous research	1 st empirical study	2 nd empirical study
	Previous research	Previous research	3 rd empirical study				Background	3 rd empirical study
			Background				Previous research	Background
								Previous research

As the table shows, the parts of the defined risk regulation regime are mainly analyzed using empirical studies, while others are mapped through their background and previous research. In the latter type of mapping, the regime content is what is primarily studied. This is because these aspects, in a descriptive sense, do not fall within the scope of the thesis' overall purpose but are still necessary to explain why the content of the regime looks the way it does and what can be assumed to explain the differences compared to other types of risks. This approach corresponds well with the principles emphasized by Hood et al. (2001) about the analytical concept as a whole.

The three empirical studies all have their methodological basis in different kinds of quantitative content analysis. Before examining the benefits of applying such methods to the research problem, the broad definition should be provided, as it is a good starting premise:

"...a research method defined briefly as the systematic assignment of communication content to categories according to rules and the analysis of relationships involving those categories using statistical methods." (Riff, Lacy, & Fico, 2014, p. 3)

More specifically, the majority of the studies (1 and 3) will rely on corpus-based studies which will focus on the analysis of linguistic patterns and content that is inaccessible for methods that rely on manual content assessment (see Baker, 2006; Brezina, 2018; Brezina et al., 2015). As the concept of risk regulation regimes is a theoretical one, thus not explicitly present in policy documents or other material that may potentially be studied, these kinds of methods should allow for "reading between the lines". This is because they enables the disclosure of patterns in language or discourse that are unlikely to be accessible through interviews, survey questions or other more traditional means in the field of sociology.

In addition to the corpus-based studies, the second empirical study's approach is based on more traditional quantitative content analysis (see Krippendorff, 2004; Neuendorf, 2016). While this relies on manual text processing and hence does not offer the same benefits as corpus-based analysis, regarding the assessment of otherwise unavailable content, it still

relies on the kind of data that should be sufficient for studying a theoretical construct such as a risk regulation regime. More specifically, it also relies on naturally occurring content in a methodological sense, meaning the empirical content has not been created for the sake of the study in the way a research interview would have been (see Krippendorff, 2004; Neuendorf, 2016). Again, anyone seeking to access a risk regulation regime through empirical research is unlikely to find it specified in a policy or otherwise explicitly mentioned in speech or text (see Hood et al., 2001). The focus on latent content in the overall methodological approach should therefore serve the aim of the thesis well.

By applying these kinds of methods in three defined empirical studies, the communicative content of the data should lead to potential answers to the thesis' overall research questions. The result of these studies, combined with the content mapping using the background information specified above, will be subject to a coherent analysis using the defined theoretical framework. Such an analysis is appropriate for explaining the content of a regime, partly on the basis of contextual factors, but also through the explanatory hypotheses applied by Hood et al. (2001).

Starting from the research problem and working its way down to the eventual scientific contribution, Figure 5 illustrates the overall way each study is expected to contribute.

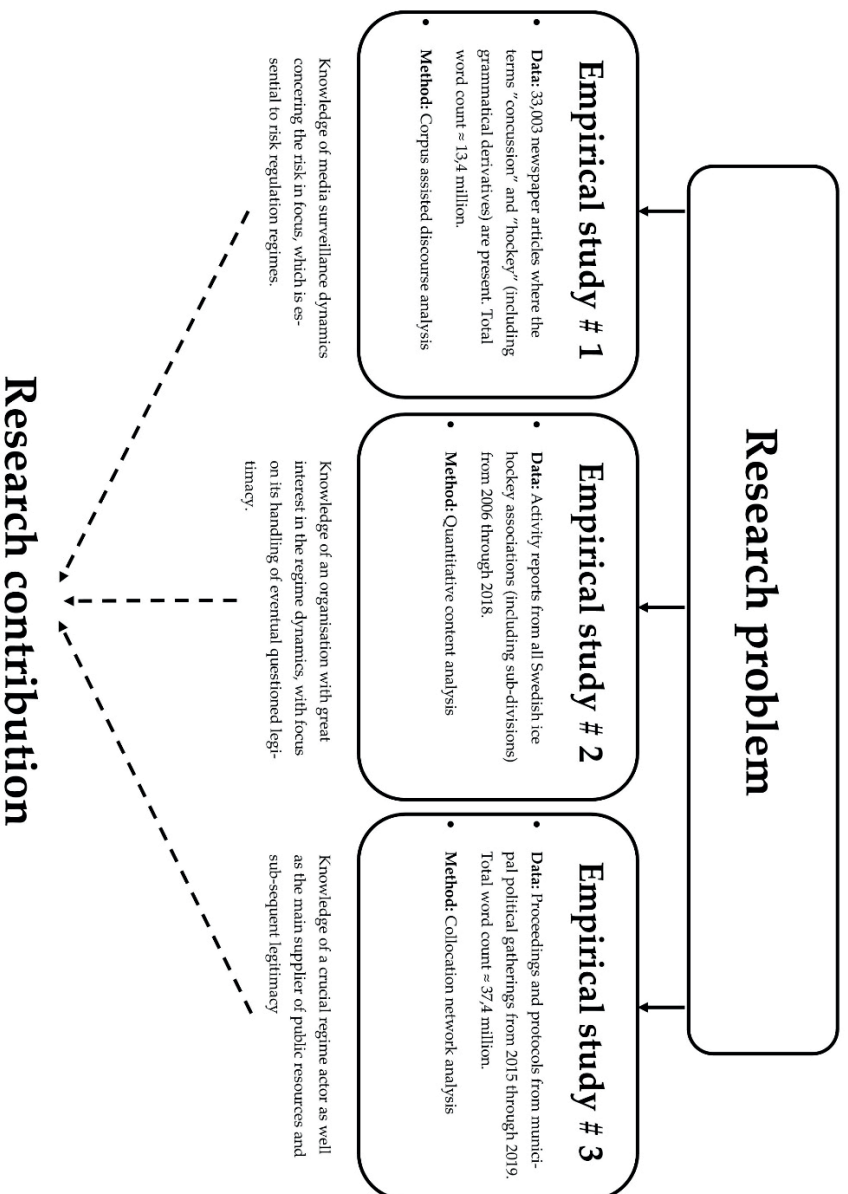


Figure 5. Overview of each empirical study's contribution.

Regarding the use of different (although related) methods for each empirical study, as opposed to using the same method on multiple occasions, several factors were crucial to this choice.

First and arguably most importantly, the research questions. For instance, the aspect of change over time that is crucial to the first study required a certain type of approach, that of keyword analysis, which is part of the overall methodological package of *CADS* (both will be explained further under 6.1). In study 3 for instance, this would not have corresponded to the research questions and so been irrelevant. There, the wider linguistic context of certain terms was the main focus, making collocation network analysis an appropriate method (see 8.1).

Second, the dynamic of the material played a role in the methodological choices. The example of study 2 illustrates this well. Just as for study 1, the research questions clearly showed that change over time is important. For this reason, it could hence have been appropriate to reapply the same analysis (keyword analysis). However, the empirical material used this study did not reach the critical mass considered a minimum for corpus-based studies (see Biber, 1993). Accordingly, the latent content (important in all three studies) had to be accessed using the more traditional means of quantitative content analysis using manual processing.

Another notable variation is found in the scope of each study, where the first one has a greater amount of text. There are several reasons for this. The first is theoretically grounded, in the sense that the part of the regime accessible through this study is not a regime actor per se (as in the other two studies), but something as broad as the public. This requires substantial and thorough coverage, which leads to the second reason: the method itself. *CADS* (see 6.1) is not a single narrow method, but a collection, where each has its own role in covering something as extensive and intricate as public opinion. This contrasts with the other two studies, which are both built around a single method of analysis.

Third, the progression of the thesis plays a part. For example, studies 1 and 3 are both partially built around the linguistic analysis of collocation (see

6.1.2.). This is explained in quite a detailed manner in the methods section of study 1, so this is not repeated for the third study.

Fourth, the methods section in study 1 is very detailed because corpus-based methods cannot currently be regarded as mainstream in sociological research. When describing an analysis built on survey data or similar, a reasonably experienced researcher can be expected to know the basics and a quick reference should be enough to clarify what was done. However, this is unlikely to be the case for corpus linguistics in the context of sociology. For example, in 6.1.2, where a contingency table is used to calculate a certain stat value. If this was to be done with something such as survey data, most sociologists can be expected to know what a contingency table is, making a detailed explanation unnecessary. This is not the case for the type of data used in this study, which is also the reason for not placing some parts of the methods section in an appendix, because the explanations are not just for reference but will need to be read by many readers, despite their disciplinary experience and skills. While this makes the methods section longer and quite detailed, there is good reason for this.

The timeframes of the empirical studies vary somewhat, for different reasons. The first study, which covers the years 1982 through 2017, does so because 1982 marks the first occurrence of the search item and 2017 the last complete year at the time of data collection (see 6.1.1 for additional information). For study 2, the timeframe relies on information from the first empirical study, specifically the point in time when media coverage started to increase (the 2006/2007 season). The endpoint, just as in the former case, was set by the last complete season at the time of data collection (2017/2018) (see 7.1.1). For study 3, the research questions did not require an analysis where time was a factor, and the time limit (2015 through 2020) was thus determined by means of appropriate corpus size and digital availability.

5.1 Concepts

The concept of *discourse* plays an important part in the methodology, most prominently in the first empirical study but occasionally in other places, so an idea about its epistemological and theoretical meaning should be

sufficient. The same should be true for the broader term *narrative*, which is occasionally used in the empirical studies.

5.1.1 Discourse

Baker (2006, p. 4) builds the general conception of discourse assessed through the corpus-based method around the definition that most sociologists would see as canonical: that of Foucault, cited below.

“‘Words and things’ is the entirely serious title of a problem; it is the ironic title of a work that modifies its own form, displaces its own data, and reveals, at the end of the day, a quite different task. A task that consists of not – of no longer – treating discourses as groups of signs (signifying elements referring to contents or representations) but as practices that systematically form the objects of which they speak (Foucault, 2013)

While this frequently cited definition provides a good conclusion about the theoretical meaning of discourse, discourse analysis per se is widely considered to be a methodological approach suitable for various areas in the social sciences (e.g. G. Brown, Yule, & Gillian, 1983; Chouliaraki & Fairclough, 2010; Lupton, 1992). By default, this method falls within the domains of qualitative methods (see Starks & Brown Trinidad, 2007), so the use of a quantitative approach that claims to assess discourse needs clarifying.

The simple explanation is that the corpora-based methods used in this thesis are aimed at using the broad academic concept of discourse as the basis for quantitative study (see Baker, 2006, p. 4). More simply, the majority of the methods applied in the thesis do conduct some degree of discourse analysis, but cannot be considered *the* discourse analysis. The benefits of analyzing discourse using corpora will be expanded on in 6.1.

Occasionally, the results of the studies will class word items as *non-discursive*. This distinction, although seemingly self-explanatory, mainly follows the principles of Fairclough (2003, 2013). Thus, any item that obviously do not contribute to the social mediation, by either structuring or

maintaining social content of some sort, will be treated as non-discursive (more on this in the methods sections of each study).

5.1.2 Narratives

Due to the term's extensive meaning, *narrative* as a concept may initially be deemed almost irrelevant or obscure due to its obvious vagueness (see Barthes, 1966). For the social sciences, it has even been described as almost non-definable (e.g. Somers, 1992). Through the perspective of historians, however, the following quote provides broadest essence of the term.

"Despite the broad debates, each of these positions shared a common definition of narrative as a mode of representation – discursive, rather than quantitative; nonexplanatory, rather than conditionally propositional; and nontheoretical, rather than the theoretically driven social sciences." (Somers, 1992, p. 600)

Of course, it could be said that this quote raises more questions than answers if the aim is to provide a definition, but it should be of interest for this thesis. For one, the generally agreed link to discourse supports the intertwining use of the terms in the analysis. Consequently, there could be questions about the added value of the narrative concept (as opposed to sticking with the formerly defined *discourse* throughout). Thus, the following quote is necessary to add further clarification.

"The new notion recognizes narrative and narrativity to be concepts of social epistemology and social ontology. These concepts posit that it is through narrativity that we come to know, understand, and make sense of the social world, and it is through narratives and narrativity that we constitute our social identities. It matters, therefore, not whether we are social scientists or subjects of historical research, but that we come to be who we are (however ephemeral, multiple, and changing) by our location (usually unconsciously) in social narratives and networks of relations that are rarely of our own making." (Somers, 1992, p. 600)

As well as further clarifying the meaning of *narrative*, the above quote helps to distinguishing it from *discourse* and, in the next step, clarifies that

although the two share conceptual features, they are not to be considered the same thing. This should be fairly apparent when it is compared to the quotes in the preceding section (5.1.1).

Although mainly associated with qualitative methods, the advantages of corpus-based approaches (see 5.0) should be apparent in assessing any latent content. Looking more specifically, and perhaps reaching a definition, the narratives of interest here should be the type that (Somers, 1992, p. 604) calls *public, cultural and institutional narratives*. More specifically, these are described as:

“...those narratives attached to ‘publics’, to a structural formation larger than the single individual, to intersubjective networks or institutions, however local or grand, micro or macro-...” (Somers, 1992, p. 604)

With this definition as the basis for the use of the *narrative* concept in the thesis, there should be good coherence between the aim, method and its occasional use.

5.2 Ontological and epistemological assumptions

Since the methods applied in the thesis share a reliance on quantitative content analysis, basic assumptions regarding ontology and epistemology should accordingly be related. Additionally, in this regard, the reliance on a particular type of analysis (the corpus-based approach) may have some implications that needs to be addressed.

For ontological assumptions, the overall approach of content analysis is quite open, in that it does not come with any given assumptions; the researcher can adjust it to suit the research problem (Graneheim, Lindgren, & Lundman, 2017). For this thesis and the methodology it relies on, the analyzed material, although varied, shares the common assumption of the existence of signifiers and meaning beyond the linguistic meaning of a given word or sentence. Thanks to Krippendorff (2019, pp. 11-12) examples of

early 20th-century content analysis, particularly of printed media, where ambitions of finding the “real” meaning of material were central, the main ontology of any related method becomes quite apparent. Texts are, beyond the axiomatic philosophical assumption of them being considered *real*, also assumed to contain information beyond their simple linguistic significance. Indeed, Krippendorff (2019, pp. 27-30) assumes six textual features that should support this kind of ontology. These include a lack of reader-independent qualities, as well as the need to relate them to a given discourse or content to achieve meaning.

As for epistemology in this thesis, a positivistic view of knowledge could be considered the core of its methodological choices. However, the ideal-type positivistic view of content analysis that is the total absence of interpretation is not fully applicable. This has to do with the component of interpretation that is, to varying degrees, present in the chosen methods. The following quote should illustrate the positivistic core and its ambiguity:

“This suggests that corpus analysis shares much in common with forms of analysis thought to be qualitative, although at least with corpus analysis the researcher has to provide explanations for results and language patterns that have been discovered in a relatively neutral manner,” (Baker, 2006, p. 18)

Riff et al. (2014) provides two basic standpoints in relation to content analysis. First, the assumption of an empirical approach, as opposed to idealistic (Riff et al., 2014, p. 4). This should be quite uncontroversial for any related methodological approach. Indeed, Neuendorf (2016, p. 22) emphasizes the methods foundation of empiricism as an inherent strongpoint. Secondly, however, the assumption of a reductionist view at the expense of a holistic one (Riff et al., 2014, p. 4) leads to questions that might be debatable in relation to this thesis. At least one of the three included studies could be argued as being suitable for the latter assumption, on the ground that it is derived from exactly the type of information that the authors build their argument on: mass communication through the media (see Riff et al., 2014, p. 4). However, the corpus-based approach (on which the first study is built) offers a methodological take in which the move from

holism to reductionism should not really be necessary to acquire the necessary information. At least not by using technical or practical limitations, because it can be argued that the reductionist approach is somewhat inadequate for fully assessing a given social reality (e.g. Verschuren, 2001).

To sum up, the thesis' epistemology can be described as following the general principles of quantitative content analysis, with some extra considerations necessary due to the corpus-based approaches.

5.3 Method discussion and limitations

For all the benefits of accessing a risk regulation regime through the methods specified under 5.0, there are a few limitations and potential questions that should be briefly discussed.

First, could the addition of some sort of qualitative study have contributed to further understanding of the risk regulation regime. Potentially, this could have included everything from an additional content analysis with a qualitative approach to an interview-based study. The fact that a number of the studies cited in 3.2 are based on qualitative assessment should confirm that this is indeed a possibility, as with several studies used by Hood et al. (2001) to disclose regime dynamics. However, despite the possibilities to contribute through such studies, the chosen macro-approach should be more appropriate, largely due to the nature of the risk. In this case, this does not refer to head injuries in terms of their severity or other factors, but to the nature of the risk in terms of novelty and the current lack of research. Thus, starting to study it from the perspective of the social sciences should benefit from a macro-perspective, from which further studies that use a qualitative approach can draw background information.

Additionally, the inclusion of a substantial qualitative study would entail the need to discard at least one of the empirical studies. This would probably be a mistake, since the coherence of the method and aim relies on how the current empirical studies can all be shown to cover substantial

regime actors, and losing any one of these would compromise the ambition of totality.

Second, even if the overall quantitative approach is accepted, the exclusive use of secondary data for the bulk of the empirical studies could be questioned. It could be feasible to design a survey that used the theoretical framework to assess supposed regime content, but such a study would probably be questionable due to a number of reasons, one of which is the sampling framework. Using the general population could be relevant for some parts of the framework, mainly related to public opinion (see Hood et al., 2001, pp. 90-111). For studies of actual regime actors, a specified sampling framework would be more complicated, given that it would require a complete list of the individuals involved in the regime as a whole or its specific actors. As a risk regulation regime is an abstract theoretical construct, rather than something visible through policy (see Hood et al., 2001), that is not practically possible.

Third, somewhat related to the first point on the absence of a qualitative approach, this limitation may entail subsequent questions about the fit between theory and method in one particular sense: the lack of micro-related perspectives. This is because one of the benefits of the risk regulation regime concept in general is its ability to bridge the gap between micro-perspectives on risk, where the individual risk-taker is in focus, and macro-related ones, such as risk society (Hood et al., 2001, pp. 14-16). While this is arguably one of the strong points of this theoretical concept, which might make it reasonable to use it in an analytical sense, using a more micro-related approach in the empirical studies and subsequent theoretical analysis is not the only way to benefit from it. In this thesis, the bridging between micro- and macro-perspectives might have limited empirical relevance. On the other hand, this strongpoint was used when the research problem was introduced and narrowed down (see Section 1). Given the empirical decisions and the arguments for the related choices, this should be a better way to using this advantage here.

6 Study 1 – Corpus-assisted discourse analysis related to media-narratives concerning head injuries in ice hockey

This study is primarily expected to answer the following research question:

- What is the media narrative about head trauma in ice hockey and its potential long-term effects, and how has it changed over time?

In its entirety, this study is relevant because the dynamics of risk regulation regimes and their variations can be partly understood through the prevailing mass-media narratives, which are one of the factors that define the context of a risk regime (Hood et al., 2001, pp. 28-29). Additionally, such factors are assigned great importance in one of the explanatory hypotheses, *opinion responsive government* (Hood et al., 2001, pp. 90-111). In other words, media surveillance plays a key role in the ambition to describe and analyze a risk regulation regime.

6.1 Method

This study will be carried out using a *corpus assisted discourse study* (CADS) which, in brief, means that linguistic factors – such as the contexts within which the relevant terms of study are mentioned – are systematized and quantitatively analyzed from a social science perspective (Partington, Duguid, & Taylor, 2013). A requirement for the method is the technical ability to analyze a given *corpus*, which is defined as an extensive quantity of text that is systematically selected for hypothesis-testing related to factors such as context and size (Hearst, 1992). As linguistic analysis, commonly known as *corpus linguistics*, this method has a history that stretches back at least three decades (e.g. Garside, Sampson, & Leech, 1988), but the improved potential for analyzing large amounts of text using software has resulted in a significant increase in the number of studies using these methods. Baker et al. (2008) show that the application of corpus linguistics in discourse-related studies, as opposed to its historically purely linguistic character, is

beneficial. Despite the method's suitability for these contexts, which makes it relevant for application in the social sciences, actors such as Baker et al. (2008) appear reluctant to favor specific methods for data analysis. However, linguistic incidence in terms of numbers and changes over time may, according to Riff et al. (2014), be studied using traditional statistical methods. In this situation, CADS becomes a tool for more practical data management, while the actual analysis is based on general methodological considerations.

The benefits of this method seem to be quite extensive. Baker (2006), who is by far the most cited author in methodological issues for CADS, emphasizes, among other things, reduced research bias, reduced risk of overly excessive influence from individual writers/authors, and increased opportunities for charting possible discursive changes. This latter point is of great relevance in this thesis, which further supports the suitability of the current method. This becomes even clearer when Baker (2006, p. 14) explicitly mentions the practical problems that arise from ambitions to achieve this through smaller scale, purely qualitative content analysis methods.

6.1.1 Material

The kind of text mass that can be used for CADS is referred to as a corpus (plural: corpora), which is described by Baker (2006) as a comprehensive representative text mass that occurs naturally. To achieve the latter requirement, the text mass analyzed must not be in any way created for the purpose of the study. This is the case here and, along with Baker's (2006) repeated reference to the types of texts in journals as a suitable material, there should be little room to question the choice of material. The question of representation in the sample is more complex, but is expected to be partly dealt with using inference methods (see 6.1.2.).

The study is based on an empirical material comprising articles, opinion pieces and other texts collected from Swedish media during a specific timeframe. The choice of empirics is mainly supported by the importance of media surveillance, as emphasized by Hood et al. (2001), regarding risk regulation regimes (more thoroughly described in 5.1).

The texts were collected through *Mediearkivet*, a Swedish media database that covers a significant proportion of Swedish print media. As stated by Riff et al. (2014, pp. 70-71), defining the population, sampling and associated sampling frame is just as important here as it is in survey research. This is somewhat tricky in this case, as the sample can be considered neither a complete set of articles nor a random sampling of every possible Swedish news article published within the specified timeframe. The sampling should thus be considered a complete textual dataset only if the population is defined by the news sources included in *Mediearkivet*. Given that these have a substantial share of the Swedish media market, that are useful for the intended types of analysis. This search covers 911 sources, dominated by printed material with identical digitalized counterparts (Mediearkivet, 2019). While most of these sources are newspapers, printed and digitalized, a few industry publications and similar are included.

Table 4 shows the searches that have been made, including the number of matches for each. To cover all the texts relating to concussion in ice hockey, a third search was used, resulting in an initial corpus of 33,033 articles.

Search term	Number of texts
Concussion*	161 214
Concussion* + hockey	14 470
Concussion* + hockey or "ice hockey"	33 003

Table 5. Summary of searches using *Mediearkivet* (translated from Swedish). Valid on 2 April 2018

The corpus set for further analysis had 13,387,578 word tokens and 197,978 word types. The former is the total number of words, while the latter is the number of unique words. For example, if the word *unicorn* occurs 337 times in the text, there would be an increase of 337 word tokens but only 1 word type.

One issue when working with material collected this way is that many Swedish newspapers use the same news source for simple reports (e.g., Tidningarnas telegrambyrå – TT), which can result in multiple near-identical texts. Although this needs to be considered if any interpretation is to be made, systematically aggregating such occurrences is not appropriate because an issue's actual exposure plays a part regarding the study's fit with the research questions. Multiple identical or nearly identical articles simply mean that there is greater exposure in terms of outreach and number of readers, so any exclusions or aggregations on such grounds may jeopardize the ability to put forward an argument based on exposure or surveillance. Similar texts are thus all treated individually, with no exceptions.

6.1.2 Data processing

In the initial text processing, this study mainly followed the suggestions of Baker (2006). Additional text-based statistical analysis mostly followed the principles of Riff et al. (2014). For processing, the *AntConc* software (Anthony, 2017) was used along with basic analytical tools supplied by the database. For further statistical analysis, SPSS (*Statistical Package for the Social Sciences*) was the main software.

The data analysis was carried out in four main steps, based on the distinctions made by Baker (2006). Each of these are described below, with Table 9 providing an overview of how each part of the analysis contributes to the thesis' research questions.

Initially, descriptive data including terminology related to head trauma in ice hockey is compiled in simple frequency distributions and graphs. This establishes trends over time regarding media exposure, although this is still simply descriptive. To make the result plausible in relation to the overall increase in media surveillance, the numbers for number of exposures are standardized using simple calculations of exposure per total number of articles/texts each year. Next, the exposure over time (independent variable=*years passed since initial hit*) and exposure (dependent variable=*standardized exposure*) are determined through bivariate correlation analysis, as recommended by Riff et al. (2014, pp. 153-154).

Although this initial analysis is merely descriptive, there are good reasons to consider discourse even at this stage. As Baker (2006, pp. 47-49) states, some of the discourse-related analysis is inevitably initiated during simpler processing, since the occurrence or non-occurrence of different linguistic expressions in the compilation provide part of a discourse. This aspect is used later in the study, especially when making overall conclusions in which this part of the study is important to the argument.

The next step in the process is to apply the process which Baker (2006, pp. 71-72) calls *concordance analysis*. As stated, this is an effective method for merging the qualitative and quantitative aspects of a text mass, where the interest is in linguistics. The method, in brief, puts specific terms in a context by systematically listing the context in which a defined word occurs (Baker, 2006, pp. 71-72). For example, if a concordance analysis is conducted for the word *klubba* (ice hockey stick) using the first part of the total corpus, the ten first concordances are as follows:

Table 6. Example presentation of common concordance analysis.

1	skott, med misstänkt hög	klubba	förbi [name]
2	slog [name] upp en	klubba	i ansiktet på en
3	faktiskt Frölundas [name:s]	klubba	i ansiktet på Luleås
4	skulle peta upp en	klubba	i ansiktet på den
5	han slagit sin egen	klubba	i flisor på [name]
6	det en och annan	klubba	i magen på motståndaren
7	av Leksandsforwarden [name:s]	klubba	i tisdags. Det när
8	utvisningar. Räcker inte det,	klubba	ner [name]". Jag hörde
9	för spel med hög	klubba	-och direkt därpå ett
10	2 x 2 minuter för hög	klubba.	"[nickname:s] protest" gav Luleå

As Table 6 shows, this analysis provides an overview of specific contexts in which a word appears. The example does not provide any discourse to analyze (given that it is taken from a specific part of the text). However, in other circumstances it could be suggested that the context in which *klubba* appears seems to be related to a hockey stick striking the opposing players or being used in another physical manner. Further discourse analysis could then, logically, include the premise that hockey sticks are mostly mentioned in text when they are used in illegal or violent ways. As seen in Table 6, the word's context is often illustrated by displaying a few words to the left and right (Baker, 2006, p. 71). As regards the choice of search item for the concordance analysis, the term CTE and related ones ("*chronic traumatic encephalopathy*", *etc.*) are most relevant for the thesis' overall purpose and the specific question in this study. This is because it is an important part of the problem, the long-term effects of repeated head trauma, along with the practical management of concordances. The latter is important for the feasibility of this part of the study, since any conclusions are dependent on manually looking at each concordance. Using the term *concussion* would, for example, give a total of 37,466 concordances, making management practically impossible, even if adjustments for identical or nearly identical articles were to be made (see 6.1.1.). Although CTE is not the entire problem regarding health issues, there is good reason for this choice in this part of the study, because it is the most appropriate sub-method for specific terms that may have a key role in the discursive relevance of long-term health effects. Even for CTE and the associated terms, illustrating each concordance like Table 6 does is unlikely to be relevant due to the sheer number of occurrences. Instead, the discourse can be described and illustrated through further systematization related to each context and then presented in an aggregated manner. To make theoretical sense of the contexts in which CTE occurs within the corpus, a deductive approach is used in this part of the study. According to Elo & Kyngäs (2008), in the methodological field of content analysis this approach is appropriate for testing a concept in a new context. While risk regulation regimes could be considered a concept, the core of the linguistic patterns being tested in this part of the study also largely relies on the background information that is a significant part of the

research problem. Through this (see mainly sections 2, 3 and 5) the following four factors were identified for further testing through concordance analysis:

- *Dementia* – because this is how the risk of long-term effects from head trauma is likely to take its most explicit form, and describes a mental state that gradually reduces opportunities for a functioning everyday life.
- *Suicide* – because the risk of this action could be said to represent the ultimate bad consequences.
- *Fighting* – because this is an aspect of ice hockey that seems to be a growing issue, both in relation to increased medical knowledge of the health effects and its moral aspects.
- *Name of affected individual* – because this could represent the linguistic outcome of discourse change related to the descriptions as regards the different forms media surveillance might take (see 5.1.2). For example: stable media surveillance with occasional peaks due to specific events, described by Hood et al. (2001, pp. 91-97) as *intermediate*, may be adequately mapped by observing the use or non-use of such names. This is because occasional peaks, if present, may be understood in relation to specific events, which in this context are likely to include the name of the affected individual.

A simple *content analysis protocol* is used to sort out the occurrence or non-occurrence of these factors in the concordances. Riff et al. (2014, pp. 98-99) stresses the importance of such a protocol, defining it as a persistent set of rules applicable to the analysis throughout the entire process of any study using such methods. Additionally, Riff et al. (2014, pp. 98-99) mention this in relation to a study's replicability, so any research done with such a method is likely to be dependent on this protocol if the reliability of the study is to be properly evaluated. In this case, the protocol consists of the above factors, complete with a clear description of how and when they are considered present in a concordance. Considering the purpose of the and the previously defined sampling method, according to Riff et al. (2014, pp. 101-108) the next step is a clearly defined presentation of the conditions for the factors'

presence or non-presence, and acknowledgements of potential conflicts. This is shown in Table 7, and the complete coding sheet is available on request.

Table 7. Coding protocol for the concordance analysis. All conditions are based on a search window setting of '100'

Factor	Conditions for = 1	Category problems
Dementia	Explicit mentioning of dementia, either in general or in the form of a specific diagnosis (e.g., 'Alzheimer's')	In some cases, terms like " <i>dementia-like symptoms</i> " occur. These are considered valid given the purpose of the category.
Suicide	Explicit mentioning of suicide, either in general or related to a specific case.	Risk of suicide and completed suicide, as well as attempts, qualify for inclusion.
Fighting	Explicit mentioning of fighting in an ice hockey game.	Non-specific trauma like 'hits to the head' are excluded because these may involve violence not related to fighting.
Name of affected individual	Explicit mention of one or more affected individuals by name.	For inclusion, the mention of a specific name must unambiguously relate to a diagnosis of CTE.

The decision to use a search window setting of 100 was made after pilot testing appropriate limits, once again consistent with Baker (2006). With these four factors in mind, concordances can be systematized in a way that is useful for understanding the media surveillance and subjected it to further theoretically grounded analysis. The first step in this process is to obtain descriptive statistics for each factor, using simple frequencies and distribution (%) based on occurrence or non-occurrence. Next, the factors are tested for inter-relationships using simple cross tabulation. Third, the trend over time will be mapped for each factor. As stated by Baker (2006, pp. 77-79), patterns useful in discourse analysis usually become visible after some sorting of the concordance is conducted. This could be considered sorting in that regard, as it is a step towards understanding the discourse. The initial list of occurrences is sorted in order of appearance, which should have some

relevance in relation to the study's research question. To make the progression of time quantifiable in a theoretically logic sense, this factor will be structured in the form of *days passed*, using the initial hit as a starting point. Accordingly, if the first mention of CTE occurs on January 1, 2004, an individual concordance dated March 12, 2008 would be assigned a value of 1532; this means that 1532 days passed between the initial hit and the unit of analysis. Not only does this procedure enable the illustration of concordances over time, but the creation of this variable also allows further analysis of the factors in relation to time. This obviously corresponds well to the overall purpose of the study. Since each factor has dichotomous values, a point-biserial correlation should be sufficient to measure association with the continuous variable of *time* (Field, 2009, pp. 182-183). For interpretation purposes, Cohen (1988) is the reference point for relationship strength.

The third part of the study concerns the analysis of *collocates*, defined by Baker (2006, pp. 95-96) as words that can be statistically determined to frequently occur in the vicinity of a specific term. This enables a search for patterns visible through a "top-down" look at a large amount of text, since the use of single excerpts does not reveal such *co-occurrences* (Baker, 2006, p. 96) in a systematic way. Here, the term *concussion* (including *concussions*, etc.) is used as a search term to determine words that are likely to appear before and after it in the corpus. In accordance with Baker (2006, p. 103), a span of -5 to +5 has been deemed fit through pilot testing, so the five words immediately before and after the term are the basis for the analysis. With this determined, the next step was to decide on a statistical measure for the analysis. Baker (2006, p. 102) mentions MI (mutual information), MI3, Z-score, Log-likelihood, Log-log and observed/expected as potential candidates, each with its own abilities in terms of favored word classes. Since this part of the study does not favor any word classes in relation to the problem, the statistical calculation of log-likelihood is determined as fit for purpose. However, it could be argued that the exclusion of *function words*, in line with Baker (2006), is a form of favoring a word class. This issue requires manual processing and is not likely to be completed using any available method, so the use of log-likelihood should not be less appropriate due to the presence of such a process. This method determines the significance of a

certain word as a collocate. If a collocate is statistically significant, it means that it is more likely to appear close to the specified term than elsewhere in the corpus file (Baker, 2006, p. 101). In the next step, such a method also enables the statistic-wise sorting of collocates.

The calculation of log-likelihood statistics is based on Gómez (2013, pp. 208-210), which specifies the following formula:

$$LL = 2 \times [a \times \log(a) + b \times \log(b) + c \times \log(c) + d \times \log(d) - (a + b) \times \log(a + b) - (a + c) \times \log(a + c) - b + d \times \log(b + d) - (c + d) \times \log(c + d) + (a + b + c + d) \times \log(a + b + c + d)]$$

Where:

a = the frequency of co-occurrence, meaning the number of times when word 1 (w_1) co-occurs with word 2 (w_2)

b = the number of instances including w_1 , but not w_2

c = the number of instances including w_2 , but not w_1

d = the total number of words in the corpus minus w_1 and w_2

If, for example, we conducted a collocates analysis of a corpus of food recipes, we might want to explore whether or not the word *apple* is a statistically significant collocate of *cinnamon*. The corpus consists of 342,000 words in total, out of which 4,262 are *apple* (w_1) and 2,682 are *cinnamon* (w_2). Set at a span of +/- 5 words, *apple* and *cinnamon* co-occurs 862 times.

This premise would lead to the following values:

$$a = 862$$

$$b = 4262 - 862 = 3400$$

$$c = 2682 - 862 = 1820$$

$$d = 342\,000 - (4262 + 2682) = 335\,056$$

These values would then result in the following calculation:

$$\begin{aligned}
 LL = 2 \times [& 862 \times \log(862) + 3400 \times \log(3400) + 1820 \times \log(1820) \\
 & + 335\,056 \times \log(335\,056) - (862 + 3400) \times \log(862 + 3400) \\
 & - (862 + 1820) \times \log(862 + 1820) - (3400 \\
 & + 335\,056) \times \log(3400 + 335\,056) \\
 & - (1820 + 335\,056) \times \log(1820 + 335\,056) + (862 + 3400 \\
 & + 1820 + 335\,056) \times \log(862 + 3400 + 1820 + 335\,056)]
 \end{aligned}$$

Further simplified, this would be:

$$\begin{aligned}
 LL = 2 \times [& 862 \times \log(862) + 3400 \times \log(3400) + 1820 \times \log(1820) \\
 & + 335\,056 \times \log(335\,056) - (4262) \times \log(4262) \\
 & - (2682) \times \log(2682) - (338\,456) \times \log(338\,456) \\
 & - (336\,876) \times \log(336\,876) + (341\,138) \times \log(341\,138)] \\
 & \approx 1914.919
 \end{aligned}$$

The threshold for an α -level of 0.05 is a log-likelihood stat of 3.8 (Gómez, 2013, p. 209), meaning that 1914.919 is associated with a very small risk of such a collocation happening by chance. Hence, we conclude that *cinnamon* is a statistically significant collocate of *apple*. When using software such as antconc, the top collocates are automatically sorted according to the stat values, in this case log-likelihood. After this, the next step is to systematically make sense of the obtained information.

Contrary to the concordance analysis, this part of the study is carried out through an inductive approach. As stated by Elo & Kyngäs (2008), this enables a more open type of content analysis, which is appropriate when there is insufficient background information on which to base assumptions regarding expected content. Therefore, no predetermined categories based on theory or background are used. Instead, the collocates themselves serve as the core of identified categories used for further analysis. This step of the process requires some interpretation, mainly qualitative. Due to the inherent double nature of the methodological concept of CADS regarding qualitative-quantitative mix (see Baker, 2006, pp. 71-72), this should not be a problem. Additionally, the interpretative part seems to correspond well with Baker (2006, pp. 104-113) as regards making sense of collocates. The initial sorting

is based on word classes, to ensure that no important information is lost in the sorting process (e.g. Partington et al., 2013, p. 26). Since Baker (2006) encourages the exclusion of grammatical *function words* in this part of the process, the word classes used will be *nouns, adjectives, verbs* and *adverbs*, thus excluding non-discursive classes such as pronouns and prepositions. Once each of those four-word classes are sorted, with the latter process based on log-likelihood stats, the thematization is carried out in accordance with the current theoretical framework and relevant background information (see mainly sections 2, 3 and 5). The word sorting is done using the Swedish Academy's wordlist (SAOL) for the proper classification of words. In cases where a given word has multiple meanings, a selection of individual collocates will be used to determine the overall word class.

The fourth and final empirically based part of the study concerns change over time, using *keyword analysis*. Baker (2006, p. 125) states that this is a good way of determining whether a certain word occurs more often in one text than another, once again through statistical analysis. With a corpus sorted time wise, starting with the first text and ending with the last, this facilitates a quantitative approach to change over time; it allows a comparison between the early and late parts of the corpus regarding words that are significantly more likely to occur in the latter, so the difference is not likely to have occurred by chance. To obtain such words, the corpus is divided into two parts: the *reference corpus* and the *target corpus*. The former serves as a baseline for comparison of linguistic differences. The method does not prescribe how to make such a division, instead it needs to be determined theoretically in relation to the research problem and discursive circumstances. In this case, the "cut point" is determined by the first concordance in the concordance analysis. Therefore, if the first occurrence of the term CTE is to January 22, 2002, any content before that is the reference corpus while any material after it is the target corpus.

Just as in the collocates analysis, the principles for applied log-likelihood regarding keywords are based on Gómez (2013, pp. 153-156). The formula for statistic calculations for each term is as follows:

$$LL = 2 \left\{ \left[a \times \ln \left(\frac{a}{E_1} \right) \right] + \left[b \times \ln \left(\frac{b}{E_2} \right) \right] \right\}$$

Where a and b represent the observed values, meaning the given frequency of a certain word, and E expresses the expected frequency for each case. The latter values are obtained using:

$$E = \frac{\sum row \times \sum column}{\sum cells}$$

For example, if we wanted to do a keyword analysis for a target corpus with texts about travel, related to a reference corpus of general lexical words from that language. In this case, we are interested in whether the term *sunshine* occurs more often in the target corpus than in the reference corpus. To statistically determine this, the use of log-likelihood would presuppose a knowledge of:

- The overall size of the reference corpus (frequency of total words)
- The overall size of the target corpus (frequency of total words)
- The occurrence of a given word in the reference corpus (frequency)
- The occurrence of a given word in the target corpus (frequency)

Once these four frequencies are obtained, which is quite a fast process thanks to the availability of corpus analysis software, the calculation of expected values will require an initial contingency table (Gómez, 2013, p. 155). In this example, we assume that the target corpus consists of 4,000 words, while the reference-corpus includes 100,000. The word *sunshine* occurs 200 times in the target corpus and 600 times in the reference corpus. The table of observed values would then look as follows:

Table 8. Contingency table of observed values in the example. Based on Gómez (2013, p. 155)

	Target corpus	Reference corpus	Total
<i>f</i> (word)	200	600	$\Sigma = 800$
<i>f</i> (other words)	$4000-200 = 3800$	$100\ 000-600 = 99\ 400$	$\Sigma = 103\ 200$
Total	$\Sigma = 4000$	$\Sigma = 100\ 000$	$\Sigma = 104\ 000$

Using these values, one is able to calculate the expected value of each cell. For example, the expected value for the target corpus regarding the occurrence of *sunshine* (E_1) is:

$$E_1 = \frac{800 \times 4000}{104\ 000} \approx 30,8$$

While the expected value of *sunshine* in the reference-corpus (E_2) is:

$$E_2 = \frac{800 \times 100\ 000}{104\ 000} \approx 769,2$$

Having calculated the expected values, we may now insert them into the formula for log-likelihood:

$$LL = 2 \left\{ \left[200 \times \ln \left(\frac{200}{30,8} \right) \right] + \left[600 \times \ln \left(\frac{600}{769,2} \right) \right] \right\} \approx 450.2$$

The stat value, in this case 450.2, is to be interpreted this way: a higher value is associated with a more significant difference in the frequencies' score (Gómez, 2013, p. 155). The stat α -level limits are set at 3.8 ($p < 0,05$) and 6.6 ($p < 0,01$) respectively (Gómez, 2013, p. 155), meaning that the (fictive) example above is highly unlikely to have occurred by chance. For practical reasons, the words selected for further analysis and interpretation are limited to the top hundred. This is because the total number of keywords is 783, even with the limit set so $p < 0,0001$ and Bonferroni-correction enabled for handling inflated errors (see Keppel & Wickens, 2004). While setting a limit on the number of words used in the actual analysis is obviously an

arbitrary and practical decision, it is a relatively common way of selecting items for further analysis (Gabrielatos, 2018, p. 15). Additionally, the sorting of matches may be done so the top words are quantitatively more relevant.

While sorting by keyness would account for the relationship between expected and observed frequencies, it would not be entirely correct to assume that the top ten words are necessarily the ones with the largest *effect* on text composition. For starters, statistical significance depends on two things: the size of a given difference or relationship and the size of the sample (Muijs, 2010, p. 78); the latter poses an obvious problem in corpus analysis. Accordingly, Gabrielatos & Marchi (2012) suggest that the sorting of keywords should principally be by effect rather than level of significance. With this clarified, it comes down to the choice of a suitable coefficient. AntConc offers a variety of such algorithms, with *the Dice coefficient*, basically a doubled ratio between shared and total numbers of occurrences in the text ranging between 0 and 1 (Curran, 2004, p. 74) as the default setting. This, and similar measures of association, could be questioned because the thing being measured is not the difference of frequency. Rather, it measures the ranking based on size in each corpus (Gabrielatos, 2018, p. 13). Similarly, measurements such as Cramers V could be inappropriate as they include measures of statistical significance in their methods of stat calculation (Gabrielatos, 2018, p. 13). Given the problems of relying solely on significance, these kinds of measures would not be favorable in this particular part of the study. According to (Gabrielatos, 2018, pp. 13-15), there are actually five methods for effect size that are relevant for keyness analysis:

First, *ratio*, which depends on the simple division of raw frequencies between the two texts. For example, a value of 2 implies that a certain word occurs twice as often in one corpus than the other.

Second, *Odds-ratio*, which adds the two corpus' sizes to the calculation.

Third, *log-ratio*, which is a logarithmic function of the straightforward ratio; an increase of one unit in the log-ratio value is equal to doubling the frequency difference between the two texts.

Fourth, *%DIFF-coefficient*, which uses a normalized measure interpreted as 0 when word frequency is equal in both texts and 100 when the occurrences in text 1 are twice as frequent as in the reference corpus. Each increase of 100 corresponds with an according increase of 1, meaning that a value of 400 would equal a frequency five times as high in the text compared to the reference corpus.

Fifth, *Difference coefficient*. This relies on standardized frequencies, though it has an important advantage over the previous measure as it allows strength-based sorting despite any mixing of positive and negative words. Even more importantly, it lacks one weakness found in the other four stats, and a quite important one (Gabrielatos, 2018, p. 15). This weakness stems from the fact that some words might have 0 occurrences in the reference corpus, so a division by zero would render each of these four measures meaningless. Excluding those words would be problematic from a theoretical or discursive sense, because a word being non-existent in the reference corpus might be quite meaningful to interpret theoretically (Gabrielatos, 2018, p. 15). In addition to excluding such words, the other way of handling this issue is to instrumentally add a given number, preferably 1, to the frequency of each word in both corpora (Gabrielatos, 2018, p. 15). As this also has obvious disadvantages, namely related to stat interpretation, the study uses the Difference coefficient for effect strength purposes.

As stated by Gabrielatos (2018, p. 15), the coefficient is obtained by the following formula:

$$DC_{word} = \frac{f(normalized)_1 - f(normalized)_2}{f(normalized)_1 + f(normalized)_2}$$

Where f_1 and f_2 represent the frequency of a given word in the reference and target corpus (in that order). The fact that each frequency is normalized means, in this context, that the frequency of a certain word is weighted against the overall size of the reference (f_1) or target corpus (f_2).

Despite the strengths of the difference coefficient, a different kind of problem arises from including words with a frequency of 0 in either text.

Basically, any such words would be assigned an effect size of 1, so the entire top would consist solely of those terms. Theoretically, this would likely cause problems due to some words' non-discursive nature. For example, an ice hockey player with a great deal of media surveillance who started playing past the time limit between the reference and target corpora would appear among the top effects by name. This problem is dealt with by separating words with an effect of 1 after the keywords' initially sorting and, after excluding function words, names of individuals, doubles and other obviously irrelevant items, internally sorting on the basis of keyness. Once this is done, remaining items will be returned to the overall sorting, with a final look at individual concordances to exclude any irrelevant items that might still present. Lastly, the remaining words to reach 10 items in total will be determined after the same kind of exclusion process. The latter approach is consistent with Baker (2006).

When working with keyness-based analysis this way, analyzing differences by plain words alone might not be entirely sufficient. Additionally, the analysis of *lemma forms* could provide further relevance for the study in linguistic terms (Baker et al., 2008). A lemma could, at least related to the way it is used for corpus-based studies, be defined as a cluster of lexical *items* that are related to each other in terms of meaning (O'Keeffe & McCarthy, 2010, pp. 172-173). For example, the word *helmet* should be aggregated with *helmets* when looking for patterns of difference, rather than treating these two terms as separate items in the analysis. When conducting corpus-based studies on material in a major language, such as English, this problem can be easily managed by importing *lemma lists* in this language. The Antconc website supplies these lists in English, French and Spanish. Working on a corpus of Swedish words, however, does not come with such bonuses, nor is it practically feasible to create such a list from scratch within the timeframe of this particular project (nor would it be appropriate for a doctoral student in Sociology to pretend to have the necessary competence). Although a few Swedish lemma lists, most notably *Språkbanken* (University of Gothenburg, 2019), are available, their format did (at the time of the analysis) not allow for direct use in the corpus software. Re-formatting by hand is not practically possible, due to the vast amount of text. So, the use of

a complete or general lemma list is not an option and, if there is to be a lemma list, it must be obtained in another theoretically meaningful way. Luckily, another part of the overall study design brought an opportunity due to its ability to identify items relevant to the thesis purpose: the collocates analysis. If, for example, the term “*doctor*” turns out to be a significant collocate of *concussion*, it would be wise to lemmatize items such as “*doctors*”, “*medical staff*”, “*physician*”, “*physicians*” and so on into a single lemma. This problem is, in fact, even more prominent in Swedish, where “*läkare*” (doctor) could be expressed through even more terms due to the nature of the language (in Swedish “*the doctor*” translates to “*läkaren*”, and so on). With the information available from the collocates analysis, each term of interest is accordingly lemmatized in line with the Swedish academy wordlist - SAOL.

For the overall study design in this part of the study, the recommendations made by Baker (2006, pp. 121-128) are core to any methodological decisions. The part that might be considered somewhat arbitrary is, however, the splitting decision. Obviously, this needs to be considered for any conclusions made in this part of the study.

Once a list of keywords is obtained, the actual change in discourse needs to be interpreted on a more qualitative basis to make sense of the actual shifts in language between the two texts (Baker, 2006, pp. 128-130). This is done through a systematic look at the concordances for the top keywords.

For summarizing purposes, Table 9 illustrates the four steps and how each is expected to contribute to the overall purpose and research question of the study.

Table 9. Overview of analytical procedures.

Procedure	Analysis	Contribution
Initial descriptives and simple statistics	Simple frequencies Weighted measure of exposure Bivariate relationships Change over time	Basic information on the trends in related media surveillance
Concordance analysis	Sorting of concordances related to a diagnosis of <i>CTE</i> Distinguishing patterns related to discourse	Content-based understanding of the contexts in which the long-term effects of head trauma (represented by the diagnosis of CTE) occurs, including changes over time.
Collocates analysis	Systematic sorting of common terms related to head injuries	Systematic knowledge on the contexts in which concussions are mentioned
Keyword analysis	Systematic sorting of changes in language over time through keyness Interpretation of a relevant keyword list	Systematic sorting and interpretation-based understanding of discourse change over time

6.1.3 Ethical considerations

The ethical question most relevant to this study's design concerns the possible consent of, and information to, the individuals or groups whose texts will be used to build the corpora. Baker (2006, pp. 37-38) explicitly states that there are good reasons to consider this in any context where texts were initially intended for commercial use, which is undoubtedly the case here. However, considering the number of individual articles that are to be used, this would make the study practically impossible. Baker's (2006)

overall assessment, however, appears to be that analyses reported at an aggregated level do not require this kind of consent, provided that the actual mass of the text is properly managed. In this study, this means that only the author knows exactly which texts form the basis of the material. It could be argued that the database that supplied the study material is open to a relatively large number of people, but this does not change how it should be difficult to linking individual articles with the results, and even where a link can be made it should not compromise anyone's integrity. The potential exception is the concordance analysis (see 6.1.2.), which needs to be handled with care as regards what is quoted. Since the results will not take the form of a concordance list, due to the aforementioned impracticalities, this should not be a problem. For collocates, the ethical considerations are basically the same, with some minor practical differences. The potentially problematic word class in terms of ethics would be nouns, because this is where names of individuals could turn up as statistically significant entities. However, should this be the case, it is highly unlikely that the significance of such a word in relation to the study would be the item itself. Rather, such an occurrence would signify that the *mention* of an individual's name is relevant for the interpretation of a discourse, not the name itself. Therefore, this is likely to be manageable through the disclosure of names that have no meaning for the analysis itself. If this is not the case, the unlikely event of ethical problems related to the collocates analysis is dealt with through individual consideration. For the initial descriptives, it is quite safe to say that the aggregated nature of the data makes this part of the study uncontroversial in terms of research ethics.

For the keyword analysis, the ethical considerations are mainly the same as for the collocates. It should, however, be noted that the unlikely event of individual names having a discursive value in themselves is even less likely to occur here, due to the practical method of calculation (see 6.1.2). Once again, such a turn of events could only be dealt with through individual consideration of the cases involved. Displaying the names of athletes is not acceptable from an ethical point of view, and is avoided throughout the study.

6.1.4 Methodological discussion

Since the CADS method cannot be considered as a single, coherent and applied one, but as a collection of methods related to corpus analysis and discourse, where the analytical tools vary between cases, every study conducted needs clear discussion of why the design was chosen. Table 9 provides the big picture, although it does not necessarily provide sufficient information about the other approaches could have been used to approach research question of the study or the thesis. While this could be discussed, the contribution column illustrates how every part of the former question is considered in the design. Additionally, the strengths and weaknesses of each of the four (see 6.1.2.) highlight the need for pluralism in the methodological approach, although it could be argued that the research question can only be answered using collocates and keyness.

For the sampling process, the search terms may be questionable due to the sole focus on concussions. As the thesis' introduction states, there are some indications that the long-term effects of head trauma may even arise after sub-concussive hits, so there may occasionally be a relevant article that is not in the corpus. Nevertheless, the applied terms should be considered superior to any other alternative. This mainly because any article related to head injuries is likely to include that term (e.g., "*...although he did not suffer a concussion*").

Regarding the use of applied methods, decisions open to question include deciding a term for concordance and the cut point for keyness analysis, as well as potential alternatives in the sampling process. Though both decisions are explained in 6.1.2, this part of the methodology should logically be considered when the results are interpreted theoretically.

The main part of the study should be replicable up to the theoretical analysis, given that the same sampling process and methods are applied.

6.2 Results and initial analysis

This sub-section presents the results of the study, sorted in accordance with the contents of Table 7.

6.2.1 Initial descriptives and simple statistics

Table 9 presents descriptive search results using the number of matches over time, between 1982 and 1991. The first year includes the first hit, while 1991 is the year before media surveillance started its apparent increase.

Table 9. Media exposure over time, 1982-1991

Year	Number of matches	Year	Number of matches
1982	1	1987	-
1983	-	1988	-
1984	3	1989	4
1985	1	1990	4
1986	-	1991	-

Figure 6 illustrates media exposure over time from 1992 through 2017, measured by the number of articles.

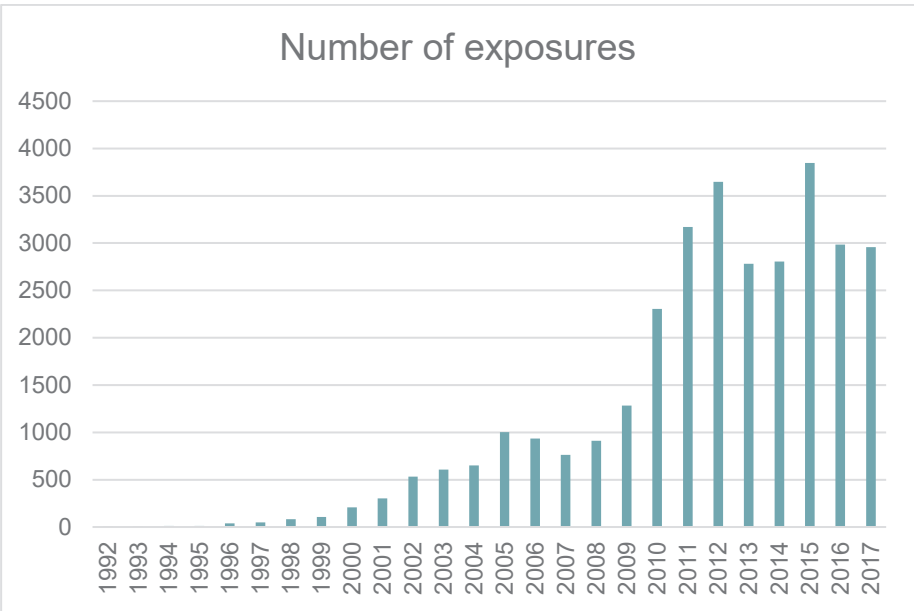


Figure 6. Number of media exposures over time.

Given that the number of articles searchable through *mediearkivet* has substantially increased over time, determining an actual increase in interest in relation to a topic using absolute numbers (as in Figure 6) might be misleading. To adjust for this, Figure 7 illustrates an adjusted exposure count related to the total number of articles (printed and web) available from mediearkivet a given year. This is calculated through the following simple formula:

$$y_{year} = \left(\frac{\text{number of hits}}{\text{number of articles}} \right) 10^4$$

Using the year of 2016 as an example, the values of 2,984 (number of hits) and 8,900,898 (total number of articles available that year) are entered and multiplied by 10^4 to make the number more manageable. Thus, the weighted measure for 2016 obtained through the following calculation is:

$$y_{2016} = \left(\frac{2984}{8900898} \right) 10^4 \approx 3,35$$

Once this weighting process is carried out for each year of data, the exposure would look like Figure 7.

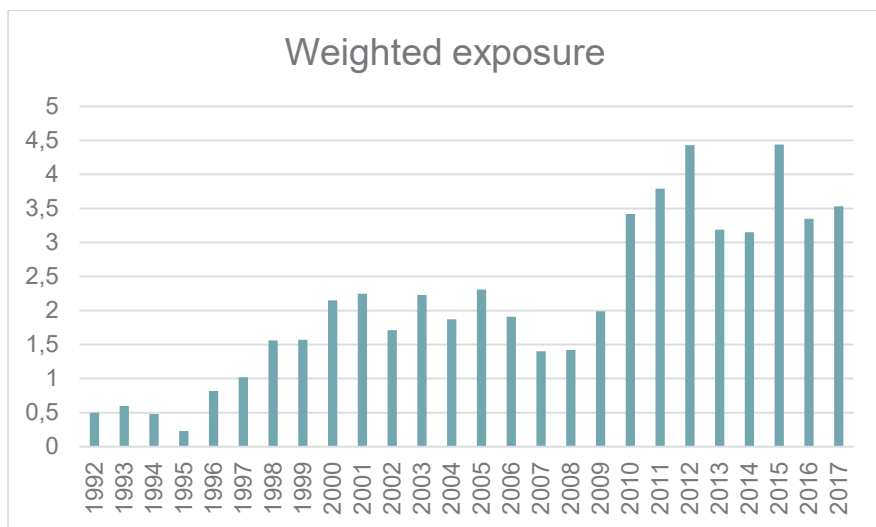


Figure 7. Standardized media exposure.

Figure 7, illustrating each year from 1992 through 2017, shows a clearly defined progression in media exposure, although the relationship does show some decreases along the way. The Shapiro-Wilks test for normality results in a p-value of 0.283, so the variable of weighted exposure can be assumed to be normally distributed and using the *Pearson’s product-moment correlation coefficient* should be quite uncontroversial. Using an independent variable of *years passed*, setting the starting point at 1992 (x-1992), the relationship between the variables can be measured through a coefficient of 0.879 (p<0.001). This indicates a fairly strong positive relationship between the time progression and media exposure. Due to the nature of the material, this absolute relationship should be the main point of interest, rather than any test of statistical significance. This is the case when inference from random sampling has no relevance to the argument. Interpreting the p-value should therefore be irrelevant, at least for the purpose of inference. However, there may be some relevance to present p-values to illustrate the probability of an effect happening by chance.

6.2.2 Concordance analysis

Table 10 shows some basic information about the concordances.

Table 10. Basic information about the concordance analysis

Search string:	cte c.t.e. c.t.e “chronic traumatic encephalopathy” “Kronisk traumatisk encefalopati” (Swedish term)
Total number of concordances:	247
First hit:	17 April 2007

Distribution, year:	2007: 1 (0.4%)
	2011: 138 (55.9%)
	2012: 3 (1.2%)
	2013: 4 (1.6%)
	2014: 33 (13.4%)
	2015: 25 (10.1%)
	2016: 22 (8.9%)
	2017: 21 (8.5%)

Some initial observations:

The first hit (see Table 9) is retrieved from the Swedish medical journal, meaning that the article is unlikely to have reached the general population. The next hit after that initial one is from 24 September 2011.

No relevant statistical effect can be determined for exposure over time. Cubic regression best determines the effect of time on exposure ($r^2=0.151$), indicating a polynomial relationship between the two. However, the fact that the first hit was from the Swedish medical journal makes the exclusion of this data point theoretically relevant. This is mainly due to the limited meaning it is likely to have for the broad discursive practice that the study aims to explore, in line with the principles regarding external validity in terms of the content's nature, as described by Riff et al. (2014, pp. 134-135). Simply put: although the Swedish medical journal mentioned the diagnosis four years before it caught the attention of mainstream media may be of interest from a discursive purpose, including this journal would jeopardize the external validity of further analysis due to its limited exposure in relation to the general public.

With the initial hit excluded, the concordance over time is shown in Figure 8.

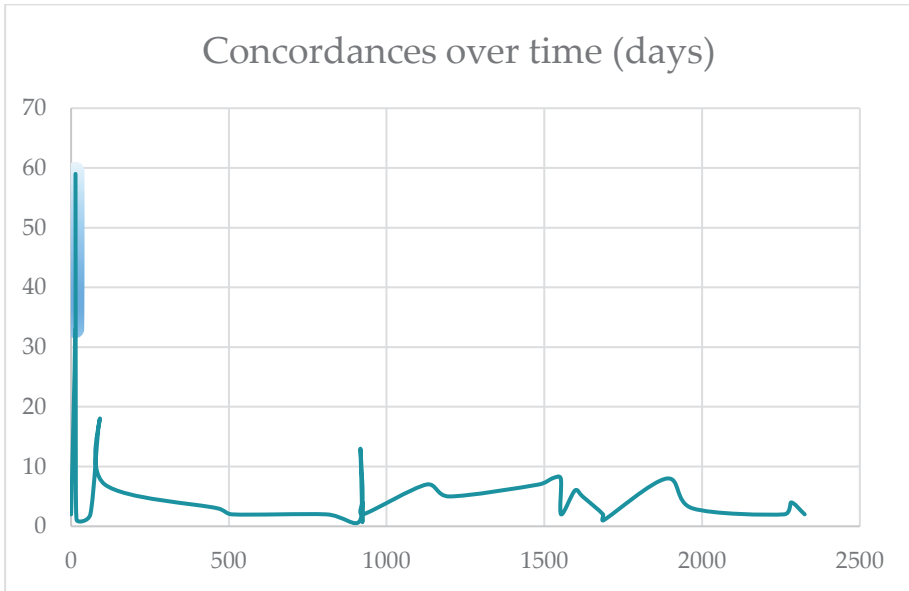


Figure 8. Concordances over time (days). Starting point: 24 September 2011.

Table 11 shows the distribution within each of the four defined factors.

Table 11. Factor occurrences

Factor	Occurrences (%)	Non-occurrences (%)
Dementia	90 (36.4%)	157 (63.6%)
Suicide	11 (4.5%)	236 (95.5%)
Fighting	21 (8.5%)	226 (91.5%)
Name of affected individual	82 (33.2%)	165 (66.8%)

The interrelationships for each factor, as regards co-occurrence or not, is as follows:

Table 12. Crosstabulation for the four defined factors. Stars indicates significance at alpha levels of 0.01() and 0.001(***) respectively.**

	Dementia		Fighting		Suicide		Name	
Dementia			No = 90 (100%)	Yes = 0 (0%)	No = 90 (100%)	Yes = 0 (0%)	No = 72 (80%)	Yes = 18 (20%)
			Chi²= 13.157 Cramers V= 0.231*** p < 0.001***		Chi²= 6.600 Cramers V = 0.163** p = 0.010**		Chi²= 11.122 Cramers V = 0.212*** p = 0.001***	
Fighting	No= 21 (100%)	Yes = 0 (0%)			No = 21 (100%)	Yes = 0 (0%)	No = 3 (14.3%)	Yes = 18 (85.7%)
	Chi²= 13.157 Cramers V = 0.231*** p < 0.001***				Chi²= 1.070 Cramers V = 0.066 p = 0.301		Chi²= 28.542 Cramers V = 0.340*** p < 0.001***	
Suicide	No = 11 (100%)	Yes = 0 (0%)	No = 11 (100%)	Yes = 0 (0%)			No = 7 (63.6%)	Yes = 4 (36.4%)
	Chi²= 6.600 Cramers V= 0.163 p = 0.010**		Chi²= 1.070 Cramers V = 0.066 p = 0.301				Chi²= 0.052 Cramers V = 0.015 p = 0.820	
Name	No = 64 (78%)	Yes = 18 (22%)	No = 64 (78%)	Yes = 18 (22%)	No = 78 (95.1%)	Yes = 4 (4.9%)		
	Chi²= 11.122 Cramers V = 0.001 p = 0.001***		Chi²= 28.542 Cramers V = 0.340 p < 0.001***		Chi²= 0.052 Cramers V = 0.015 p = 0.820			

Using the relationship between the factors *suicide* and *name* as an example, Table 12 is to be interpreted this way: in cases where *suicide* occurs, four (36.4%) also contain *name*. The relationship between the two is not, however, statistically significant.

In this interpretation, it would seem as if the factors *dementia*, *suicide* and *fighting* solely occur independently of each other in the concordances. This does not necessarily mean they are never mentioned together in one coherent narrative (for example, one newspaper story may contain multiple concordances), but it should be of discursive interest that they are managed in a way where they are never, even in a single concordance, directly

connected to each other. As two of them (*dementia* and *suicide*) are potential consequences of CTE and one is a potential trigger for the condition, this could be considered quite remarkable. Without overinterpreting the meaning of statistical significance in this context, the fact that each of these non-co-occurrences has a low p-value tells us that that this could have happened for discursive reasons rather than by chance.

For the occurrence of *name*, the most unexpected thing could be that *suicide* and *dementia* played out the way they did. From a media narrative perspective, however, it could be that both factors are intimately connected to personal tragedy, so the explicit mention of individuals is likely. From a discursive perspective, it could be argued that increasing general knowledge about the condition, its existence and its nature, might lift the narrative beyond single stories, hence making the discussion more general. However, as Figure 8 illustrates, much of the surveillance occurred in relation to the initial “breakout”, which should increase the chance of narratives being related to stories about individual tragedies.

For the point-biserial correlations, the variable of *time* is made logarithmic to correct for initial skew. After this procedure, the skew value is limited to 0.124 (S.E.: 0.159). For the dichotomous variables associated with each of the four factors, non-presence and presence is coded by 0 and 1 respectively. Table 12 illustrates the point-biserial correlation for each factor with the associated p-value.

Table 13. Point-biserial correlations between the variable *Log(time)* and the four defined factors. The correlation marked ** is statistically significant at 99% level.

Factor	Coefficient value	p-value
Dementia	0.090	0.172
Fighting	-0.107	0.103
Suicide	-0.196	0.003**
Name of affected individual	-0.114	0.081

As shown above, suicide is the only significant relationship, where the r^2 value (≈ 0.038) indicates a shared variability of about 3.8%. Considering Cohen (1988) principles, this relationship should be regarded as a *small effect*. Starting with the non-significant effect, the way that *name* shows no significant change over time seems to correspond with the interrelationships described above, where co-occurrences of *name* and factors related to personal tragedy (*suicide* and *dementia*) did not show a significant relationship. Again, this might have been expected because the condition was only just starting to become common knowledge in 2011, possibly making stories about individual tragedies more likely in a media narrative. However, this was not the case, even though most of the concordances occurred close to the first mention of the condition. Considering these results, it should not be surprising that the occurrence of *name* does not change significantly over time.

6.2.3 Collocates analysis

Tables 11 to 14 illustrate the top ten collocates for the following word classes: nouns (Table 14), verbs (Table 15), adjectives (Table 16) and adverbs (Table 17). Function words, such as prepositions and pronouns, have been excluded from the results. As stated by Baker (2006), these words do not contribute much to an analysis based on discourse, so this decision should be non-controversial. The complete list of filtered items is available on request. As defined in the method section, each table uses the following premises for the search:

- Word span: 5 words to the left and right
- Stat calculation method: Log-likelihood
- Search string: *hjärnskak** (*concussion*, including all potential word endings)

Each table is followed by a basic analysis of the discursive meaning of the term, i.e., how and why it may be a significant collocate in this context. This is achieved by looking manually at the concordances of each term. Some of the terms are grouped by similar meanings, here confirmed by the collocates. Examples in the free text are not direct quotes, but paraphrases to

illustrate the typical contexts of a term. After the analysis of each item/term for each word class, an overall discourse analysis is given as free text. In accordance with the inductive approach specified by Elo & Kyngäs (2008), this should result in a number of categories defined by the nature of the collocates obtained in each word class.

Table 14. Collocates (nouns). Statistical values are based on a calculation of Log-likelihood (see 6.1.2).

Rank:	Term:	Translation:	Frequency:	Frequency (left):	Frequency (right):	Stat:
1	sviterna	the (ill) consequences	739	726	13	8439.0
2	säsongen	(the) season	1090	473	617	4750.3
3	matchen	the game	1093	353	740	4412.6
4	antalet	the number	449	491	48	4232.9
5	sviter	(ill) consequences	342	323	19	3787.6
6	karriären	the career	466	131	335	3075.2
7	ishockey	ice hockey	763	437	326	3071.6
8	sjukhus	hospital	406	349	57	3005.2
9	tackling	body check	513	147	366	2847.8
10	isen	the ice	623	497	126	2834.0

The collocates of *sviterna* and *sviter* imply that complications from concussions are frequently mentioned, indicating that the injury covered in the corpus is associated with potential ill effects. Due to the sampling method used, it cannot be determined whether this is specific to concussions or is common in relation to all types of injuries.

Säsongen may not initially make a lot of sense as a collocate, but a look at individual concordances reveals how it is often used in relation to the time a player who suffered a concussion is absent from the team lineup (as in “*he is expected to be out of the game for the remainder of the season*” or “*the season might be jeopardized due to the injury*”). This collocate is therefore also attributed to

the ill term effects of concussions, even though the discursive meaning might be somewhat different than the collocates case. This is because absence plays an important role, rather than just complications in themselves. In some cases, however, *säsongen* is used to illustrate a timeframe for a given number of injuries (e.g., *the latest concussion is his third this season*).

Matchen should be quite frequent in any case concerning ice hockey, or any situation related to sports played as competitive matches. Individual concordances do, however, indicate that the main reason for the term being a collocate is because absence in ice hockey is quite often measured by the number of games. This regardless of whether the absence is related to injury or suspension for causing an injury. Contrary to the former term *säsongen*, absence expressed in terms of games might be more direct, because it may concern a player leaving an ongoing game.

Antalet seems mainly to concern two things: numbers of concussions or numbers of games missed in relation to concussions. In the latter case, it mainly concerns trends related to teams, or in some cases the entire league, rather than individual players. The majority of occurrences concern the overall trend of concussions (e.g., *the number of concussions in the top hockey league remain high*) or topics about concussion mitigation (e.g., *softer glass might reduce the number of concussions*).

Karriären is attributed mainly to career-ending concussions, either definitive by describing a player who was or is forced to end their career due to concussions, or where a player's career is jeopardized due to a concussion. As the word form, *the career*, indicates, the collocate relates to individual players rather than an overall trend. Occasionally, the term is also used in a retrospective perspective to describe a retired player's history of concussions.

Ishockey as a collocate in this context is quite unclear in terms of its reasons. In many cases, it is included in the heading of an article to depict its theme, with concussion then included to briefly describe the subject of the article. It could thus be argued that this collocate is mainly non-discursive. In some

cases the term is, however, used to illustrate trends (e.g., *concussions in the game of ice hockey are increasing*) or players retiring (e.g., *A was forced to stop playing ice hockey last year due to repeated concussions*). The term is, consequently, mainly non-discursive, with a few exceptions.

Sjukhus is present in the collocates list because concussions, at least those severe enough to attract media attention, often require hospital treatment. Due to sampling reasons, it is not possible to determine whether it is more commonly mentioned for concussions than for other injuries. One observation of potential interest is how the term is sometimes used to illustrate a negation; sometimes the fact that a head hit or similar injury did not require hospital care is used to illustrate the apparent non-severity of the injury.

Tackling as a collocate seems to be attributed mainly to how head injuries are generally often caused by body checks, regardless of whether they are legal or illegal. The concordances show how these descriptions often take the form of *A suffered a concussion after an illegal body check from B* or similar.

Isen is a significant collocate because many concussions, regardless of whether the initiating body check is legal or illegal, seem to involve a player's head making physical contact with the ice. Additionally, being "on the ice" may be a metaphor for being present in a game, and consequently this collocate also occurs in cases where players exit a game or re-enter the play (e.g., *A left the ice in the middle of the third period due to a concussion*).

For nouns in general, collocates appear to be related to three main themes: first, the dimension of *time* (as shown through *säsongen*, *matchen*, *antalet* and *karriären*); second, the dimension of (ill) *consequences* (as shown through *sviterna*, *sviter* and *sjukhus*); and third, the dimension of *trigger* (as shown through *Tackling* and *Isen*). As the individual descriptions show, some cases may overlap. This is illustrated in Figure 9, where the three dimensions are depicted with each item's position marked in relation to the three. This shows that only two of the items can be placed within the boundaries of a single dimension. The categories/dimensions thus cannot be considered mutually exclusive using theoretical means.

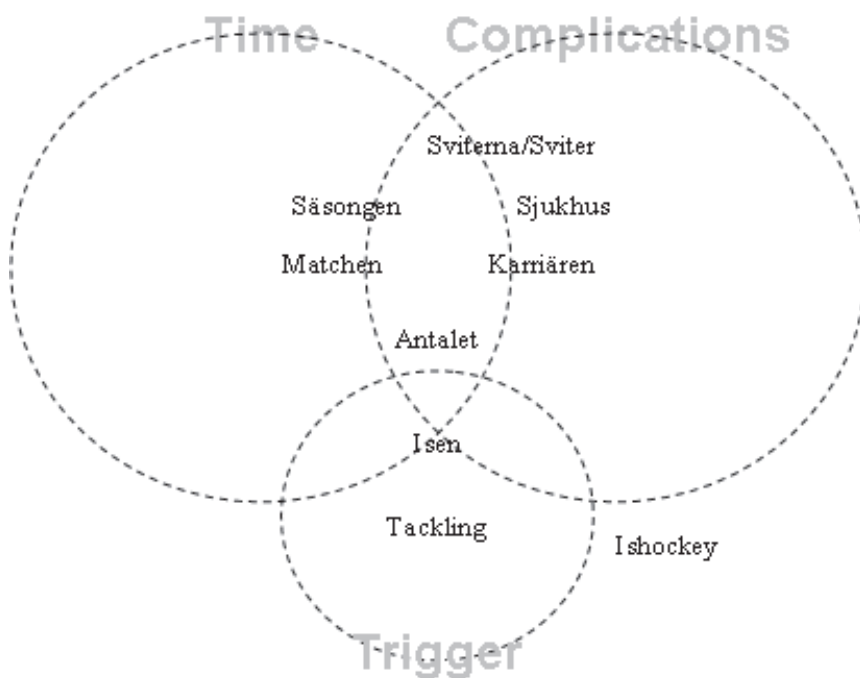


Figure 9. Each noun collocate placed in relation to the three identified dimensions.

The dimension of *time* primarily relates to absence, where a concussion results in a player being kept away from ice hockey games. It may also relate to a period of time from an ice hockey perspective, where seasons rather than years are used as time units for incidents. The following quotes describe occasions where the associated collocates indicate such a narrative.

"[player name] missed the entire 2000-2001 season due to a series of concussions..." (corpus extract, author's translation)

The reason for placing this collocate somewhat towards the boundary of complications is that *säsongen*, when similarly to the above quote, illustrates an absence from the game that would probably not be highlighted unless it related to severity, which logically manifests in the form of complications.

Here, the term *säsongen* is used to illustrate absence from the game, using the time unit of a season.

"This is [team name]'s sixth concussion, just in the current season..."
(corpus extract, author's translation)

"Since this was his second concussion this season, he was sent home..."
(corpus extract, author's translation)

The above quotes illustrate the use of *säsongen* as a unit of time, first in relation to numbers associated with an entire team and second in relation to an individual player. Thus, using this noun indicates a defined time unit to which concussions are related, apparently mostly in cases where repeated ones occur. The rules and schedule of an ice hockey season do not say a great deal about the healing process or complications from an individual player's level. Therefore, from a discursive point of view, the presence of such a collocate may indicate that missed games more prevalent in the media narrative than individual health. Although this cannot be statistically determined, the absence of nouns related to more general, non-hockey related aspects of time (such as months) could suggest such a nature to this narrative.

The collocate of *matchen* is used in a similar way, despite the quantity of time passing in a game (rather than an entire season) giving it a rather different dimension.

"[Player A] is also missing this game due to complications from his concussion." (corpus extract, author's translation)

"[Player A] was taken to a hospital with a suspected concussion after the game last Thursday." (corpus extract, author's translation)

Simply put, games are the events in which most concussions occur, which is reflected in the latter of the two quotes. The former quote better illustrates the dimension of time, because it is a subset of the collocate of *säsongen*. A season consists of a particular number of games, making games the smallest constituents of the time units that relate to ice hockey.

Antalet is considered as evenly divided between time and complications due to its tendency to describe increasing numbers and severity measured by

absence. The former could, in some senses, be attributed more to severity than time, but since the concordances indicate that the term is generally used this way in cases where an overall trend is described, its placement is equally split between the two – as illustrated by these two quotes.

“...at the same time as the number of concussions has increased drastically, the severe share of these has also increased...” (corpus extract, author’s translation)

“[Team A] have likely set some kind of record for concussions with numbers close to 15 during this season...” (corpus extract, author’s translation)

As Table 14 shows, this collocate is heavily dominated by the left frequency, which would logically mean that most cases relate to the overall trend (if the opposite was true, it would imply that *antalet* was more likely to be connected to other signifiers in the text). Together with the time aspect (increase over time) and the severity often described in relation to this, the collocate is deemed to be split between the two dimensions of time and complications. This is despite how an increase in numbers does not, in itself, signify complications.

The dimension of *complications* comes from a narrative in which severity plays a big role. Given the nature of the risk, complications should be the potential ill effect, since head trauma is merely the cause and not a complication. Also, the whole implied paradigm shift in perspectives on head trauma now occurring in ice hockey seems to only partially be happening due to the quantitative increase in blows to the head and concussions. Instead, complications seem to play a significant role in the recent increased attention and concern.

Looking at the collocates placed within the boundaries of this dimension, as shown in Figure 9, *sviter/sviterna* have a fairly obvious tie to complication due to their linguistic meaning. This is illustrated by these quotes:

“The Canadian came to [Team A] last summer and was supposed to be a leading player, but after four months of (ill) consequences from a

concussion he was forced to announce his retirement on January 9".
(corpus extract, author's translation)

"[Player A] was, however, not on the ice for any of the games, since he is still suffering from the (ill) consequences of a concussion..." (ccorpus extract, author's translation)

In these two cases (translated from the collocates of *sviter* and *sviterna* respectively, which is not visible in English), the relation to complications as a dimension is easily recognizable, as is the fact that severity is primarily related to absence from the game rather than personal health. The latter fact explains the slight overstep into the dimension of *time*, since lengthiness plays an obvious part in the narrative. However, in some cases the collocate manifests in a way that does focus on health-related issues.

"[Player A] is still suffering from the effects of his last concussion, the one that ended his career. The worst symptoms have subsided, but he is constantly tired. He had to interrupt his business studies due to tiredness." (corpus extract, author's translation)

"A check against the boards in January 2014 put a stop to his active career. [Player A] still suffers from the effects of the concussion. "I'm having trouble engaging in cardio. I also have to lie down to rest every day to cope with the day." (corpus extract, author's translation)

Personal health is the main narrative here, rather than the individuals' inability to play ice hockey. This assumption is strengthened by both extracts originating in articles about retired players, who will not eventually return to the game. Besides the obvious relevance to the dimension of *complications*, some connection to the dimension of *time* remains, even in these kinds of individual concordances. This mainly because the presence of symptoms is a problem due to their persistence, once again reconnecting to the overall problem of the risk.

Next, the collocate of *sjukhus* connects to the dimension of complications mainly because any concussion requiring hospital treatment is likely to have complications (although studies of the relationship between hospital care

and severity are scarce). Since this collocate has no apparent connection to the dimension of time (or trigger), it is located solely within the boundaries of complications. Two typical concordances are presented below.

“He collided with [Player A], landed on his head and ended up in hospital with a suspected concussion.” (corpus extract, author’s translation)

“[Player A] hit his head on the boards, collapsed and was carried out on a stretcher with a suspected concussion. He was not taken to hospital. ‘I’m alright, it was just unnecessary!’” (corpus extract, author’s translation)

In these two quotes, it could be argued that the collocate of *sjukhus* in the latter is used in a way that illustrates severity even more. The lack of hospital treatment is quite explicitly used to underline the fact that the affected players’ injury is not considered serious, and there are therefore no complications in that case. Still, it should be noted that most of the individual collocates relate to situations where the incident did lead to hospital treatment, signifying complications rather than the lack of them.

The collocate of *karriären* is divided between time and complications due to the word’s previously described use. It could be used to illustrate a given, although somewhat fluid in terms of measurement, timeframe. This is much like *säsongen* or *matchen*, aside from the fact that players’ careers can vary significantly in length.

“It was the third concussion of his career. But he returned soon. ‘I got going as soon as the headaches disappeared, and have not felt anything since.’” (corpus extract, author’s translation)

Here, the collocate is used to illustrate the number of concussions during a player’s career, for reference purposes (time). However, given that the number of concussions over a career is considered important, it may also illustrate the use of the collocate to illustrate severity (complications). The other main use works in a similar way, as the following quote shows.

"[Player A] was on the team roster for last season, but only played one exhibition game before a concussion put an end to his career." (corpus extract, author's translation)

It this case, the dimension of complications might be considered more prominent because the incident is described as career ending, which obviously indicates complications. The collocate might be also considered as defining time, since it clearly marks the end of the time unit described above.

For *isen*, the way in which it is the only collocate split between three dimensions becomes quite obvious in these three quotes, where each one represents a different use:

"[Player A], who lost his helmet and hit his head against the ice, suffered a major concussion and three loose teeth." (corpus extract, author's translation)

"[Player A] had to leave the ice with a suspected concussion after a brutal body check." (corpus extract, author's translation)

"[Player A] was finally back on the ice after his concussion..." (corpus extract, author's translation)

The first quote is obviously related to the dimension of *trigger*, since the player's hitting the ice is what initiates the concussion. The cause-and-effect logic could be debated in a theoretical sense, but nevertheless the collocate is somehow involved in the triggering process. The second quote illustrates a brush against the dimension of *complications*, because the player's removal from the game is apparently connected to complications. This could, however, be questionable because a concussion now automatically leads to a player being removed from the game. However, this was not the case for some of the corpus, and concordances show that this use of the collocate is present throughout. The third quote illustrates the dimension of *time*, somewhat instrumentally but effectively. Simply put: returning to the game marks the end of an absence. It could be argued that the former quote also

does this, but it does not say whether the affected player was sidelined after the incident.

Lastly, the collocate of *tacklingen* is placed solely within the boundaries of *trigger*, as it is quite obviously where the linguistic meaning seems to be.

“[Player A] suffered a concussion after a body check from [Player B].
(*corpus extract, author’s translation*)

“The star forward [Player A] was forced to discontinue this Saturday’s junior world championships game versus [Team A] due to a suspected concussion after a violent body check.” (*corpus extract, author’s translation*)

Although a body check could be legal or illegal in the rules, cases where the term is used as a collocate are almost exclusively the initiation of a concussion. In addition to being legal or not, the collocate is sometimes accompanied by an adjective describing its nature, as is the case in the latter quote.

Lastly, *ishockey* is the only collocate to be left outside all three dimensions. This corresponds well with the previous statement about its non-discursive nature.

Table 15. Collocates (verbs). Statistical values are based on a calculation of Log-likelihood (see 6.1.2).

Rank :	Term:	Translation:	Frequency :	Frequenc y (left):	Frequenc y (right):	Stat:
1	ådrog	incurred	1608	987	621	18079. 8
2	drabbades	suffered (as in “suffered a concussion”)	1638	1404	234	17145. 8

3	drabbats	affected (as in "affected by symptoms")	1366	1271	95	14012.4
4	befarad	No sufficient single English translation. The term describes a suspicion with negative connotations.	714	707	7	8587.6
5	fått	received (as in "received treatment")	1336	1124	212	8487.8
6	haft	No sufficient single English translation. Might, in some cases, be translated as "had" or "has".	791	653	138	4742.1
7	ådragit	contracted/sustained	317	301	16	3656.8
8	upprepad e	repeated	346	308	38	3596.0
9	säger	says	1141	312	829	3281.6
10	vila	rest (as in "he was ordered one week of rest")	464	156	308	3085.8

Ådrog or *ådragit*, translated as *being subject to*, acknowledges the occurrence of concussions in a way that could be considered neutral; it does not overtly indicate that the affected individual is subject to a risk that is either voluntary or due to external forces. It indicates neutrality on the matter. If the term is to be determined in terms of accountability, it is probably more likely that the public perceives it as if the individual at risk is somewhat accountable (although SAOL limits the term to the individual *being subjected to* something).

Drabbades or *drabbats* indicates that many concussions are described in terms of players being affected by something, regardless of the mechanism or cause. For linguistic reasons, this could be interpreted as indicating that concussions are *being done* to players, as opposed to players exposing themselves to this risk, so implying that “external forces” are at work.

Befarad may be present because of the uncertainty related to concussions. Since the injury is more abstract than other comparable ones, this verb might be an expression for difficulties of diagnosis. Once again, all such comparisons to other injuries should be considered in relation to the chosen sampling method. This term is almost exclusively used to describe specific situations, with a few cases where it is accompanied by an additional collocate in form of an adjective (e.g., *befarad lättare hjärnskakning*).

Fått might encompass a player being on the receiving end of various occurrences, mainly body checks, treatment, symptoms or the concussion itself. Once again, it makes the player the recipient, even if the concordances indicate that cases were accidents rather than illegal acts on the ice.

Haft seems to mainly refer to a player’s previous history of concussions, or in some cases general injury history. Occasionally, it also refers to a single injury, although this use of the word might be questionable from a linguistic perspective (e.g., *A has had a concussion during the year*).

Upprepade mainly refers to players suffering repeated concussions (usually more than two). Individual concordances indicate that this is frequently mentioned in relation to players who must retire prematurely due to concussions. In a handful of cases, it is also used to illustrate the growing knowledge about repeated head trauma that is not necessarily concussive (e.g., *repeated blows to the head might cause problems later in life*).

Säger seems to be a collocate because individuals, such as coaches, team doctors or the affected player, are often interviewed in direct relation to the injury (e.g., *he will be out indefinitely due to a concussion, says A, the team doctor*). It could thus mainly be considered a non-discursive collocate.

Vila relates to concussion protocol, which states that any player with a concussion must initially be ordered total rest. In some cases, it is associated with a given timeframe, either in retrospect or in a way that indicates the expected period of rest (e.g., *A will have to rest for at least a week due to a concussion sustained during the last game* or *A needs complete rest for three weeks due to a concussion*).

Overall, the verb collocates could be interpreted in a way that is best described through the three dimensions shown in Figure 10. First, the dimension of *passive actor* (as shown through *drabbades/drabbats* and *fått*). Second, the dimension of *active actor* (as shown by *ådrog/ådragit*). Third, the dimension of *perceived severity* (as shown through *upprepade* and *vila*).

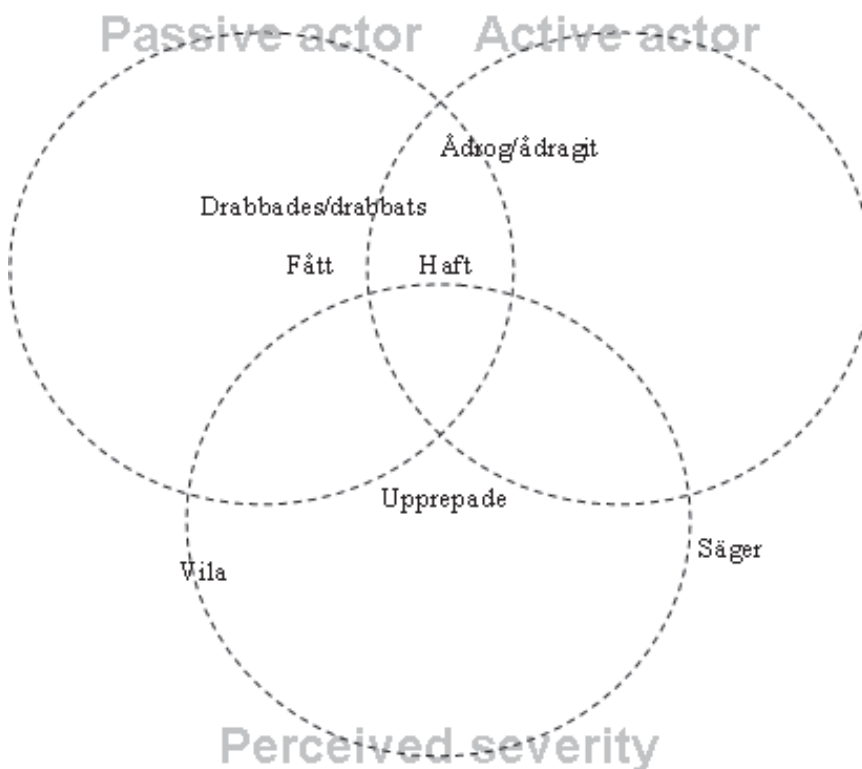


Figure 10. Each verb collocate placed in relation to the three identified dimensions

The dimensions of *passive* and *active actor* can be sub-categories of the overall dimension of actor, which here refers to an individual who is present in relation to the explicit mention of a concussion. However, once it is divided into the two sub-dimensions, it exclusively refers to the individuals subjected to the risk. In the case of *passive actor*, the individual is linguistically referred to as a person on the receiving end of an action, with little or no personal accountability. For *active actor*, the individual is instead linguistically mentioned as more aware and/or able to affect the series of events that led to the outcome. The dimension of *perceived severity* is made up of collocates that imply some ambition to describe the severity of a concussion, even though this is largely an abstract injury in relation to others (thus the label *perceived severity*, rather than just *severity*). Additionally, none of the collocates seems to relate to this uncertainty.

As for nouns (see Figure 9), a couple of collocates/items straddle the boundaries between the dimensions. This word class cannot thus be considered mutually exclusive as regards the identified dimensions.

Starting with the dimension of *active actor*, the adjoined collocates of *ådrog/ådragit* indicate that an individual (here referred to as *actor*) has had something done *to him* in the risk-related process that led to a concussion.

“The defenseman [Player A] is due to return after the concussion he incurred playing against [Team A].” (corpus extract, author’s translation)

This quote could be considered somewhat limited in its illustration of the collocate’s distinctive features, mainly due to the limitations of translated quotes. There is no perfect translation that distinguishes this lexical term from seemingly similar ones in English. The reason this collocate strives somewhat outside the boundaries of its prime dimension is because of how it is defined in SAOL, which does not really allow the interpretation that an individual is subjected to something. However, the concordances and general use of the term should permit it to be placed mostly within the dimension’s boundaries.

Drabbades/drabbats shares almost the same meaning in a risk-related sense, but differs linguistically in relation to the actor exposed to the risk and any ill effects. This difference relates to how they are viewed, whether they are passively exposed or bring the risk upon themselves. In this case it is the former, resulting in the dimension of *passive actor*. The transition into the sub-dimension of general actors again stems from the impracticality of concluding that every concordance of the collocate should be interpreted in the sense of a passive actor. Here, SAOL is more explicit about the term indicating that something, in this case a risk outcome, is being done to someone, rather than vice-versa.

"[Player A] broke his jaw, nose and cheekbone, while additionally suffering a serious concussion." (corpus extract, author's translation)

"In Sweden, players like [Player A] and [Player B] have suffered serious concussions, and the latter might not be able to continue his career." (corpus extract, author's translation)

"26 days have passed since [Team A]'s core player [Player A] suffered a concussion after an illegal hit from [Team B]'s [Player B]. (corpus extract, author's translation)

The first quote illustrates a collocate use where the exact circumstances which triggered the concussion are unclear, although using this term indicates that the player is considered a passive agent in a linguistic sense. The second quote has a similar narrative, although the long-term consequences described could be considered as reinforcing how the player had something done to him, even if that is through a narrative and not in the sense that the incident could be interpreted in this way. The third quote underlines the verb by referring to the trigger of an illegal act on the ice.

Fått is placed solely within the limits of passive actor, since it is quite literal in terms of meaning. Contrary to the previous two signifying collocates for passive or active actors, this one is easy to translate without any substantial loss of meaning. *Fått*, in this specific context, simply means received or "had

received". To make the sentences more correct idiomatically, however, it will be replaced by "sustained" in relevant quotes.

"[Player A] was taken to a hospital, where he was found to have sustained a concussion." (corpus extract, author's translation)

When put into context in the quote above and compared to *drabbats/drabbades*, there is less clarity whether this collocates indicates a passive actor through the contexts in which it occurs. Instead, the decision to put it within the boundaries of this dimension is because the linguistic meaning of *fått* places someone on the receiving end. Accordingly, a qualitative analysis of a single text (such as the latest quote) would be unlikely to distinguish such a pattern. However, because corpus linguistics reveals language patterns in a systematic manner, this valuable information to be obtained. In other words, this is a case where the overall pattern plays the major role, not the individual concordances. As the following quote shows, in some cases the collocates is used at a macro-level rather than for descriptions of specific incidents.

"So far, 43 players in [league name] have sustained concussions. More and more voices are now raised in support of rule changes and the punishing of head hits." (corpus extract, author's translation)

Here, it should be even clearer that this collocates only makes sense at an overall level. The sentence's meaning is clear, but it does not adequately illustrate the specific function of the collocates *fått* in relation to other collocates related to this dimension.

Haft is not only difficult to translate properly, (see Table 15), it is also quite hard to determine in relation to the defined dimensions. It is related to individual player's injury history, more than it is to the descriptions of overall trends. Accordingly, it could be determined as being related to actors in general, but the concordances do not permit a properly motivated decision for passive or active actor and, unlike the collocates *fått*, nor does the lexical word itself. The placement should thus be in the space shared by passive and active actor.

In conclusion, the two dimensions of active and passive actor may not have completely clear boundaries. The presence of the two, however, is advantageous both theoretically and linguistically in relation to the verb collocates. Also, while the absolute limits may be unclear, the main verbs for actors are clear about the dimension in which the main part of the collocate should be placed.

When it comes to *perceived severity*, two collocates fall within it. First, *upprepade*, which is solely within the bounds of this dimension. While it could be argued that repeated concussions are related to actual rather than perceived severity, the complexity of the risk and associated injury again indicates that these conclusions are somewhat arbitrary. Repeated concussions are obviously a cause for concern, but from a more objective point of view it seems that a single concussion can be equally devastating in terms of ill health. When the term is used in the general media, it is unlikely that its use to express severity is supported by thorough research on the injury's medical aspects. In fact, head injuries seem to be quite abstract even within the medical field. There should be some truth in this even when the description of a single case indicates that severity is measured by repetitiveness, as is in the following quote:

"[Player A] is one of many players forced to give up his career due to repeated concussions." (corpus extract, author's translation)

This case description makes it plausible that there is a cause and effect-relationship, where repetition is the cause. However, it is unlikely that even the physician responsible for the relevant decisions can trace any symptoms or associated problems to this factor; the last concussion could, in theory, have been just as damaging if it were the first one (even if the exact circumstances are not apparent in the individual concordance).

In other cases, the collocate is used to describe the severe nature of a current trend:

*"The most worrying thing is the high frequency of head injuries.
Numerous players have suffered repeated concussions, which increases*

the risk of persistent complications and lifelong disabilities.” (corpus extract, author’s translation)

Once again, the collocate is used to describe severity, despite the inherent uncertainty regarding the nature of the risk.

Although it is connected to severity, but in more indirectly, *vila* is part of the protocol that should accompany any concussion, mild or severe. This relates to the dimension of perceived severity because of the overall impression given in the concordances, where it is quite frequently mentioned when a player suffers from persistent symptoms or otherwise describes the problems associated with the need for rest. This is illustrated in the following examples:

“You cannot do anything about a concussion, only rest. If you have an injured knee or a shoulder it is possible to do rehab training. Here, you needs to be symptom- free for two weeks to be allowed easy bicycle training, and when the headaches returned the only thing to do was to start over.” (corpus extract, author’s translation)

“I have had concussions before and rest is the only thing to do, just lie down and listen to something without a computer or cellphone. Light and sound is not pleasant at this time.” (corpus extract, author’s translation)

In those cases, the need for rest – and that it is the only available treatment – could be considered a way of emphasizing the severity through comparison with other injuries. However, the reason the collocate is placed on the dimension’s border is related its use to describe general absences from the game:

“He suffered a concussion and was forced to rest for several games.” (corpus extract, author’s translation)

Here, it is obvious that the collocate refers to absence rather than complications or severity. This is because the timeframe is a number of games, which has no relevance in relation to health complications.

The collocate *säger* remains outside the three identified dimensions, due to its non-discursive nature in this context.

Table 16. Collocates (adjectives). Statistical values are based on a calculation of Log-likelihood (see 6.1.2).

Rank:	Term:	Translation:	Frequency:	Frequency (left):	Frequency (right):	Stat:
1	kraftig	major (as in major concussion, opposed to minor)	1031	1005	26	11674.9
2	lättare	lighter (as in lighter concussion)	752	731	21	7154.6
3	tidigare	previous <i>or</i> earlier	734	279	455	3981.4
4	lindrig	mild	342	314	28	3969.6
5	flera	several	659	501	158	3952.8
6	allvarlig	serious	414	369	45	3800.5
7	misstänkt	suspected	315	306	9	3446.0
8	svår	severe	385	373	12	3297.3
9	förra	the last (in the sense of <i>the previous time</i>)	507	136	371	2510.3
10	senaste	the latest	540	250	290	2475.7

Kraftig, *lättare*, *lindrig*, *allvarlig* and *svår* indicate that concussions are frequently mentioned in contexts where their perceived severity is described. The fact that *kraftig* ranks higher does not necessarily mean that more severe concussions are more common or more commonly reported, as

the uncertainty associated with such an injury might render it hard to adequately describe severity in media surveillance (although it is, in some cases, backed up by the team's medical personnel).

Tidigare frequently indicates that a player has a history of concussions or, in some cases, other injuries as well as the article's subject. It may also indicate something like a comeback after injury that occurs sooner than expected (e.g., *back earlier than expected*), or that an incident happened in a previous game. In a handful of cases, the term is used to illustrate advancing knowledge on the health effects of concussions (e.g., *it was previously believed that dementia in contact sports mainly occurred in boxing*)

Flera also implies a history of concussions, or in some cases a trend in terms of numbers. It may refer to individual players, teams, occasionally the entire league, or even ice hockey in general.

Misstänkt indicates that a player may or may not have suffered a concussion. It reflects the uncertainty associated with head injuries, even though few injuries are likely to be correctly diagnosed on the ice.

Förre seems to apply in two main cases: either where a player has suffered previous concussions (e.g., *the concussion prior to the one in the article*), or where an incident occurred in the last game, last season, etcetera. Quantitatively, a quick estimation from the concordances indicates that the latter is more common.

Senaste has a similar meaning to the previous term, but indicates that an injury is the most recent one (thus meaning that a player have suffered equivalent injuries before), or that an incident occurred in the most recent game. However, in roughly half the cases, it seems to be used to indicate a more macro-related trend in concussions (e.g., *there has been a major increase in concussions over the last few years*).

Summarizing the adjective collocates, three dimensions appear, just as for the two previous groups. First, the dimension of *perceived severity* is once again present, as it is for verb collocates. Generally, its meaning is the same

here, although the other dimensions may alter its dynamics in this context. Second, the dimension of *time*, which was also present in noun collocates. Once again, this shows the importance of time for this injury, but here it is mainly due to the history of an actor and role it may play in the injury's potential consequences. Third, the dimension of *uncertainty* is present, although not as prominent as the other two in terms of collocate numbers. This dimension relates to the nature of the injury itself, in terms of being abstract even to medically qualified staff.

Since the meanings of the first two have already been explained, there is little reason for repetition. However, describing their relationship may be relevant because they have not occurred together, but rather in relation to separate word classes. Time describes head trauma from a perspective that considers the history or repetitiveness of concussions and, because repetitiveness plays an important role in relation to severity, time and severity are quite closely intertwined. Consequently, no individual collocates are placed solely within the boundaries of time, because each one could be considered have some relationship to perceived severity. This also relates to the dimension of time, as long-term effects probably make the link between an incident and its effects even less clear, due to the generally abstract nature of the injury. The dimension of uncertainty is present because of a single collocate and does not overlap with the other two. However, it needs to be considered a dimension, as the collocate it represents cannot be theoretically related to the previous two. Figure 11 illustrates the relationships of the collocates within the framework of the three dimensions.

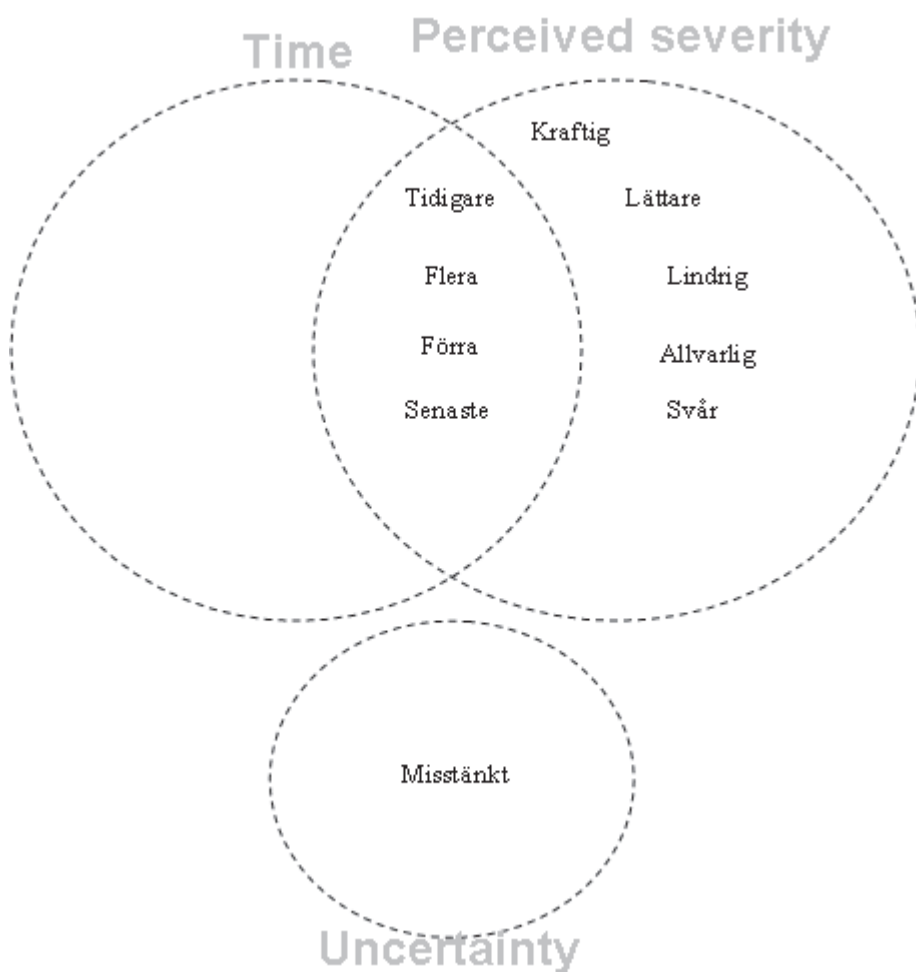


Figure 11. Each adjective collocate placed in relation to the three identified dimensions.

Since perceived severity was initially discussed in relation to the collocates, the placement of the five collocates of *kraftig*, *lättare*, *lindrig*, *allvarlig* and *svår* within the limits of this dimension should be self-explanatory. The following quotes, however, further highlight how they all relate to severity, with the latter being mainly perceived rather than absolute.

“...the hit that made [Player A] go into the glass headfirst resulted in a serious concussion.” (corpus extract, author’s translation)

"[Player A] suffered a mild concussion after the hit and missed one game" (corpus extract, author's translation)

"[Player A] was taken to hospital, where he was found to have suffered a serious concussion and a deep cut to his forehead. He was hospitalized for observation." (corpus extract, author's translation)

"[Player A] suffered a severe concussion in January. Last night, he was back on the ice as a winner." (corpus extract, author's translation)

Once again, it is obvious that the description of the injury's severity is largely arbitrary in media narratives. Sometimes, medical staff might be involved (as is presumably the case in the third quote, since it includes hospital treatment). Given the complex and abstract nature of the injury and the large degree of uncertainty related to it, this again contributes to an overall narrative that gives the impression of the risk being "measurable" or "quantifiable" to a substantially larger extent than is the case. Discursively, this might be considered to be somewhat downplaying the uncertainty involved, although this would not necessarily be done intentionally.

The time-related collocates are, with only a few exceptions, used in a sense where the seriousness or non-seriousness of a head injury is related to the history of a player's previous concussions.

"The 31-year-old Canadian has previously suffered several serious concussions." (corpus extract, author's translation)

The above quote describes seriousness using an individual's concussion history as the major timeframe, so using the dimension of time in a discursive way that may not be fully supported by medical evidence. Although there seems to be little doubt that repeated concussion is a bigger problem on aggregated level, again, the injury or risk is far more complex and associated with a significant degree of uncertainty.

"[Player A] was forced to announce his retirement from the game last week due to several concussions." (corpus extract, author's translation)

Describing the risk in accordance with the quote above could, discursively, indicate a narrative where seriousness is once again connected to repetition over time, even though a single concussion might be serious enough to end a player's career and cause future health problems.

The uncertainty that is not explicitly manifested in the two main dimensions of adjective collocates is, on the contrary, explicitly displayed through the only collocate to support the dimension of uncertainty.

“[Player A] was left lying on the ice, bleeding heavily, before being helped off the ice with a suspected concussion. (corpus extract, author's translation)

Incidents such as the one described above are not necessarily limited to head injuries, as even less abstract injuries like broken bones may require hospital examination to determine their existence. However, although an X-ray can establish that a bone is broken, injuries to the brain are in many ways far more complex. Also, new and evolving knowledge about CTE and the long-term health consequences may make uncertainty more significant for head injuries specifically.

Table 17. Collocates (adverbs). Statistical values are based on a calculation of Log-likelihood (see 6.1.2).

Rank:	Term:	Translation:	Frequency:	Frequency (left):	Frequency (right):	Stat:
1	borta	absent, gone or away	1370	509	861	8561.6
2	tillbaka	back (as in back after injury)	1248	894	354	6491.2
3	sedan	since	1165	448	717	5090.2
4	fortfarande	still	805	585	220	5077.0
5	inom	within	459	64	395	2909.6

6	också	also	581	282	299	2079.6
7	även	also	547	188	359	2026.4
8	hur	how	538	267	271	1996.5
9	bara	only	595	202	393	1912.0
10	ännu	still (as in “is still present”)	339	232	107	1683.2

Borta mainly refers to a player’s absence due to injury. In occasional cases it refers to incidents happening in away games (*borta* can also be translated as *away*), as well as a player being unconscious.

Tillbaka refers, in most cases, to a player returning after a concussion. In some cases, however, it refers to symptoms returning, resulting in an interruption to the return to play under the concussion protocol.

Sedan may refer to an individual being gone from the game for a given timeframe (e.g., *A has been away since January due to a concussion*) or due to an incident (e.g., *A had to leave the ice after suffering a concussion*). The concordances show a great deal of variation regarding this term, probably because *sedan* has many possible meanings in Swedish, depending on the context in which it is used.

Fortfarande seems to occur in two main cases: either when a player is still absent from the game (mainly due to injury), or when describing the nature of an injury keeping a player from returning to the game (e.g., *A is still on injury reserve due to post-concussion syndrome* or *A still suffers from headaches due to the concussion he suffered four weeks ago*). Additionally, there are some cases where the term is used to illustrate a persistent issue unrelated to a specific individual (e.g., *The number of concussions in the game is still on the increase*).

Inom is mainly used to describe trends related to concussions in the game (e.g., *the number of concussions in ice hockey is increasing*). In a couple of cases

however, it concerns multiple incidents happening within a given timeframe (e.g., *he suffered two concussions within a time span of only a month*).

Också and *även* are, as the concordances imply, likely to occur as collocates for non-discursive reasons. They occur frequently due to the media habit of including player injuries for a team in each match commentary (e.g., *A is also on the injury reserve due to a concussion*). Additionally, in some cases they are used to illustrate head injury trends (e.g., *It should also be noted that the overall number of concussions in the league has increased over the last five seasons*).

Hur also seems to be mainly non-discursive, occurring as a collocate primarily for grammatical reasons (e.g., *How many concussions? How many games? or How is rehabilitation progressing?*).

Bara occurs for a variety of reasons, but an important one is related to the rehabilitation associated with concussions. More specifically, it is often related to instances where this protocol is not progressing as expected (e.g., *Since his last concussion, A has only been able to exercise lightly*). Occasionally, it is used to indicate the minor nature of a specific injury (e.g., *Since the concussion is considered a minor one, he should be able to return to play by next week*).

Ännu regularly refers to problems or symptoms that remain after a significant amount of time has passed (e.g., *A is still feeling the symptoms after a concussion last fall*), as well as repeated concussions, either in a single player, an entire team, or ice hockey in general.

When it comes to adverbs, more so than for the other word classes described, one dimension is more prominent than others: namely, the dimension of *availability* for play. This manifests mainly through collocates that represent a narrative where the ability to be on the ice is frequently used to describe an injury's nature, for both quantitative and qualitative reasons.

In addition to this, a dimension related to *concussion protocol* is necessary to make sense of the collocates that describe a rehabilitation process without mentioning absence from or presence in the game. From a discursive point

of view, these two can be considered obviously intertwined in the mediated narrative.

To include all potentially discursive collocates, a third dimension of *overall trend* is added, consisting of instances where collocates are used to underline a narrative that describes a more macro-related trend of concussions in ice hockey.

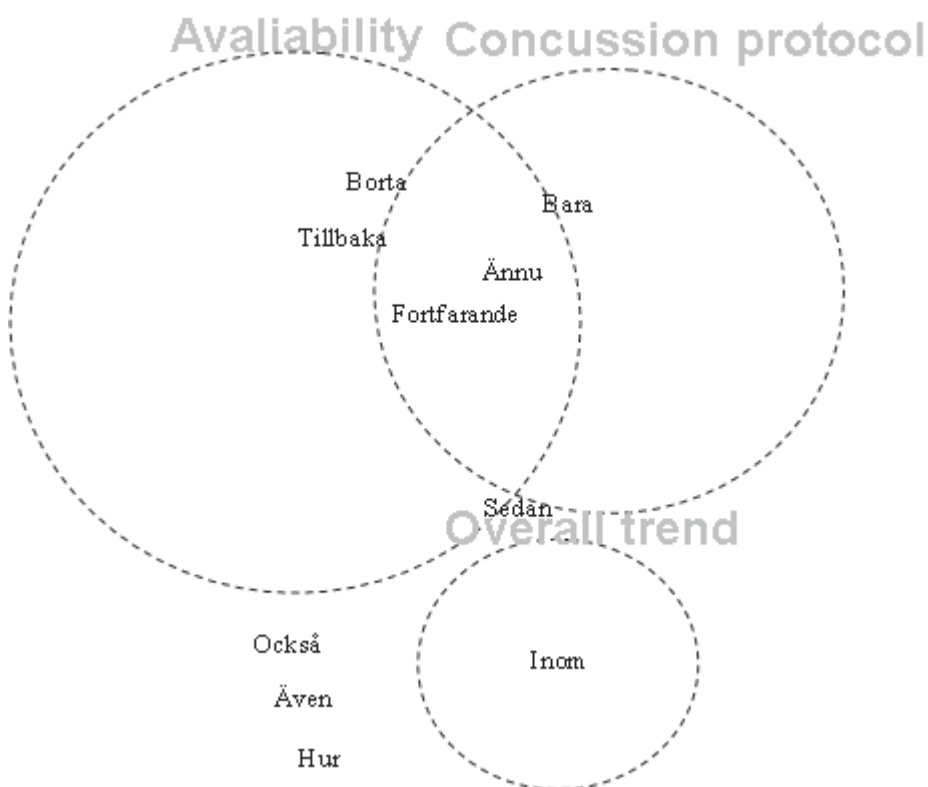


Figure 12. Each adverb collocate placed in relation to the three identified dimensions.

As Figure 12 illustrates, the dimension of *availability* takes a great deal of space within the domains of this word class. However, no collocates can be placed entirely within its dimensions, because concussion protocol and its impact a player's ability to return or remain absent from the game is unavoidable. The opposite is also true, i.e., no collocates can be deemed solely relevant to this discursive dimension. Once this is established, each

one and their relationship is easily illustrated using individual concordances.

“A concussion kept him out of play for a week.” (corpus extract, author’s translation)

“However, he also suffered a concussion in January and was absent from the game for about two weeks. (corpus extract, author’s translation)

“[Team A] is still waiting for the comeback of vital defender [Player A] after a concussion and the decision will be made on the day of the game...” (corpus extract, author’s translation)

Again, the consequences of concussions are frequently described in terms of players being able or unable to play, disclosing a media narrative where the sport itself (rather than health aspects or similar) is likely to be the focus of the coverage.

The dimension of *overall trend* is, as clearly shown by Figure 12, the only one with a collocate entirely within its boundaries. Although this is the only collocate in this dimension, it is also clear that the word is used mainly to illustrate a more macro-related viewpoint, making the dimension unavoidable for discursive purposes.

“Concussions are a problem for ice hockey as a whole, but [Team A] has also been affected extra hard with six head injuries within a year.” (corpus extract, author’s translation)

“In recent years, a particular focus has been aimed at repeated concussions, where athletes within for example ice hockey have been subjected to severe, long-term long-lasting effects.” (corpus extract, author’s translation)

Contrary to the two previously described dimensions, the quotes illustrate a narrative in which health problems are the focus of media surveillance, indicating that this might be more prominent when the discourse is lifted to a more macro-related perspective. However, there could be reason to believe

that this perspective is minor in relation to the volume of general media surveillance on the subject. This is certainly the impression given by the frequencies presented in Figure 12, where the collocates related to availability and concussion protocol are an obvious majority in terms of share numbers. Despite simple frequency counts having some limitations, this is not surprising given how much of a sports section is likely to be dedicated to basic reporting, rather than investigative journalism. In these circumstances, it should be safe to say that the majority of the surveillance reaching the public is somewhat in line with the dimensions identified above.

6.3 Keyword analysis

In accordance with principles of splitting (see 6.1.2) and the results presented under 6.2.2, the cut point between reference and target corpora was set as 24 September 2011. This resulted in the size relationships shown in Figure 13.

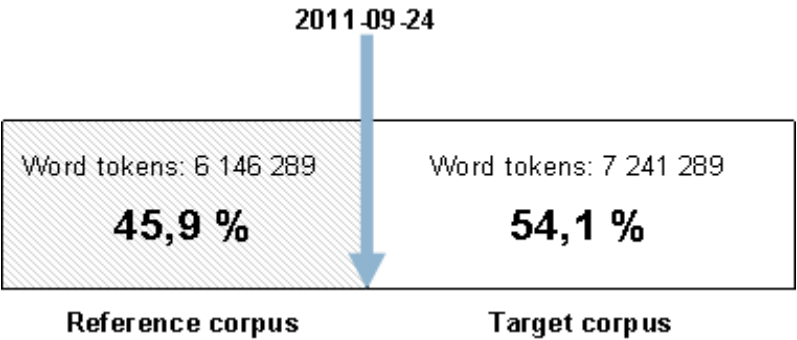


Figure 13. Illustration of the relationship between the reference and target corpora.

After applying the exclusion procedures described in the method section, the top ten keywords are identified as:

Table 18. Top ten keywords. All items are significant at an alpha level of $p < 0.0001$, with Bonferroni correction applied. Method for keyness calculation: Log-likelihood. Method for effect calculation: Difference coefficient (see 6.1.2. for a thorough description).

Rank	Item	Effect	Keyness	Frequency
1	braincool	1.000	242.13	197
2	situationsrummet	1.000	86.03	70
3	omvandlas	0.9866	408.62	350
4	huvudtackling	0.98	1069.43	935
5	årslönen	0.9778	119.29	105
6	kontraktstiden	0.9613	194.09	179
7	kylning	0.9232	116.05	118
8	hjärntrappan	0.915	332.54	345
9	hjärnskakningssymptom	0.868	86.13	100
10	sängliggande	0.8644	69.19	81

Below, each item is described with an English translation, function and contextual examples. There is a discussion about the potential discursive meaning of each item.

Braincool is a company that manufacturing a *cooling helmet*, designed for the immediate treatment of mild traumatic brain injuries. A look at the concordances shows that there are discussions among team management and medical staff about their use.

“Through such treatment, the expectation is minimized brain damage. Previously, BrainCool has obtained clinical data indicating that...”
(author’s translation)

“In co-operation with Malmö Redhawks [Swedish elite hockey team, author’s note] and one more hockey team, the medical company BrainCool is set to test its portable cooling system Polarcap on players with suspected concussion...” (corpus extract, author’s translation)

Initially, it may appear that newly developed medical equipment should be considered non-discursive as a keyword, simply because such an item can be a keyword for logical reasons: if the invention is new, the reference corpus cannot logically contain the word. However, there may be a reason to consider the item in a broader discursive sense. For example, if a medical issue is deemed urgent for media surveillance purposes, it may be more likely to be reported upon earlier in the process. The concordances do, in this case, indicate that the focus is on a specific product: Polarcap. If there were a great deal of activity in the company about this product during the time covered by the reference corpus, then the non-existent coverage could have been interesting for discursive purposes. However, the company has had major development, generally and in relation to this product, mainly after the critical date of 24 September 2011 (BrainCool, 2019). Therefore, there are probably two reasons why the analysis resulted in this item being the top keyword: first, the method used for measuring item effect (see 6.1.2); second, the fact that the product did not exist before 24 September 2011. Repeating the study when (if) the product is established as a treatment would add sufficient information regarding its actual strength as a keyword. There is still reason to observe its existence from a wider perspective, because the development of such a product can say something about societal trends or discourse. That is not, however, a question for an analysis of media surveillance.

Situationsrummet, roughly translated as “the situation room” refers to an external space with manned video surveillance for external reviews of game situations in the top league of Swedish ice hockey. Using video material, they can report non-penalized situations from any game to the disciplinary committee (see 2.4.1). It was established before the 2014/2015 season, with player safety as one motivating factor.

“I feel that this work is a priority (...) The short-term measure is the situation room, where we evaluate these situations.” SHL’s then-director of sports (corpus extract, author’s translation)

This collocate also ranks highly due to its complete absence from the reference corpus, giving it an effect size of 1.000 (see 6.1.2). The conditions

for further discussion on discourse are also quite similar to Braincool, in the sense that it might be discursive from a broader perspective, but this is unlikely in relation to the purpose of this study. The fact that the top Swedish ice hockey league introduced this function for use during games may have a discursive meaning related to the overall purpose of this thesis. However, since this study aims to acquire knowledge specifically about the media narrative, it may not be discursively interesting because its strength as a keyword depends on its nonexistence prior to 24 September 2011. If future studies were done and the item remains a keyword, the discursive meaning may be viable for further analysis.

Omvandlas, directly translated as “converts into”, mainly refers to a section of the regulations that allows players subject to disciplinary action to convert some of their suspension into a fine.

“...suspended for seven games, although three of those will be converted into a fine of SEK 7,500. [player name] suffered a concussion from the impact. (corpus extract, author’s translation)”

There could be several reasons for this item being a keyword with substantial strength. Firstly, the opportunity to make these conversions is relatively recent, as it was established after the 2004/2005 season (Swedish Ice Hockey Association, 2007). It may also reflect a trend in which suspensions are increasingly converted into fines, although this has not been verified due to a lack of data. Once again, the discursive meaning cannot be determined from the perspective of the media narrative, even though the system for fines might be interesting in itself.

Huvudtackling translates to “head hit”, and is quite self-explanatory. A head hit is, as opposed to a regular hit (usually described simply as a ‘hit’), a body check in which the principal point of impact on the receiving player is the head.

“...[player name] was dropped by a head hit from [player name] and is still under hospital care for a concussion.” (corpus extract, author’s translation)”

This item should be considered discursively interesting for several reasons, but primarily because of the linguistic use and language change that might be traced through it; increasing use may be the linguistic consequence of a trend in ice hockey. Describing such incidents in terms of head hits could indicate that this phenomenon or type of incident has created the demand for a term due to changes within the game. Previously, when head hits were a more modest phenomenon with few consequences for the game itself, it is less likely that a specific linguistic term was needed; if a hit aimed at the head of an opposing player occurred during the game, it was likely to be described in general terms, i.e., as ‘a hit to the head’. However, in this analysis, descriptions seem to have been successively replaced by the more specific term ‘head hit’, thus indicating that it has generated its own linguistic term. This becomes even more obvious in Swedish, which uses compound words, so the word *huvudtackling* should be considered a single linguistic term, as opposed to the translated term of ‘head hit’. Again, the media plays a great role in the overall societal discourse about language change. As such, it is not unlikely that the shift from a more general description of incidents to establishing a one-word-term emphasize a type of on-ice violence will have some impact on the public.

Årslönen translates as “the annual salary”.

“The salary varies during the contract period, but the average annual salary is SEK 38 million.” (corpus extract, author’s translation)

Kontraktstiden translates as “contract period”.

“The assistant captain will obviously stay for the remaining contract period.” (corpus extract, author’s translation)

“The salary varies somewhat for the contract period, but the payment per season for [player name] will be SEK 53 million.” (corpus extract, author’s translation).

These two items are likely to be keywords for a very simple reason: the introduction of the NHL’s (National Hockey League) salary cap in 2005. There is little reason to go into detail about the practical implications, but it

regulates the total amount any team can spend on player salaries over a season. These items are likely to be more prominent in the target corpus because of their function in relation to the salary cap, where the 'cap hit' of a player's contract depends on the average salary (hence *årslönen*) during the total contract period (hence *kontraktstiden*) (see NHL, 2005). Because of this, it could be quite controversial to deem these two items non-discursive at an overall level. There may be reason to discuss the meaning of the salary cap for sport in general, and the tendency to view the game as more of a business, but that is a different discussion.

Kylning translates as "cooling", and refers solely to the brain injury treatment.

"One benefit of cooling for ice hockey players who sustain a concussion is that doctors and other medical staff are present when the injury occurs..." (corpus extract, author's translation).

This item is almost exclusively associated with the keyword related to the medical company Braincool. This item is not, however, assigned an effect strength of 1.000, for which there is a simple. The previous term, *braincool*, is a noun with no linguistic function. *Kylning* on the other hand, is a lexical word that can occur sporadically in other contexts. Overall, however, the item should be considered equally meaningful to the item *braincool*, i.e., mainly non-discursive from a media surveillance perspective.

Hjärntrappan does not seem to have an accepted English translation, but it could be described as "*concussion protocol*". A direct translation would be "*the brain stair*", as the term relies on the metaphor of steps that must be taken before a player can return from a concussion. The protocol consists of six different steps, where the first bans all physical and mental stress and the sixth allows a player to return to the game. To progress, the player needs to be symptom free for a minimum of 24 hours for each step (Tegner, Gustafsson, Lundgren, Forssblad, & Sölveborn, 2007). Use of the protocol for rehabilitation purposes is a priority for the Swedish Ice Hockey Association.

“He has had to start over on the concussion protocol a couple of times and no one knows when he might return.” (corpus extract, author’s translation)

“He has been stuck on the first step in the concussion protocol, where you can hardly check your cellphone and prefer to lie in a dark room.” (corpus extract, author’s translation)

“Given that he is now following the concussion protocol, he is likely to miss the semifinal.” (corpus extract, author’s translation)

There are no apparent logical or practical reasons for this item to appear as a keyword, since this type of concussion protocol was established prior to the threshold between reference and target corpora. Some kind of discursive change can therefore be assumed when interpreting this. To start with, the concussion protocol may have received more attention in the media surveillance once the risks of long-term damage became clearer. Because the corpus cut-off point is designed with this development in mind, this would be supported by the methodological considerations. Simply put, increased awareness of long-term effects may not be revealed through the qualitative interpretation of fewer individual texts. However, using a method like CADS to reveal macro-related patterns related to linguistics and potential discourse, may make this apparent.

Obviously, there could be other explanations. One might be the overall increase of concussions in the game, which would logically inflate the number of text references to the protocol. Although plausible, this is contradicted by the previously cited main study, which reveals a linearly increasing trend starting as early as the 1984/1985 season (Pauelsen et al., 2017). While this may not explain the prominence of this keyword, the combination of this increase and the increasing awareness of the long-term impact, on which the corpus division is based, may be at the core of this discursive shift. There could be reason to reflect on cause and effect in relation to this shift, because it is possible that the media narrative may very well have an increased focus on concussion protocol among that affected sections of the ice hockey community. To determine which trend should be

considered the trigger is hard to achieve theoretically, but is not very important in relation to the overall purpose of this part of the thesis.

Basically, the effect of the media narrative on the public and its importance in the discourse is unlikely to be affected by this contradiction to any relevant extent; information that reaches the public will eventually be the same regardless of this cause-and-effect relationship. Additionally, although there may be confounding reasons, the discourse shift determined by this empirical study relates to the media, with any other shifts open to speculation.

Hjärnskakningssymptom simply translates as “concussion symptoms”.

“[player name] still suffers from concussion symptoms and is far from participating in practice.” (corpus extract, author’s translation)

“The fact that he only played for [team name] a short period was because [player name] suffered severe and long-lasting concussion symptoms during his time here.” (corpus extract, author’s translation)

Once again, there is no apparent non-discursive reason for this item being a keyword, leading to the initial assumption that some kind of discursive shift is involved. The reasons for this may be somewhat the same as for *huvudtackling*. Here, it is obvious that symptoms related to concussions are not a new phenomenon as of 24 September 2011, which should be true whether considered in relation to sheer numbers, where the increase in concussions could play a substantial role, or in a linguistic sense, where descriptions of symptoms likely exist throughout the corpus. Instead, the interesting element should be how symptoms are increasingly described using a single term, as opposed to more general descriptions. If this were the case, an early example could be “He missed the game due to symptoms related to a concussion”, whereas a later example might be “he missed the game due to concussion symptoms”. The translation from Swedish to English again somewhat loses the clarity of such a shift, because of Swedish’s use of compound words (*hjärnskakningssymptom* is one linguistic term for functional purposes, unlike “concussion symptoms”).

Sängliggande translates to *bedridden*, in a non-voluntary, medically related way.

“To this day [player name] is bedridden. He describes how he has to sleep every day to have the energy to help his children with their homework in the evenings.” (corpus extract, author’s translation)

“He tried to participate in his team’s practice, but after ten minutes he had to stop and was bedridden for three days.” (corpus extract, author’s translation)

While the other items on the list may show somewhat similar functional patterns in a potential discourse shift, this one stands out. This due to its powerful function in a narrative sense, where it is often (as the above quotes illustrate) functions as an illustration of athlete’s personal tragedies described in terms of suffering. It is somewhat trickier to discern what the significant increase in this word actually reflects in a discursive sense, than it is for *huvudtackling* and *hjärnskakningssymptom*. In these cases, the items were deemed to represent a language shift in which earlier ways of describing a phenomenon were successively replaced by more straightforward terms. This is unlikely for *sängliggande*, because this term is not new or even increasing in a general language sense. Instead, it might be more logically coherent to consider the effect that uncovering the risk might have on the way the media reports incidents related to head injuries, primarily dramaturgically. In describing someone as *bedridden*, powerful as it is, the overall trend might be reflected in individual articles. Again, this would be the kind of trend for which corpus-based methods are ideal tools, in terms of uncovering otherwise elusive patterns.

Table 16 provides an overview of excluded items (see 6.1.2.) sorted into categories. All items have been checked by scanning concordances. The complete list of top keywords, exclusions included, is available on request.

Table 16. Overview of exclusions by category.

Category:	Description:	Number of items:
Names of individuals	Self-explanatory in terms of content. The high frequency and the theoretical reasons for this procedure are explained in 6.1.2.	97
Obviously non-discursive items	Items with an obvious logical explanation for their variation over time that is not related to discourse. For example: the top league's name change to SHL in 2013 resulted in this being the number one item (excluding those where effect = 1).	22
Obvious lemmas	Items that were exclusively collocates of other items on the list. For example: the term average occurred in the vicinity of monthly salary in almost every occurrence, indicating that these two together formed a discursive meaning.	2

6.4 Theoretical analysis, discussion and interpretation

The purpose of this section is to create a theoretically grounded understanding in relation to the results and initial analysis presented in 6.2. Although this will mainly correspond the previous section, some deviations in order may be necessary to keep the text theoretically coherent. Some background information previously specified in the text may be used to support an argument. Since this empirical study focuses largely on media narratives and media surveillance, the elements of the theoretical framework that are directly relevant will occupy a substantial part of the analysis. This should not be problematic, given that the thesis' overall theoretical analysis and interpretation, targeting the continuum of the empirical studies, is properly conducted.

Starting with the initial descriptives and simple statistics presented in 6.2.1, one initial observation relates to the exposure patterns of concussions in ice hockey over time. Hood et al. (2001, pp. 91-97) stress how media surveillance is superior to other ways of accessing public attitudes, making it key to their

explanatory hypothesis of *opinion responsive government*. Since 6.2.1 starts with a simple account of the overall trend, comparing the disclosed pattern with the three overall media profiles presented by Hood et al. (2001, pp. 91-93) is of theoretical interest. These are: low profile, intermediate profile and high profile. A visual interpretation of the study's results, using the weighted exposure displayed in Figure 7 for reference, may suggest that the intermediate profile is the best fit. This would indicate that surveillance is relatively stable over time, but occasionally shows somewhat of an increase due to journalistic investigations or similar activities. However, looking at the sub-types presented under *high profile*, the one relating to exponential growth seems to be a good fit for the statistically determined effect of time on exposure. Visually, one could judge that the effect in this case was quite stable growth, rather than exponential, but given the choices this is the only one that really captures such an increase.

All things considered, none of the three main profiles really fit the pattern perfectly, mostly because the increase, although somewhat variable over time, visually appears to have a fairly linear trend. This is not reflected in any of the typical patterns presented by Hood et al. (2001, pp. 91-93), which is probably related to the nature of the risk studied in this thesis. Using this premise for interpretation related to the public attitudes about a given risk in Hood et al. (2001, pp. 94-97), there are a couple of attitudes and patterns that might be relevant here. One that may be a better fit than others is the *issue-attention cycle*, which largely depends on publicity about the risk's potential consequences. Additionally, it is characterized by low levels of stability over time, which may be supported up by the gradual increase over time for weighted exposure. However, it is hard to establish an order of relevance using theoretical claims. For example, the pattern of *high but little examined concern* could be just as relevant, since this includes the component of low awareness in relation to the public's true attitudes. This could be valid here, since the authors highlight how this non-awareness depends on low levels of conflict within the regime. In relation to the definitions that comprise this conflict level, none of the empirical data suggests otherwise at this point. In brief, no part of the material or its subsequent analysis supports the claim that there is a substantial level of conflict regarding the regulation or

governance of the risk studied in this thesis. The same seems to be true of the available background information (see mainly 2.4). As is often the case, this should not be used to make a claim for weakness related to the theoretical framework or the study itself. These six attitude patterns are, as is the case for any reference framework, mainly used for their function of ideal types, and are useful for providing a frame of reference for empirical studies. This latter clarification is obviously relevant to all of this study and has no more significant relevance here.

Once the dynamics of the overall media surveillance is determined in terms of attitude pattern and main profile, this needs to be fit into the broader picture supplied by the explanatory hypotheses of *opinion responsive government* to be theoretically meaningful. Again, this hypothesis is understood mainly through the opinions of the general public (see Hood et al., 2001, pp. 90-111). Public opinion may contribute to a certain degree of understanding regarding risk regulation in general. However, Hood et al. (2001, pp. 97-109) mainly use this as a step in a larger process, where strategies for managing a given picture using public opinion are the next logical step in determining the explanatory capacity of the hypothesis.

There are acknowledged limitations regarding the study that Hood et al. (2001, pp. 91-93) build these three main types upon. In short, this concerns the non-inclusion of certain media types, where the lack of local newspapers is deemed especially relevant here, due their presence in the study sample used for analysis.

Moving to the concordance analysis, the decision to exclude the initial hit for the chosen item corresponds with the nature of the explanatory hypothesis called *opinion responsive government*. To clarify, highlighting media surveillance as the most reliable measurement of public attitudes supports the exclusion of an item that is highly unlikely to ever reach the public due to the narrow audience for the initial hit. While physicians, as a professional group, are important in relation to the regime in general, their medical journal is of limited relevance to the public, making it inadequate for the explanatory hypothesis.

In a visual interpretation of Figure 8, again based on the typical patterns uncovered by Hood et al. (2001, pp. 91-93), the exposure of CTE as a specific issue could be deemed a *high profile* type of surveillance. This is mainly because of the “spikes” in the hits, where the initial one is the largest. For the defined sub-types, it seems that the *issue-attention-cycle* pattern, which is characterized by quite high peaks and overall volatility (Hood et al., 2001, p. 93) is the best fit. In trying to make sense of the dynamics in relation to this specific risk, the concordances indicate that most of the spikes are related to certain incidents, with one example being the deaths of three players in a short period of time (see 1.3). Regarding the attitude patterns, the relationships mentioned in relation to the initial descriptives and the overall coverage trend should also apply here.

For accessing the dynamics of the individual concordances and the four factors, the hypothesis of opinion responsive government may no longer seem adequate, although the potential effect on attitude patterns might be initially interesting. Because the salience of the risk is assigned a great deal of importance when determining the eventual fitness of the six alternatives (see Hood et al., 2001, p. 93), the way a given risk is presented to the general public could be considered somewhat important. Certainly, the saliency of the risk should logically be reflected in the nature of the content, more so than the volume of surveillance. Based on the four defined factors of dementia, suicide, fighting and name (see 6.2.1), the saliency of this risk can potentially be accessed through various results. First, the distributions of occurrence and non-occurrence, where the former seemed to favor dementia (36.4%) and name (33.2%) in simple proportions. The fact that dementia is quite frequently mentioned close to CTE could, due to the probable impact of such a diagnosis, affect salience in a way that may strengthen the very tragedy and implied human suffering connecting to the overall risk. The name of the affected individual being proportionally quite prominent may have a similar effect, probably because it could provide the risk with a “face”, linking to the voices of side-effects described by Beck (1992, p. 61), and intertwining the macro-perspective of risk society with a more relatable perspective in terms of risk. This aside, the fact that a factor such as suicide does not occur as frequently (4.5%) does not necessarily mean that its

contribution to risk saliency should be ruled out. In fact, the occurrences do not, by themselves, say anything about the public's perceived severity of a given factor. It might be argued that a factor such as dementia is perceived as more or less severe than, for example, suicide. However, this would be difficult to determine using empirical evidence for a given context.

Taking these occurrences into account, attitude patterns may need to be reevaluated in relation to this part of the study. If the argument of high saliency is to be made using these occurrences, the patterns that remain relevant are *issue-attention cycle*, *general and consistent concern* and *high but little-examined concern*. On a scale where five is the maximal score, these three are assigned four, five and five points respectively (Hood et al., 2001, p. 94). The last one, however, comes with a reason for caution, as the score is supplemented by a question mark, because it is partly characterized by non-explored attitudes. This pattern was subsequently discussed in relation to the initial descriptives, where it was deemed somewhat relevant. Considering the spikes visible in relation to concordances over time, the issue of CTE may further support this claim. In relation to the other dimensions of polarization/conflict and opinion stability, where the pattern has a low level in the former case and an unknown level in the latter, this addition is not likely to contribute further understanding. On the contrary, this part of the results in no way contradicts these levels, so the pattern remains theoretically plausible.

While the initial trend over time and the nature of the content may indicate a pattern on the high salience side of the spectrum, the fact that the pattern discussed above relies on a non-explored (although assumed high) level should logically, when applied to a specific risk, be a cause for interpretive caution. Although media surveillance is considered a good source of public opinion (Hood et al., 2001, p. 94), public attitudes regarding saliency are yet to be assessed through survey methods. The opposite pattern in this regard, namely '*Don't know, don't care*' could be argued for from a perspective in which there are great differences between public knowledge and the severity stated by experts. However, although somewhat supported in background information, this does not correspond to the results of this

study. This is especially true when the importance of media surveillance in relation to public opinion is considered, as the concordances indicate that a certain amount of the diagnosis' severity is mediated.

Leaving aside the parts of the theoretical framework related to the media narrative and public opinion, the surveillance's nature, as mapped through the concordance analysis, is also relevant in understanding the risk regulation regime from the perspective of context and content (see Hood et al., 2001, pp. 28-32). Regarding *type of risk*, which is part of the regime context, its overall nature is not stated in the results themselves. However, some elements that Hood et al. (2001, pp. 28-32) state are relevant could apply to the concordance analysis, mainly in relation to how the given risk or consequence is presented in terms of its nature. Returning to the frequency distribution, it does not say anything about familiarity, impact, probability, or other important factors in an absolute sense. Despite this, the importance of media surveillance for broader societal discourse purposes is likely to reflect upon the broad narrative nature of what is on 'the agenda', and relates to the other contextual element of public preferences and attitudes. The contextual element that is least likely to be reflected through the results of this study is organized interests, although the contexts in which certain actors occur will have some relevance even at this point (the third empirical study examines this aspect in more detail).

The four factors used to assess the concordances all relate to the inherent features of context described by Hood et al. (2001, p. 29). The severity of the consequences of the risk is an aspect that is broadly considered using factors such as suicide and dementia. Given how the latter played out regarding occurrences and the undeniable impact on individual health, it may provide clues about how the type of risk is perceived, although experts may or may not have a different opinion. Hood et al. (2001, p. 29) make a point of this severity in a situation of non-regulation, so eventual consequences should be considered from this situation if a risk is to be understood at a basic level regarding context. Again, this empirical study says nothing about this in terms of actual severity or the nature of regulation, but it is appropriate to

revisit this central part of the overall context later (in relation to the collocates analysis).

When considering the results where the interrelationships between the four factors are mapped using crosstabulation (see Table 12), the most theoretically interesting part may be that names and the factors of suicide and dementia do not co-occur in a linguistic sense. Setting aside language-based reasons for, this may lead to questioning the decision to connect the occurrence of names with the apparently logical connection that the risk is assigned a “face” through this narrative. This is something that is not disclosed just through frequencies. Here, it is important to stress that these co-occurrences are mainly linguistic, so this does not mean that an individual is not mentioned in the same text (e.g., newspaper article) as dementia or suicide. However, the lack of linguistic co-occurrences should imply something in relation to the presented narrative. Determining this through theoretical interpretation could be difficult at this stage, but might be easier once the additional empirical studies are in place for the general theoretical discussion.

As for the point-biserial correlation presented in Table 13, there is little reason to conduct in-depth theoretical interpretations, since the only significant effect (time – suicide) was a weak one. In relation to public attitudes, it could be argued that the lack of significant change over time in the exposure of suicide and dementia in relation to the diagnosis would strengthen the likelihood of a *Don't know, don't care* attitude pattern (see Hood et al., 2001, p. 94) due to the relation to saliency. However, such an effect is, for practical reasons, nearly impossible to determine in a causal manner. In fact, the connection requires somewhat indirect theoretical reasoning to even be a logically valid argument. In relation to type of risk, it could be that stability over time for the content type implied by these results would, with the stated overall increased exposure over time, affect the risk status in terms of it being established or non-established (see Hood et al., 2001, p. 29). Again, it is not practically possible to determine the appearance of this effect in a causal sense.

For the collocates analysis, the surveillance is likely to be less interesting than the implications for type of risk. It should, however, be noted that even here most of the argumentation is again based largely on the significance of the surveillance in relation to public opinion and attitudes.

The noun collocates presented in Table 14 resulted in the dimensions of *time*, *complications* and *trigger* (see Figure 9). Through theoretical interpretation, all three may have some relevance regarding type of risk. Starting with the dimension of time, the narrative provided through the relevant collocates implies some kind of ambition to quantify an abstract phenomenon. Although a broken bone is likely to have a fixed schedule for healing and rehabilitation based on empirical data and clinical studies, head injuries are far more complex. The use of time-related collocates could then imply either that this is not possible, as some individual concordances suggest, or give the impression of the opposite. However, the importance assigned to possibility of quantification by Hood et al. (2001, p. 29) is highly likely to have some consequences for how the inherent features of the risk are communicated to the public. As the rehabilitation or healing process is essentially abstract, time could be one thing that is easily understood by the public.

The complications dimension could work in a similar way, although more purely related to consequences. Since the potential handling of such consequences plays a role in the concept e.g. Hood et al. (2001, p. 29), the fact that a collocate such as *sjukhus* occurs in this dimension might somewhat reflect society's ability to deal with a given risk through a given institution. This is an aspect that is unlikely to appear in the simple interpretation of the results, as this is not a connection likely to be made merely in relation to the risk. While the other collocates in this dimension should be considered more individual-related, in terms of risk type and consequences, they should be just as relevant in terms of impact.

The last dimension, trigger, could easily be seen as an expression of the source, which is another important element recognized by Hood et al. (2001, p. 29). Although this might largely contribute to assumptions made by the

public regarding initiating events, there is good reason to problematize this because of the simplifications in any assumptions regarding cause and effect. Since type of risk as a concept, the way it is described by Hood et al. (2001, p. 29), assigns a great deal of importance to how a risk may play out in a situation with no regulation, there is good reason to take the chain of events one step further. The collocates in this dimension, mainly *tackling*, can act as an initiating source only in a situation where this is permitted due to a lack of regulation. At this point of the thesis, it is not possible to draw conclusions about the format of this regulation in the regime, but it is safe to say that although the public may consider a body check the initiating event, the chain of actions starts elsewhere. It could be argued that this is the case for every risk concept once the theoretical idea of risk regulation regimes is accepted. However, when a dimension such as *trigger* is identified, this might be even more essential than in general cases that relate to the public understanding of a given risk.

Moving on to the verb collocates, the dimension of perceived severity makes it appropriate to take another look at the discussion about types of risk. Since the severity of potential consequences is an important factor here, and accessing public preferences and attitudes is important for adequately mapping the regime's context (Hood et al., 2001, p. 29), co-incidence may be crucial. If the media surveillance mediates a picture in which the consequences of a certain risk are pictured as quantifiable or of generally clear severity, the premise of a regime in terms of its context might be somewhat skewed. The consequences of such a skew are obviously quite abstract and inappropriate for determining cause and effect, as regards the outcome in terms of regime content. However, when the risk regulation regime is theoretically mapped using the overall picture supplied by the thesis' empirical studies, this is something that needs to be considered.

The other two verb-related dimensions, which relate to passive and active actors, are both likely to be linguistically in character terms. Accordingly, any theoretical interpretation needs to be performed with consideration for language and its effects. Because this, in more general risk terms, indicates a divided narrative where actors (or individuals) are seen as either subjected

to a risk or exposing themselves to one, in that sense that more accountability is probable. This may be of interest in relation to how risk type is intimately connected to severity in the absence of regulation (see Hood et al., 2001, p. 29), because this division can be seen as theoretical in terms of how the individual is exposed to the risk. Simply, a view promoting the perspective of passive actor could have implications for how a lack of regulation is perceived. How this would or would not affect the overall regime is a complex question that will be better answered once the overall results of the empirical studies in the thesis are theoretically interpreted. While this is the case for every part of the regime content, aspects in which public preferences and attitudes may be affected by linguistic implications, such as passive or active actor, can be considered especially important.

Analyzing the adjectives theoretically takes less time, as two of the dimensions involved (time and perceived severity) have already been dealt with in relation to other word classes. From a purely linguistic point of view there may be some reason to interpret the differences between occurrences in relation to the associated word class. However, as this thesis concerns sociology rather than pure linguistics, this is not relevant.

One dimension was identified solely in relation to this word class, namely that of *uncertainty* (see Figure 11). In relation to type of risk, this is quite straightforward due to the sociological term of uncertainty (see 4.1). All the components presented by Hood et al. (2001, p. 29) should thus be somewhat applicable. In fact, the factors related to type of risk combined with the general sociological conceptions of the term uncertainty, could be said to possess great significance importance when understanding public preferences and attitudes. A logical consequence of this dimension would then be that parts of the surveillance imply a significant amount of uncertainty on the matter, which could affect the potential to assessing the topic in a rational matter. However, the fact that this dimension arose from a single collocate, making it statistically less prominent than the two previously analyzed dimensions, could indicate that it is not to be considered a very prominent issue when describing the regime context. Turning the order of reasoning around, it might actually relate to the fact

that this collocate and its dimension lack prominence, at least partly because of its very general, non-specific, relationship to the important parts of a given type of risk in relation to regime context. As mentioned in the results section, the collocate is also somewhat vague in the sense that the concordances imply that it is generally used in a way that might illustrate any injury. There may thus be good reasons for excluding the dimension of uncertainty from further analysis when its prominence is based solely on the collocates. Instead, theoretically analyzing the discrepancy between the uncertainty associated with head injuries and its lack of prominence in media narratives and subsequent public preferences and attitudes may be relevant. However, this question is better suited to the overall theoretical analysis.

As for adverbs, this word class is the only one with a dimension that relates to the overall trend in ice hockey regarding the risk. It could be argued that the cumulative effect of all the individual stories and the trend towards increase has the potential to affect discourse, especially for the importance of general information flow in the media in relation to overall societal discourse, as stressed by Hood et al. (2001, pp. 91-97). This aside, the information that reaches the individual consumer still mainly consists of stories, with this dimension being the clear exception in its signification of the direct telling of an overall trend. Notably, this dimension, once again, builds mainly on a single collocate (see 6.2.3), although a statistically quite prominent one (see Table 17). The other two dimensions, *availability* and *concussion protocol*, are intertwined for a lot of practical and discursive reasons (see Figure 12), something that is also likely to have theoretically grounded consequences. Given important factors related to type of risk and general regime context, such as quantifiability (see Hood et al., 2001, p. 29), the occurrence of collocates related to concussion protocol and player availability for games, mainly in relation to the latter, is likely to be a major part of any discourse related to type of risk. This does not mean that the presence of a defined concussion protocol makes the risk quantifiable, but its presence and continuous references to it when the risk is mentioned may contribute to a discourse in which quantifiability is perceived in a certain way. One approach could be to consider the discrepancy between the level

of risk quantifiability achieved in the concussion protocol and the perceived level that the related discourse implies for the public. One possible outcome could be that although the protocol is founded on a general awareness of the uncertainty and abstract nature of the risk, the references to it may give the impression of a measurable risk. As in most cases, and arguably even more so here, due to the apparent logical discrepancy, the overall significance of media surveillance for societal discourse is quite significant for the overall regime context.

In the theoretical analysis of the keyword part of the study, all conclusions and arguments need to be related to the actual change implied by these words. This should correspond well with the role this part is thought to play in relation to the overall purpose of this empirical study (see 6.0 and Table 9). Here, it should be quite clear that the acknowledged relevance of media surveillance in relation to overall discourse can logically also be used in a context where discourse change is the main interest. Out of the ten top statistically determined keywords, only those deemed likely to be discursive ones (see 6.2.4) will be subjected to theoretical analysis.

Starting with *huvudtackling*, the fact that a coherent term for body checks that impact the head appears to have resulted in linguistic change in how they are depicted in the press may be of interest for several theoretically relevant reasons. The most relevant one here probably relates to type of risk (see Hood et al., 2001, p. 29). Such a linguistic change may not have a significant impact on inherent features such as severity, probability or cause. However, the establishment of a coherent term over time may well have some meaning in relation to factors such as familiarity and, perhaps most of all, how well-established the risk is perceived to be. Examining the actual linguistic implications in relation to public preferences and attitudes might be complex in terms of mapping cause and effect in such a purely linguistic change, but a shift towards increased familiarity and establishment should be a logical consequence.

Hjärntrappan, already described in terms of discursive meaning, could be seen to relate to a type of risk-features risk (see Hood et al., 2001, p. 29), such

as increased awareness related to severity and quantifiability when considered in an instrumental sense. Moving to more complex relationships between linguistics and discourse in these two risk-features, this would be somewhat reconnected to perceived severity, with the same overall sense as it is defined in relation to the collocates. Through the alleged quantifiability of the risk that may grow from the statistically significant increase in term use, there is a probability that the public perceive this risk as possible to measure and assess in a rational manner, which may well affect their overall impression of the risk. For a consumer, this process could work as follows: A person consumes media material that regularly head injuries in ice hockey. Over time, there is increased occurrence of an item related to concussion protocol, which is a device for managing concussions in a rational way, and the likelihood that this person sees this increases over time, so increasing the likelihood of perception related to the risk's quantifiability. As this is an individual example, the cumulated effect for discourse in society, as defined by Hood et al. (2001, pp. 91-97), would affect public preferences and attitudes in relation to this risk. Contrary to the cross-sectional approach to perceived severity shown in the similar discursive meanings related to the collocates, this is related to a statistically determined change over time.

Hjärnskakningssymptom, is generally of discursive interest for the same reasons as *huvudtackling* (see 6.2.4), but may be somewhat different in relation to theoretically based discourse about the type of risk and any cohesive effect on regime content. While the two items represent a common change in language use, in the sense of a movement from broad description to specific term, the theoretical implications for discourse shift in relation to the specific risk are likely to vary. For this item, the relevant phenomenon comprises physical symptoms related to concussions. Unlike *huvudtackling*, relates to damaging consequences rather than the cause of the injury. From the perspective of the impact of a media narrative, once a risk is communicated in the form of symptoms, it is likely to have moved past simple probabilities and quantifiability and into mediated severity, and broken down, at least in most cases, to an individual level. Since the importance of the combination of consequence and probability is stressed by Hood et al. (2001, pp. 91-97), a linguistic shift where such symptoms are

statistically determined would indicate a potential shift in relation to public attitudes and preferences, where consequences are more apparent. Given the nature of the item and the implications of individual stories in the concordances (see 6.2.4), it is likely that this increase is mainly mediated independently of the other side of the spectrum, probability. The latter is, in fact, not obviously present in any of the top ten keywords.

In many ways, the item *sänsliggande* is quite closely related to the previous one, but differs because it expresses a specific and concrete consequence rather than a general symptom-related increase. In line with the simple interpretation of discourse (see 6.2.4), the increased use of the term could be understood as a consequence of the overall effect of discourse surveillance described by Hood et al. (2001, pp. 91-97), not vice-versa. Simply put, if a shift in surveillance can be tracked through linguistic changes, as the previously mentioned item of *huvudtackling* suggests, this could obviously affect the media narrative and create a demand for storytelling that mediates the phenomenon through individual suffering. This is not the only way for the media to respond to such a shift, but it would explain the presence of this item among the top ten. Reasoning in this way can potentially generate many of questions about cause and effect in media surveillance and discourse. However, the fact that media surveillance and overall discourse could work both ways should not be a controversial argument.

7 Study 2 – Quantitative content analysis related to the ice hockey community

This study is primarily expected to answer the following research question:

- What kind of information is communicated by the Swedish ice hockey communities about head trauma's long-term effects on athletes' health, how has this changed over time and how can the nature of this information be related to the current risk regulation regime?

This approach should correspond well with the overall concept of risk regulation regimes, given that the analyzed information plays a great role in several aspects of this concept. In accordance with Hood et al. (2001), this information should be relevant in relation to *organized interest groups* and the explanatory hypothesis featuring *interests, lobbies and experts* (for detailed definitions, see 5.1.). Additionally, the use of *organizational legitimacy* for further analysis comes with the basic assumption of a striving for legitimacy by the organizations (see W. R. Scott, 1991a). Analyzing material communicated by the Swedish Ice Hockey Association, makes it possible to study the process involved in this striving. Finally, the specific form of the question relates to the previous empirical study, where the results regarding a profound discursive shift on the subject should promote a responsive shift by the relevant organizations. In summary, the first part of research question aims to provide an integrative approach using the theoretical framework and the thesis' previous empirical study.

The second part of the research question seeks to advance knowledge about whether and how risks are included in this communication. While this is not necessarily connected to the risk studied in this thesis (although it may be), it should have potential as a component of regime understanding because maps the general attitude towards risk in what is likely a significant regime actor. Additionally, it is likely to support the rationale of the third empirical study, since the risks explicitly acknowledged by this actor are likely to impact on what other actors might consider important for this regime.

7.1 Method

This study is performed using quantitative content analysis and is mainly consistent with the standard principles of such methods (e.g. Krippendorff, 2004; Neuendorf, 2016; Riff et al., 2014). This method, originally defined as "*a research technique for the objective, systematic and quantitative description of the manifest content of communication*" (Berelson, 1952, p. 18), emphasizes the analysis of quantifiable and recurring aspects of text content, focusing on *manifest* content (White & Marsh, 2006, pp. 22-23). The latter is quite prominent here, as this empirical study strives to keep interpretation to a

minimum. On the contrary, the texts being analyzed have the purpose of explicitly communicating certain types of activities (see 7.1.1), so they are well suited for analysis of manifest content. Any theoretically based interpretation will therefore be saved for the bigger picture, where the recurrence of certain content will be analyzed in the broader context of the risk regulation regime and the other empirical studies, i.e., the result of the first one, which serves as the basis for further deductive analysis (see Elo & Kyngäs, 2008). The study itself will thus be conducted only using manifest content, making the quantitative approach to content analysis the best suited one.

A core feature of this method is the use of *analytical constructs*, which are considered key to accessing the text's content and answering the research question (White & Marsh, 2006, p. 27).

"Analytical constructs operationalize what the content analyst knows about the context." (Krippendorff, 2004, p. 34)

With the above quote in mind, the constructs in this study should reflect two main things to be considered valid. First, the context of the risk regulation regime, as described under 4.2.1.1. Second, the overall discourse implied by the results of the first empirical study. Using these two premises, a deductive approach where the content is reflected through analytical constructs should be possible. Accordingly, this will be done in the part of the study that examines the first research question. In developing such a construct, Krippendorff (2004, pp. 173-179) argues that this should rely on at least one of four possible *sources of certainty*. First, *previous successes and failures*, where the construct design is based on the fact that it worked previously. Second, *expert knowledge and experience*, where the design of a construct relies on hands-on expertise rather than, for example, a theoretical model. Third, *established theories*, where the construct basically follows the general scientific principles that constitute what is to be considered a theory. Fourth, *embodied practices* are used to supply the construct when none of the previous three are available.

For this study, *previous successes and failures* is appropriate. This is mainly because the analytical construct and the corresponding rationale are not the result of a theoretical background, but rather the first empirical study and the statistical relationships in its conclusions. This corresponds well with the example of Stone & Hunt (1963), as rendered by Krippendorff (2004, p. 174). The analytical construct that is used as a rationale, while initially based on previous research in terms of the explicit research question, is supported through the empirical and statistically significant findings of an additional study conducted by the same author. While this was conducted on different material, it supplies a great deal of contextual information, making it the core of the analytical construct. This is despite previous research and, to some extent, expert knowledge on the subject indisputably playing a key role for rationale of the initial study.

In addition to the thesis' first empirical study, the analytical construct and research rationale also relies on the overall theoretical framework, namely the prominence of *organized interests* emphasized by Hood et al. (2001). Given the premise that the Swedish Ice Hockey Association, including its sub-divisions, is an important actor in relation to organized interests, communication from these organizations should be important in understanding the overall risk regulation regime. To summarize, the theoretical framework supplies the overall analytical construct for what type of material is deemed interesting, while the empirical study supplies the assumption on which the construct is analyzed, namely the logical consequence that the interests are likely to make a positive societal impact. In the case of the second part of the research question, through which the more general risk aspect is studied, the theoretical framework supplies a rationale for the study mainly because it puts the organization in a context where risk is important. Although the thesis is mainly occupied by one quite specific risk, knowledge about the overall aspects of risk communicated by a relevant actor is relevant.

With the construct base determined, it is also necessary to determine the *type of construct* on which a given content analysis is built (Krippendorff (2004, pp. 179-185). In this case, the construct largely coincides with the type

described as *indices and symptoms*, building on variables that should be correlated with other variables in a manner relevant for the analysis. Practically, this is expressed through an interest in frequency and change over time, thus exploring the variables of time and frequency (see 7.1.2). If this type of construct is to be applied, Krippendorff (2004, p. 181) suggests that these *indices* must fulfil two conditions to be considered valid. First, there should be no correlation between the indices and any supposedly construct-independent phenomena. Second, they should not depend on irrelevant variables. These two requirements could, in this study, be somewhat problematic as the causal relationships needed to fully assess them are unlikely to be adequately determined through this type of material. In fact, mapping a risk regulation regime should not, at least in the descriptive phase, require the determination of such relationships. However, this needs consideration when the results are interpreted. The overall analytical construct is illustrated in Figure 14.

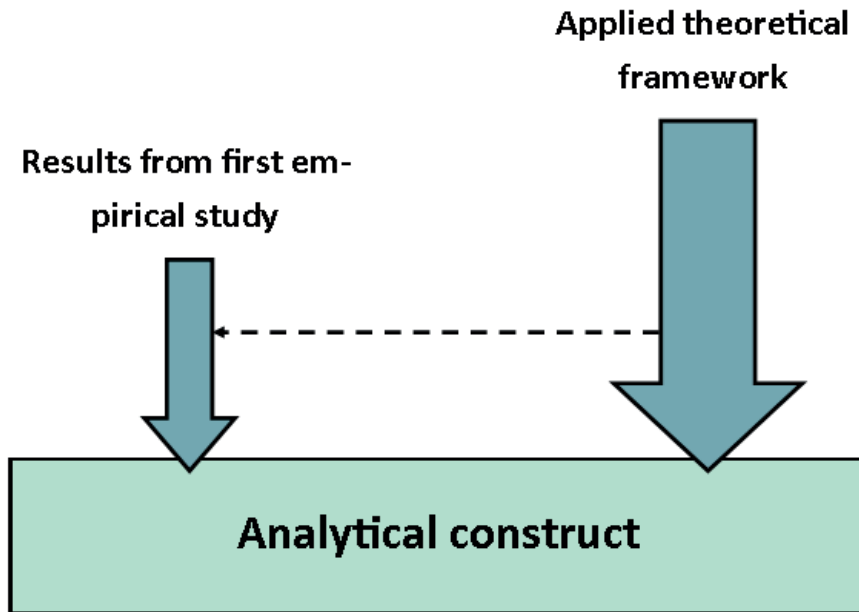


Figure 14. Illustration of the overall analytical construct for empirical study 2

7.1.1 Material

The empirical material for the study will consist of all available activity reports published by the Swedish Ice Hockey Association and its local divisions in a given time period. To be consistent with the first empirical study, this starts with the 2006/2007 season, because this marks the starting point of the observed increasing trend in exposure of the subject (see 7.2.1). The end point will be set to the 2017/2018 season, simply because this is the last available one at the time of analysis.

The actual material, namely activity reports, consists of documents that are a part of standard reporting procedure in most Swedish organizations of this kind. The documents are obtained through their online availability in the first collection round, and through personal contact in the second round. The Swedish Ice Hockey Association has 22 geographically based sub-divisions (see 2.4.3), each with its own annual activity report. Including those of the parent association, this potentially means 276 documents for analysis. Since the whole population of texts is targeted, there is no sampling process in the sense that a sample is used as a tool to draw conclusions in relation to a defined population. When it comes to content analysis, such a text mass is considered a *census* (Krippendorff, 2004, p. 120), characterized by its inclusion of the entire population, so there is no need for exclusion. However, as some cases are missing from the documents analyzed in this case, it could be considered a sample rather than a population. On this premise, the sample type that fits best is *convenience sampling*, which is characterized by availability rather than strategic choices (Krippendorff, 2004, pp. 120-121). There are a number of problems related to such sampling when it comes to quantitative content analysis, namely the risk of bias or even deception (Krippendorff, 2004, p. 121). In this case, the latter should not be a problem, given that no sub-organization will deliberately withhold their documents due to their content. For bias, nothing appears obvious, but the potential risk would be of a systematic nature in the missing cases.

Overall, for the sampling choices, it could be said that the initial ambition was to analyze the census, while the outcome was a convenience sample. This needs to be considered when conclusions are drawn.

Table 17 provides an overview of the documents used in the analysis. The sub-divisions are all coded from 1-22, while the parent association is 0.

Table 17. Overview of text availability for analysis. 0 represents documents from the parent association, while the following 22 each represent one geographical sub-division.

	06/0 7	07/0 8	08/0 9	09/1 0	10/1 1	11/1 2	12/1 3	13/1 4	14/1 5	15/1 6	16/1 7	17/1 8	Σ
0		x	x	x	x	x	x	x	x	x	x	x	11
1	x	x	x	x	x	x	x	x	x	x			10
2													0
3								x	x	x	x	x	5
4						x	x	x	x	x	x		6
5					x	x	x	x	x	x	x	x	8
6	x	x	x	x	x	x	x	x	x	x	x	x	6
7				x	x	x	x	x	x	x			7
8								x	x	x		x	4
9											x	x	2
10											x		2
11													0
12													0
13							x	x	x	x	x	x	6
14									x	x	x	x	4

1 5	x	x		x	x	x	x	x	x	x	x	x	8
1 6	x	x	x	x	x	x	x	x	x	x	x	x	12
1 7									x	x	x	x	4
1 8									x	x	x	x	4
1 9													0
2 0											x		1
2 1													0
2 2	x	x	x	x	x	x	x	x	x	x		x	11
Σ	5	6	5	7	8	9	10	12	14	15	14	14	11 9

The documents varied substantially in their size and format. The largest documents had almost 80 pages, while there were a few that were no longer than 19 pages. This variation seems to be because the contents were very different. For example, some sub-divisions included detailed results from every game played during the season, while others only briefly summarized these results.

For every interpretation of the results, the nature of the analyzed material must be considered. The most important factor is perhaps who the organization responsible for the document expects to read it. While activity reports may, in the most general sense, be a means of communication between the board of an organization and its members, there are other factors to consider. For instance, municipalities or other funding organizations may have demands or policies that the document must

comply with to secure funding. In addition to the implications this may have on the target audience, variations in these policies may explain the variations in document length and format. Still, activity reports of this kind should be considered a substantial part of the communication that takes place between these organizations and other relevant actors in the risk regulation regime. The material's main limitation in terms of outreach could, on the other hand, be that it is not deemed as an important part of the communication between the organizations and the public. To access such communication, marketing material would probably be a better indicator.

7.1.2 Data processing

For the practical process of coding, all data processing is done by the author, so specific qualifications, training and instructions for external coders (see Krippendorff, 2004, pp. 125-131; Neuendorf, 2016, pp. 157-159) are not necessary. A coding scheme is, however, used for transparency reasons and to carry out a pilot test. This is conducted by allowing a second person to perform an additional round of coding for a randomly selected document, where any difference to the author's interpretation is used for further adjustments before the analysis of the remaining data.

In relation to the defined research questions, the main point of interest regarding content is the tendency, or lack of it, to emphasize ice hockey as a positive presence on behalf of society. This would include benefits to the local community, health benefits and positive effects on companionship and sportsmanship, to name a few. To quantify these claims, this study largely relies on content being *inherent* in the text (see Krippendorff, 2004, p. 19), so the amount of interpretation when discerning the content of interest must be kept to a minimum. This is achieved partly through sole focusing on manifest content, as opposed to latent content (see Krippendorff, 2004, p. 19). While this may not be completely achievable, due to the partial interpretation always involved in any text, one way to keep the analysis focused on manifest content should be a detailed definition of categories that are robust enough to allow for replicability (see Krippendorff, 2004, p. 24).

Regarding the second part of the research question, it is best suited to deductive analysis. As previously stated, Elo & Kyngäs (2008) emphasize that this approach is appropriate when testing an established concept in a new context. Here, this is the general sociological concept of risk. In broad terms, the basic principle of a text unit explicitly mentioning risks builds on the six categories established by Lupton (1999a, p. 14): environmental, lifestyle-related, medical, interpersonal, economic and criminal. However, to make this part of the study more suitable for further analysis, it is necessary to move beyond merely noting the number of times the concept of risk is explicitly mentioned. Therefore, the risk related sub-categories will be further sorted. To observe the deductive approach, this division will rely on a binary division between *risks related to the health of the individual* and *other risks*, with the rationale based on the overall research problem and its specific risk. This sub-concept of risk is, in terms of definition, based on what Lupton (1999a, p. 14) would probably categorize a *lifestyle* risk, rather than the apparently more relevant *medical* risk. This is because the latter category is emphasized as being a more macro-related one that concerns issues such as side effects of the medical system, rather than ill health due to participating in specific activities. Lifestyle risks are, on the other hand, among those exemplified as leisure activities (Lupton, 1999a, p. 14). Thus, any risk-taking associated with an activity such as ice hockey should fall within this category. From here on, this risk will be referred to as *health risks*.

The study of change over time regarding the occurrence of risk in general as well as the ratio between general and health-related risks is therefore possible. The use of health risks in general, as opposed to the specific risk of head injuries, could make this approach less suitable for the thesis' overall research problem. However, the fact that the given risk is very specific in nature makes it unlikely to have a significant presence in manifest content, so a broader perspective on health risks is required. Even here, the aim is to create categories that allow replication (see Krippendorff, 2004, p. 24).

To define the process of distinguishing coding units, proper unitizing (see Neuendorf, 2016, pp. 72-74) is of great importance. First, this requires a clear definition of the qualitative aspects of what is an occurrence, or differently

expressed: the conditions under which the value of *occurrence* = 1. As stated, this is whenever the text explicitly emphasizes the positive societal effects of the ice hockey, regardless of the macro or micro perspective. All other units of texts are simply associated with a value where *occurrence* = 0. This coding process should be relatively simple, given that there are only two categories. However, there may be uncertainty about whether an occurrence counts as one or more. To avoid any inconsistencies, the principles relating to defining units (see Neuendorf, 2016, pp. 70-74) are described: occurrences are only counted as more than one when they are clearly distinguishable in the text. Practically, there must be at least one unit where the value of occurrence = 0 between occurrences for multiple values of 1 to be counted. Due to the nature of the analytical construct, the rationale for the units should be considered deductive (see Elo & Kyngäs, 2008). Table 18 provides an overview of the conditions.

Table 18. Overview of conditions for each value/category for research question 1

Value	Condition(s)
1	Unit of text explicitly emphasizing the societal benefits of ice hockey and/or the work of associated organizations as: Health benefits Benefits related to democratic values Benefits related to social capital or similar Benefits related to sportsmanship (or similar morally related factors)
0	All units not falling under the conditions for 1.

For the risk related part of the analysis, the same rules as above apply to the general distinction of risk versus non-risk. The sub-categories of health versus other will be binary coded using the same principles. These are illustrated in Table 19.

Table 19. Overview of conditions for each value/category for research question 2

Value	Condition(-s)		
1	Unit of text explicitly mentioning any type of risk. This may include: Economic risk Reputational risks Health risks Risk of organizational problems Staff shortages	1.1	Risks related to human health (injury, disease, etc.)
		1.0	All risks not falling under the conditions for 1.1.
0	All units not falling under the conditions for 1.		

For reliability purposes, two randomly selected documents were subjected to a second round of coding by a fellow PhD student (thank you for your time, Sara). In addition to the tables above, the colleague was instructed to go through the texts twice, once for *benefits* and once for *risk*. When compared to the author's interpretation of the same texts, the results of the coding process ended up coinciding to roughly 85%.

For the data analysis, a given *variable* and a specified *metric* to measuring the former's variability is required, in relation to the understanding of data language *syntax* (Krippendorff, 2004, p. 153). Other components, such as *grammar*, should mainly be considered irrelevant in this case because the study is of a non-linguistic nature. In this case, the variables of interest are built on simple frequencies, where each value of 1 represents the occurrence of the category, i.e., each time the text explicitly emphasizes the positive societal effects of ice hockey, the count increases by one. The same principles apply to the risk-related parts. The actual units of analysis will be the seasons described in the texts, thus relating actual variability to the season. However, with the number of available texts varying quite substantially

depending on which season is analyzed (see Table 17), the actual metric needs to be standardized to facilitate further data analysis. This is achieved by dividing the number of observed occurrences with the total number of texts available for that season. Therefore, the metric will be labeled *occurrences per text*. As a measurement, this should be considered a typical *ratio metric* (see Krippendorff, 2004, p. 169). Due to the applied weighting, values should be continuous in nature.

Once the process of sorting and categorization is complete, prominence and changes over time are studied through the following analyses:

Initially, there is a brief descriptive rendition of the material, containing simple frequencies for the prominence of the analysis' main categories. In addition to total prominence, this is broken down for each season. The latter is best done by illustrating occurrences over time, similar to Figure 8.

Pearson's product-moment correlation coefficient is used to test the relationship between the two variables of *time* and *occurrence*, due to the theoretical assumption of linearity (see Krippendorff, 2004, p. 244; Neuendorf, 2016, p. 179; Riff et al., 2014, pp. 118-119). If the assumption of lack of outliers or homoscedasticity is violated, Spearman's rho (see Krippendorff, 2004, p. 250; Neuendorf, 2016, p. 179; Riff et al., 2014, p. 155) will be the main correlation measurement. Whichever coefficient is used, the limits defined by Cohen (1988) should be appropriate for determining correlation strength. For descriptives and further analysis, SPSS (statistical package for the social sciences) is used.

In addition to the main quantitative parts of the study, a small section covering the qualitative aspects of the risk counts is included in the results. This mainly builds on a deductive approach to the material, where the counts of risk, as specified in Table 19, are further categorized using an inductive approach. This basically means that the categories are derived from the material itself, rather than from previous research or similar (Elo & Kyngäs, 2008, p. 3). Although this may contribute little to the overall purpose of the study and its main design, this additional analysis may help readers understand the data.

7.1.3 Ethical considerations

While not all the material used for analysis was publicly available in the sense that it was directly downloadable (although the vast majority was), the purpose of such documents is to communicate their content. Therefore, the use of such material should be quite unproblematic. Each sub-division was emailed a brief description of the project, as well as offered a more in-depth description. Some requested more information, and were supplied with a thorough research plan, including basic methodology.

Occasionally, names of athletes or other members of the association may be mentioned in the text, which is dealt with using anonymization if required. As the documents are open access to anyone, explicit mentions of individuals would probably be quite simple to track down despite being anonymized. However, results are presented in an aggregated manner, so this should not be an issue. Even in a situation when mentioning an individual (even if anonymized) is unavoidable, perhaps due to the need for a relevant quotation, it is highly unlikely that tracking the name would involve sensitive data in the way defined in Section 13 of the Swedish Personal Data Act (SFS).

7.1.4 Methodological discussion

Since the analytical method defined under 7.1.2 is limited to bivariate analysis, no claims to causal relationships are supported by the results of this study. Although this could be considered a limitation in a general methodological sense, this can be justified for two reasons. First, the research question, supported by the defined analytical construct, does not imply causation and does not require these relationships to be determined for it to be considered properly assessed. Second, the overall rationale of the thesis, building on societal discourse, should not require such relationships for it to be theoretically meaningful. Simply, if a co-variance between time and occurrence can be established through the chosen methods, this should be discursively interesting even though a causal link cannot be proven. In any event, the presence of such an increase (or even decrease) would be likely to have implications for discourse whatever the actual mechanisms. If any

discussion of potential causes is conducted, this should be in relation to the overall theoretical analysis rather than single empirical studies.

7.2 Results

For initial information, tables 20 and 21 present the results in terms of simple counts as well as weighted ones.

Table 20. Initial count on *benefits* (as defined in Table 18)

Season	Documents (#)	Benefits = 1	Benefits (weighted)
2006/2007	5	4	0.80
2007/2008	6	2	0.33
2008/2009	5	4	0.80
2009/2010	7	7	1.00
2010/2011	8	9	1.13
2011/2012	9	6	0.67
2012/2013	10	15	1.50
2013/2014	12	13	1.08
2014/2015	14	15	1.07
2015/2016	15	29	1.93
2016/2017	14	27	1.93
2017/2018	14	33	2.36

Table 20. Initial count on *benefits* (as defined in Table 18)

Season	Documents (#)	Risk = 1	Risk (weighted)	Risk=1.0	Risk=1.1	Risk=1.0 (weighted)	Risk=1.1 (weighted)

2006/2007	5	11	2.20	11	0	2.20	0
2007/2008	6	12	2.00	12	0	2.00	0
2008/2009	5	7	1.40	6	1	1.20	0.20
2009/2010	7	7	1.00	7	0	1.00	0
2010/2011	8	9	1.13	9	0	1.13	0
2011/2012	9	4	0.45	3	1	0.33	0.11
2012/2013	10	21	2.10	19	2	1.90	0.20
2013/2014	12	14	1.17	13	1	1.08	0.08
2014/2015	14	28	2.00	27	1	1.92	0.07
2015/2016	15	29	1.93	25	4	1.67	0.27
2016/2017	14	42	3.00	36	6	2.57	0.43
2017/2018	14	37	2.64	34	3	2.43	0.21

Figure 15 illustrates the change in emphasized benefits over time, where the x-axis represents time, and the y-axis specifies the weighted count for each one. The season of 2006/2007 is the first to be analyzed and is “year 0” in the figure.

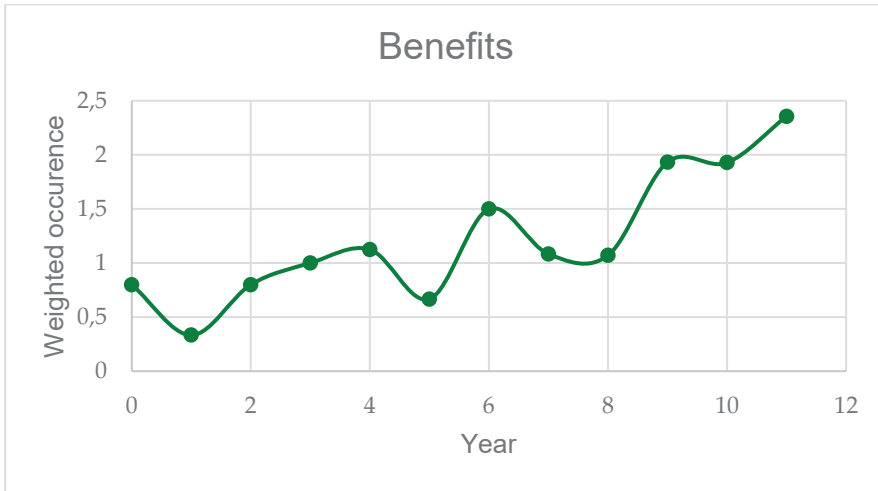


Figure 15. Overview of *Benefits* measured through weighted counts over time.

The apparent visual increase in the emphasized benefits in the material over time is supported by a value of Pearson's correlation coefficient of 0.854 ($p < 0.001$), which is the appropriate measure due to lack of outliers and heteroscedasticity (see 7.1.2). Using the widely cited limits specified by Cohen (1988), the positive relationship between the two variables is considered a strong one.

Figure 16 shows the change over time regarding risk, including the subdivisions of injury-related and non-injury-related risks (as specified in Table 18).

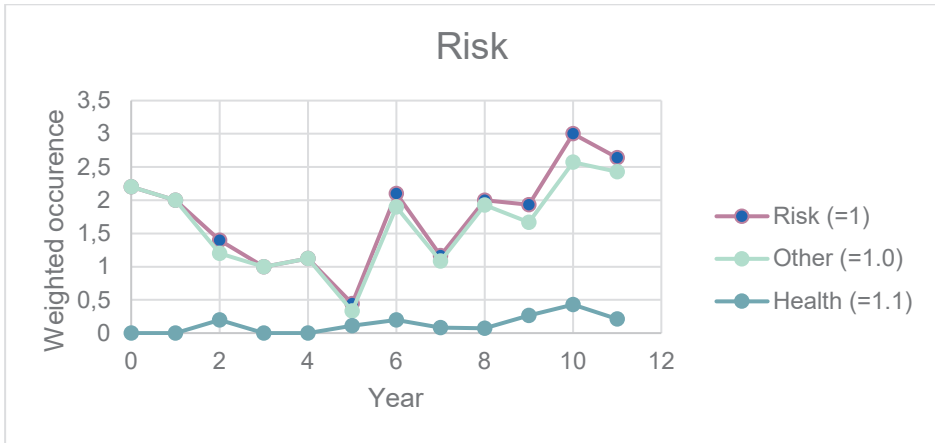


Figure 16. Overview of *risk*, including sub-divisions, using weighted counts over time.

Starting with a visual interpretation, the general notion of risk does seem to increase somewhat over time. However, the relationship is less linear than for *benefits*. For the sub-divisions of health-related and non-health-related risks, the latter seems to follow the general occurrence of risk quite well, while the former is hard to interpret due to small numbers. For the relationship between *year* and *risk*, the associated value of Pearson's r is 0.418 ($p=0.177$), indicating a medium-strong relationship with too high a risk to have occurred by chance. The corresponding measure for *other risk* is 0.319 ($p=0.312$), and for *health risk* 0.693 ($p=0.012$). Hence, only the sub-division of health risk could be deemed interesting for further theoretical interpretation regarding change over time. However, any subsequent interpretation should consider that the change is small counted in actual numbers.

7.2.1 Additional qualitative information

This section gives some brief information about what the counts regarding risk actually consisted of. As this is mainly deductive (see 7.1.2), the categories are derived from the material (see Elo & Kyngäs, 2008, p. 3).

Table 21. Categories, examples and numbers regarding risk counts.

Type of risk:	Example:	Count:
Economic	Lack of funding, liquidity problems	39
Moral, attitude or conduct	Bad behavior among players, parents or audience (including inappropriate language)	41
Organizational	Lack of staff (athletes as well as other), insufficient facilities.	133

Table 21 illustrates the derived categories, while Table 22 breaks down the counts by season.

Table 22, derived risk categories broken down on season.

Season	Organizational	Moral, etc.	Economic
2006/2007	6	4	2
2007/2008	4	5	2
2008/2009	2	2	2
2009/2010	3	2	2
2010/2011	6	2	1
2011/2012	1	0	1
2012/2013	13	2	4
2013/2014	8	1	4
2014/2015	21	4	2
2015/2016	18	7	7
2016/2017	27	5	5
2017/2018	24	7	7
Total:	133	41	39

For health-related risks, the numbers are smaller and insufficient for inductive categorization. However, an overall description of the counts is provided in Table 23.

Table 23. Overview of 1.1 counts (health risks).

Type of health risk	Count
Injuries in general	3
Unspecified injuries	1
Arm injuries	1
Head injuries	12
Transport-related injuries	1
Collarbone injuries	1
Total:	19

7.3 Analysis

This sub-section has three parts. First, there are initial observations and comments about the results' meaning in a descriptive manner. Second, discussion that presents a general interpretation of the meaning of the results. Third, a theoretical part in which the results are interpreted in relation to the thesis' defined theoretical framework. Because the first empirical study is an important part of the theoretical construct on which this second study relies, its results will occasionally be referred to.

7.3.1 Initial observations and comments

The observed increase in the tendency to actively emphasize the positive societal effects of ice hockey is mainly based on the positive co-variation with the time variable. Correlation strength should be considered the main reason for this, since the p-value may have questionable relevance due to the non-random nature of the sampling (see 7.1.1). However, this by no means implies causation between the two variables, although this does not have any significance for the rationale behind the study. Therefore, the only really valid observation that should be considered for further analysis and discussion in relation to these two variables is the *increase over time*. Looking more specifically at the numbers in Table 20, the weighted count for the

emphasis on societal benefits saw a 300% increase between the initial year and the last. The increase is not consistent when broken down season by season, but the linearity of the effect is obvious in the overall data.

For risk, the increasing exposure of injury-related risks is the only element relevant for a subsequent discussion and analysis. The relationship between *time* and *risk* (general) as well as the sub-theme of *other risk* could be interesting in terms of absolute effect, but the small numbers for units of analysis makes these effects non-relevant.

7.3.2 General discussion

The observed increase in the promotion of societal benefits corresponds well with the predispositions resulting in this study's rationale, as well as its overall theoretical construct. This does not imply that the previously observed increase in exposure for media coverage is the mechanism that triggered the subsequent increase in the emphasis of societal benefits. Rather, this should be understood as part of an overall discursive shift in which the relationships between relevant actors are unsuited to causal explanations. The two trends of increase mapped by this empirical study and the first one (not including health risks at this point) can be considered consistent with each other rather than contradictory, supporting the idea of coherent discourse in a general sense.

7.3.3 Theoretical interpretation

In relation to Hood et al. (2001), the results of this study may have a number of implications for the defined risk regulation regime. First, and perhaps even foremost, the organizations analyzed, and their communications, will have obvious implications for the dimension of regime context defined as *organized interests*. With this aspect covering the dynamics between different groups that have stakes in a defined regime (Hood et al., 2001, p. 30), the actions of the Swedish Ice Hockey Association should arguably be considered central as regards the game's advocates, and thus an organized interest with a large stake in the limited governance of the specific risk. Considered this, the way their activities are increasingly promoted as positive for society corresponds well with their expected position in the

regime regarding the information supplied by these organizations. Hood et al. (2001, p. 30) emphasize power relationships between such groups as an important factor in regime context, and since there is effectively no comparable organization in terms of size and strength with an opposing interest in the specific risk, the promotion of positive effects on society are not likely to be actively or explicitly contradicted on a significant scale. On a speculative level, actors that may have an interest in disputing the positive societal effects of ice hockey could be those that compete for public resources, primarily for other leisure activities. However, developments in which non-profit organizations in leisure activities were to explicitly and publicly discredit each other seems highly unlikely.

In relation to the three explanatory hypotheses, relevance initially seems to vary greatly. For the *market failure hypothesis* (see Hood et al., 2001, p. 70), there seems to be little reason for the actors to emphasize their positive effect on society given a premise where a risk is regulated through market-determined mechanisms. Any questions of information or opt-out costs would be intertwined with the actual risk rather than how it is communicated by the interest group that acts as a stakeholder in the activity. In a more critical sense, it could be argued that the propensity to actively seek information about a certain risk could potentially be affected by an overall picture in which an activity gains positive connotations for reasons such as positive societal effects. Here, this would arguably not be built upon the dubious assumption that the public consumes the texts being analyzed, as this is highly unlikely. Instead, such an effect would have to be based on an argument of general discourse and the sport's public image, where the information supplied by the Ice Hockey Association, as a prominent stakeholder, has a certain impact. In other words, if general discourse on the topic discourages active information seeking on the potential severity of the risk (due to positive societal impact or otherwise), this may play a crucial part in the dynamics of *information cost*, emphasized by Hood et al. (2001, p. 30) as an important element in the market's ability to manage a risk. Other than those indirect reflections, there is little reason to go deeper into the market failure hypotheses at this point.

When it comes to *opinion responsive government* (see Hood et al., 2001, pp. 90-111) the results of this study may not really relate well to the assessment of public opinion. Again, the public is unlikely to be the main target of the information analyzed in this study. However, the way in which the Ice Hockey Association, including its sub-divisions, chooses to present itself may reflect upon the general discourse, hence public opinion. For example, media surveillance again plays a crucial role in anyone wanting to access this opinion (Hood et al., 2001, pp. 91-97), so that any success in affecting the shape of such surveillance would logically also affect the main source of information for the regime. If the Ice Hockey Association, as an actor in the risk regulation regime, has any ambition or desire to affect these preferences, their own materials might have some success, despite being sporadically accessed by the public. This would not necessarily imply that the observed increase in the explicit mentions of positive societal effects is part of an active engagement from the organization, for the purpose of governance. Instead, it should be understood as a discursive part of the regime that may or may not have a subsequent effect on regulation when considering the hypothesis of opinion responsive government.

The hypothesis that may be most relevant for the observed increase is *interests, lobbies and experts* (see Hood et al., 2001, p. 112), mostly because the analyzed data comprises material explicitly communicated by a regime actor based on organized interest. The three main patterns may vary in relevance for the Ice Hockey Association as a significant regime actor, but the fact that the risk has had more coverage may be reflected in exactly the type of change that potentially explains the observed increase in a discursive sense.

On a broader note, any impact an actor may have due to interest in the regulated risk could be considered in relation to the existing dynamics for business interests that characterize the regime. The observed increase may reflect these dynamics, as the discourse may or may not be of interest for these actors. Given the three distinctive patterns for business interests (see Hood et al., 2001, p. 112), the regime studied in this thesis should be considered to a case in which profit-driven organizations are limited to non-existent. Despite the Swedish sporting movement possibly undergoing

somewhat of a more business-related or commercial trend, the civil movement still dominates the sport, so the regime should be considered in relation to this category. Consequently, promoting ice hockey is mainly an issue for non-profit organizations, with the majority assessed using the data in this study. The observed increase could then, although somewhat indirectly, be understood as part of the overall interest-related dynamics of the regime, in which the implicit duty to promote positive elements of the sport is their sole responsibility. However, as previously mentioned, there are likely to be few opponents to this, so the observed increase is unlikely to be countered in an organized manner. The observed increase in the promotion of positive societal effects may therefore be not only deemed significant for the general discourse associated with the regime, but even as dominant. Without claiming causality, this could be a plausible theoretical bridging of the gap between content communicated by the Ice Hockey Association to the concrete reality that results in public resources being spent on the sport, despite the notion of risk.

One thing that might complicate this relationship is the double nature of ice hockey clubs as employers, in some cases, while still being largely voluntary based (see 2.4.3). Although somewhat speculative, a potential consequence of the theoretical bridging described above, and its discursive implications, may be that activities that would be considered too risky for ordinary employers are more likely to be tolerated when there is an established discourse about non-profit activities and perceived positive societal effects.

Moving to the supporting framework of organizational legitimacy, the initial observation is that the observed increase in the explicit emphasis on positive societal effect corresponds well with its basic core premises. The activity subject to the regime's regulation is completely dependent on public resources for its large-scale existence, so it should not be surprising that the organization that is the favored actor in the regime emphasizes its positive societal effects. This conforms well to some of the basic premises of organizational legitimacy in a general sociological sense (see Parsons, 1960;

W. R. Scott, 1991a). From any perspective, the Ice Hockey Association should be considered the main organized interest and therefore the main advocate for ice hockey. Consequently, the main burden of proof regarding the positive societal effects of ice hockey ought to fall on the association. Considering the main principles of Parsons (1960), no positive societal effects equals no organizational legitimacy, and a lack of organizational legitimacy will make claims on public resources impossible in the long run. Additionally, the activities that constitute the core of any ice hockey association would be a lot harder to exercise under the pressures and questioning that a lack of legitimacy would result in (see Deephouse et al., 2017, p. 31). Therefore, the results correspond well with the overall premise.

The theoretical interpretation of the observed increase in the explicit mention of health risks does not seem to fit the framework quite as nicely as the increase in the promotion of positive effects, although there are some parts that may help when it comes to theoretical understanding. Perhaps the primary one of these is the previously discussed absence of business interests. Simply put, if such actors were more prominent in the regime, an explicit increase in the emphasis on health risks may have been less likely in a discursive sense, due to smaller degrees of freedom in how they could manage the supplied information. Where the Ice Hockey Association dominates the regime in terms of organized interest, the notion of explicitly mentioning such a trend could be a form of self-critique the organization can afford. It should be noted that this needs to be considered in discursively, as covered by the results, because there is little to imply that the increase is actively or consciously coordinated. An interesting comparison is how the issue of CTE was dealt with by the NFL, an organization far more business-related than the Swedish Ice Hockey Association.

This theoretical analysis does not necessarily imply that an actor in a regime with more organized business interests would avoid highlighting an issue that may disadvantage its main activities. Logically, it could be to the advantage of an actor to proactively highlight issues before other parts of the regime do so. The situation of financial dependency related to public resources would make the observed increase logically in line with the

principles of *coercive isomorphism* (see Powell & DiMaggio, 1991a, pp. 67-69), in the sense that emphasizing positive societal effects could be a rational step to avoid dissatisfaction from the suppliers in the regime. This process would then affect all the competing organizations in the relevant category, namely those that claim public resources for leisure or health promoting activities. While the general discourse states that a given activity, such as ice hockey, contributes positively to society due to the public health benefits, social capital and so on, there may be little reason to explicitly emphasize such benefits. However, impending change, such as new medical knowledge about the risk of long-term ill health may create what could be called a 'discursive demand' on behalf of the organizations that depend on those resources. Such an argument would not be limited to risks like the one in this thesis. Any potential disadvantage for similar organizations could theoretically trigger a similar trend. For example, Swedish football clubs have had to deal with issues related to hooliganism. Since the main argument of isomorphism is explaining why organizations tend to be quite similar (Powell & DiMaggio, 1991a, pp. 63-64), any such actor would arguably be subject to this process if it needed to justify its activities in terms of societal benefit. This leads to the next category, namely *mimetic isomorphism* (see Powell & DiMaggio, 1991a, pp. 69-70), which relies on the mimetic effect that uncertainty may have on the actions of organizations. From a merely descriptive point of view, the results from this study do not disclose anything. However, the fact that the empirical material being analyzed derives from the kind of document that is a widely used communication model for non-profit organizations may mirror the actions of similar organizations in the same category. This could be considered quite contradictory, as the information leading up to the observed increase has previously been argued as reflecting the discursive shift regarding risk in a theoretically plausible manner. However, the help provided by using additional supporting theoretical frameworks (see Hood et al., 2001), means that all possible explanations should be considered; also, the two explanations may not be contradictory when considered from the perspective of general discourse. Mimicking other organizations in the search for legitimacy could be a consistent element, while the explicit claim

for positive societal effects could be the response due to a discursive shift. If so, communication that enables such adjustments as a result of a risk that may jeopardize legitimacy takes place within the context of a communicative structure determined through imitation. This would allow an alternative discussion about how the observed increase potentially may or may not be an indirect result of another mimicking process, which would require that other organizations in the field had managed similar situations. It could be argued that such organizations exist, perhaps most obviously in the football community due to their handling of hooliganism. This discussion is unlikely to move past the theoretical stage in this thesis, because anything else would require substantial empirical study of these organizations and be irrelevant to the thesis' topic. However, this does illustrate the theoretical basis of how organizations in a similar field may or may not imitate each other, despite providing more detail than is the case in Powell & DiMaggio (1991a).

Normative isomorphism (see Powell & DiMaggio, 1991a, pp. 69-70) does not appear to have many benefits as a theoretical explanatory model for the observed increase in the promotion of health benefits. This mainly because the Ice Hockey Association is still, at least as a whole, considered a non-profit organization that relies on volunteer work. The likelihood of the organization being significantly shaped by a certain type of professionals is thus unlikely.

For the observed increase in health risks being mentioned in the texts, the potential points of explanation grounded in organizational legitimacy have a few more implications that can be further analyzed. Following up the previous reasoning relating to the questionable management of the issue by the NFL, the concept of isomorphism may seem contradictory, given that this would apparently be just the type of organization subject to mimicking (see Powell & DiMaggio, 1991a, pp. 69-70). However, institutional organization theory in general, especially that applied by Powell & DiMaggio (1991a), seems to rely on the possible mimicking of general organizational structure rather than isolated actions. There is therefore no apparent contradiction between the general concept of isomorphism and a

situation in which the previous decisions of significant actors are found to be inappropriate. Furthermore, the dynamics of the Swedish civil movement and the mainly non-profit basis of sporting organizations such as the Swedish Ice Hockey Association, may make business-driven actors such as the NFL unsuitable for any isomorphism in that context.

To conclude, the results from the second empirical study should be considered as corresponding well with what can be expected when the general and supporting theoretical frameworks of this thesis are applied analytically. Consequently, this study will be retained for further regime analysis in the cohesive theoretical analysis, where the three empirical studies are integrated to map and understand the regime.

8 Study 3 – Collocation network analysis of the regime's political context

The aim of this study is to systematically map the discourse surrounding ice hockey in the context of local political decision-making in Sweden. It aims to answer the following research question:

- In what contexts in municipal political records is the game of ice hockey explicitly mentioned?

The rationale of the empirical study coheres to the thesis' overall aim and its theoretical framework, due to the crucial role Swedish municipalities play as a core actor in the risk regulation regime (see 2.5.3 for more information on the municipalities). Their greatest influence is arguably that the sport could not be played in an organized, large-scale manner without the support of these regime actors, i.e., without ice to play on, there would be no ice hockey competitions. Accordingly, municipalities should be considered the main grassroots actor for governance within this regime.

8.1 Method

The study will follow the main principles of collocation network analysis stated by Brezina et al. (2015), who are considered leaders in this method. For purely statistical considerations, Brezina (2018) will be used as a primary source.

8.1.1 Material

The study will rely on empirical information from the political units with responsibility for leisure facilities in the fifty most populous municipalities in Sweden. Table 24 presents some information about these. The numbers are based on public statistics from Statistics Sweden (2019a).

Table 24. Overview of Sweden's fifty most populous municipalities. Numbers from Statistics Sweden (2019a)

Name	#	Population (end of 2018)	Name	#	Population (end of 2018)	Name	#	Population (end of 2018)
Stockholm	1	962,154	Halmstad	18	101,268	Karlskrona	35	66,675
Gothenburg	2	571,868	Sundsvall	19	98,850	Varberg	36	63,630
Malmö	3	339,313	Södertälje	20	97,381	Östersund	37	63,227
Uppsala	4	225,164	Botkyrka	21	93,106	Norrköping	38	61,769
Linköping	5	161,034	Växjö	22	92,567	Gotland	39	59,249
Örebro	6	153,367	Karlstad	23	92,497	Falun	40	58,923
Västerås	7	152,078	Haninge	24	89,989	Trollhättan	41	58,728
Helsingborg	8	145,415	Kristianstad	25	84,908	Uddevalla	42	56,259
Norrköping	9	141,676	Kungsbacka	26	83,348	Örnsköldsvik	43	56,089
Jönköping	10	139,222	Solna	27	80,950	Nyköping	44	56,011
Umeå	11	127,119	Järfälla	28	78,480	Skövde	45	55,729
Lund	12	122,948	Luleå	29	77,832	Borlänge	46	52,224
Borås	13	112,178	Sollentuna	30	72,528	Hässleholm	47	52,121
Huddinge	14	111,722	Skellefteå	31	72,467	Sundbyberg	48	50,564
Eskilstuna	15	105,924	Täby	32	71,397	Sigtuna	49	48,130
Nacka	16	103,656	Kalmar	33	68,510	Tyresö	50	48,004
Gävle	17	101,455	Mölnådal	34	68,152	Total		6,107,855

These figures are from the end of 2018, when the Swedish population was 10,230,185 (Statistics Sweden, 2019b), so the material represents around 59.7%. The corpus is built using all the available political records from the last five years from the appropriate committee in each of the fifty analyzed municipalities. This could include:

- Meeting agendas
- Meeting minutes

- Appended documents
 - E.g., expert reviews of financial consequences related to discussions

The form of the analyzed political units may vary somewhat, because each municipality is organized somewhat differently. The main criterion is that the organizational unit that generates the texts must be the political assembly that processes matters concerning leisure activities and similar issues. In most cases, these units will be the *Kultur- och fritidsnämnd* in Swedish, which is where issues related to culture and leisure are managed at municipal level. The best equivalent in English is *the municipal board of culture and leisure*.

This kind of unit is standard in municipal politics in Sweden. Other standard examples are the *Socialnämnd* (board of social care) and the *Barn- och utbildningsnämnd* (children and education board).

The following quote, which provides a short description of the work of a *Kultur- och fritidsnämnd*, is from one of the analyzed municipalities:

“The objective of [Kultur- och fritidsnämnden] is to promote cultural activities and leisure in the municipality. The [nämnd] must, through close cooperation with associations, organizations and cultural workers active within the municipalities’ domains, encourage and support the work they do.” (Danderyd municipality, 2021) (author’s translation)

Although these descriptions may vary depending on the municipality, this is a good representation of the usual purpose of these units. They are boards of local politicians who are elected by public vote every four years, usually answerable to the highest decision-making body, the *kommunfullmäktige*, (see Swedish Municipalities and Regions, 2021), which roughly translates to municipal council.

In Danderyd, the above example, there are ten *nämnder*. This is fairly representative of municipal structures, although some larger ones tend to have more specialization. For example, Stockholm has 15 corresponding

units, where *idrottsnämnden* focuses solely on sport-related leisure. There are some exceptions to the questions dealt with in studied unit. Halmstad uses the designation *Teknik- och fritidsnämnd* (board of engineering and leisure), so records also include issues such as road maintenance (Halmstads municipality, 2021), while Borås Municipality uses the term *Fritids och folkhälsonämnd* (board of leisure and public health), where there is an explicit emphasis on health promotion (Borås municipality, 2021).

These minor differences aside, the common point of each analyzed political unit is that it deals with sport-related issues. The data collection process made it apparent that the standard number of meetings during a calendar year varies from 8 to 11, usually with a break during the summer (e.g. Karlstads municipality, 2021; Växjö municipality, 2021; Örebro municipality, 2021).

Most political units have a corresponding administrative unit, the *förvaltning*, which is where the decisions and orders from the political units are executed (e.g. Varbergs kommun, 2021). Accordingly, some of the analyzed documents were created at these apolitical entities, but are based on political decisions.

Data collection was carried out using online services from each municipality. Availability varied somewhat, as different municipalities have different systems and policies. These organizations work under a standard known as *offentlighetsprincipen*, the principle of public access to official documents, so any information such as this can be obtained by the public (see Government offices of Sweden, 2016). It would therefore have been theoretically possible to access the documents by other means, if they were not accessible online. However, there are several reasons for only using the files available online.

First and probably foremost, even a thorough collection of texts for each municipality would fall short of the sampling status of *census* (Krippendorff, 2004, p. 120). For one, a census would require all 290 Swedish municipalities. Additionally, there is no feasible way to confirm that the collected texts comprise every document processed at every meeting. Thus, further

collection through formal requests for documents would not improve the sampling.

Second, whether a text can be added to a large corpus depends on its format. This was possible for most of the texts available online, although a few scanned PDFs could not be converted to text and thus had to be excluded. If additional documents were requested using the above principle, it could result in the need for scanning/digitalization, followed by text conversion. Because this could be necessary for several thousands of pages, it would not be practically possible.

Third, and partially a consequence of the first two, requesting additional material would not add any value to the corpus in terms of the methodology. The size of the digital collection was already adequate (see below) and the opportunities for inferential claims would not be improved.

Table 25 provides an overview of data availability. Of the 50 analyzed municipalities, exactly half of those had data available for each of the five years. For a year of documentation to be considered complete, the minimum requirement was the availability of all board meeting minutes for that year. Another 19 municipalities had partial data available by year, so 6 of 50 municipalities are missing cases in the study.

Table 25. Overview of data availability. Green fields are complete collections.

Year	15	16	17	18	19	Year	15	16	17	18	19
Borlänge						Karlskrona					
Borås						Karlstad					
Botkyrka						Kristianstad					
Eskilstuna						Kungsbacka					
Falun						Linköping					
Gotland						Luleå					
Gävle						Lund					
Göteborg						Malmö					
Halmstad						Mölnadal					
Haninge						Nacka					
Helsingborg						Norrköping					
Huddinge						Norrtälje					
Hässleholm						Nyköping					
Järfälla						Sigtuna					
Jönköping						Skellefteå					
Kalmar						Skövde					
Year	15	16	17	18	19	Year	15	16	17	18	19
Sollentuna						Täby					
Solna						Uddevalla					
Stockholm						Umeå					
Sundbyberg						Uppsala					
Sundsvall						Varberg					
Södertälje						Västerås					
Trollhättan						Växjö					
Tyresö						Örebro					
Örnsköldsvik						Östersund					

The collection procedure resulted in a corpus of roughly 34.7 million word tokens and 586 thousand word types.

8.2 Data analysis

This empirical study is performed using *collocation network analysis*. The method relies on the basic assumption that discourse can be revealed through lexical patterns and the way these collocate (Brezina et al., 2015, p. 142). Unlike the collocation analysis carried out in the thesis' first empirical study (see 7.1.2 and 7.2.3), the addition of *network* takes the data processing beyond the initial node word, mapping patterns in multiple stages. If, for example, we again use *cinnamon* as the node, a collocates analysis would show the terms likely to occur in a window around that word. Assuming that *apple* again appears as a discursively interesting top collocate, the next step in a collocation network analysis would be to use the term *apple* as an additional node and statistically determine its collocates. This will result in an additional set of collocating terms, where some may be unique to one of the nodes and some may be shared collocates, where a given word is a collocate of more than one node. The terms *dessert* or *eat* could be such an example for cinnamon.

For collocation in networks, three main criteria are suggested by Brezina et al. (2015, pp. 140-141) for identification. The first is *distance*, which refers to the span or collocation window around the selected node. The second, *frequency*, specifies the number of occurrences of a given word around the node. The third, *exclusivity*, refers to the occurrence of a given word around a node compared to how often it appears in the rest of the corpus.

These three correspond well to how the collocation analysis was carried out in the first empirical study. However, for collocation networks, Brezina et al. (2015, p. 140) argue that additional criteria suggested by Gries (2013) should be considered. The article pays most attention to the criterion of *directionality*. According to Gries (2013, p. 141), commonly used measures of collocation are limited because they do not cover whether one term is more predictive of another when it comes to collocation relationships. For example, applying a directionally sensitive association measure to the collocation of *apple* and *cinnamon* is likely to achieve a symmetrical relationship between the two; whichever is the node, the relationship is

probably equally strong. Other cases can have asymmetrical relationships, such as if a corpus of newspaper articles from all media coverage in a single year were to be analyzed. Brezina (2018, pp. 70-71) illustrates this using the terms *red* and *herring*. They state that any time the word *herring* occurs in a text, it is very likely to be accompanied, more specifically preceded, by the term *red*. However, if this is reversed, the term *red* as a node is not even a fraction as likely to be accompanied by the word *herring* in its occurrences.

Gries (2013) states that common measures of collocation do not consider directionality. Log-likelihood, the stat used in the first empirical study, is one of these. Instead, he recommends the use of ΔP (‘Delta-P’), which will be the statistical measurement used in this study.

The equation for this, from Brezina (2018, p. 72), is:

$$\frac{O_{11}}{R_1} - \frac{O_{21}}{R_2}, \frac{O_{11}}{R_2} - \frac{O_{12}}{C_2}$$

O is the observed frequency, while C and R are column and row values. The subscript numbers are from a contingency table in which a cell is referred to by column and row. For example, 21 is the observed frequency in the second row and the first column of the contingency table (see Brezina, 2018, p. 70).

The table below provides basic information about the analysis’ initial node search.

Table 26. Search information

Search string	Frequency
hockey	2794

Adding asterisks (*) before and after the term of interest should then include all those referring to ice hockey. A manual concordance check shows that this includes direct references to the game (*hockey* and *ishockey*) as well as more indirect ones (*hockeyklubba*, *hockeyrink*, etc.).

After obtaining collocates of the initial node, further expansion of the network is done using the principles of distance, frequency, exclusivity and directionality.

If a collocation network graph is to be properly interpreted and theoretically analyzed, it must not have too many nodes or collocates, a problem called *overpopulation* (see Brezina et al., 2015, p. 149; Brezina, Weill-Tessier, & McEnery, 2020a). This can be avoided in two ways: setting a proper stat threshold or filtering (Brezina et al., 2020a, p. 25). The ΔP stat threshold is set at a level that provides a non-overpopulated graph. For this study, a value of 0.016 was appropriate. For filtering, the process excludes terms using given criteria. Just as in the thesis' first empirical study, grammatical function words and obviously non-discursive words are the exclusion criteria, and the list of excluded items is available on request.

For practical analysis, the *Graphcoll* tool from the *Lancsbox* software package (version 5.1.2) is used (Brezina, Weill-Tessier, & McEnery, 2020b). This allows an integrated collocate search and subsequent visual presentation using graphs.

8.3 Discussion and limitations

Just as in the first empirical study, the analysis is based on word items rather than lemmas. Although the *Lancsbox* tool has a lemma function and a variety of languages to choose from (including Swedish), the results of test runs indicated that lemmas were not applicable.

The study's design should be replicable in that the methods for data collection and subsequent analysis would generate the same set of collocates if each step is followed. However, some degree of arbitrariness is involved in building a collocation network; which item is to be expanded as an additional node is not always statistically determined, as the factor of discursive interest may also need to be considered. To minimize this issue, the results section clearly describes why a collocate was chosen for expansion at each step of the process.

The stat threshold for inclusion is also somewhat arbitrary, as the methodological sources do not specify when the criteria are met. Instead, they emphasize the need to select a limit that is based mainly on avoiding overpopulation (see 8.2). This is not fixed, as overpopulation is largely based on the researcher's visual assessment. Therefore, factors such as the presentation format (in this case a monograph thesis) may influence the process. This needs to be considered when interpreting the results.

For the sampling process, selecting municipalities by population size could have been done in other ways, such as by identifying the biggest ice hockey municipalities. Although interesting, there are two reasons this is inappropriate. First is the obviously arbitrary process this would require; while population size is absolute, the status of ice hockey in a municipality is subject to qualitative or cultural factors that are hard to operationalize. Second, the target population. The object of study is society as a whole, rather than just the elements with a special interest in ice hockey. This is true for the sake of narratives and discourses, and for the general assumptions in the theoretical framework.

Lastly, there is reason to clarify the rationale of this study in relation to the other two. Unlike those, this study is not by definition connected to risk, neither specifically head injuries (the first study) nor a broad perspective on risk (the second study). Instead, the rationale focuses on the status of municipalities as a core actor in the regime and the need for knowledge of the discursive status of ice hockey in their setting.

8.4 Results

This section presents the collocation network, step by step. One node is added at a time and a graph presented for each step.

8.4.1 Collocation network

The initial step, using the node **hockey**, is shown below.

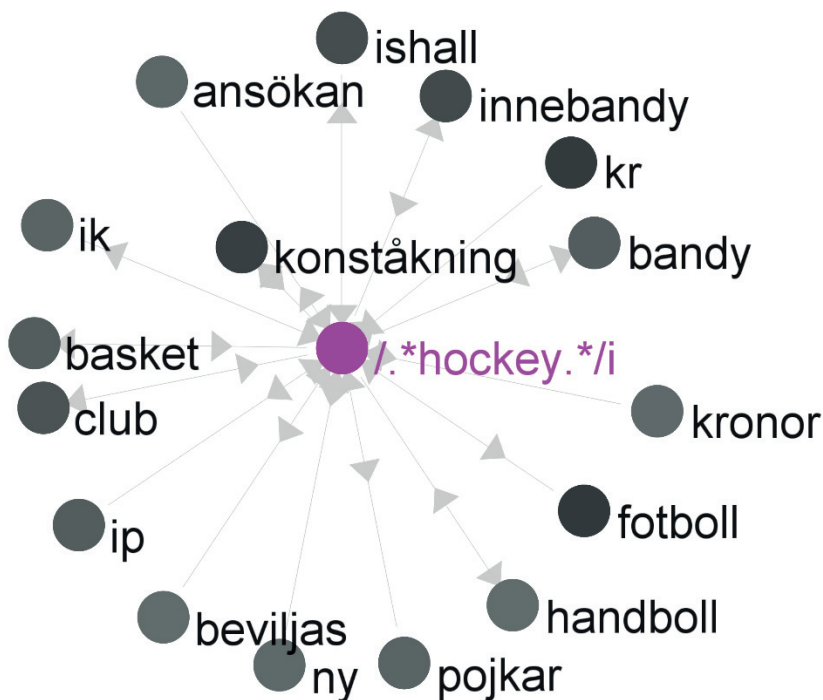


Figure 17. First degree collocates of **hockey**. Collocation window: ± 5 . Stat: ΔP (threshold: 0.016). Filter: function words and obviously non-discursive terms removed

In the graph, the physical distance between the node and each collocate represents the strength of the relationship measured by association. The collocate of *konståkning* (figure skating) is thus strongest because it is the collocate most likely to appear in the vicinity of the node than elsewhere in the corpus. The arrows on the lines connecting the node and collocates show the *directionality*. Their relative positions show the relative strength of the association measures, depending on which word is used as the node, so illustrating whether one term is more predictive of the other. For instance, *konståkning* (figure skating) has both arrows close together, indicating that the relationship is strong no matter which item is the node. The greater distance between the arrow that points towards the node and the node indicates that the item would be a stronger predictor if the node and collocate order were reversed. This can be somewhat cumbersome to

interpret visually, but the stat and bi-stat values of Table 27 are good reference points for items.

Additionally, the shading of each collocate's dot shows its frequency. A darker shade is a higher frequency word.

The next step expands the network using a first degree collocate as an additional node. Here, *konståkning* (figure skating) is selected, as it is the strongest collocate (see Figure 17). The expanded network is shown in Figure 18.

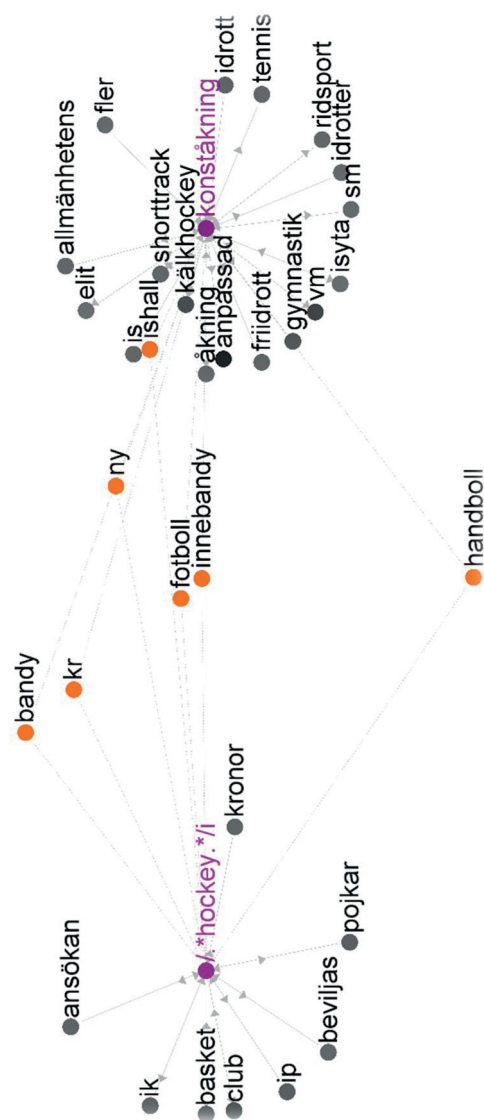


Figure 18. Collocation network expanded by one node, 'konståkning'. Collocation window: ± 5 . Stat: ΔP (threshold: 0.016). Filter: function words and obviously non-discursive terms removed

The additional node is interpreted similarly to the first one in terms of strength, frequency and exclusivity. However, there are now a couple of items with orange dots next to them. These are *shared collocates*, meaning that they collocate with both nodes. Their position relative to the nodes is primarily for readability, so cannot be interpreted in terms of relative connection strength, etc.

In the third step, a shared collocate is expanded to increase the network to three nodes. The item *ishall* (indoor ice rink) is selected first, due to relationship strength and directionality.

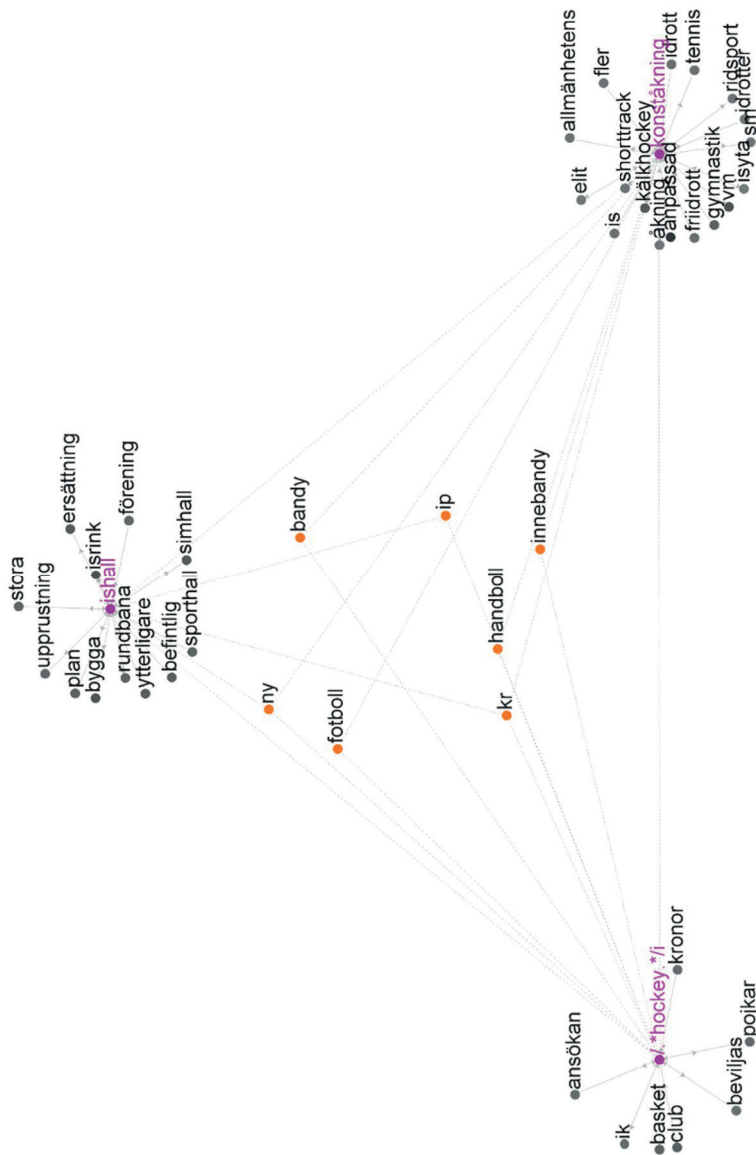


Figure 19. Collocation network expanded to three nodes. Collocation window: ± 5 . Stat: ΔP (threshold: 0.016). Filter: function words and obviously non-discursive items removed

Figure 19 is interpreted the same way as the previous one, although some of the shared collocates are now shared between two or three nodes. For instance, the item *kr* (SEK) is shared by all three nodes, as is *ny* (new). The next step, the final one, expands *kr* due to its strength and directionality in the network. *ny* is more of a one-sided collocate because it has a weaker connection than *kr* to other nodes when it is used as a node itself. The arrows indicating relationship directions are difficult to see in this graph and those following it. To access them, please refer to the relationship between an item's stat and bi-stat values in Table 27.

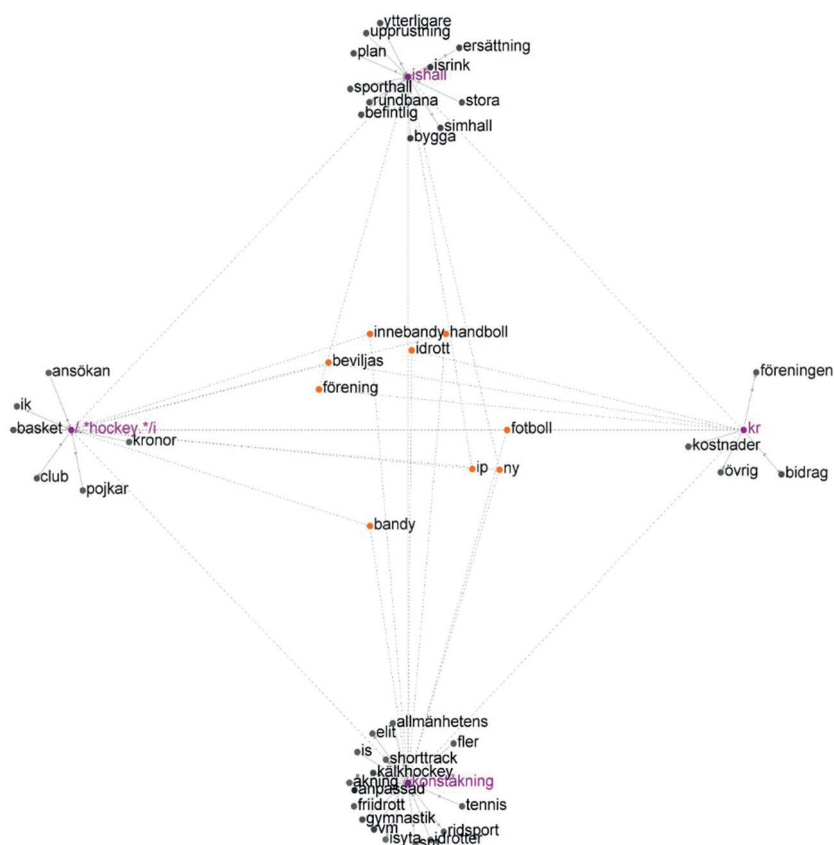


Figure 20. Collocation network expanded to four nodes. Collocation window: ± 5 . Stat: ΔP (threshold: 0.016). Filter: function words and obviously non-discursive terms removed

to for items where the meaning is not obvious. The bi-stat is the measurement of directionality, so if the value of the statistic is higher than the bi-statistic the node is more predictive of the collocate than would be the case if the relationship was reversed.

The information will be presented node by node.

Table 27. Collocate information, node by node as used in the collocation network analysis.

Node: *hockey*						
Collocate	Translation	Stat (ΔP)	Bi-stat	Frequency (collocate)	Frequency (corpus)	Position (left/right)
fotboll	Soccer	0.0714712898	0.0494179557	200	4041	L
kr	SEK (Swedish currency)	0.0663632898	0.0022680632	192	81939	R
konståkning	Figure skating	0.0604774218	0.3427235589	169	493	R
innebandy	Floorball	0.043993632	0.107912508	123	1139	L
ishall	Indoor rink	0.0407083344	0.033901915	114	3355	L
club	Club	0.0346611808	0.0474014898	97	2043	R
basket	Basketball	0.0260785487	0.0411878537	73	1769	L
ip	Abbreviation for 'idrottsplats',	0.025396087	0.0054464092	72	13032	R

	recreation ground					
bandy	Bandy	0.02503636 98	0.10424342 52	70	671	R
pojkar	Boys	0.02090928 11	0.00805126 7	59	7257	R
ik	Abbreviation for 'idrottsklubb' , sports club	0.02066599 03	0.01761488 17	58	3278	L
ansökan	Application	0.01842416 04	0.00271487 13	53	18970	L
ny	New	0.01702487 05	0.00157289 27	50	30266	L
kronor	SEK (Swedish currency)	0.01652252 01	0.00130980 13	49	35278	R
handboll	Handball	0.01643385 66	0.04223913 25	46	1087	L
beviljas	Is approved	0.01619006 8	0.00473856 88	46	9548	R
Node: konstākning						
Collocate	Translation	Stat (ΔP)	Bi-stat	Frequen cy (collocat e)	Frequen cy (corpus)	Position (left/rig ht)
hockey	Hockey	0.28188022 23	0.05635638 65	139	2466	L
anpassad	Adapted (as in "adapted	0.13179986 2	0.03912072 16	65	1661	L

	to figure skating")					
ishall	Indoor rink	0.1439216172	0.0211502855	71	3355	L
ny	New	0.0964925212	0.0015731068	48	30266	L
vm	Abbreviation for "world championships"	0.0750396471	0.0878728486	37	421	L
bandy	Bandy	0.0689471656	0.0506574172	34	671	R
kålkhockey	Sled hockey	0.0588228092	0.5370236696	29	54	R
gymnastik	Gymnastics	0.0506602141	0.0142640724	25	1751	L
idrott	Sports	0.0319731291	9.431893E-4	16	16720	R
friidrott	Track & field	0.0303742795	0.0082781026	15	1809	L
tennis	Tennis	0.0283748641	0.0174425593	14	802	R
is	Ice	0.0283234682	0.0053999659	14	2586	L
allmänheten	Public	0.0263188672	0.0073767338	13	1759	R
kr	SEK (Swedish currency)	0.0240089307	1.447936E-4	13	81939	R

fler	More/additional	0.0236571241	4.915668E-4	12	23742	L
shorttrack	Shorttrack	0.0223122003	0.6470449376	11	17	R
elit	Elite	0.022302434	0.0308849903	11	356	R
åkning	Here: skating	0.0223003597	0.0256870485	11	428	R
ridsport	Equestrianism	0.0222973347	0.0206240126	11	533	L
sm	Swedish championships	0.0222935319	0.0165274672	11	665	L
fotboll	Socceer	0.0221962714	0.002708211	11	4041	R
handboll	Handball	0.020252948	0.0091857168	10	1087	L
innebandy	Floor ball	0.0202514499	0.0087657161	10	1139	Middle
idrotter	Sports	0.020213191	0.0040395906	10	2467	R
isytta	“place for ice-based sports”	0.0182473098	0.0303914617	9	296	L
Node: ishall						
Collocate	Translation	Stat (ΔP)	Bi-stat	Frequency (collocate)	Frequency (corpus)	Position (left/right)

ny	New	0.18334840 11	0.02034002 65	618	30266	L
ip	Abbreviation for 'idrottsplats', recreation ground	0.14360264 39	0.03697983 78	483	13032	L
Isrink	Skating rink	0.03874721 5	0.80237621 88	130	162	L
hockey	Hockey	0.03093045 07	0.04207988 8	104	2466	R
simhall	Public swimming facility	0.02998359 07	0.02344387 32	101	4291	L
kr	SEK (Swedish currency)	0.02953477 9	0.00121204 88	107	81939	L
ersättning	Remuneratio n	0.02938588 07	0.02269623 37	99	4344	L
ytterligare	Additional	0.02401428	0.00541049 35	82	14896	L
befintlig	Existing	0.02364814 93	0.01147969 81	80	6912	L
plan	Court (as in 'basketball court')	0.02219357 5	0.00465192 42	76	16012	R
konståk ning	Figure skating	0.02115028 45	0.14392160 94	71	493	R
sporthall	Gymnasium	0.02044581 82	0.01613678 92	69	4251	R

stora	Large	0.0185372104	0.003316099	64	18763	L
rundbana	Oval track	0.0184762214	0.3279474517	62	189	R
förening	Association	0.0172250553	0.0045968523	59	12575	L
upprustning	Renovation/re-equipping	0.0171528091	0.0121490323	58	4737	M
Node: kr						
Collocate	Translation	Stat (ΔP)	Bi-stat	Frequency (collocate)	Frequency (corpus)	Position (left/right)
idrott	Sport	0.0341358388	0.1669728603	2830	16720	L
bidrag	Grant/subsidy	0.0300007756	0.0678734094	2538	36170	L
föreningen	The association	0.0209096034	0.0753040054	1763	22713	R
beviljas	Is granted	0.0172659623	0.1478631587	1434	9548	R
kostnader	Costs	0.0170589154	0.0653556612	1445	21350	L
övrig	Other	0.0167290187	0.3086641109	1378	4431	L
förening	Association	0.0162853254	0.1059029417	1361	12575	R
Node: idrott						

Collocate	Translation	Stat (ΔP)	Bi-stat	Frequency (collocate)	Frequency (corpus)	Position (left/right)
kr	SEK (Swedish currency)	0.1669771586	0.0341365963	2830	81939	R
fritid	Freetime/leisure time	0.1402400507	0.1358781919	2352	17257	R
kultur	Culture	0.107270628	0.0130824956	1859	137576	R
förening	Association	0.0969929121	0.1289485228	1627	12575	R
motion	Exercise	0.0561392138	0.1188611587	942	7895	R
anläggningar	Facilities	0.0375716786	0.0332541719	637	18892	L
anläggning	Facility	0.0334936076	0.0828428961	563	6758	R
utbud	Supply	0.0284867842	0.0783017517	479	6081	L
utöva	Practice	0.0283656922	0.2394307425	475	1980	L
rikt	Rich	0.0267457268	0.2097609113	448	2131	L
hälsa	Health	0.0255658264	0.0434016364	432	9847	R
tillgängligt	Available (as in 'available for sports')	0.0250026838	0.174113466	419	2400	R

ytor	Areas	0.02064842 44	0.05686861 96	348	6069	L
avdelning	The section	0.02024732 34	0.10017911 52	340	3378	R
barn	Children	0.01915972 32	0.00518664 35	350	61845	R
rekreation	Recreation	0.01901308 52	0.12207815 03	319	2603	R
friluftsliv	Outdoor life	0.01645530 24	0.06627300 37	277	4150	R
aktivitet	Activity	0.01627164 17	0.03221185 9	276	8444	R

8.5 Analysis

This section has two main parts. The first discusses the thematic meanings and general discursive implications of the network. The second analyzes the network in relation to the overall theoretical framework.

8.5.1 Discursive implications of the network

The results presented under 8.3.1 and 8.3.2 show that ice hockey is directly or indirectly mentioned in relation to the contexts presented below. Items with possible multiple meanings have been checked using the KWIC (*key words in context*) function, which is an integrated part of the LancsBox software. Please see Table 27 for translations.

Sport in general is indicated by the presence of other sports, such as the items *fotboll*, *handboll*, *innebandy* and *basket*, but also through more general items related to sport such as *idrott*. The latter term is discursively important, because its associated collocates provide insight into what is broadly associated with sports. Items such as *health*, *exercise*, *recreation* and *outdoor life* show that sports in general have a positive discursive meaning in political records. None of the associated items can be considered negative. While this does not automatically mean that sports are exclusively referred to in a

positive sense, the methodological approach of collocates analysis should lead to the interpretation that sports are more favorably referred to than other topics in the records.

As somewhat of a sub-category to the above, ice hockey is most frequently mentioned in relation to other ice sports. *Konståkning* is the most prominent item here, as it has a strong bi-directional association with ice hockey. This is a case where directionality and the choice of ΔP play a clear role in understanding the context. By threshold, the directional relationship between the items is strong enough for a two-way collocate, but the bi-stat indicates that ice hockey is more likely to be present around *konståkning* in the corpus than vice-versa. Why this is could be debated, but one reason could be the facilities used for ice sports; these may be mainly intended for ice hockey, but there are strong incentives to use them for other sports. This does not imply conspiracies, rather a common path for political discussion to take discursively. **hockey** (n=2794) is much more frequent than *konståkning* (n=493) in the corpus, which is logical given the difference in the number of active athletes (Swedish Sports Confederation, 2016). However, the chosen statistical method relies on relative frequencies, so this cannot explain the outcome.

The item *ishall* is a fairly strong collocate shared by **hockey** and *konståkning*, implying that the sport is frequently mentioned in relation to facilities where it is played. On its own, it largely seems to co-occur with facilities for other sports, such as *sporthall* and *simhall*. It also appears that the role of the studied political units is to provide such facilities, although this is not mandatory for municipalities. This is expressed through items such as *upprustning*, which refers to the renovation of facilities, as well as expressions such as *ny* and *ytterligare*, which mainly co-occur with the node because new facilities are commonly discussed in the records.

Financial items are quite prominent in the network, most explicitly through the node of *kr*. This indicates that ice hockey is mainly an issue of financial commitment for municipalities, a relationship that is physically manifested in the public facilities described above. Although this is likely to be the case

for other sports discussed by these political units, the results indicate that ice hockey is discussed more than other recreational activities. Another item that shows this is the shared collocate of *beviljas*, indicating funding approval, which may be related to direct grants for associations' running costs or specific funding for assets, facilities or events. Other items related to finances include *kostnader* and *bidrag*.

Some items that cannot be sorted into the three discursive categories, but may still be of discursive interest. The item *pojkar* indicates that boys are more likely to be mentioned in the context than girls. One reason for this may be the significant gender differences among active ice hockey players (see 2.4.3). However, the opposite is true for figure skating (see H. Larsson, 2018, p. 57), so this explanation may not hold. The thesis' delimitation does not allow extensive theoretical reasoning related to gender, but there may be an opening for studies and the item cannot be dismissed as having no discursive interest.

The item *barn* indicates that children are frequently mentioned in the context, leading to the conclusion that recreation activities for this group are frequently provided as a reason for investing public resources in sport in general.

The presence of *förening* probably indicates the character of the civil movement, in which local and national associations are the organizations through which sport is practiced and are the main organizations eligible for public funding.

through policies and similar, is thus built upon the assumption of hockey as a health-promoting activity. However, nothing in the results suggests this assumption is built on robust empirical evidence. The information-gathering part of the regime thus seems somewhat questionable vis-à-vis the probabilities associated with a given risk not only not being regulated, but even encouraged through resource allocation. However, there is unlikely to be active *information-gathering* on this issue. At best there may be reactive information gathering, relying on other actors to supply information, although this may change as media coverage of the risk increases.

The tool of *behavior modification* may, given the network, be perceived as working somewhat backwards, as ice hockey is obviously facilitated largely through public investment. In another sense, this could be considered as corresponding to rational regime action. Hood et al. (2001, pp. 26-27) quite explicitly state that this is a complex area, due to the results' tendency to differ from the original intention. Looking at the items with an emphasis on benefits (*health, exercise, recreation, outdoor life, etc.*), while they do not necessarily take place in a completely safe environment, they could be perceived as more risk-free than the alternatives. Put in another way, if a child does not play ice hockey, they may have a lower risk of suffering head trauma. However, if they choose to use the time they would otherwise have spent on ice hockey using drugs, their risk of injury has not necessarily decreased. Because this could be a potential consequence of cutting municipal funding (although the probability of this example occurring can be debated), the effects are hard to overlook. This does not necessarily mean it is a deliberate choice in this case, but complexity must be considered before claiming that a major regime actor (such as a municipality) is encouraging risk.

The implications are quite clear for organizational legitimacy as an overall approach. First, the confirmed position of ice hockey, and other sports, in a context in which public funding appears to be taken for granted (although it is not mandatory for municipalities), means that the legitimacy of beneficiary organizations is crucial – mostly because the basic premise of legitimacy is necessary for any organization receiving public investment of

the kind present in the studied field or regime (see W. R. Scott, 1991a, p. 169). Not only is an ice hockey association's access to public resources undisputable in a quantitative manner, the outcome network in this study also shows that financial issues are probably the most common context in which the sport is discussed. This is reflected thematically in two ways; first, the references to financial terms (such as *kr*); second, the facilities necessary for associations to engage in their activities (such as *ishall*). The latter is not about economic investment in a purely linguistic sense, but the network overall implies that this is the case. This is reinforced by the ownership dynamics of indoor rinks in Sweden, where municipalities are the dominant actor (see 2.4.3). Bearing in mind the basic premises of the theoretical approach, ice hockey associations can be perceived as having legitimacy. Consequently, they are regarded as appropriate to the societal system in which their activities occur (see W. R. Scott, 2014, p. 71), giving the organizations the freedom to pursue their activities – here, making playing organized ice hockey possible, thanks to a lack of questioning that would otherwise complicate matters (see Deephouse et al., 2017, p. 31). Basically, the everyday activities of Swedish ice hockey associations can be perceived as being facilitated through legitimacy. A discursive shift in this regard would thus have consequences that could, in the long term, be existential.

In addition to the general consequence of legitimacy, i.e., the freedom to conduct activities, other possible consequences are indirectly related to legitimacy. One example could be the double nature of ice hockey clubs and their activities, with some players involved at a hobby level and others who are formally part of an employment relationship regulated by Swedish labor law (see 2.4.3). Their legitimacy and subsequent freedom to pursue activities raises a potential dynamic in which this legitimacy is gained only through the voluntary and leisure-related activities (as the network could imply), but it can also be used to pursue professional activities once it is achieved. Although somewhat speculative, this may affect employed players, whose commitment is perceived as deeply intertwined with the voluntary activities, resulting in a situation in which what should be a standard employment relationship in terms of safety actually takes place as part of a discourse with other connotations.

Despite its indirect relationship to legitimacy, it should be interesting to consider whether this collocation network could reflect an organizational field. The key feature of these fields is that they constitute a recognized area of social life manifested through different actors (Powell & DiMaggio, 1991a, pp. 64-65), and the network contains some items that could be perceived as existing in such a context. The collocates related to sports in general, which often take the form of specific sports such as *tennis*, could be thought of as other actors in the field. Likewise, municipalities are likely to exist in such a context, as they allocate resources in a way that is one example of how actors constitute a field (see Powell & DiMaggio, 1991a, pp. 64-65). It should not be assumed that a complete organizational field is reflected in the collocation network. Firstly, such a deductive approach would require a different research question and a different approach to expanding nodes. However, the fact that parts of the collocation network partially reflect the organizational field serve the study design well, by strengthening the fit between the empirical approach and theoretical framework. Additionally, these parts of the collocation network suggest an institutional context that includes organizations related to ice hockey, which should be considered in any interpretation of an institutional nature (see W. R. Scott, 2014, p. 222). It is important to recognize that the limitation this suggests is nothing more than a suggestion. Thoroughly mapping an organizational field requires other types of studies that are incompatible with the thesis' delimitations. However, collocation network analysis might be suitable for further empirical studies with a scope of this kind.

As regards isomorphism and organizational similarities, the study may not initially appear to say much about the presence of conformity in the field, i.e., there is no information about how the actors found in several items (e.g., those related to sports in general) are organized. However, the main actor covered through this study is the one being empirically investigated: Swedish municipalities. Firstly, the fact that all municipalities, with no exceptions, fund the sports movement through its associations indicates some type of conformity. Again, this is not a mandatory commitment for these actors; municipalities could provide limited or no funding to sports associations, but all of them in this study do so. Both competitive and

institutional isomorphism (see Powell & DiMaggio, 1991a, p. 66) should have some relevance here.

Competitive isomorphism builds upon rational factors related to market mechanisms (see Powell & DiMaggio, 1991a, p. 66), and could hence easily be dismissed as irrelevant because of the nature of the organizations studied here. Essentially, municipalities are part of the public domain, so largely work outside general market mechanisms. However, this reasoning would miss a couple of important points. One is that municipalities depend on a critical mass of inhabitants; partly for financial reasons, as a certain level of tax income is necessary. Municipalities should be thus perceived as partly working in a competitive environment, something manifested through their extensive use of advertising to show that they are an attractive place to live.

The conformity between municipalities regarding investments in sports could thus be perceived as an effect of competition. Basically, a municipality that does not fund sports may be perceived as unattractive by potential residents, which could result in long-term problems due to negative demographic trends.

As for institutional isomorphism, the sub-categories of coercive, mimetic and normative (see Powell & DiMaggio, 1991a, pp. 67-74) may all contribute different aspects.

For coercive isomorphism, the pressure exerted by other organizations in a field may have many forms. Associations for which ice hockey or sports in general are the main activity seem likely to claim resources through legitimacy. Aside from the financial terms, items such as *ansökan* reveal the presence of a formal system through which these organizations apply for funding. Rejections are likely to be questioned and would probably have to be well reasoned.

Given that municipalities are not obliged to actively promote activities such as culture or sports, the most explicit form of coercive isomorphism – when the state exercises power by legal means – does not clearly exist. However, there are other factors to consider that are not laws per se. For example, if

residents in a municipality are shown to be poor at physical activity in national surveys, there is likely to be criticism that could be perceived as this type of isomorphism. In this case, demonstrating municipal investments in improved sporting facilities would be helpful.

Mimetic isomorphism could relate to the network in two ways, in terms of organization. First, from the perspective of the municipalities, where the urge to create an attractive place to live may result in mimicking successful organizations of the same kind: other municipalities. As every municipality does fund sport activities and facilities, this mimicking would reproduce this standard solution. On the other hand, even less successful municipalities (e.g., those with a net minus population growth or poor finances) provide funding to sports organizations, so anyone looking for success factors that are exclusive to prosperous municipalities would be unlikely to focus on this. However, more specific factors, such as the level of resources provided to these activities or the presence of certain facilities (such as ice rinks), could still be useful in this isomorphic sense. The current study says little about whether this is the case here.

Second, mimetic isomorphism could potentially exist among the organizations that receive public funding for sports. For example, any sporting association that hopes to secure public funding for new facilities is likely to look at how organizations who successfully done so dealt with the application process, perhaps even what positive societal factors they emphasized. Items such as *ansökan* could suggest the presence of a standard process that organizations are expected to follow, indirectly related to the organizational legitimacy necessary to receive public resources.

There is little indication of normative isomorphism in the results. Although this does not mean there is no conformity from standardized professions or active networking between municipalities or other organizations (see Powell & DiMaggio, 1991a, pp. 70-74), speculation would be unwise. There might be reason to raise these aspects up in the concluding theoretical discussion, but based solely on background information about the municipalities. It could be argued that municipalities are similar in a number of ways, and

question the uniqueness of this observation. However, this shows the usefulness of isomorphism: the absence of mandatory commitments is what makes this case unique, because it is not properly explained by normative isomorphism, although this is the case for other municipal commitments.

In conclusion, the collocation network seems to correspond well to the theoretical framework, with the most relevant parts relating to organizational legitimacy. However, for risk regulation regimes, the fit is more peripheral. This could be regarded as an expected outcome, because the study does not include risk per se, but instead aims to increase knowledge of significant actors in the regime, making the connection relevant but indirect. This strengthens the argument regarding how the two main parts of the theoretical framework supplement each other in relation to the thesis' overall aim, which will be further described in the analysis section.

9 Analysis and discussion

This section focuses on the cohesive theoretical implications of the three empirical studies. Arguments are made by applying the theoretical framework to the aggregated results of the empirical studies, sometimes combined with additional regime information from the background and previous research. The analytical tool of risk regulation regimes is the main focus and organizational legitimacy will be referred to where appropriate. To ensure no important parts of organizational legitimacy are overlooked, there is a section dedicated to this part of the framework, where anything that has not been used analytically will be discussed in relation to the results.

After the analysis and discussion related to the theoretical framework, the section ends with a brief discussion about other implications. This is divided between implications for the theoretical field of risk and other implications.

9.1 Explanatory hypotheses

This section applies the three explanatory hypotheses presented by Hood et al. (2001) to the results. A thorough summary of these hypotheses is provided under 4.2.1.2, although each one is briefly revisited in the text below.

The *market failure hypothesis* relies on the mechanisms of a free market, in which regulation or public governance occurs when an entity fails to deliver satisfactory solutions (see Hood et al., 2001, p. 70). Given the basic premise that government regulation is carried out after a free exchange of goods, or *the market*, has failed to supply adequate risk regulation, the result should be of interest - more specifically, three parts that work together structurally in a sociologically interesting way.

First, the liberal market principal of individual choices regarding risk avoidance through goods or services builds upon the assumption of available information. This is reflected through the underlying dimension of *information cost* (see Hood et al., 2001, pp. 71-74). However, knowledge about head injuries is not only inaccessible to the public (see 3.1.2), but the first empirical study also indicates that the public are only sporadically made aware of the dangerous long-term consequences of head injuries in ice hockey (see 6.3), based on the premise that media surveillance is a valid measure of this. Thus, there is little reason to believe there is enough knowledge for a substantial number of people to abandon the sport, on behalf of themselves or their dependents, based on the knowledge of this risk.

Second, study three and the background information (e.g., 2.4.3) confirm that ice hockey in Sweden cannot be perceived as working on a free market as regards the financing of its activities. The importance of public resources, partly through direct funding but perhaps even more in the dynamics of facilities' ownership, places these organizations outside of market competition. The ability of the market to supply adequate regulation is thus questionable; it could still be argued that the decision to participate (or not) in ice hockey is made by the individual, sometimes on behalf of dependents,

and that the organizations must take action to maintain recruitment to the sport. The results of study two do not contradict this, although it would be hard to argue that the tendency to emphasize the sports' positive societal effects is aimed at these individuals.

Third, the integration of this hypothesis with the overall concept of organizational legitimacy could add to the doubt about the market's regulatory ability in this case. It appears that the presence of legitimacy through the receipt of public resources (see W. R. Scott, 1991a, p. 169), which study three appears to indirectly confirm, could itself jeopardize the mechanisms necessary for a free market approach because of the factors involved in information cost (see Hood et al., 2001, pp. 71-74). This is because any individual who encounters an activity known to have legitimacy at an institutional level should already have positive opinions of it, making further information gathering unnecessary.

To summarize, explaining the regulation of head injuries in ice hockey using the market failure hypothesis could be appropriate in the sense that the market does fail in this regard, but is simultaneously inappropriate because the main principles of the free market are not necessarily present to begin with.

The explanatory hypothesis of *opinion responsive government* is based upon the premise of public regulation, and explained mainly by the attitudes and preferences of the general public (see Hood et al., 2001, pp. 91-93). On this basis, the theoretical analysis following study one indicated several things relevant for further analysis. For one, the material did not show any substantial conflict about the governance of this risk (see 6.3), which is consistent with previous research and the information in the background section. It could be argued that study three indicates the same thing, since spending public resources could almost be taken for granted at a municipal level. It could thus be the case that there are currently no obvious incentives for a risk regulation regime to move beyond having little concern for opinion. However, study one indicates that coverage of head injuries is increasing, so this situation could potentially change. If so, the conflict level

in the regime may also rise, thereby putting the accepting spending of public resources into question. This process would be likely to coincide with a shift in the pattern of public attitudes (see Hood et al., 2001, pp. 94-97), where study one indicated that media surveillance is currently most aligned with *issue-attention cycle* (although not consistently, see 6.3). Increasing conflict combined with increasing media coverage may instigate a shift towards another pattern. Which pattern is a matter of speculation, but because the number of people affected by the risk is likely to remain the same and a rising conflict level would be the main instigator, the *complex and dynamic attitudes* pattern may be most likely. This might be expressed as increasing questions from the public about the appropriateness of significant public funding for an activity that is quite dangerous. Ice hockey interest groups, either formal ones such as associations or informally, from pure interest, could take the other side of the argument, producing increased conflict of the type that is important in the theory.

Interestingly, the clubs' tactic, indicated in study two, of the increasing tendency to promote the sport's positive societal effects, could be seen in two ways. On one hand, this tendency could correspond to a future shift in the patterns, especially if that this would eventually jeopardize their claim on public resources (see W. R. Scott, 1991a, p. 169). On the other hand, the trend shown in the study is not necessarily best suited for a shift towards *complex and dynamic attitudes*, but might be just as fitting for *general and consistent concern*.

Overall, this explanatory hypothesis seems better suited to the results of each study. Additionally, applying organizational legitimacy as a supporting theoretical framework seems more relevant in this case, especially in relation to how this aligned with the results.

Somewhat related to the discussion above, the hypothesis of *interests, lobbies and experts* can largely be assumed to involve the Ice Hockey Association, its sub-divisions and clubs as parties in a potentially increased conflict in the regime, as well as the actors specified in 2.4.3. This hypothesis is mainly based on the organized interests, which all have different stakes in the

regulated risk, trying to explain it through their dynamics (see Hood et al., 2001, pp. 112-121).

Given that these dynamics work in circumstances where profit-driven business interests are small or non-existent (see 7.3.3), the increase observed in study two needs to be put in a broader perspective if it is to offer a theoretically based explanation. Using legitimacy as a tool, it would be good to move the argument beyond the ice hockey community's striving for legitimacy and to look at other actors in the regime. As stated previously (see 2.4.3), the municipalities analyzed in study three all made financial commitments to sport and recreation, despite not being obliged to do so. Although apparently on the governance side, municipalities must also be considered part of the regime through their other interests. As distributors of public funding, they could be perceived to be equally dependent on public income (financed by the state or tax income, etc.), so they could also be viewed as striving for legitimacy – and their conformity in their financial undertakings could be perceived as indicating that they are striving for legitimacy.

The above phenomenon could be perceived as an expression of *mimetic isomorphism* (see Powell & DiMaggio, 1991a, pp. 67-74), as municipalities may be copying the funding concepts that are outside their mandatory ones. There is thus reason to believe that the hockey associations and the municipalities providing funding may, to some extent, be on the same side in terms of organized interest groups. This corresponds with the claim that there may be strong interest groups in the public sector that are not part of the regulatory regime (Hood et al., 2001, p. 114), because municipalities could be classed as an interest rather than an entity with a regulatory purpose. With the two actors central to this regime, the amount of *pressure* could be assumed to be mild. However, the potential shift in the demand for regulation, which is likely to happen if the observed increases in studies one and two continue, may entirely change the dynamics. In an extreme case, the role of municipalities would shift and leave the hockey associations vulnerable, as an organized interest. The increased tendency observed in

study two is in line with this, although there is no certainty about the future role of media surveillance.

The perspective that makes municipalities an interesting regime actor, but not governing organizations, may appear to favor those with an interest in the sport's long-term survival. Ice hockey associations would be lucky to have these organizations on their side in a situation where the sport is increasingly questioned. However, the potential for municipalities to gain legitimacy by mimicking each other by funding sports is not limited to ice hockey. Instead, it is easy to argue that this kind of public funding is more likely to be channeled through activities that are still considered to be health promoting, if the health benefits of ice hockey are questioned. Once any questioning of this starts, the mechanisms involved in the regime may even speed up a shift in municipal attitudes, specifically in relation to ice hockey, without general questioning of the nearly axiomatic attitude of public funding for sports and leisure.

Although the business pattern referred to above might seem the best fit here, because of the lack of a profit motive, there may be reason to look at the two other business interests (see Hood et al., 2001, pp. 114-117). The second pattern, in which stakeholders work within a dynamic where profit for one party means a loss for another, may be unsuitable due to the previously discussed limitations in explaining this regime using a free market. However, there are some things to consider. For one, study three clearly shows that ice hockey exists in a context with other sports, all depending on public funding for their survival. A conflict of interest might be found in local debates about whether it is appropriate for a municipality to spend vast amounts of money on an ice rink when other sports are disadvantaged (e.g. Korsgren, 2013). The increase in self-promotion observed in study two is compatible with such a situation, although it is also equally compatible with the general assumption of legitimacy in claims on public resources. There are suggestions in the results of study three that indicate a wider set of competitors for public resources, such as cultural interests, which are also party to this debate (e.g. SVT Nyheter, 2009).

Another aspect that could put the assumption of this as an exclusively non-profit driven regime in a different light is the concept of organizational fields (see 5.2.1). The key suppliers and actors mentioned by Powell & DiMaggio (1991a, pp. 64-65) as vital parts of such a field are frequently profit-driven, although the field may be built around an activity that is not. For example, the construction and maintenance of an ice hockey arena is a large project that is likely to offer job opportunities and make a profit for contractors. Organizations with profits from these kinds of activities will have some interest in a related risk regulation regime, although indirectly.

In summary, there are reasons not to immediately conclude that this regime is solely non-profit oriented. However, this does appear to be the most suitable pattern for its risk regulation, and the results of the empirical studies do not suggest otherwise.

9.2 General implications for the risk regulation regime

When it comes to context and content (see Hood et al., 2001, pp. 28-32), some interesting elements emerge when the results from the three empirical studies are intertwined. For context, these may not say much about the *type of risk*, but are more comprehensive for *public preferences and attitudes* and *organized interests*. The latter two have largely been covered in the explanatory hypothesis. For content, the results have some interesting implications for *size*, as well as *structure* and *style*.

Size, which is partly set through regime *aggression*, has implications for the results if each study is looked at indirectly. For study three, risk in general, as well as the particular risk in the regime, is absent in the discourse measured by word items. There is thus little indication of systematic information gathering or discussions on risk overall, risk-reward or otherwise. The assumption of legitimacy gained through the description in 9.1 may make this more interesting, since there is likely to be little interest in further examining an activity that facilitates this. The conclusion should not be drawn that the absence of explicit discussion about risk in the public documents analyzed in study three automatically means this question is

never raised in local political contexts. However, the topic's total absence from the vast amount of analyzed text is remarkable. A comparison with the results of study two, although it was methodologically different, is interesting because there are instances where risk was discussed, in general and specifically health-related, and occasionally even the topic of head injuries. If considered from the viewpoint of legitimacy, the observed increase in the issue's media exposure in study one and its potential consequences may create concern in the ice hockey associations before the matter reaches organizations such as municipalities, because the associations will find their core activities increasingly questioned. A municipality that acquires legitimacy through promoting activities such as ice hockey may eventually shift funding to other activities if risk or other factors make the existing arrangement unsuitable. The ice hockey associations, which need legitimacy to receive the public resources necessary for their long-term survival, have no such options. The discrepancy between the results of studies two and three regarding the presence of risk may therefore not be as surprising as first appears.

For *structure* (see Hood et al., 2001, pp. 30-31), the discussion of private and public sectors and their mix in the regime is crucial. Again, this is linked to the fact (see 9.1) that although "pure" profit-driven business interests are rare in the regime, regarding them as totally absent is an oversimplification. In this regime, it is noteworthy that the private sector, to whatever degree it might be present, can be expected to coincide with public and non-profit interests to the extent that it could be easy to conclude that the regime is free from such interests. Interestingly, this division can be found all through the ice hockey organizations, since some are partly run as companies (see 2.4.3). However, the conclusion drawn from the available facts and figures in background information must be that non-profit interests still dominate the regime, although this might change in the future if, for example, the so called 51% rule (see 2.4.3) is rescinded. This has been up for discussion (e.g. Szemberg, 2020) and is likely to cause further debate.

Using a more critical approach, there is the issue of players' double nature, as they may be considered employees in some cases and individuals

enjoying a leisure activity in another (see 2.4.3). While hockey clubs are mainly non-business related and may benefit from these connotations in terms of the general public and political entities, their formal employment of players should bring increased responsibility. Indeed, the assumption could be that a profit-driven organization is subjected to harder surveillance and even governance if their main activity saw an increase in injuries with potential long-term effects, which would make it beneficial for the clubs to give prominence to their non-profit sides instead. Whether this true for Swedish ice hockey clubs is largely speculative at this point, but the issue could potentially cause further debate if the observed trends continue.

It should be noted that the ice hockey associations, as regime actors, do not necessarily fit either the public or private sector as they are generally understood. However, since the latter are largely associated with business interests and profit-driven activities, this might be even more ill-fitting in cases where there are few elements of business interest. It could be possible to add a category for a non-profit sector that is not defined as inherently public or private, but this is not compatible with the relevant parts of the theoretical framework and would be outside the thesis' delimitations.

Overall, there are few implications from the empirical studies in this regard. The prominence of finance-related collocates in study three could be interpreted as indicating commercial interest, but there is little evidence that these relate to other factors than purely financial facts, which are equally relevant for a non-profit organization to consider in facilitating their everyday activities. The plausible conclusion from the material in this thesis is thus that this part of the framework, the aspect of structure, is not a good theoretical fit. The same can be said of the element of *style* on an overall level, since the empirical orientation of the thesis is more macro-oriented and focused on naturally occurring phenomena (in this context, content that already existed and was not created for the study). Therefore, it does not break down attitudes in the way necessary to thoroughly map them for further argument.

For the regime's *control components* (see Hood et al., 2001, pp. 23-27), the overall results and background information mean that further interpretation focuses on non-action rather than action. This is due to the good additional fit of organizational legitimacy, which indicates that the regulatory situation is not merely the lack of regulation, but even emphasizes the activity that is the regulation regime's main object. However, the empirical data offers little evidence that the regime's governing actors are conducting any active *information gathering*. There are some indications in study two that the associations are aware of the problem from a certain perspective, and study one indicates the media's increasing awareness and monitoring of the issue. This meets the criteria for *reactive* information gathering, because the regulating part can be assumed to be relying on others. It is not possible to draw conclusions from the data about the extent to which regulating actors process the available information and the extent to which this is organized. Despite this, it seems plausible that if future information instigates regulative action, it is more likely to come from media surveillance than any other source. Once the issue is highlighted, a shift from reactive gathering to interactive or even active gathering could occur, marking a potential regime shift. With the mechanisms of legitimacy and the current claim on public resources assumed to be present (see W. R. Scott, 1991a, p. 169), the initial step in governmental or regulatory action in the regime is unlikely to be increased regulation, but rather a pullback of the mechanisms that supply legitimacy for the actors. Any suggestions about how this process may occur require a great deal of speculation, but could be thought to affect ice hockey clubs and their associations in two ways. The first would be more direct regulation through *behavior-modification* (see Hood et al., 2001, p. 27), such as directives from authorities on the risk-prone parts of the game. The second would be more indirect regulation aimed at the main funders, namely the municipalities. Once again, these can be perceived as being on the regulative side, as well as subject to the necessary legitimacy, where this type of regulation would presume more of the latter. In any case, any regime shift towards stricter regulation is likely to include the municipalities withdrawing funding and eventually rendering activities impossible. Whether this happens on their own initiative to avoid criticism or through

explicit or implicit pressure from governmental authorities is of lesser importance. The instigator for the withdrawal of funding could be direct legislation (explicit) or more indirectly, for example a report from the public health authority on how ice hockey poses a health threat for players (implicit). No matter which scenario plays out, municipalities may be likely to comply, but the overall dynamics of a risk regulation regime make it plausible that the process will include a degree of resistance from several actors. Without any idea of proving causality, study two's observed increase in promoting the sport as beneficial can be seen in this context, and continuing development should be expected to increase if and when the game starts to be questioned. The phenomenon of *coercive isomorphism* (see Powell & DiMaggio, 1991a, pp. 67-69) is likely to be present in such a process, where municipalities may initially find themselves at a disadvantage due to pressure from the ice hockey community and from governmental entities. Municipalities may then place pressure on actors in the ice hockey community to mitigate the risk being regulated. Once again, the position of municipalities in the regime appears somewhat ambiguous.

Once the privilege of remaining *unquestioned*, as specified by Deephouse et al. (2017, p. 31), ends for any organization involved, the ordinary activities of this organization are likely to be jeopardized. A municipality should not reach this point, because this type of organization can legally claim tax income. However, this still requires legitimacy in the institutional sense, so promoting a seemingly risky activity by funding it may be stopped simply to avoid further questioning of its legitimacy. Study three reveals items that correspond to this process, mostly due to the prominence of items related to the benefit of sports in the collocation network (see 8.4.1). This discourse is currently reasonable, but may change if the general societal discourse shifts, as indicated in study one. The game of ice hockey cannot, in the long run, be generally discussed in terms of positive health effects if the general discourse in society is increasingly likely to be about its negative health effects.

9.3 Other aspects of organizational legitimacy

In addition to the implications discussed under 9.2, there are other parts of the overall approach of organizational legitimacy worthy of mention.

Initially, it could be argued that the theoretical area seems to fit the empirical results quite well, not only due to a seemingly good cohesion with the defined research problem, but also due to its usefulness as an extension to the concept of risk regulation regimes. Throughout the analysis, it has become apparent that the latter concept would have been limited on its own, precisely because any further analysis conducted with the support of the framework would be restricted to lack of regulation, with a limited ability to cover the lack of risk governance that is characterized through emphasis. Looking at the theoretical roots of legitimacy, it is also unlikely to be adequately analyzed using the rational-choice models that are the counterpart of institutional theory (see Powell & DiMaggio, 1991b). Anyone trying to rationally explain the (arguably irrational) behavior of governing organizations that leads to the promotion of activities that are in many senses risky would find it difficult. The fit of organizational legitimacy specifically, and neo-institutional theory in general, thus works well given the strengths of these approaches.

The reasoning under 9.2 does not include any references to *organizational fields* (see Wooten & Hoffman, 2017). This must not be taken to mean that this essential part of the theory is irrelevant. As stated in 5.2.1, the concept of such fields is quite compatible with the presumed presence of a risk regulation regime, making it relevant overall. However, once this assumption is made, it is hard to use this aspect of the theory in a manner that adds surplus value in the way organizational legitimacy is expected to as a supporting element in the thesis' theoretical framework. This aside, it is essential to understand the dynamics of the fields to fully apply the concept of legitimacy, as they are the basis of where legitimacy is supplied and received.

Due to the market-related discussion in 9.3, mainly in relation to the *market failure hypothesis*, it could be argued that the type of isomorphism referred to as *competitive* (see Powell & DiMaggio, 1991a, p. 66) would be suitable for in-depth analysis. Although these perspectives have a fundamental common principle, that of the reliance on market-economy-related forces, it is not likely to make further contributions to understanding the regime. Powell & DiMaggio (1991a, p. 66) do state that institutional isomorphism is to be considered a complementary aspect in relation to competitive isomorphism rather than purely an argument against it, the absence of free market competition discussed in 9.2 is likely to make the latter irrelevant, especially considered that institutional isomorphism can be considered such a good fit.

9.4 Summary of implications drawn from the theoretical framework

In relation to the research questions defined under 1.2 and the empirical results, which have been analyzed separately and together, the most significant implications of the thesis are summarized below.

The media narratives regarding head trauma and its potential long-term effects in ice hockey have recently seen changes. For one, the issue is increasing when it comes to attention in a quantitative sense, and the media coverage also seems to have changed in terms of content. The results indicate a growing awareness of the seriousness of the type of analyzed risk over time, whereas results for the corpus as a whole indicate that severity is prominent when concussions are mentioned. The importance of media surveillance in understanding risk regulation regimes, especially regarding general discourse and public attitudes (see Hood et al., 2001, pp. 91-97) makes this essential to understanding the dynamics of the regime, especially for anyone aiming to make assumptions about its future.

The information communicated by the Swedish ice hockey community, i.e., the Ice Hockey Association and its sub-divisions, has shown an increasing propensity to explicitly promote the positive societal effects of the sport. This should, in a discursive manner, be considered as corresponding with the former observation about increasing media surveillance, given the basic

assumption of legitimacy as necessary for the claim on public resources. With study one serving as the rationale for decisions on the analysis of change over time, it is clear that the observations from the two studies predictably coincide in a discursive sense. This is particularly interesting when the overall theoretical framework is applied, as both observed changes over time are likely to have consequences for the risk regulation regime.

In addition to this, a tendency for the ice hockey community to emphasize different kinds of risks is observed for the last six years. While not as coherent as the tendency related to societal benefits, it could be perceived as interesting considering the applied theories. The sub-category of health risks, also associated with an increase over time, is more theoretically interesting than risk in general. In terms of actual numbers, it is a small increase from which it is not appropriate to draw theoretical implications.

When it comes to political contexts, ice hockey occurs most prominently in relation to financial discussions and decision-making, which may be directly or indirectly, such as by funding of facilities such as ice rinks. It is also part of the general context of sports, in which the benefits of such activities, for example health and exercise, are explicitly emphasized. Due to the analysis and its ability to disclose the directionality of lexical patterns, it is apparent that ice hockey is a substantial entity in this context, due to its sheer numbers compared to other sports. The analytical method did not uncover any items that could, in an explicit or arguably even implicit manner, be discursively related to risk. This must not be taken to mean that these issues are totally absent from political discussions. Instead, the results suggest that risk is no more likely to be mentioned in relation to ice hockey than anywhere else in analyzed records.

9.5 General implications for the theoretical field of risk sociology

Considered in the context of risk as a general sociological phenomenon, the most prominent and perhaps most expected implication of the three empirical studies in this thesis is likely to be the apparent social content with which the risk in focus seems to be associated. Indeed, the results could

easily be argued for as corresponding to the influential suggestions of Kasperson et al. (1988), in the sense that the lack of regulation, and emphasis through public funding, is unlikely to be adequately explained by basic aspects of risk, based on likelihood and empirical ambitions of risk and reward. Study three has no indication of the structural undertakings of Swedish municipalities when it comes to ice hockey's reliance on such information. Rather, the financing of these activities and the positive connotations explicitly present in the material could be understood as relying on ice hockey having an embedded social content. In this regard, the results correspond with the general theory of risk in the social sciences.

However, there is one factor that makes it stand out. This is the element of action as described by Renn (2017), which seems to presume action in mitigating risk or non-action on behalf of society, individuals or organizations. Emphasizing, as opposed to mere tolerance through a lack of regulation, appears ill fitted to explain such public undertakings. The theoretical approaches that do cover such social processes are those related to edgework and voluntary risk taking, but there are two reasons these are inappropriate. First, their micro-nature. The examples used in this theoretical field, including high-risk sports (e.g. Lyng, 1990), are almost exclusively ones related to the individual; there is no corresponding approach related to voluntary risk taking among organizations in general or society as a whole, by means of governing entities, that is well-known in the field. Second, risky activities are occasionally being promoted through the public sector, by funding or otherwise, does not imply that the risk has intrinsic value, or even that the sanctioning system knows that the activity is risky. Instead, the social processes working through that function might create a discourse in which the activity is assigned positive connotations, such as health promotion, despite a lack of empirical evidence. The increase observed in study two and the linguistic context of ice hockey in study three might be considered products of this discourse, although an empirical investigation to determine risk versus health benefit for the sport is probably impossible in practice.

Looking at the risk concepts presented in 4.1, the one that could have some relevance for interpreting the results would be the use of risk as a forensic resource (see Douglas, 1990). However, this builds on a premise that works somewhat backwards in relation to the concept. Specifically, a risk that is emphasized to sustain given cultural conditions is not the type of risk studied in this thesis *per se*. Instead, the risk that the public sector targets by funding sporting activities is probably the alternative cost of a society where the population does not get enough exercise. This is implicitly clear in study three, where the linguistic patterns indicate an emphasis on benefits such as exercise, health, and recreation. By definition, although not explicitly expressed, a lack of these things is a risk at a population level. There is little reason to believe that the emphasis would be built around moral imperatives, meaning that risk is central to the discourse in a way that perceived risk induces cultural stability rather than value-based imperatives.

More prominent, however, is the fact that the profound neutrality described by Lupton (1999b) could be argued to be the structural force that enables the promotion of an activity that involves a great deal of risk. This enables a discourse in which the funding of risk-prone activities is facilitated using the alleged, although never explicitly specified, science about the risk of a lack of exercise. Such reasoning does not imply a conspiracy, instead it should be perceived as a way of understanding how social structures may work to give a risky activity the status of a healthy one without further questioning. This might be about to change, when the neutral position of these activities as positive for public health comes under scrutiny. Given the results of study one, this may already be happening.

To summarize, the combined results of the three empirical studies in this thesis strengthen the overall argument that risk is associated with social content, beyond simple ideas about risk-versus-reward on a calculable basis. However, existing general theories in the field are not best suited to situations in which risk is emphasized at a macro-level, despite individual perspectives related to the active risk looking for intrinsic value. This could be interpreted in three ways. First, the problem defined in the thesis could be regarded as marginal in terms of numbers. Indeed, promoting risk taking

through public funding is not likely to be a common phenomenon. Second, the problem might lack a broad theoretical fit because it is a novel one in many regards. As previously mentioned, medical knowledge related to head injuries in Swedish ice hockey is emerging, so it might be some time until the game is more commonly associated with risk than with exercise and positive health effects. Again, the results of study one indicate that this process is already ongoing. Third, it could be assumed that while it is an emerging phenomenon, the risk might remain marginalized in terms of prevalence and so use more niched theoretical approaches, such as risk regulation regimes for advancing knowledge in sociological studies.

9.6 Other theoretical implications

Before concluding, a brief discussion about a modern classic – not specifically related to risk – that might be indirectly applicable to the results. More specifically, Elias & Dunning (2008), previously described under 2.2. Overall, their arguments seem consistent with the observation of a changing image for the sport, which could also change its public image. One interesting premise is the argument that modern sports differ from general societal recreation in a historical sense, due to the potential negative impact on consumer conscience (Elias & Dunning, 2008, p. 141). This is considered a consequence of the general process of civilization, where primitive activities such as gladiator games have been replaced by organized and more regulated activities such as ice hockey.

In the light of this, a question could be asked about the consequences when it is revealed that a sport potentially has large-scale negative health impacts on active athletes. One logical assumption would be that the demand for sports is likely to remain, due to its increasing importance in the people's lives (Elias & Dunning, 2008, p. 219). It could be equally likely that some kind of structural consequences will occur when the freedom from bad conscience is jeopardized. These consequences do not even have to be the product of new medical knowledge, they could simply be the product of the general civilizing process (see Elias & Jephcott, 1982), in which violence is less tolerated.

Additionally, something might be said about the contribution to the sub-discipline frequently referred to as the sociology of sport. It could be argued that this thesis is likely to fit into the existing bulk of studies that strengthen the general assumption behind the field's existence: the notion that sports and the context within which they exist cannot be adequately described without the inclusion of societal factors and structures. In this case, macro-related ones would probably be any social scientist's best guess as to why an activity that, in a quantitative sense, might be quite risky, can achieve a nearly unquestioned status as a positive societal force and have a nearly undisputed claim on public resources. Time will tell whether this position will last in the long run.

9.7 Methodological implications

As stated in 1.4, the unique contribution of this thesis was assumed to be the assessment of a risk regulation regime using corpus-based methods. An evaluation of how well the applied methods worked is therefore necessary. Initially, the empirical material used in studies one and three respectively simply could not have been processed using any other available method considered standard for sociology. The reason for this is practical, because the working hours needed to access such material manually are logically impossible, despite the choice of method for a potential analysis based on manual handling. Study two is the exception, as it was built around manual analysis of text. However, the rationale for the study was based on study one (see 7.1), making it largely irrelevant when evaluating the appropriateness of the overall methodological choices.

More important for the results, however, was the ability of the corpus-based methods to access latent content otherwise inaccessible to researchers who want studying discourse in different manners (see Baker, 2006). Even if there was a way to make traditional quantitative content analysis practically possible for the material used in this case, it is highly unlikely that the latent content assessable using the applied methods could have been obtained. Although there are other methods related to latent content, their limitations regarding can be practically analyzed are reflected in common practice.

Therefore, features such as collocation networks are feasible when such latent content is to be accessed.

A risk regulation regime's latent nature means that anyone hoping to study it will have to look "between the lines" to analyze its content for information about its dynamics. This is a consequence of the nature of these regimes, as they do not exist on paper in any shape or form (see Hood et al., 2001). CADS-based studies may not literally read between the lines (just to be safe), but this can be claimed metaphorically. Although this could be said of almost any method that aims to analyze latent content, the large scale is what makes it unique. In this study, none of the results would have been obtainable with other methods. For example, the increase in media surveillance or the political contexts in which ice hockey is mentioned would have to be studied through small-scale analysis, with more uncertainty in the interpretation of the results.

It is noteworthy that risk regulation regimes have not previously been studied this way, given that they constitute the type of social entities for which corpus-based methods for discourse study are suitable. The most likely explanation for this is that these methods are still quite novel in sociology in general, and risk sociology in particular. However, with their usefulness for the subject largely established through published studies (e.g. Boholm, 2012; Hamilton et al., 2007; Zinn, 2018), these methods should now be ready for application in more specialized theoretical concepts. Risk regulation regimes are one of these, and hopefully this thesis will be an initial piece in the puzzle.

9.8 Policy implications

When interpreting the results from a policy perspective, it is appropriate to consider the potentially problematic combination of two things. First, the observed increase in media coverage of head injuries in ice hockey, from study one. Second, the positive connotations of the sport when it is explicitly mentioned, from study three. There is little reason to believe that the decisions by Swedish municipalities to grant public funding to ice hockey are based on empirical knowledge related to risk and benefit. Still, the public

could easily get that impression when the discourse in study three is communicated.

While there is limited coverage of the issue, a lack of empirical evidence to back up claims for health might not be a major problem. However, as awareness arises, there could be a demand for such evidence. To make the potential situation very concrete: it would be precarious for any public official or politician to be in a situation where they are responsible for proclaiming that an activity promotes health if no sufficient data backs this up. If the increasing coverage continues, that situation seems increasingly likely in the long run.

The most prominent policy implication drawn from this thesis is the demand for robust data whenever an activity is granted legitimacy through public funding, on the basis of it being positive for public health. The public entities that facilitate activities such as ice hockey through funding and other means must have adequate answers if the question of risk and reward is raised. This is not easy to accomplish, especially when such complex and abstract parameters as head injuries are involved. No easy answers such as “There is a risk of long-term effects on the brain but the cardio training that comes with it makes up for this” are likely to be available and are unlikely to be credible. However, given that health promotion seems to be the natural argument for current policy regarding the nearly axiomatic undertakings by municipalities for ice hockey and other sports, this complexity cannot lead to the presumption that there is no need for robust data. Instead, this complexity should lead to its acknowledgment by the public sector. This would essentially mean that affected functions, such as political units, abandon the previously axiomatic acceptance of sports in general as healthy and instead assume a more critical position. Therefore, in cases where complexity makes empirical knowledge about risk and benefit incalculable, this complexity will need to be publicly addressed whenever it comes up for discussion. It would be beneficial to the credibility of public organizations if they prepare for this proactively, contrary to a situation in which increasing media surveillance raises the question and the only answers are seemingly axiomatic ones about public health.

In addition to health promotion, a potentially broader implication for public policy can be found in the general obligations of Swedish municipalities and how they are motivated or rationalized. As stated in 2.4.3, funding sports and leisure is not mandatory for municipalities, so it could be expected they have a specific goal. Whether this is related to public relations, investment that hopes to expand the tax base or simply a service to the inhabitants, there should be expectations that any public actor – such as municipalities – has a clear goal for these commitments. Additionally, each goal should be possible to evaluate quantitatively, to some extent. If the goal of funding an ice hockey rink is to improve public health among the population by increasing the amount of exercise, there should be more than axiomatic assumptions behind this reasoning.

Table 28. Summary of findings and implications.

The risk regulation regime associated with head injuries in Swedish ice hockey	Risk regulation regimes as a theoretical or analytical concept	Sociological risk theory in general
<ul style="list-style-type: none"> ○ Changed media narratives over the last decades ○ Increased coverage ○ Rising awareness of severity ○ Communication from the ice hockey associations ○ Increased tendency to promote positive societal effects ○ Works in line with the changing media narrative ○ Consistent with the assumption of legitimacy as crucial for claim on public resources ○ Mentions of the game in political contexts: mostly economical ○ Ice hockey is a crucial part of a context of sports and similar activities where benefits of these are emphasized ○ The method of choice did not disclose any apparent discourse on risk. 	<ul style="list-style-type: none"> ○ The theoretical concept arguably fit the data quite well ○ Goes for the specific risk as well as the method of choice ○ Beneficial to focus on latent content ○ The use of organizational legitimacy as a supporting framework worked especially well ○ Due to this, the emphasizing of risk by actors otherwise expected to work on the regulating side could be properly assessed through the overall theoretical framework of the thesis 	<ul style="list-style-type: none"> ○ Results mostly in line with current risk theory ○ The lack of regulation/emphasizing through public funding cannot be explained by basic aspects of risk building on likelihood and empirical ambitions of risk and reward. ○ Hence, the social content of the risk is necessary to analyze for proper understanding. ○ In this case, the positive connotations of ice hockey and its associated discourse seems crucial ○ Exception: ○ Current theory seems to be lacking when it comes to the coverage of societal emphasizing of risk. ○ Risk taking and so forth is mainly threatened on a micro level

9.9 Contributions and potential for future research

This thesis aimed to map the risk regulation regime associated with head injuries in Swedish ice hockey by using three research questions, all somewhat macro-related and focusing on naturally occurring content. The corpus-based methods applied worked quite well for this approach, which became clearer with each analysis and subsequent theoretical analysis. Most obviously, the focus on latent content that is the core of such methods (which is true even in more traditional quantitative content analysis) allowed an analysis of features that would have been difficult to achieve using other methods. One example of this is in the third study, where the contexts in which ice hockey were discussed could be systematically and discursively analyzed in a way that one would be challenging with an alternative method. With political units such as the one analyzed in this regime, as well as in others, assumed to be crucial actors, it further underlines the method's benefits for understanding any regime. With this in mind, further studies of the regulation of different risks may be beneficial for the field as a whole.

Due to the chosen methods, no data collection through surveys or similar has been analyzed. The same is true for qualitative data from interviews, etc.

The thesis' nature, in terms of the defined research problem and the empirical studies are all being explorative in character, is now well supported. However, for any further studies of this regime that in any way build on these implications, other data types could be helpful in improving the understanding of the regime. Research questions in such approaches could include, but are definitely not limited to, the aim of achieving a more thorough understanding of how media narratives actually affect general discourse at an individual level, or whether people involved in political work at a local level see the presence of risk regulation in their everyday work.

For qualitative approaches in particular, there is an additional reason for further studies using such methodological approaches. This is because the analytical concept of risk regulation regimes aims to bridge the gap between the individuals that are exposed to risk and macro-theoretical concepts such as risk society (Hood et al., 2001, pp. 14-16). This thesis has largely been focused on the latter, in terms of empirical studies and the subsequent theoretical analysis of the results. Further studies of the same risk using similar theoretical approaches but different, namely qualitative, methods should thus be beneficial for the field as a whole.

In addition to this regime, the results of the empirical studies and subsequent theoretical analysis may have a broader significance for studies of risk regulation regimes in general. First and most prominently, this thesis should be suitable as the type of study requested by Hood et al. (2001) for the further development of their theoretical concept. Exactly how it will fit into this development will be determined by its reception (and hopefully through further publications by myself). However, the best chance of broad contributions to and development in the general field should be how the risk was assessed using the supporting framework of organizational legitimacy. Not only did this approach fit particularly well with the concept of risk regulation regimes, due to their general similarities – regime on one hand and organizational field on the other – but, more importantly, it enabled the analysis of a risk for which governance or regulation cannot be properly analyzed only through regulation or lack thereof. Basically, in any situation in which a risk can be perceived as being promoted by the actors that are expected to conduct governance, the level of regulation is inadequate. Without providing examples, there are other risks subject to this kind of management, so it is beneficial for the field as a whole, and for further studies of risk regulation regimes, that adding organizational legitimacy to gain more thorough understanding worked out well. Further studies with a similar theoretical approach, related to the scope of this thesis or otherwise, could be beneficial.

Even more broadly, this thesis could also have implications in the general theoretical field of risk. Most prominent is the fact that public sector

emphasis on risk, through resource allocation or otherwise, appears to lack obvious connections to the broad theory of the field. The potential reasons for this are discussed in 9.5. Depending on which reason is assumed to be likely, the implications for the theoretical field may differ. However, if the risk studied in this thesis continue to gain public awareness, there could be a demand for a theoretical approach that can be generally applied. Unlike the above discussion related to risk regulation regimes, a separate or supporting theoretical perspective such as legitimacy could be argued to be unlikely to fill such a gap, if and when risks emphasized by supposedly governing actors are no longer a marginal phenomenon. Instead, the contemporary theory of risk in sociology is likely to benefit from further developing perspectives that are based on the assumption that risk is associated with a social content, explaining the phenomenon of risk emphasis at a macro-level. This thesis provides no suggestions for how such a process will develop and which contemporary perspectives might be best suited. Most likely, it may be mentioned as an example a work that highlighted the problem while the one such risk was being uncovered. Although this would constitute a contribution to the field in its own right, any mentions are likely to be limited to this because the number of similar studies is likely to grow as the issue of risk becomes more prominent.

Last but certainly not least, the fact that this thesis has been an ongoing project since 2017 has some consequences for future research potential. For instance, the two largest Swedish evening newspapers both substantially increased their coverage of concussions in ice hockey and its potential long-term effects in 2018, including large article series and numerous perspectives. This was not covered in the first empirical study due to the time limits of the sampling process (see 6.1.1), so there should be an opening for potential replications of not only the first empirical study, but even other parts of the thesis. The first would, of course, be most obviously affected by a change in media coverage, but the larger premise that such coverage largely reflects public attitudes, and in the long run general discourse, could have implications for other empirically based parts as well. This is to be expected when the object of study concerns a phenomenon that is relatively new in a given discipline, risk related or otherwise.

10 References

Ali, I., Hashim, A., Wan-Ismail, W., Isnin, Z., & Mohd-Nazeri, M. (2011). Spectators safety awareness in outdoor stadium facilities. *Procedia Engineering*, 20, 98-104.

Almond, E. (2017). Renowned concussion doctor says he found CTE in living NFL player. Retrieved from <http://www.mercurynews.com/2017/11/16/renowned-concussion-doctor-says-he-found-cte-in-living-nfl-player/>

Anderson, E., & Kian, E. M. (2012). Examining media contestation of masculinity and head trauma in the National Football League. *Men and Masculinities*, 15(2), 152-173.

Anthony, L. (2017). Antconc (Version 3.5.0). Tokyo, Japan: Waseda University.

Asken, B. M., McCrea, M. A., Clugston, J. R., Snyder, A. R., Houck, Z. M., & Bauer, R. M. (2016). "Playing through it": delayed reporting and removal from athletic activity after concussion predicts prolonged recovery. *Journal of athletic training*, 51(4), 329-335.

Bailes, J. E., Petraglia, A. L., Omalu, B. I., Nauman, E., & Talavage, T. (2013). Role of subconcussion in repetitive mild traumatic brain injury: a review. *Journal of neurosurgery*, 119(5), 1235-1245.

Baker, P. (2006). Using corpora in discourse analysis: A&C Black.

Baker, P., Gabrielatos, C., Khosravinik, M., Krzyżanowski, M., McEnery, T., & Wodak, R. (2008). A useful methodological synergy? Combining critical discourse analysis and corpus linguistics to examine discourses of refugees and asylum seekers in the UK press. *Discourse & Society*, 19(3), 273-306.

Ball-King, L., Watt, J., & Ball, D. J. (2013). The rise and fall of a regulator: adventure sports in the United Kingdom. *Risk Analysis: An International Journal*, 33(1), 15-23.

Barthes, R. (1966). Introduction to the structural analysis of the narrative.

Bartle, I. (2009). A strategy for better climate change regulation: towards a public interest orientated regulatory regime. *Environmental Politics*, 18(5), 689-706.

Baugh, C. M., Meehan III, W. P., Kroshus, E., McGuire, T. G., & Hatfield, L. A. (2019). College football players less likely to report concussions and other injuries with increased injury accumulation. *Journal of neurotrauma*, 36(13), 2065-2072.

Baugh, C. M., Stamm, J. M., Riley, D. O., Gavett, B. E., Shenton, M. E., Lin, A., . . . Stern, R. A. (2012). Chronic traumatic encephalopathy: neurodegeneration following repetitive concussive and subconcussive brain trauma. *Brain imaging and behavior*, 6(2), 244-254.

- Beck, U. (1992). *Risk society : towards a new modernity*. London: Sage.
- Beck, U. (1999). *World Risk Society*: Wiley.
- Beck, U., Giddens, A., & Lash, S. (1994). *Reflexive modernization: Politics, tradition and aesthetics in the modern social order*: Stanford University Press.
- Benson, B. W., Meeuwisse, W. H., Rizos, J., Kang, J., & Burke, C. J. (2011). A prospective study of concussions among National Hockey League players during regular season games: the NHL-NHLPA Concussion Program. *Canadian Medical Association Journal*, 183(8), 905-911.
- Berelson, B. (1952). Content analysis in communication research.
- Biber, D. (1993). Representativeness in corpus design. *Literary and linguistic computing*, 8(4), 243-257.
- Black, J. (2008). Constructing and contesting legitimacy and accountability in polycentric regulatory regimes. *Regulation & governance*, 2(2), 137-164.
- Boholm, M. (2012). The semantic distinction between “risk” and “danger”: A linguistic analysis. *Risk Analysis: An International Journal*, 32(2), 281-293.
- Borås municipality. (2021). Fritids- och folkhälsonämnden. Retrieved from <https://www.boras.se/kommunochpolitik/kommunensorganisation/namnder/fritidsochfolkhalsonamnden.4.57c85441578f0628c8292c8.html>
- Bourdieu, P. (1988). Program for a Sociology of Sport. *Sociology of Sport Journal*, 5(2), 153-161.
- BrainCool. (2019). BrainCool web page. Retrieved from <http://www.braincool.se/>
- Brenner, J., & Swanik, K. (2007). High-risk drinking characteristics in collegiate athletes. *Journal of American college health*, 56(3), 267-272.
- Brezina, V. (2018). *Statistics in corpus linguistics: A practical guide*: Cambridge University Press.
- Brezina, V., McEnery, T., & Wattam, S. (2015). Collocations in context: A new perspective on collocation networks. *International Journal of Corpus Linguistics*, 20(2), 139-173.
- Brezina, V., Weill-Tessier, P., & McEnery, A. (2020a). #Lancsbox 5.0 manual.
- Brezina, V., Weill-Tessier, P., & McEnery, A. (2020b). #LancsBox v. 5.x.
- Brown, G., Yule, G., & Gillian, B. (1983). *Discourse analysis*: Cambridge university press.

- Brown, K. M., Hoyer, R., & Nicholson, M. (2014). Generating trust? Sport and community participation. *Journal of Sociology*, 50(4), 437-457.
doi:10.1177/1440783312467091
- Brown, M. (2015). Biggest Global Sports: A statistics-based analysis of the world's most popular sports. Retrieved from <http://www.biggestglobalsports.com/>
- Brymer, E. (2010). Risk taking in extreme sports: A phenomenological perspective. *Annals of Leisure Research*, 13(1-2), 218-238.
- Caron, J. G., Bloom, G. A., Johnston, K. M., & Sabiston, C. M. (2013). Effects of multiple concussions on retired national hockey league players. *Journal of sport and exercise psychology*, 35(2), 168-179.
- CBS News. (2013). NFL commissioner on concussion settlement: "There was no admission of guilt". Retrieved from <https://www.cbsnews.com/news/nfl-commissioner-on-concussion-settlement-there-was-no-admission-of-guilt/>
- Centrum för idrottsforskning. (2022). Medlemmar. Retrieved from <https://idrottsstatistik.se/foreningsidrott/medlemmar/>
- Chouliaraki, L., & Fairclough, N. (2010). Critical discourse analysis in organizational studies: Towards an integrationist methodology. *Journal of management studies*, 47(6), 1213-1218.
- Cleland, J. (2019). Sports fandom in the risk society: Analyzing perceptions and experiences of risk, security and terrorism at elite sports events. *Sociology of Sport Journal*, 36(2), 144-151.
- Coakley, J. (2011). Youth sports: What counts as "positive development?". *Journal of Sport and Social Issues*, 35(3), 306-324.
- Cohen, J. (1988). Statistical power analysis for the behavioral sciences. In: Erlbaum Associates, Hillsdale.
- Curran, J. R. (2004). From distributional to semantic similarity.
- Curry, T. J. (1993). A little pain never hurt anyone: Athletic career socialization and the normalization of sports injury. *Symbolic interaction*, 16(3), 273-290.
- Danderyd municipality. (2021). Kultur- och fritidsnämnden. Retrieved from <https://www.danderyd.se/kommun-och-politik/organisation/namnder/kultur--och-fritidsnamnden/>
- Daneshvar, D. H., Nowinski, C. J., McKee, A., & Cantu, R. C. (2011). The Epidemiology of Sport-Related Concussion. *Clinics in sports medicine*, 30(1), 1-17.
doi:10.1016/j.csm.2010.08.006

- Dart, R. (2004). The legitimacy of social enterprise. *Nonprofit management and leadership*, 14(4), 411-424.
- Davis, J. O. (1991). Sports injuries and stress management: An opportunity for research. *The sport psychologist*, 5(2), 175-182.
- Deephouse, D. L., Bundy, J., Tost, L. P., & Suchman, M. C. (2017). Organizational legitimacy: Six key questions. *The Sage handbook of organizational institutionalism*, 4(2), 27-54.
- Delaney, J. S., Caron, J. G., Correa, J. A., & Bloom, G. A. (2018). Why professional football players chose not to reveal their concussion symptoms during a practice or game. *Clinical Journal of Sport Medicine*, 28(1), 1-12.
- Delorme, R., & Lassarre, S. (2014). A new theory of complexity for safety research. The case of the long-lasting gap in road safety outcomes between France and Great Britain. *Safety Science*, 70, 488-503. doi:10.1016/j.ssci.2014.06.015
- Dixon-Woods, M., Yeung, K., & Bosk, C. L. (2011). Why is UK medicine no longer a self-regulating profession? The role of scandals involving "bad apple" doctors. *Social science & medicine*, 73(10), 1452-1459.
- Dodds, A., & Kodate, N. (2011). Accountability, organisational learning and risks to patient safety in England: Conflict or compromise? *Health, Risk & Society*, 13(4), 327-346.
- Douglas, M. (1990). Risk as a forensic resource. *Daedalus*, 1-16.
- Durkheim, E. (2014). *The division of labor in society*: Simon and Schuster.
- Elias, N., & Dunning, E. (2008). *Quest for excitement: Sport and leisure in the civilising process*: University College Dublin Press.
- Elias, N., & Jephcott, E. (1982). *The civilizing process* (Vol. 2): Pantheon books New York.
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), 107-115. doi:10.1111/j.1365-2648.2007.04569.x
- Erlanger, D. M., Kutner, K. C., Barth, J. T., & Barnes, R. (1999). Neuropsychology of sports-related head injury: Dementia Pugilistica to Post Concussion Syndrome. *The Clinical neuropsychologist*, 13(2), 193.
- Fainaru-Wada, M., & Fainaru, S. (2013). *League of denial: The NFL, concussions, and the battle for truth*: Three Rivers Press.
- Fairclough, N. (2003). *Analysing discourse: Textual analysis for social research*: Psychology Press.

- Fairclough, N. (2013). *Critical discourse analysis: The critical study of language*: Routledge.
- Field, A. (2009). *Discovering statistics using IBM SPSS statistics*: sage.
- Fitzpatrick, J. S. (1980). Adapting to danger: A participant observation study of an underground mine. *Sociology of Work and Occupations*, 7(2), 131-158.
- Fletcher, R. (2008). Living on the edge: The appeal of risk sports for the professional middle class. *Sociology of Sport Journal*, 25(3), 310-330.
- Forsdyke, D., Smith, A., Jones, M., & Gledhill, A. (2016). Psychosocial factors associated with outcomes of sports injury rehabilitation in competitive athletes: a mixed studies systematic review. *British Journal of Sports Medicine*, 50(9), 537-544.
- Foucault, M. (1991). Governmentality. In G. Burchell, C. Gordon, & P. Miller (Eds.), *The Foucault effect : studies in governmentality : with two lectures by and an interview with Michel Foucault* (pp. 87-104). Chicago: Univ. of Chicago Press.
- Foucault, M. (2013). *Archaeology of Knowledge*. Westminster: Westminster: Taylor and Francis.
- Frey, J. H. (1991). Social risk and the meaning of sport. *Sociology of Sport Journal*, 8(2), 136-145.
- Fuller, C., & Drawer, S. (2004). The application of risk management in sport. *Sports medicine*, 34(6), 349-356.
- Gabrielatos, C. (2018). Keyness Analysis: nature, metrics and techniques. *Corpus Approaches to Discourse: A Critical Review*, 225-258.
- Gabrielatos, C., & Marchi, A. (2012). Keyness: Appropriate metrics and practical issues.
- Garside, R., Sampson, G., & Leech, G. (1988). *The computational analysis of English: A corpus-based approach* (Vol. 57): Longman.
- Gavett, B. E., Stern, R. A., & McKee, A. C. (2011). Chronic traumatic encephalopathy: a potential late effect of sport-related concussive and subconcussive head trauma. *Clinics in sports medicine*, 30(1), 179-188.
- Giddens, A. (2013). *In defence of sociology: essays, interpretations and rejoinders*: John Wiley & Sons.
- Giulianotti, R., & Klauser, F. (2010). Security governance and sport mega-events: Toward an interdisciplinary research agenda. *Journal of Sport and Social Issues*, 34(1), 49-61.

Goldberg, D. S. (2008). Concussions, professional sports, and conflicts of interest: Why the National Football League's current policies are bad for its (players') health. Paper presented at the HEC forum.

Gómez, P. C. (2013). Statistical methods in language and linguistic research: Equinox London.

Gouvier, W. D., Prestholdt, P. H., & Warner, M. S. (1988). A survey of common misconceptions about head injury and recovery. *Archives of Clinical Neuropsychology*, 3(4), 331-343.

Government offices of Sweden. (2016). The principle of public access to official documents. Retrieved from <https://www.government.se/how-sweden-is-governed/the-principle-of-public-access-to-official-documents/>

Grabosky, P. (2013). Beyond Responsive Regulation: The expanding role of non-state actors in the regulatory process. *Regulation & governance*, 7(1), 114-123.

Graneheim, U. H., Lindgren, B.-M., & Lundman, B. (2017). Methodological challenges in qualitative content analysis: A discussion paper. *Nurse Education Today*, 56, 29-34.

Gries, S. T. (2013). 50-something years of work on collocations: What is or should be next.... *International Journal of Corpus Linguistics*, 18(1), 137-166.

Guszkowska, M., & Bołdak, A. (2010). Sensation seeking in males involved in recreational high risk sports. *Biology of Sport*, 27(3).

Haase, A. M. (2011). Weight perception in female athletes: Associations with disordered eating correlates and behavior. *Eating Behaviors*, 12(1), 64-67.
doi:<https://doi.org/10.1016/j.eatbeh.2010.09.004>

Halmstads municipality. (2021). Teknik- och fritidsnämnden. Retrieved from <https://www.halmstad.se/kommunpolitik/politikochbeslut/namnder/teknikochfritidsnamnden.829.html>

Hamilton, C., Adolphs, S., & Nerlich, B. (2007). The meanings of 'risk': A view from corpus linguistics. *Discourse & Society*, 18(2), 163-181.

Hardes, J. (2017). Governing sporting brains: concussion, neuroscience, and the biopolitical regulation of sport. *Sport, ethics and philosophy*, 11(3), 281-293.

Hearst, M. A. (1992). *Automatic acquisition of hyponyms from large text corpora*: Association for Computational Linguistics.

Heyvaert, V. (2011). Governing climate change: towards a new paradigm for risk regulation. *The Modern Law Review*, 74(6), 817-844.

Hockeyallsvenskan. (2022). Hockeyallsvenskan. Retrieved from www.hockeyallsvenskan.se

Hockeyettan. (2022). Hockeyettan. Retrieved from www.hockeyettan.se

Holme, R. (2003). Drinking water contamination in Walkerton, Ontario: positive resolutions from a tragic event. *Water Science and Technology*, 47(3), 1-6.

Hood, C., Rothstein, H., & Baldwin, R. (2001). The government of risk: Understanding risk regulation regimes: OUP Oxford.

Hood, C., Rothstein, H., Baldwin, R., Rees, J., & Spackman, M. (1999). Where risk society meets the regulatory state: Exploring variations in risk regulation regimes. *Risk Management*, 1(1), 21-34.

Hootman, J. M., Dick, R., & Agel, J. (2007). Epidemiology of collegiate injuries for 15 sports: summary and recommendations for injury prevention initiatives. *Journal of athletic training*, 42(2), 311.

Hoye, R., Nicholson, M., & Brown, K. (2015). Involvement in sport and social connectedness. *International Review for the Sociology of Sport*, 50(1), 3-21. doi:10.1177/1012690212466076

Huber, M. (2004). Insurability and regulatory reform: Is the English flood insurance regime able to adapt to climate change? *The Geneva Papers on Risk and Insurance. Issues and Practice*, 29(2), 169-182.

Hughes, R., & Coakley, J. (1991). Positive deviance among athletes: The implications of overconformity to the sport ethic. *Sociology of Sport Journal*, 8(4), 307-325.

Hutchison, M. G., Lawrence, D. W., Cusimano, M. D., & Schweizer, T. A. (2014). Head Trauma in Mixed Martial Arts. *The American Journal of Sports Medicine*, 42(6), 1352-1358. doi:10.1177/0363546514526151

Hutter, B. M. (2005). Ways of seeing": Understandings of risk in organizational settings. *Organizational encounters with risk*, 67-91.

Hutter, B. M. (2006). Risk, regulation, and management. *Risk in social science*, 202-227.

Hutter, B. M. (2008). Risk regulation and health care. In: Taylor & Francis.

Hutter, B. M., & Power, M. (2005). *Organizational encounters with risk*: Cambridge University Press.

International Olympic committee. (2018). Ice hockey equipment and History. Retrieved from <https://www.olympic.org/ice-hockey-equipment-and-history>

- Irving, S. (2009). *Hockey and Philosophy* (N. Baillargeon Ed.): University of Ottawa Press.
- Iverson, G. L., Gaetz, M., Lovell, M. R., & Collins, M. W. (2004). Cumulative effects of concussion in amateur athletes. *Brain injury*, 18(5), 433-443.
- Jennings, W. (2010). Governing the Games in an age of uncertainty: The Olympics and organisational responses to risk. In *Terrorism and the Olympics* (pp. 149-176): Routledge.
- Jennings, W., & Lodge, M. (2011). Governing mega-events: Tools of security risk management for the FIFA 2006 World Cup in Germany and London 2012 Olympic Games. *Government and Opposition*, 46(2), 192-222.
- Joseph, C. M., Robert, W., Jeffrey, B., Austin, A., Christina, M., & Vincent, M. Chronic traumatic encephalopathy in contact sports: a systematic review of all reported pathological cases. *PLoS ONE*, 10(2), e0117338.
doi:10.1371/journal.pone.0117338
- Junge, A., Rösch, D., Peterson, L., Graf-Baumann, T., & Dvorak, J. (2002). Prevention of soccer injuries: a prospective intervention study in youth amateur players. *The American Journal of Sports Medicine*, 30(5), 652-659.
- Karatas, O. (2016). A Research into Evaluation of Basketball Athletes' Risk Perception Level. *International Education Studies*, 9(5), 108-114.
- Karlstads municipality. (2021). Sammanträdestider för kultur- och fritidsnämnden. Retrieved from <https://karlstad.se/Kommun-och-politik/Kommunens-organisation/Namnder/Kultur--och-fritidsnamnden/Sammantradestider/>
- Kasperson, R. E., Renn, O., Slovic, P., Brown, H. S., Emel, J., Goble, R., . . . Ratick, S. (1988). The social amplification of risk: A conceptual framework. *Risk analysis*, 8(2), 177-187.
- Kent, J., Faulkner, A., Geesink, I., & FitzPatrick, D. (2006). Towards governance of human tissue engineered technologies in Europe: Framing the case for a new regulatory regime. *Technological forecasting and social change*, 73(1), 41-60.
- Keppel, G., & Wickens, T. (2004). Simultaneous comparisons and the control of type I errors. *Design and analysis: A researcher's handbook*. 4th ed. Upper Saddle River (NJ): Pearson Prentice Hall. p, 111-130.
- King, N. M., & Robeson, R. (2013). Athletes are guinea pigs. *The American Journal of Bioethics*, 13(10), 13-14.
- Korsgren, M. (2013). Politisk oenighet kring hockeyn i Gimo. *Svt Nyheter*. Retrieved from <https://www.svt.se/nyheter/lokalt/uppsala/politisk-oenighet-kring-hockeyhallen-i-gimo>

Krippendorff, K. (2004). *Content Analysis: An Introduction to Its Methodology*: Sage.

Krippendorff, K. (2019). *Content analysis : an introduction to its methodology* (Fourth edition ed.): SAGE.

Kroshus, E., Baugh, C. M., Daneshvar, D. H., Stamm, J. M., Laursen, R. M., & Austin, S. B. (2015). Pressure on sports medicine clinicians to prematurely return collegiate athletes to play after concussion. *Journal of athletic training*, 50(9), 944-951.

Kroshus, E., Garnett, B., Hawrilenko, M., Baugh, C. M., & Calzo, J. P. (2015). Concussion under-reporting and pressure from coaches, teammates, fans, and parents. *Social science & medicine*, 134, 66-75.

Kurowski, B., Pomerantz, W. J., Schaiper, C., & Gittelman, M. A. (2014). Factors that influence concussion knowledge and self-reported attitudes in high school athletes. *The journal of trauma and acute care surgery*, 77(3 0 1), S12.

Larsson, A. (2018). Samlat grepp mot hjärnskakningarna. Retrieved from <http://www.swehockey.se/Nyheter/nyheterfransvenskaishockeyforbundet/2018/September2018/ledarkronika>

Larsson, H. (2018). Idrottens könsmonster. In *Resurser, representation och "riktig" idrott - Om jämställdhet inom idrotten* (pp. 57-95): Centrum för idrottsforskning.

Law, G., & Bloyce, D. (2019). 'Pressure to play?' A sociological analysis of professional football managers' behaviour towards injured players. *Soccer & Society*, 20(3), 387-407.

Lehtonen, K. (2017). Building of the legitimacy of a sports organization in a hybridized operating environment: Case Finland. *European Journal for Sport and Society*, 14(2), 166-181.

Levi-Faur, D. (2011). Regulation and regulatory governance. *Handbook on the Politics of Regulation*, 1(1), 1-25.

Lidskog, R., & Sundqvist, G. (2012). Sociology of Risk. In S. Roeser, R. Hillerbrand, P. Sandin, & M. Peterson (Eds.), *Handbook of Risk Theory: Epistemology, Decision Theory, Ethics, and Social Implications of Risk* (pp. 1001-1027). Dordrecht: Springer Netherlands.

Lindström, S. (2017). En väntad dom som kan få konsekvenser för idrotten. *Expressen*.

Lloyd-Bostock, S. M., & Hutter, B. M. (2008). Reforming regulation of the medical profession: The risks of risk-based approaches. *Health, Risk & Society*, 10(1), 69-83.

Lupton, D. (1992). Discourse analysis: A new methodology for understanding the ideologies of health and illness. *Australian journal of public health*, 16(2), 145-150.

- Lupton, D. (1999a). *Risk*: United Kingdom: Taylor & Francis Ltd - M.U.A.
- Lupton, D. (1999b). *Risk and sociocultural theory: New directions and perspectives*: Cambridge University Press.
- Lupton, D. (2013). *Risk* (2nd ed.. ed.). London: Routledge.
- Lupton, D., & Tulloch, J. (2002). Life would be pretty dull without risk: Voluntary risk-taking and its pleasures. *Health, Risk & Society*, 4(2), 113-124. doi:10.1080/13698570220137015
- Lyng, S. (1990). Edgework: A social psychological analysis of voluntary risk taking. *American Journal of Sociology*, 95(4), 851-886.
- Lyytimäki, J., Assmuth, T., & Hildén, M. (2011). Unrecognized, concealed, or forgotten – the case of absent information in risk communication. *Journal of Risk Research*, 14(6), 757-773. doi:10.1080/13669877.2011.571773
- Majone, G. (1999). The regulatory state and its legitimacy problems. *West European Politics*, 22(1), 1-24.
- Malcolm, D. (2021). The impact of the concussion crisis on safeguarding in sport. *Frontiers in sports and active living*, 3, 42.
- Malcom, N. L. (2006). "Shaking it off" and "toughing it out" socialization to pain and injury in girls' softball. *Journal of contemporary ethnography*, 35(5), 495-525.
- Marx, K. (1969). *Kapitalet : kritik av den politiska ekonomin*. Lund: Lund : A-Z.
- May, P. J. (2007). Regulatory regimes and accountability. *Regulation & governance*, 1(1), 8-26.
- McGannon, K. R., Cunningham, S. M., & Schinke, R. J. (2013). Understanding concussion in socio-cultural context: A media analysis of a National Hockey League star's concussion. *Psychology of Sport and Exercise*, 14(6), 891-899.
- McGivern, G., & Fischer, M. D. (2012). Reactivity and reactions to regulatory transparency in medicine, psychotherapy and counselling. *Social science & medicine*, 74(3), 289-296.
- McKinlay, A., Bishop, A., & McLellan, T. (2011). Public knowledge of 'concussion' and the different terminology used to communicate about mild traumatic brain injury (MTBI). *Brain injury*, 25(7-8), 761-766.
- Mediearkivet. (2019). <http://www.mediearkivet.se>
- Meyer, J. W., & Scott, R. (1983). Centralization and the legitimacy problems of local government. *Organizational environments: Ritual and rationality*.

Micheli, L. J., Glassman, R., & Klein, M. (2000). The prevention of sports injuries in children. *Clinics in sports medicine*, 19(4), 821-834.

Motion 2005/06:Kr237. (2005). Professionell boxning. Retrieved from https://www.riksdagen.se/sv/dokument-lagar/dokument/motion/professionell-boxning-i-sverige_GT02Kr237

Mrazik, M., Dennison, C. R., Brooks, B. L., Yeates, K. O., Babul, S., & Naidu, D. (2015). A qualitative review of sports concussion education: prime time for evidence-based knowledge translation. *British Journal of Sports Medicine*. doi:10.1136/bjsports-2015-094848

Muijs, D. (2010). Doing quantitative research in education with SPSS: Sage.

Munro, E. (2005). A systems approach to investigating child abuse deaths. *British Journal of Social Work*, 35(4), 531-546.

Munro, E. (2010). Learning to reduce risk in child protection. *British Journal of Social Work*, 40(4), 1135-1151.

Myndigheten för samhällsskydd och beredskap, & Statens folkhälsoinstitut. (2010). *Fysisk aktivitet*

och skador - Statistik och analys. (MSB 0147-10).

Neuendorf, K. A. (2016). *The content analysis guidebook*: Sage.

NHL, N. (2005). Collective bargaining agreement. Retrieved from <http://www.nhl.com/ice/page.htm?id=26366>

Nixon, H. L. (1992). A social network analysis of influences on athletes to play with pain and injuries. *Journal of Sport and Social Issues*, 16(2), 127-135.

O'Keeffe, A., & McCarthy, M. (2010). *The Routledge handbook of corpus linguistics*: Routledge.

Olofsson, A., & Rashid, S. (2009). Introduktion. In A. Olofsson & S. Öhman (Eds.), *Risker i det moderna samhället : samhällsvetenskapliga perspektiv* (1. uppl. ed., pp. 13-38). Lund: Lund : Studentlitteratur.

Olofsson, A., & Öhman, S. (2009). *Risker i det moderna samhället : samhällsvetenskapliga perspektiv* (1. uppl. ed.). Lund: Lund : Studentlitteratur.

Overdevest, C., & Zeitlin, J. (2014). Assembling an experimentalist regime: Transnational governance interactions in the forest sector. *Regulation & governance*, 8(1), 22-48.

Parent, M. M. (2010). Decision making in major sport events over time: Parameters, drivers, and strategies. *Journal of Sport Management*, 24(3), 291-318.

- Parsons, T. (1960). *Structure and process in modern societies*: Free Pr.
- Partington, A., Duguid, A., & Taylor, C. (2013). *Patterns and meanings in discourse: theory and practice in corpus-assisted discourse studies (CADS)* (Vol. 55): John Benjamins Publishing.
- Partridge, B. (2014). Dazed and confused: sports medicine, conflicts of interest, and concussion management. *Journal of bioethical inquiry*, 11(1), 65-74.
- Pauelsen, M., Nyberg, G., Tegner, C., & Tegner, Y. (2017). Concussion in Ice Hockey-A Cohort Study Across 29 Seasons. *Clin J Sport Med*, 27(3), 283-287. doi:10.1097/jsm.0000000000000347
- Perks, T. (2007). Does sport foster social capital? The contribution of sport to a lifestyle of community participation. *Sociology of Sport Journal*, 24(4), 378-401.
- Perrott, T. A. (2019). Doing hot and 'dirty' work: Masculinities and occupational identity in firefighting. *Gender, work & organization*, 26(10), 1398-1412.
- Peterson, T. (2003). Idrott mellan folkrörelse och kommersialism. *Svensk idrottsforskning*(2), 60-64.
- Pettersen, K. (2016). Understanding uncertainty: thinking through in relation to high-risk technologies. In *Routledge handbook of risk studies* (pp. 57-66): Routledge.
- Pidgeon, N., & Butler, C. (2009). Risk analysis and climate change. *Environmental Politics*, 18(5), 670-688.
- Polsky, S. (1997). Winning medicine: professional sports team doctors' conflicts of interest. *J. Contemp. Health L. & Pol'y*, 14, 503.
- Powell, W. W., & DiMaggio, P. J. (1991a). The iron cage revisited: Institutional Isomorphism and Collective Rationality in Organizational fields. In W. W. Powell & P. J. DiMaggio (Eds.), *The new institutionalism in organizational analysis* (pp. 63-82). Chicago: University of Chicago Press.
- Powell, W. W., & DiMaggio, P. J. (1991b). *The new institutionalism in organizational analysis*. Chicago: Chicago : University of Chicago Press.
- Power, M. (2005). Organizational responses to risk: the rise of the chief risk officer. *Organizational encounters with risk*, 132-148.
- Power, M. (2007). *Organized Uncertainty: Designing a World of Risk Management*. Oxford: Oxford: Oxford University Press.
- Power, N. G. (2008). Occupational risks, safety and masculinity: Newfoundland fish harvesters' experiences and understandings of fishery risks. *Health, Risk & Society*, 10(6), 565-583.

- Renberg, M. (2017). Isen är inte en frizon. *SVT Sport*.
- Renn, O. (2017). Risk governance: coping with uncertainty in a complex world: Routledge.
- Riff, D., Lacy, S., & Fico, F. (2014). Analyzing media messages: Using quantitative content analysis in research: Routledge.
- Ringuet-Riot, C., Cuskelly, G., Auld, C., & Zakus, D. H. (2013). Volunteer roles, involvement and commitment in voluntary sport organizations: evidence of core and peripheral volunteers. *Sport in Society*, 17(1), 1-18.
doi:10.1080/17430437.2013.828902
- Roderick, M., Waddington, I., & Parker, G. (2000). Playing hurt: Managing injuries in English professional football. *International Review for the Sociology of Sport*, 35(2), 165-180.
- Ronglan, L. T. (2015). Elite sport in Scandinavian welfare states: legitimacy under pressure? *International journal of sport policy and politics*, 7(3), 345-363.
- Rothstein, H. (2003a). Neglected risk regulation: the institutional attenuation phenomenon. *Health, Risk & Society*, 5(1), 85-103.
- Rothstein, H. (2003b). Risk management under wraps: self-regulation and the case of food contact plastics. *Journal of Risk Research*, 6(1), 61-74.
doi:10.1080/1366987032000047806
- Rothstein, H. (2004). Precaution Bans or Sacrificial Lambs? Participative Risk Regulation and the Reform of the UK Food Safety Regime. *Public Administration*, 82(4), 857-881.
- Rothstein, H. (2006). The institutional origins of risk: A new agenda for risk research. In: Taylor & Francis.
- Rothstein, H., Huber, M., & Gaskell, G. (2006). A theory of risk colonization: The spiralling regulatory logics of societal and institutional risk. *Economy and Society*, 35(1), 91-112.
- Ruef, M., & Scott, W. R. (1998). A multidimensional model of organizational legitimacy: Hospital survival in changing institutional environments. *Administrative science quarterly*, 877-904.
- Safai, P. (2003). Healing the body in the "culture of risk": Examining the negotiation of treatment between sport medicine clinicians and injured athletes in Canadian intercollegiate sport. *Sociology of Sport Journal*, 20(2), 127-146.
- Sam, M. P. (2011). Building legitimacy at Sport Canada: pitfalls of public value creation? *International review of administrative sciences*, 77(4), 757-778.

- Sam, M. P., & Tore Ronglan, L. (2018). Building sport policy's legitimacy in Norway and New Zealand. *International Review for the Sociology of Sport*, 53(5), 550-571.
- Sarna, S., Sahi, T., Koskenvuo, M., & Kaprio, J. (1993). Increased life expectancy of world class male athletes. *Medicine and science in sports and exercise*, 25(2), 237-244.
- Schneider, S., Seither, B., Tönges, S., & Schmitt, H. (2006). Sports injuries: population based representative data on incidence, diagnosis, sequelae, and high risk groups. *British Journal of Sports Medicine*, 40(4), 334-339.
- Scott, C. (2010). Regulating in global regimes.
- Scott, W. R. (1991a). Unpacking institutional arguments. In W. W. Powell & P. J. DiMaggio (Eds.), *The new institutionalism in organizational analysis* (pp. 168-182). Chicago: University of Chicago Press.
- Scott, W. R. (1991b). Unpacking Institutional Arguments/The New Institutionalism in Organizational Analysis. Ed. Walter Powell, W and Paul DiMaggio. In: Chicago: University of Chicago Press.
- Scott, W. R. (2014). Institutions and organizations: Ideas, interests, and identities (4th ed.): Sage publications.
- Sharma, V. K., Rango, J., Connaughton, A. J., Lombardo, D. J., & Sabesan, V. J. (2015). The Current State of Head and Neck Injuries in Extreme Sports. *Orthopaedic Journal of Sports Medicine*, 3(1). doi:10.1177/2325967114564358
- Shin, W., Mahmoud, S. Y., Sakaie, K., Banks, S. J., Lowe, M. J., Phillips, M., . . . Bernick, C. (2014). Diffusion measures indicate fight exposure-related damage to cerebral white matter in boxers and mixed martial arts fighters. *AJNR. American journal of neuroradiology*, 35(2), 285. doi:10.3174/ajnr.A3676
- Shrier, I., Charland, L., Mohtadi, N. G., Meeuwisse, W. H., & Matheson, G. O. (2010). The sociology of return-to-play decision making: a clinical perspective. In: LWW.
- SICO. (2018a). Athletes minds. Retrieved from <https://sico.nu/athletes-minds/>
- SICO. (2018b). Hjärnskakningar och mentalhälsa. Retrieved from <https://sico.nu/for-spelare/hjarnskakningar-och-mentalhalsa/>
- SICO. (2018c). Om oss. Retrieved from <https://sico.nu/om-oss/>
- Simon, H. A. (1955). A Behavioral Model of Rational Choice. *The Quarterly Journal of Economics*, 69(1), 99-118. doi:10.2307/1884852
- Slovic, P. (1987). Perception of risk. *Science*, 236(4799), 280-285.

- Sojka, P. (2011). "Sport" and "non-sport" concussions. *CMAJ : Canadian Medical Association Journal*, 183(8), 887-888. doi:10.1503/cmaj.110504
- Somers, M. R. (1992). Narrativity, narrative identity, and social action: Rethinking English working-class formation. *Social science history*, 16(4), 591-630.
- SOU 2000:1. En uthållig demokrati? Politik för folkstyrelse på 2000-talet. Stockholm.
- Sparf, J. (2009). Organisering av riskhantering. In A. Olofsson & S. Öhman (Eds.), *Risker i det moderna samhället : samhällsvetenskapliga perspektiv*. Lund: Studentlitteratur.
- Spira, L. F., & Page, M. (2003). Risk management: The reinvention of internal control and the changing role of internal audit. *Accounting, Auditing & Accountability Journal*, 16(4), 640-661.
- Starks, H., & Brown Trinidad, S. (2007). Choose your method: A comparison of phenomenology, discourse analysis, and grounded theory. *Qualitative health research*, 17(10), 1372-1380.
- Starr, C. (1969). Social benefit versus technological risk. *Science*, 1232-1238.
- Statistics Sweden. (2019a). Sveriges 50 största kommuner efter folkmängd. In.
- Statistics Sweden. (2019b). Sveriges befolkning. Retrieved from <https://www.scb.se/hitta-statistik/sverige-i-siffror/manniskorna-i-sverige/sveriges-befolkning/>
- Steiner, H., McQuivey, R. W., Pavelski, R., Pitts, T., & Kraemer, H. (2000). Adolescents and sports: risk or benefit? *Clinical Pediatrics*, 39(3), 161-166.
- Stern, R. A., Riley, D. O., Daneshvar, D. H., Nowinski, C. J., Cantu, R. C., & McKee, A. C. (2011). Long-term consequences of repetitive brain trauma: chronic traumatic encephalopathy. *Pm&r*, 3(10), S460-S467.
- Stone, P. J., & Hunt, E. B. (1963). *A computer approach to content analysis: studies using the General Inquirer system*. Paper presented at the Proceedings of the May 21-23, 1963, spring joint computer conference, Detroit, Michigan.
- Strittmatter, A.-M., Stenling, C., Fahlén, J., & Skille, E. (2018). Sport policy analysis revisited: the sport policy process as an interlinked chain of legitimating acts. *International journal of sport policy and politics*, 10(4), 621-635.
- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of management review*, 20(3), 571-610.

Sullivan, S. J., Bourne, L., Choie, S., Eastwood, B., Isbister, S., McCrory, P., & Gray, A. (2009). Understanding of sport concussion by the parents of young rugby players: a pilot study. *Clinical Journal of Sport Medicine*, 19(3), 228-230.

Svedberg, L., von Essen, J., & Jegermalm, M. (2010). Svenskarnas engagemang är större än någonsin: insatser i och utanför föreningslivet. In.

Svenska ishockeyläkarförbundet. (2000). Föreningsstadgar. Retrieved from <http://www.oocities.org/hockeydoktor/stadga.html>

Svensson, E. (2016). Social adekvans i straffrättsdogmatiken. *Svensk juristtidning*.

SVT Nyheter. (2009). Kultur istället för ishall i Huskvarna. Retrieved from <https://www.svt.se/nyheter/lokalt/jonkoping/huskvarna-kultur-istallet-for-ishall-i-huskvarna>

Swedish Boxing Federation. (2017). Om boxning. Retrieved from <http://www.swebox.se/Forbundsinfo/Omboxning/>

Swedish Government. (2017a). Folkhälsa och idrott. Retrieved from <http://www.regeringen.se/regeringens-politik/folkhalsa-och-idrott/>

Swedish Government. (2017b). Satsningar på idrotten i höstbudgeten. Retrieved from <http://www.regeringen.se/pressmeddelanden/2016/09/satsningar-pa-idrotten-i-hostbudgeten>

Swedish Hockey League. (2022). Svenska hockeyligan. Retrieved from www.shl.se

Swedish Ice Hockey Association. (2007). Nya bötesnivåer i disciplinärenden i Elitserien och HockeyAllsvenskan [Press release]. Retrieved from <http://www.mynewsdesk.com/se/pressreleases/nya-boetesnivaer-i-disciplinaerenden-i-elitserien-och-hockeyallsvenskan-177438>

Swedish Ice Hockey Association. (2018a). Arbetsordning för disciplinnämnden. Retrieved from http://www.swehockey.se/globalassets/svenska-ishockeyforbundet/om-forbundet/namnder-och-kommitteer/disciplinnamnden/dn_delegationsordning_2012_ny.pdf

Swedish Ice Hockey Association. (2018b). Förbundsakta. Retrieved from <http://www.swehockey.se/omforbundet/forbundsakta/>

Swedish Ice Hockey Association. (2018c). Verksamhetsbeskrivning- Svensk ishockey. Retrieved from <http://www.swehockey.se/globalassets/svenska-ishockeyforbundet/om-forbundet/forbundsinformation/svensk-ishockey-lr.pdf?w=900&h=900>

Swedish Municipalities and Regions. (2014). *Anläggningar för kultur, idrott och fritid*. Retrieved from <https://webbutik.skl.se/bilder/artiklar/pdf/7585-459-5.pdf?issuusl=ignore>.

Swedish Municipalities and Regions. (2018a). The role of the municipalities. Retrieved from <https://skl.se/tjanster/englishpages/municipalitiescountycouncilsandregions/theroleofthemunicipalities.1302.html>

Swedish Municipalities and Regions. (2018b). Swedish municipalities, regions and county councils. Retrieved from <https://skl.se/tjanster/englishpages/municipalitiescountycouncilsandregions.1088.html>

Swedish Municipalities and Regions. (2021). Så styrs en kommun. Retrieved from <https://skr.se/demokratiledningstyrning/politiskstyrningfortroendevalda/kommunaltsjalvstyresastyrskommunenochregionen/sastyrskommunen.735.html>

Swedish Schools Inspectorate. (2012). *Idrott och hälsa i grundskolan - med lärandet i rörelse*. Retrieved from <https://www.skolinspektionen.se/globalassets/publikationssok/granskningsrapport/er/kvalitetsgranskningar/2012/idrott/kvalgr-idr-slutrapport.pdf>

Swedish Sports Confederation. (2012). Idrotten i siffror [Sports by numbers]. *Annual report by Swedish Sports Confederation*.

Swedish Sports Confederation. (2016). Idrotten i siffror [Sports by numbers]. *Annual report by Swedish Sports Confederation*.

Swedish Sports Confederation. (2017). Riksidrottsförbundets stadgar - I lydelse efter RF-stämman 2017. Retrieved from http://www.rf.se/globalassets/riksidrottsforbundet/dokument/dokumentbank/stadgar-och-regelverk/rf_s-stadgar.pdf?w=900&h=900

Swinbourne, R., Gill, N., Vaile, J., & Smart, D. (2016). Prevalence of poor sleep quality, sleepiness and obstructive sleep apnoea risk factors in athletes. *European Journal of Sport Science*, 16(7), 850-858. doi:10.1080/17461391.2015.1120781

Szemberg, S. (2020, 08-07). Varje klubb borde själv få bestämma. *Idrottens affärer*.

Tator, C. H. (2014). Chronic traumatic encephalopathy: How serious a sports problem is it? *British Journal of Sports Medicine*, 48(2), 81. doi:10.1136/bjsports-2013-093040

Taylor-Gooby, P., & Zinn, J. O. (2006a). The current significance of risk. *Risk in social science*, 1-20.

Taylor-Gooby, P., & Zinn, J. O. (2006b). *Risk in social science*: Oxford University Press.

Taylor, T., & Toohey, K. (2005). Impacts of terrorism-related safety and security measures at a major sport event. *Event Management*, 9(4), 199-209.

Taylor, T., & Toohey, K. (2007). Perceptions of terrorism threats at the 2004 Olympic Games: Implications for sport events. *Journal of Sport & Tourism*, 12(2), 99-114.

Tegner, Y., Gustafsson, B., Lundgren, L., Forssblad, M., & Sölveborn, S. A. (2007). Hjärnskakning och idrott: nya riktlinjer för handläggning inom idrotten. *Idrott och kunskap*.

Telford, A., Finch, C. F., Barnett, L., Abbott, G., & Salmon, J. (2012). Do parents' and children's concerns about sports safety and injury risk relate to how much physical activity children do? *British Journal of Sports Medicine*, 46(15), 1084-1088.

Testoni, D., Hornik, C. P., Smith, P. B., Benjamin Jr, D. K., & McKinney Jr, R. E. (2013). Sports medicine and ethics. *The American Journal of Bioethics*, 13(10), 4-12.

Thiemann, P., Legenbauer, T., Vocks, S., Platen, P., Auyeung, B., & Herpertz, S. (2015). Eating Disorders and Their Putative Risk Factors Among Female German Professional Athletes. *European Eating Disorders Review*, 23(4), 269-276.
doi:10.1002/erv.2360

Thurman, D. J., Branche, C. M., & Sniezek, J. E. (1998). The epidemiology of sports-related traumatic brain injuries in the United States: recent developments. *The Journal of head trauma rehabilitation*, 13(2), 1-8.

Tiberghien, Y. (2009). Competitive Governance and the Quest for Legitimacy in the EU: the Battle over the Regulation of GMOs since the mid-1990s. *European Integration*, 31(3), 389-407.

Tidningarnas telegrambyå - TT. (2017). Hovrätten dömer Jakob Lilja för misshandel. *Dagens nyheter*. Retrieved from <https://www.dn.se/sport/ishockey/hovratten-domer-jakob-lilja-for-misshandel/>

Tikkanen, M. W. (2006). Development of a drinking water regulation for perchlorate in California. *Analytica Chimica Acta*, 567(1), 20-25.

Toohey, K., & Taylor, T. (2008). Mega events, fear, and risk: Terrorism at the Olympic Games. *Journal of Sport Management*, 22(4), 451-469.

United states court of appeals. (2016). National football league players concussion injury litigation. FindLaw.

University of Gothenburg. (2019). Språkbanken. <https://spraakbanken.gu.se/>

van Mechelen, W. (1997). The severity of sports injuries. *Sports medicine*, 24(3), 176-180.

Varbergs kommun. (2021). Kultur- och fritidsförvaltningen. Retrieved from <https://www.varberg.se/kommunpolitik/kommunensorganisation/forvaltningar/ku lturochfritidsforvaltningen.4.63c5311513f7b9eaf4e9a9.html>

Ventresca, M. (2019). The curious case of CTE: Mediating materialities of traumatic brain injury. *Communication & Sport*, 7(2), 135-156.

Verschuren, P. J. (2001). Holism versus reductionism in modern social science research. *Quality and Quantity*, 35(4), 389-405.

Vogel, J., Amnå, E., Munch, I., & Häll, L. (2003). Föreningslivet i Sverige: Välfärd, socialt kapital och demokratiskola. *Sociologisk Forskning*, 40(2), 53-89.

Work Environment Act, 3 C.F.R. § 3 (2022).

Växjö municipality. (2021). Sammanträdestider. Retrieved from <https://www.vaxjo.se/sidor/politik-och-demokrati/organisation-och-politik/namnderna-och-deras-forvaltningar/kultur--och-fritidsnamnden/sammantradestider.html>

Wankel, L. M., & Kreisel, P. S. (1985). Factors underlying enjoyment of youth sports: Sport and age group comparisons. *Journal of sport psychology*, 7(1), 51-64.

Weber, M. (1978). Economy and society: An outline of interpretive sociology (Vol. 1): Univ of California Press.

Weber, M. (2009). The theory of social and economic organization: Simon and Schuster.

Weber, M., & Edwards, M. G. (2012). Sport concussion knowledge in the UK general public. *Archives of Clinical Neuropsychology*, 27(3), 355-361.

Wegrich, K., & Jann, W. (2006). Theories of the policy cycle. In *Handbook of public policy analysis* (pp. 69-88): Routledge.

Weinstein, M. D., Smith, M. D., & Wiesensthal, D. L. (1995). Masculinity and hockey violence. *Sex Roles*, 33(11-12), 831-847.

Wennerholm, M. (2004). Tillåt slagsmål! Retrieved from <https://www.aftonbladet.se/sportbladet/hockey/sverige/shl/article10488498.ab>

Wennerholm, M. (2017). Bortom all vett och sans. *Aftonbladet*.

White, M. D., & Marsh, E. E. (2006). Content analysis: A flexible methodology. *Library trends*, 55(1), 22-45.

Williams, D., & Odin, L. (2016). Board diving regulations in public swimming pools and risk of injury. *Risk analysis*, 36(6), 1251-1261.

Wilson, T. C. (2002). The paradox of social class and sports involvement: The roles of cultural and economic capital. *International Review for the Sociology of Sport*, 37(1), 5-16.

- Wooten, M., & Hoffman, A. J. (2017). Organizational fields: Past, present and future. *The Sage handbook of organizational institutionalism*, 1, 131-147.
- Young, K. (1993). Violence, risk, and liability in male sports culture. *Sociology of Sport Journal*, 10(4), 373-396.
- Young, K. (2019). *Sport, violence and society*: Routledge.
- Yusko, D. A., Buckman, J. F., White, H. R., & Pandina, R. J. (2008). Risk for excessive alcohol use and drinking-related problems in college student athletes. *Addictive behaviors*, 33(12), 1546-1556.
- Zinn, J. O. (2009). The sociology of risk and uncertainty: A response to Judith Green's 'Is it time for the sociology of health to abandon "risk"?'. *Health, Risk & Society*, 11(6), 509-526. doi:10.1080/13698570903329490
- Zinn, J. O. (2017). The meaning of risk-taking – key concepts and dimensions. *Journal of Risk Research*, 1-15. doi:10.1080/13669877.2017.1351465
- Zinn, J. O. (2018). The proliferation of 'at risk' in The Times: a corpus approach to historical social change, 1785-2009. *Historical Social Research/Historische Sozialforschung*, 43(2 (164), 313-364.
- Örebro municipality. (2021). Fritidsnämnden. Retrieved from <https://www.orebro.se/kommun--politik/politik--beslut/namnder/fritidsnamnden.html>

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