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Checking In, Concussions Out: Body checking as a way of reducing concussion rates

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CHECKING IN, CONCUSSIONS OUT: BODY CHECKING AS A WAY OF REDUCING
CONCUSSION RATES

Undergraduate Thesis

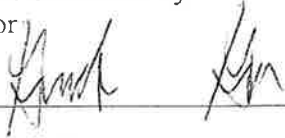
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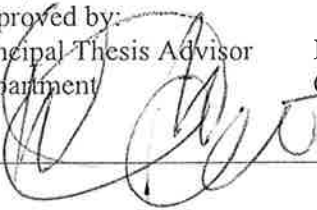
By

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Portland, Maine
May 2019

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I. Abstract

Women's college ice hockey, according to a study released by the NCAA in 2014, has the highest rate of self-reported concussions of any collegiate sport, men's or women's. This is shocking, considering the fact that body checking is illegal in women's ice hockey. Why are these rates so high when there isn't body checking? This investigative research project aims to realize a novel approach at reducing concussion rates in women's ice hockey by doing the unexpected: Allowing body checking. If body checking were allowed, this would reduce the rate of concussions if it were to be implemented and taught under proper standards and techniques. With the increasing concern for concussions in high school hockey, and the current rules and precautions in place, there is focus on girls' high school ice hockey in Maine. Maine is the optimal place to introduce body checking into girls' ice hockey. Researching this topic goes into uncharted depths in the body checking debate, as there is very little information that supports my these ideas, and lots of information that immediately refutes them. The research being pursued will hopefully support the notion to allow body checking in girls' high school ice hockey, as opposed to continually disallowing it. Research participants are athletic trainers, coaches, athletic directors, and referees around the state of Maine who have worked with high school ice hockey players. This research project serves as a foundation for future research and implementation of body checking in women's ice hockey, and contains several analyses pertaining to my research within the topic.

II. Acknowledgments

I would like to offer my thanks to all participants within my study as well as my faculty advisor Dennis Gilbert, M. F. A., for working with me in creating and executing the study, as well as monitoring the progress of this undergraduate honors thesis at the University of Southern Maine. I would also like to thank Daniel Panici, Ph.D., and Rebecca Nisetich, Ph.D., as additional components of my thesis committee, overseeing my thesis defense and offering their help. Thank you to Josephine Pucci, co-founder of the Headway Foundation, for being a resourceful and impactful interviewee. Thank you as well to the Undergraduate Research Opportunity Program and its committee at the University of Southern Maine for helping to shape and further explore through my research. Lastly, I'd like to thank my friends and family who have supported my research.

III. Introduction & Background

Wording best in an article by *The Canadian Broadcasting Corporation* (2014), “A concussion is a traumatic brain injury that results from a blow to the head. Symptoms include headache, confusion, memory loss, dizziness and nausea or vomiting. With repeated concussions, the brain can be permanently damaged.”

Beyond the problems of concussions in the National Hockey League are problems of concussions in women’s ice hockey, at all levels. An article released by the National Collegiate Athletic Association (NCAA) in 2014 detailed that in 2010, a study focusing in on 20,000 athletes at over 600 registered collegiate institutions reported that women’s collegiate ice hockey players had the highest rates of self-reported concussions for both male and female collegiate sports (Bell, Hwang, Paskus, Hainline, 2014). Hootman, Dick, and Agel (2007) revealed that over a four year collection period of data, women’s ice hockey had the highest rate of concussions per athlete-exposure amongst, yet again, all collegiate sports that were surveyed. An athlete-exposure(A-E) is defined as “1 athlete participating in 1 practice or game.” It is important to note that a separate study found that, conversely, concussion rates in ice hockey did not vary by sex (Rosene, Raksnis, Silva, Woefel, Visich, Dompier & Kerr, 2017). Either way, the fact that the rate at which concussions happen in women’s college ice hockey is frightening, considering the fact that the game does not allow for body checking and simply body contact. Ultimately, why are the concussion rates higher than or on par with the men’s game, if there is no body checking at any level for the women’s game?

First and foremost, it is important to note that at all levels for boys’ and girls’ ice hockey, the principles are the same, and so are the rules. What differentiates between the two is that eventually boys are allowed body checking, and girls are not. This carries through from professional hockey to international hockey - checking allowed in men’s hockey, and disallowed in women’s hockey. The equipment is also the same - though at high international

and professional levels of women's hockey, a cage is a typical extension of the helmet, whereas at high international and professional levels of men's hockey, a visor is the typical extension of the helmet. Because of this, it dismisses the somewhat backwards idea that visors for women would be more beneficial than cages - in fact, it raises another question; would women have even higher rates with just visors? This is not a major factor, but may be an interesting point of contention for further research.

Secondly, it is important to realize and distinguish the difference between body contact, and body checking. Body contact, as described by USA Hockey, is "when a skater makes body contact while angling or impeding the puck carrier and attempts to steal the puck." This is completely legal for the girls' and women's games, respectively. However, body checking, also as described by USA Hockey, is when "a player may legally attempt to separate a puck carrier from the puck using the trunk of his [or her] body." This, conversely, is completely illegal in the women's game, at all levels of play. Any sort of illegal body check within the men's game would "include taking more than two strides to make contact, contact with the head, jumping, extending the arms and hitting from behind," which would also carry over to the women's game if body checking were to be allowed. Two strides to make contact implies a charging penalty, contact with the head implies a penalty, jumping into a check is illegal, and extending the arms and hitting from behind often results in a hitting from behind or boarding penalty.

In talking to former U. S. Olympic women's ice hockey player, Josephine Pucci, in an interview by phone, she said that the line between what is body contact and what is body checking is blurred, and that there are discrepancies between referees. One referee may be more or less lenient toward physical play that may not be legal as opposed to another referee. This distinction is extremely important to note, as this is a recurring theme amongst respondents within my own personal study.

Inconsistency of refereeing is by no means a fresh point of interest, especially in the women's game. On Thursday, February 21, 2002, at the Olympic Games in Salt Lake City, the United States' women's ice hockey team ultimately fell to the Canadian women's ice hockey team in the gold medal game. However, it was marred by inconsistent officiating, seeing the Canadians get called for *eight* consecutive penalties, which included phantom (or nonexistent) cross checking and tripping calls. While the Canadians won, Hayley Wickenheiser, arguably the best female hockey player ever, called it "atrocious," as did Canada's captain, Cassie Campbell (Jacobs, 2002). Nevill, Hemingway, Greaves, Dallaway, and Devonport (2017) suggest that there is a certain inconsistency in situations where referees' decision-making processes are directly affected by their surroundings.

Though the referees' styles may be affected by their surroundings, it doesn't account for why body contact and body checking are held under a blur from an officiating standpoint. Shapcott, Bloom, and Loughhead (2007) suggested that women's hockey players are more likely to engage in more aggressive play when referees are less likely to catch them engaging in that act. However, for the most part, this most likely differs from body contact or checking, in which the puck is near the point of physical contact, in which the referee is most likely aware of the play. Hancock and Ste-Marie (2012) say that higher level referees with more experience are more likely to make accurate decisions whereas lower level referees with less experience are more likely to make inaccurate decisions on the ice.

While body contact... and referees... are inherently part of the women's game, body checking just isn't. In fact, the last time body checking was allowed in the women's game was the 1990 International Ice Hockey Federation's inaugural women's ice hockey world championship. European women's teams, at the time, played with body checking, and asked for it to be allowed in the tournament, though Canada and the United States played without it. European teams believed that this would give them a slight advantage over the two North

American powerhouses. A long story short, it actually gave the *North Americans* the advantage, who trounced their competition. Since that fateful tournament, body checking has simply not been allowed.

While I've strived to stay away from a gender perspective, it is necessary to talk about within this introduction, as it is a large factor of why body checking is simply not allowed. Weaving and Roberts (2013) suggest that traditional stereotypes of females/female athletes are problematic in breaking the prohibition of body checking; they say that "By incorporating checking into the women's game, it does not mean that violence will increase. Rather, by breaking down stereotypical barriers in women's sport, we will, in turn, create wonderful opportunities for girls and women to participate in a sport that demands physicality and develops new views of the female athlete capabilities" (p. 477). To clarify some of this wording - violence will not increase, but injuries will.

Beyond gender comes the issue of injuries. To be frank, the root cause of most hockey-related injuries is unfortunately: body checking. Emery, Kang, Schier et al. (2010) concluded from their study that "Among 11- to 12-year-old ice hockey players, playing in a league in which body checking is permitted compared with playing in a league in which body checking is not permitted was associated with a 3-fold increased risk of all game-related injuries and the categories of concussion, severe injury, and severe concussion" (p. 2265).

There is a significant risk especially with younger/less experienced players, which is problematic for girls' ice hockey players. Some players, upon high school, are skating for the first time, which only complexifies the matter.

Teaching anticipation, though, could be a saving grace in reducing *all* injuries. Mihalik, Blackburn, Greenwald, Cantu, Marshall and Guskiewicz (2010) highlight and endorse the "need to provide players with the necessary technical skills to heighten their awareness of imminent collisions and to mitigate the severity of head impacts," within ice

hockey. If players are able to properly *deliver, anticipate, and receive* body checks, injury rates including concussion rates will undoubtedly be reduced.

It's not that females aren't able to physically handle body checking, either. In 2005, Angela Ruggiero made her impact as the first non-goaltender to participate in a professional men's ice hockey game. According to a 2005 Associated Press article, Ruggiero experienced the physicality of the men's game and immediately responded: "Seconds after being checked on her third shift of the night, Ruggiero responded by slamming a Rio Grande Valley Killer Bees player into the boards." With proper training, as cited earlier, the game can indeed be the same. There is no reason why, if a female hockey player is matured and skilled, that they should continually be disenfranchised from having the ability to play men's professional hockey, body checking included.

Mac Schneider of Vox News published an article in early 2018 that quoted from a 2012 American Medical Society for Sports Medicine position statement that, "in sports with similar playing rules, the reported incidence of concussion is higher in female athletes than in male athletes." Other studies reaffirm this statement as well. BlueCross BlueShield's *The Health of America* report (2016) indicated that, "the growth of diagnosis rates for young females increased 118 percent from 6.1 to 13.3 diagnoses per 1,000 members, compared to an increase for young males of 48 percent from 11.5 to 17.0 diagnoses per 1,000 members during the study period [2010-2015]." This is a staggering statistic for both young men and women, but especially on the basis of the growth of diagnosis rates for women, which is hard to justify given the lack of apparent physicality that is initially seen in women's sports.

There are several medically suggested reasons as to why concussions are believed to happen more frequently in women's sports than men's. Collins, Fletcher, Fields et al. (2014) suggest that "smaller mean neck circumference, smaller mean neck to head circumference

ratio, and weaker mean overall neck strength were significantly associated with concussion,” and that typically, women have less overall neck strength. Though this point is understood, there is the possibility that this has to do with training as well; how women/girls train may not emphasize the importance of neck strength conditioning. This was very much brought to my attention after giving an oral presentation at the University of Southern Maine’s 2019 Thinking Matters Conference, after talking with a medical professional post-presentation. Hrysomallis (2016) found that “Concussed athletes had lower overall preseason isometric neck strength than non-concussed athletes,” implying that neck training does indeed work if taught properly (p. 1122).

Another important factor to take into consideration is that of playing style. Naturally, as one might expect, more physical contact typically results in higher rates of injury. In comparing results of a seven-year long study of men’s and women’s collegiate ice hockey players, Agel and Harvey (2009) concluded that “there were high rates of concussions from player contact,” for both men’s and women’s players. And, as T. J. Oshie, forward for the NHL’s Washington Capitals put it, despite how many concussions he’s had, “If I’m not going to play my style of hockey, I might as well not be playing... When I’m out there, the last thing I’m thinking about is if I’m going to get hurt or if I’m going to get another concussion. If it happens, it happens...” (Khurshudyan, 2019). While this is not particularly the best mindset from a medical standpoint, it is the ‘hockey player’ mindset.

A third factor is hormonal differences between men and women. In a study done by Covassin, Elbin, Harris, Parker, and Kontos (2012), they found that “...female athletes performed worse than male athletes on visual memory and reported more postinjury symptoms after concussion,” implying that there are problems within the hormonal differences inherent in male and female athletes. Likewise, a study done by Covassin, Elbin, Crutcher, and Burkhart (2012), found that “Results revealed female concussed athletes

reported more concussion symptoms compared to male athletes and more severe declines in simple and choice reaction time compared to their baseline measures. Moreover, female concussed athletes were 1.7 times more cognitively impaired than male concussed athletes” (p. 422).

A fourth factor in research is that of the difference of nerve fiber structure. Dollé, Jaye, Anderson, Ahmadzadeh, Shenoy, and Smith (2018), found that “At 24h post-injury, female axons exhibited significantly more swellings... than male axons... may also contribute to more extensive axonal pathology in females compared to males exposed to the same mechanical injury.” It is important to understand that an axon is a long threadlike part of a nerve cell along which impulses are conducted from the cell body to other cells. This, essentially, in this context, means that given the same injury, females’ nerve fiber structures have more potential to exhibit more negative reactions and/or problematic effects.

Whatever the case may be, the high rate of concussions in women’s sports in general represents a huge problem in the world of sport. In fact, Covassin, Moran, and Elbin (2016) concluded in their study that in all sports with the exception of lacrosse, female athletes had an overall greater time loss than their male athlete counterparts. Not only are these concussions proving to be happening at a greater rate for female athletes than male athletes, but concussions seems to have a generally more prolonged and negative effect on female athletes.

If body checking were to be allowed in girls’ high school ice hockey, instances of concussions and the rate at which they occur would be reduced, thus creating a safer sport for women and girls alike. High school hockey is a stepping-stone for many girls in their paths to NCAA ice hockey. Body checking should be introduced at this level. With regard to the level, the focus of my survey and research study pertains to Maine girls’ high school hockey.

The reality of this statement is that there is little-to-no evidence that actually supports it. On the other hand, there are many studies that refute it. Carson (2013) says “data points continue to support the knowledge that policy allowing body checking increases the risk of all injuries and the risk of concussion specifically.” Additionally, that “A five-year cohort study (2002 to 2007) that included all age groups, provides further evidence demonstrating that injury risk increases 3.75 times in leagues that permit body checking compared with those that do not permit body checking” (Darling et al., 2011 as cited in Carson, 2013). Those are strong refutes against my initial argument.

However, I feel strongly about my statement and am willing to make a case for its legitimacy in this paper. Ultimately, the hope is that data collected within my study as well as comments collected within my study will shape up to a response from participants that would support a trial year of body checking in girls' high school ice hockey in Maine, if body checking were properly taught under NFHS (The National Federation of High School Sports) guidelines, including a) how to prepare and brace for a body check, b) how to properly deliver a body check, and c) what is deemed illegal or legal. This trial year would be taking place at the high school level and while I would certainly be interested in carrying out this study, I do not have the funds nor resources to properly embrace it and allow for it to happen in a professional manner at this time.

IV. Methodology

Maine has just 16 girls' high school ice hockey teams. This is a very small sample size in comparison to a state like Massachusetts that has over 90 girls' high school ice hockey teams. Maine has a sample size small enough that it can be managed but large enough so that it can give meaningful survey results.

There are 8 teams within the North Division to survey: Lewiston, Edward Little/Leavitt/Poland, Mt. Ararat/Morse, Brunswick, Greely/Gray-New Gloucester, Yarmouth/Freeport, Winslow/Gardiner, and St. Dominic.

There are 8 teams within the South Division to survey: Portland/Deering, Gorham/Bonny Eagle/Massabesic, Scarborough, Biddeford/Thornton Academy/Wells, Cape Elizabeth/Waynflete/South Portland, Falmouth, York/Traip/Marshwood, and Cheverus/Kennebunk.

Most teams within the state are composed of a collective group of players from multiple towns within the area. The feeder programs and teams within the state are similar to this, once again composing of players within an area. Feeder programs are programs that develop younger players within their towns to be able to compete at higher levels such as high school hockey or prep hockey. Additionally, only a handful of these 16 teams have middle school programs. Between the middle school and feeder programs, many towns are not able to field a full team, and often, there are many first-year players on any given team. Adding a player from another town onto a high school team that does not have the affiliated team is subject to Maine Principals' Association approval. In example, a player from Cornish would need approval from the Maine Principals' Association in order to play for Gorham/Bonny Eagle/Massabesic. Any town that does not have a girls' ice hockey program will allow for a girl to play on the boys' team, with body checking enabled. This often happens in towns that are too far from a girls' program.

My study did not involve any players within the organizations themselves, as to avoid any run-ins with breaching privacy of student-athletes, or the Health Insurance Portability and Accountability Act of 1996 (HIPAA). My study consists of surveying, for each of 16 Maine high schools that have ice hockey as a competitive and non-club sport, athletic directors, athletic trainers, boys' head coaches, and girls' head coaches. There was also additional surveying done of prominent referees within the state of Maine (typically 10+ years' experience each as a designated survey grouping).

There were 16 designated athletic directors, 16 designated athletic trainers, 16 designated boys' head coaches, 16 designated girls' head coaches, and 4 designated referees to be surveyed on an individual basis. Survey questions and content varied based on title. In total, there were 68 total designated participants for this survey.

- Of 16 designated athletic directors, 3 responded, for a response rate of 18.75%.
- Of 16 designated athletic trainers, 2 responded, for a response rate of 12.5%.
- Of 16 designated boys' head coaches, 1 responded, for a response rate of 6.25%.
- Of 16 designated girls' head coaches, 5 responded, for a response rate of 31.25%.
- Of 4 designated referees, 2 responded, for a response rate of 50%.
- Of 68 total designated participants, 13 responded, for a response rate of ~19.11%.

The response rate, across the board, was disappointing. Each participant was sent an introduction email, a unique survey link with a consent form via a second email, and a check-in third email. Participants were also given contact info of my supervisor, Dennis Gilbert, and myself if they had run into any questions. Before getting into actual analysis of survey results, there are several points that need to be taken into consideration:

- a. Of the 3 athletic directors who responded, 3 enlisted the help of their athletic trainers. 2 out of the 16 athletic directors gave answers via email, as opposed to answering the survey directly, which nullifies their answers, as they are not registered into survey results.

b. Of 16 designated boys' head coaches, 4 responded after the check-in third email that they did not have anything to do with girls' ice hockey, and thus did not participate because of that idea. This implies that they did not pay any attention or bother to read the introduction email, which clearly stated the importance and role of their participation within this study. This also turns into question whether or not others simply ignored the introduction email, and thus, the rest of the study. If this is true, it explains why the overall response rate is so low - people are not taking the survey seriously nor legitimately, and are ignoring it altogether.

Survey results will be divided into titles, followed by an analysis of the survey data before moving onto the next title. At the end of the survey results and analyses, there will be a comprehensive analysis of all data.

V. Analyses of Surveys

Title: Athletic Director Survey

Chart is from page 39.

With the given data in hand from these three athletic directors, it is surprising that girls' high school ice hockey players have less concussions per year than boys' high school ice hockey players.

	Boys' Ice Hockey	Girls' Ice Hockey
2018-19	2	1
2017-18	6	2
2016-17	3	2
2015-16	3	1

This, however, is an extremely limited sample size, which happens to be a recurring theme in future data sets. There is not a single year through the data collected that signifies that girls had higher rates of concussions than boys. Additionally data collected outside of the survey (i.e. an email and not a survey response) indicated more of the same.

These results are contrary to the results of the 2014 NCAA study referenced earlier, though it could be that it has to do with the level of play in comparison to collegiate ice hockey. This is high school girls' ice hockey in Maine, which, as later analyses find, is not a 'concussion hotbed.' However, with that being said, it was still an extremely limited sample size to work with, and may fluctuate depending on the year or school.

One thing to take into consideration in looking at these numbers is that one of the schools cited 4 concussions in boys' ice hockey alone in 2017-18, which somewhat skews the table and the overall percentage of concussions of boys' players versus girls' players.

As said previously, there were several additional data sets from athletic directors that chose not to respond to the survey itself, instead either offering their statistics via email or making their athletic trainers answer, despite the athletic trainers having their own survey.

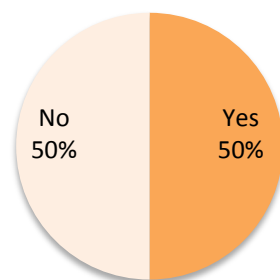
From a personal standpoint, this is somewhat disconcerting, that there are some athletic directors that do not have direct access to these records, and that they are kept with athletic trainers instead, while others have direct access. This is surprising, as the records seemed to be more informal than formal.

Title: Athletic Trainer Survey

Chart is from page 41.

Athletic trainers' responses were somewhat surprising, as they had different responses to questions on all but 20% of all questions asked. Out of the unanimous and non-split decisions answers, like girls' head coaches in the upcoming analysis of Appendix D, they did believe off of Q1 that the majority of concussions happening to girls' ice hockey players are not the results of unexpected collisions. Like coaches (80% of coaches to be specific), both athletic trainers were not surprised that 2014 NCAA study reported that women's college ice hockey players had the highest rate of self-reported concussions among all collegiate athletes, male and female. However, there was discrepancy with Q2 as they were split on whether self-reported concussions were typically higher for girls' than boys' players.

One trainer said yes, that there were inconsistencies in officiating between Maine high school hockey referees, and what is deemed physical contact or body checking differs on a referee-to-referee basis (Q4).



Both trainers, though, mostly agreed that the MPA and NFHS do a pretty good job of working to minimize concussions and the rate at which they occur, as well as placing an emphasis on player safety as well. However, when posed with a question of the effectiveness of the current rules in place at the high school level for boys' ice hockey do well in minimizing head contact and penalizing those who break those rules (Q10), one trainer

slightly disagreed while the other moderately agreed, which were not convincing results (and somewhat controversial) in comparison to their previous answers about the MPA and NFHS.

Both trainers were less than or immediately neutral on the thought of allowing body checking in girls' ice hockey at the Maine high school level (Q11) and these results were exactly the same for the thought of allowing body checking in girls' ice hockey nationally at the high school level (Q12). Both agreed to some extent that allowing body checking in girls' ice hockey would indeed create more injuries (Q14) - which was an expected result. However, when posed with the idea of supporting a trial year of body checking in girls' high school ice hockey in Maine, if body checking were properly taught under NFHS guidelines, including a) how to prepare and brace for a body check, b) how to properly deliver a body check, and c) what is deemed illegal or legal (Q15), one of the trainers said that maybe, they would support it, under the condition that a "factor that needs to be looked at is girls' strength specifically neck strength," which runs a parallel to one of the reasons why people believe that female are more susceptible to concussion rates.

Title: Boys' Head Coach Survey

This data set, in particular, is the most frustrating and neutral data set of the five surveys. There is not much analysis to offer here, which is somewhat disappointing. It was initially expected that more boys' head coaches to respond, though after three emails to each (a total of 48 emails), and merely five responses (a yes, a "why are you contacting me," and a maybe), this particular survey has fallen well below expectations.

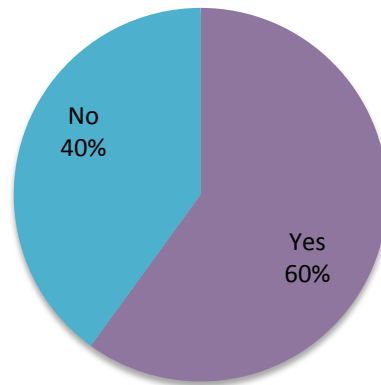
Additionally, another frustrating aspect of this particular survey is the lone respondent's concussions per year chart that only listed two concussions from this past season in the grid and how they came to be. It is simply not enough data to work with, being only 2 descriptions out of 9 potential concussions. While memory plays a large part in this, the value of the response is minimal and does not detail much.

Overall, this is an extremely disappointing segment of my study as a whole. While the idea of omitting this portion of the study was entertained, it is included on the basis that it does offer a minimal insight into the 'neutral' aspect of the uneasiness amongst boys' coaches as well in allowing body checking in girls' hockey. While this is not inherently for sexist reasons (i.e. girls are supposed to be pure, inferior), it does have to do with keeping the sports separate from a physical standpoint, as it promotes girls playing boys' hockey - something that is somewhat socially frowned upon.

A colleague explicitly expressed that "girls should not play boys' hockey, and that girls should develop as girls players, with other girls." While this is understandable, there are instances in which women's hockey players have played in men's leagues (Shannon Szabados, Manon Rheaume, Hayley Wickenheiser, Angela Ruggiero, etc.). The separation of girls from boys' hockey is ultimately down to a debate over gender equality, is not pursued within this paper beyond what was said in the introduction.

Title: Girls' Head Coach Survey

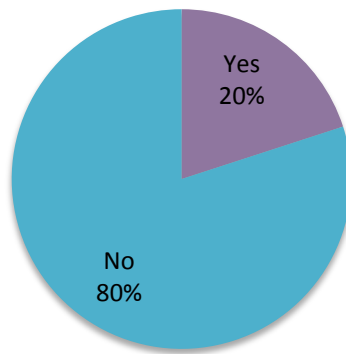
Charts are from pages 50 to 62.



The girls' head coaches had the most intriguing responses across all survey responses. Only 60% of surveyed coaches said that they had seen their players have at least one concussion over the past four years (Q1). This is surprising, but not when accounting for the turnover rate of head coaches; one respondent who didn't have any instance of concussion amongst their players had only one year of coaching their team. Conversely, the other respondent citing no concussions had been coaching for three years.

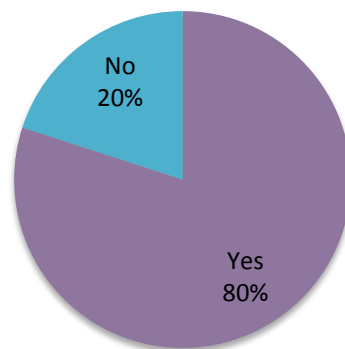
Of the concussions remembered by the three coaches reporting to have had them in their players, thirteen of the fourteen concussions remembered (93%) were in-game. Eleven of thirteen (85%) of these concussions were the result of expected or unexpected collisions. Three of thirteen (23%) were *definitively* the result of an unexpected collision (Q3). However, though there were definitive unexpected collisions, coaches unanimously agreed that unexpected body checks were not the root of the majority of concussions.

Instances of self-reported concussions were a controversial topic. Only 60% (Q5) said that they believed that self-reported concussions happened more frequently with girls than boys, which was very surprising based on my previous review of most literature. Yet, 80% (Q7) thought that the 2014 NCAA study, again referenced earlier, was surprising.



For one coach, it seems that they are torn across this topic, as it was expected of Q7 to parallel Q5 statistically speaking.

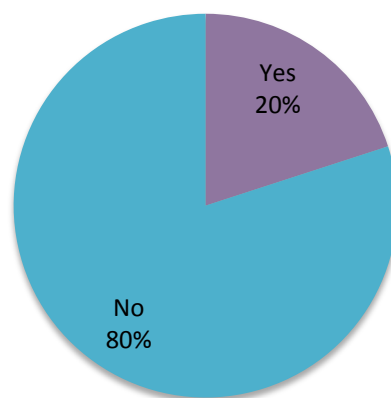
Let’s get into something that is somewhat shocking with relevance to inconsistency of refereeing within the sport. 80% of the girls’ head coaches believe that there are *indeed* inconsistencies between Maine high school hockey referees, and what is deemed physical contact or body checking differs on a referee-to-referee basis (Q8).



This is a recurring theme amongst the statistics. The Maine Principals Association does place a heavy emphasis on player safety, judging by these comments from Q12: “Both the MPA and Officials have emphasized the past 8-10 years an extreme crackdown any and all head contact, even accidental.” “MPA can't protect players but stricter penalties are in place.” “Each year the MPA holds a mandatory rules clinic for all head coaches. There is always an emphasis on concussion protocols as well as an emphasis on illegal contact that

may result in a concussion symptom.” With all of this taken into consideration, it’s apparent that while everyone is aware of the problems with concussions and how rules are in place to prevent those concussions from happening, inconsistency in refereeing that potentially allows for more aggressive and physical play substantially detracts from the overall effectiveness of the emphasis on protecting players from head trauma and concussions.

Most (60%) of the coaches somewhat to moderately agree that the current rules in place at the high school level for boys' ice hockey do well in minimizing head contact and penalizing those who break those rules (Q13). However 80% (Q20) of coaches would *not* support a trial year of body checking in girls' high school ice hockey in Maine, if body checking were properly taught under NFHS guidelines, including a) how to prepare and brace for a body check, b) how to properly deliver a body check, and c) what is deemed illegal or legal. One of the major flaws in this study arises from this question, in which additional answers as to why coaches felt so strongly on this end of the spectrum were not pursued. On the other hand, there were several important responses from previous questions that shaped this 80% statistic.



FOR BODY CHECKING:

1) “If taught at an early age the girls, much like the boys, understand how to correctly incorporate body checking as well as receive the physical contact. There is far too much ambiguity in what is allowed in the girl's game which manifests itself in inconsistent refereeing and presents a danger with regard to concussions.” *As the lone respondent who supports body checking, it is hard to gage the value in comparison of allowing body checking to make its way into girls’ hockey as opposed to disallowing it. On the other hand, ambiguity of what is allowed in the girls’ game again points to inconsistency of officiating.*

AGAINST BODY CHECKING:

1) “the boys and girls play by the same rules except on body checking/contact. I do not believe that girls hockey should allow body checking, but that officials need to be better trained on what is body contact and what is body checking.” *It is interesting to note here that there is an emphasis on the officiating here.*

2) “Unquestionably no on multiple levels. First, the game is very immature and aside from the top teams, the majority all have inexperienced players that do not have the skating skills required to protect themselves. **Secondly, the current rash of head injuries at Prep and NCAA levels suggest that the girls are more susceptible to concussions (though theories why are varied)**. Finally, it is not what the girls want. They want to play a hard and physical game, but none that I have coached on teams or in clinics have ever suggested the would prefer a checking game.” *This response is considerably similar to the response before, but does add to the claim made earlier about rates of concussions for female athletes by saying how girls are more susceptible to concussions. It is intriguing that this coach makes note that ‘it is not what the girls want,’ though this is completely contrary to multiple sources, especially that of the lone coach who is for body checking.*

3) “there are a lot of girls that can barely skate. bodychecking would be devastating to them and their development as players.” *Perhaps Maine girls’ ice hockey is lagging behind in developing players, given the statement that “there are a lot of girls that can barely skate.”*

4) “there are some new girls learning the sport at the HS stage. Therefore, they aren't ready to engage in learning to body check.” *Again, this speaks to the problem of development of girls’ ice hockey players, and starts to point fingers at feeder programs, and the lack of overall participation from girls’ hockey players within the state in general.*

Another interesting part of the research was the amount of time missed based on data of instances of concussions remembered. Concussions, on average, without including the concussion that sidelined a player for the entire season, kept players out for two to three weeks. This is a statistic that is odd, as only two of the reported concussions saw the player see one month or more of their season diminished due to their injury. This means that the majority of concussions happening are mild; this can be further explored due to the idea that perhaps the skill level and physical strength/training plays a role in why the concussions are just mild. If the concussions were of a bigger problem with players missing more time than what has been explored, there may be a correlation in play with the pace and skill level of the players involved – meaning that concussions within women’s college ice hockey and prep hockey *should* typically be more severe than *just* high school hockey. However, in reviewing literature, it is hard to gage if this could be a potential correlation.

Based on this evidence that the mild concussions that happen at lower levels including high school hockey and within youth hockey start to stack up, concussions at the prep and collegiate levels more severe and more detrimental to the well-being and physical health of any given player. As Covassin, Moran, and Elbin (2016) had explored, the high concussion rates in women’s sports often lead to instances of extended time loss within players. If

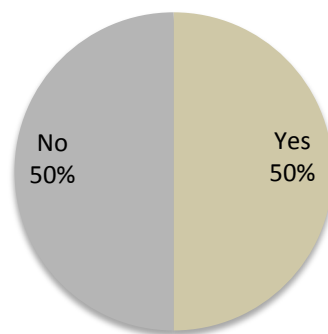
concussions are happening at the rate at which they are, then surely part of the reason behind the rate is the rate at which they occurred at an earlier age.

Title: Referee Survey

Charts are from pages 63 to 67.

The referees that were surveyed were two prominent referees within the state of Maine, meaning that they have held numerous years of officiating experience, as well as having a significant impact on the Maine hockey refereeing community as a whole.

Something that immediately stands out to me, is question two, addressing the statement: “Different referees lean toward more physicality or less physicality during girls' ice hockey games.” The two respondents were interestingly split on this question, which was not what was expected, considering they’re representing Maine hockey referees.



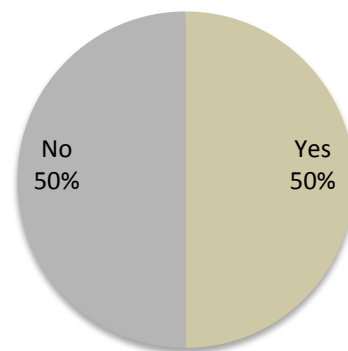
It’s a very interesting split, as it is ultimately an honest view from a prominent referee, implying that this indeed is a problem. This plays back on what Josephine Pucci said about referees – even at the international level – having biases or tendencies to call games differently from a physical aspect than their counterparts. *However* on question one, both referees unanimously decided that there are not *inconsistencies* between Maine high school hockey referees’ tendencies in refereeing what is deemed physical contact or body checking; that this does not differ on a referee-to-referee basis in girls' high school hockey. These two questions (Q2/Q3), though close in wording, were not meant to be manipulative. There is a possibility that one of the referees, who responded that yes, different referees lean toward more physicality or less physicality, is saying that while there are not inconsistencies in what

is concretely by definition a penalty, they may allow for more freedom of girls' players to utilize their bodies in such a physical way that it veers on the borderline of what is legal or illegal.

While the responses varied, it does indeed *affirm* the problem of inconsistency of officiating being detrimental to not only what would potentially be the girls' body checking game, but the boys' side as well.

The respondents do generally agree that rules in place are sufficient in protecting players from concussions, and that the MPA and NFHS both place a significant emphasis on protecting high school girls' ice hockey players. Both were in strong agreement that the NFHS rules are also *effective* in minimizing body checking in girls' ice hockey.

Another very interesting point, though, is that there is another split on supporting a trial year of body checking in girls' high school ice hockey.



This is *monumental* as it is a higher-up person within the sphere of Maine high school hockey in general that supports a major change to the game. Upon looking back at this result, it would have been convenient to include a write-in box as to why they support/do not support it. While the coaches had explicitly clear reasons as to why, answered by different questions, referees' answers aren't entirely indicative of reasoning behind their answers here.

One of the respondents said that question eight does not make sense, considering the fact that the boys' and girls' high school ice hockey players play under the same rules with the exception of body checking; it was my fault in not clarifying what had been meant by this question. The question was intended to be focused on the disciplinary side of the rules, including penalties and in-game disciplinary actions.

Respondents' answers varied in content, which was good to see with such a small sample size. The difference between the respondents was interesting, as each response that is different can be justified.

VI. Further Discussion

There are several things regarding my study and information gathering practices that should have been done differently. There should have been an inclusion of more open-text response boxes, as to include more varied thoughts amongst more subject matters. Also, keeping a consistent scale from question-to-question would have allowed for clearer answers; removing numerical values as well and instead going by qualitative terms only. Several questions could have been reworded, and perhaps that several questions be completely omitted.

As for the analyses themselves, here are eight key points as well as discussion:

1. One of the largest takeaways from my analyses is that there is undoubtedly a major inconsistency in officiating in girls' ice hockey. This was previously highlighted in the introduction. Nearly half of participants believed that there is inconsistency(ies) in what is deemed body contact or body checking in girls' high school ice hockey in Maine. If it's happening at the high school level, and the international level, then it is certainly happening at the collegiate level and levels below high school (though may not be as apparent in Maine, with limited programs). The Maine Principals' Association must act on this and make sure that their officials are well-versed in what is deemed body contact versus body checking, as this line has conclusively gotten much too blurry. Consistency is key.
2. *Most* participants were generally uneasy about supporting, much less allowing, a trial year of body checking in girls' high school ice hockey in Maine, if body checking were properly taught under NFHS guidelines, including a) how to prepare and brace for a body check, b) how to properly deliver a body check, and c) what is deemed illegal or legal. This was incredibly surprising, given the narrative that was worked with previously before this study - which was that girls would like to body check, and

that coaches would like to see it too. Lim, Han, Uhlhaas, and Kaiser (2015) suggest that females mature from a mental state faster than males, which means that it would indeed be easier to teach females at a younger age, or high school age, as to ensure a smooth transition into body checking. If players are taught anticipation from an early age as well, that dramatically reduces the rate at which any injury occurs. In a study involving young female ice hockey players, Decloe, Meeuwisse, Hagel, and Emery (2014) say that “player education sessions regarding how to safely receive body contact or body checking could also be studied as an intervention,” (p. 6) implying that properly training players how to receive and deliver checks needs to be focused on to reduce injury rates.

3. The skill gap in Maine girls’ high school ice hockey is a massive barrier to allowing body checking. It may be suggested, based on these results, that if body checking were to be allowed, it only be allowed at the *varsity* level in high school, as to put less inexperienced skaters at risk of injury. Risk of injury with inexperienced or physically unprepared skaters seemed to be at the forefront of importance with several varying responses.
4. It seems that most of the participants are fully aware that concussions are a problem in girls’ and women’s ice hockey, especially when it comes down to the collegiate level. The awareness demonstrated by survey respondents was enlightening and does make it clear that this is an issue that is ongoing and being watched carefully. Part of the battle is simply knowing that concussions in women’s ice hockey are a serious problem, and it was a little bit surprising to me that nobody asked why. Or came up with a separate answer, beyond the trainer whose comment about neck strength implied that as a major cause.

5. For the most part, participants thought that the NFHS and MPA jointly do a pretty good job at keeping the sport of ice hockey safe, with very protective rules, and enforcement in place in case that rules get broken.
6. All participants that were asked if they were comfortable and well-versed in identifying symptoms of concussions said ‘yes.’ This implies that student-athletes are in safe hands, from athletic trainers to coaches.
7. Concussions for boys’ ice hockey seemed to be slightly more frequent than concussions in girls’ ice hockey. While there is no concrete data from boys’ head coaches, the rate at which concussions happened via athletic directors, trainers, and girls’ head coaches suggest that boys’ high school players in Maine have slightly higher rates of concussions than girls’ players. This is not definite.
8. A concussion is a concussion, even if simply a mild instance. Concussions happening at high rates at lower levels will contribute to the severity of concussions at higher levels. Even if the player misses only a few weeks, the concussion history is established and becomes a problem. Concussions need to be stopped at a lower level, which really puts my argument into jeopardy given the surrounding literature that pertains to the negative effects of allowing body checking in youth hockey, in relation to concussions.

The million-dollar question then becomes, ‘what’s next?’ There were comments from a prominent and well-known girls’ ice hockey coach in the state of Maine, who had this to say about my study: “I would encourage you, however[instead of studying girls’ high school ice hockey in Maine], to study the top prep and even college programs... I think you will find that there is a very high incident of concussions in girls hockey at the top prep level (Kent, Nobles, Williston, St Paul’s, Andover, . . .).” This was eye-opening, as it was something that had not been touched on. The same individual within my study also cited that high school hockey for *most* participants within the state of Maine was generally the last level of competitive organized ice hockey that they would play by saying, “For the huge majority of HS players, it is the final level of competitive play for them.”

Combined with the statistics and commentary found within my study that support the notion that body checking *should not* be allowed at the Maine girls’ high school hockey level, my initial research statement is, unfortunately, incorrect for the Maine high school girls’ level. However, there is enough room to test that a higher level, given the faster play, more experienced players, better skaters, and upward trend of physical contact as a whole.

While the implementation of a trial year may not be the first item on the agenda to tackle, there is a plan for it. It should be ‘grandmothered in,’ and not forced on all levels of play at once. Part of the reason girls’ high school ice hockey in Maine was chosen was for *adaptability*, in which players can be molded and transformed from non-body checking to body checking. This plan must be implemented in a controlled environment, such as Maine preparatory or high school hockey, with a limited sample size. This implementation plan would be less likely to work in a state like Massachusetts, which features over ninety girls’ ice hockey high school programs, and thus, becomes a logistical nightmare.

Sixteen teams (the number of teams in Maine) would be an ideal sample size, with limited participants. Assuming body checking is *only* allowed for the varsity level, the max

number of participants would be 320; Massachusetts would be close to 2,000. If a trial year were to be allowed with body checking implemented, the use of athlete-exposures would be the best way of measuring concussion statistics. To reiterate, an athlete-exposure(A-E) is defined as “1 athlete participating in 1 practice or game.” Results could then be analyzed at the rate of an incident per one thousand athlete-exposures. To best make use of the data, injuries other than those to the head should be tracked as well.

Coaches would have to be taught under USA Hockey guidelines to properly implement, train, and coach their players as to what is considered a body check, as well as the legal and illegal ways to deliver, or receive.

Though a trial *year* would be *optimal*, a summer league session would suffice for a data collection period, which would not interfere with the winter league regular season.

VII. Conclusion:

It is crucially important to note that the purpose of this study and thesis is not to be right or wrong.

It is to establish a foundation for future studies that support thoughts about body checking being a way to reduce high rates of concussions within women's and girls' ice hockey and/or other methods of reducing these rates.

The reality of this topic is that it is a novel approach that has not yet seen sufficient research to accurately dictate a comprehensive result and conclusion. However, there is a framework for future research that has been grounded by this thesis.

This thesis has offered a deep-dive into concussions in women's ice hockey, why they happen, and what can be done to start minimizing them and protect the heads and lives of female ice hockey players. Additionally, there have been suggestions for the next steps made that could potentially lead further research, and have started a new chapter in the war on concussions in sports.

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IX. Full Survey Results

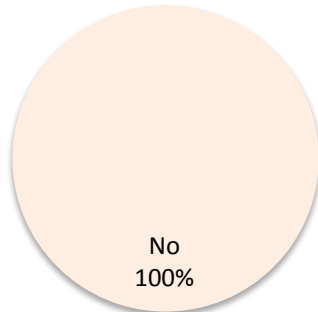
Title: Athletic Director Survey. Respondents: 3.

1. Using your knowledge and IMPACT testing data, please list, to the best of your ability, the number of concussion per year that have happened in boys' ice hockey as well as girls' ice hockey at your school.

	Boys' Ice Hockey	Girls' Ice Hockey
2018-19	2	1
2017-18	6	2
2016-17	3	2
2015-16	3	1

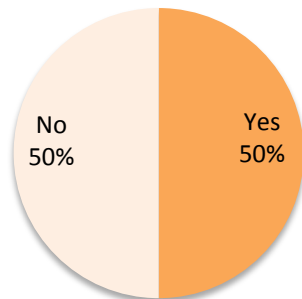
Title: Athletic Trainer Survey. Respondents: 2.

1. The majority of concussions that happen to girls' ice hockey players are from unexpected body checks from opposing players.



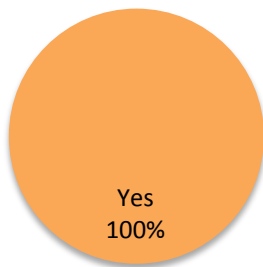
Value	Percent	Count
No	100.0%	2
	Totals	2

2. In your opinion, are instances of self-reported concussions typically higher with girls than boys?



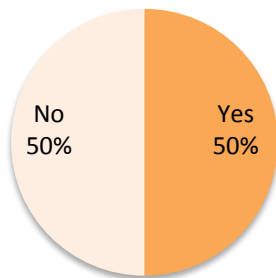
Value	Percent	Count
Yes	50.0%	1
No	50.0%	1
	Totals	2

3. Do you feel that, in general, athletic trainers in Maine high schools have sufficient training in identifying concussion symptoms in all ice hockey players after they sustain hits or any incidental contact to the head?



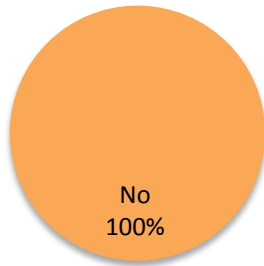
Value	Percent	Count
Yes	100.0%	2
	Totals	2

4. Do you believe that there are inconsistencies between Maine high school hockey referees, and what is deemed physical contact or body checking differs on a referee-to-referee basis?



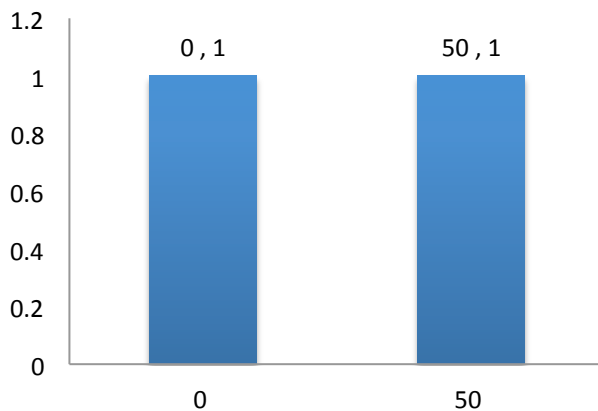
Value	Percent	Count
Yes	50.0%	1
No	50.0%	1
	Totals	2

5. A 2014 NCAA study reported that women's college ice hockey players had the highest rate of self-reported concussions among all collegiate athletes, male and female. Is this surprising to you?



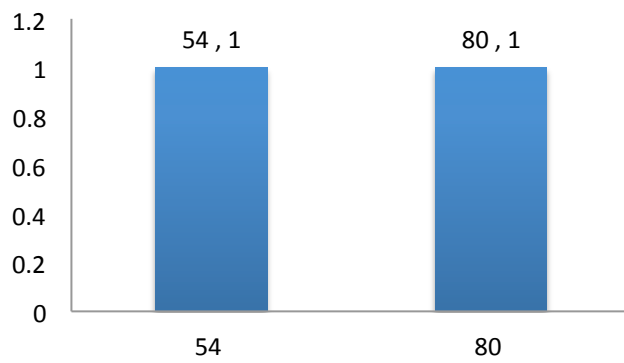
Value	Percent	Count
No	100.0%	2
	Totals	2

6. Girls' high school hockey would see less instances of concussions if body checking were allowed because girls would be more adequately protected for the physical contact inherent in the game.



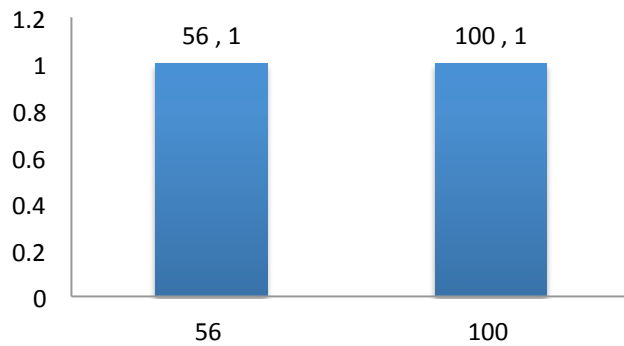
Count	Response
1	0 (Strongly disagree)
1	50 (Neutral)

7. NFHS rules effectively protect players from head trauma and concussions.



Count	Response
1	54 (Neutral)
1	80 (Agree)

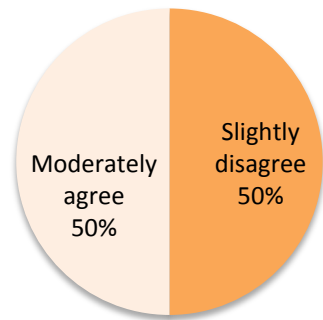
8. The MPA places a sufficient and effective emphasis on protecting players from head trauma and concussions.



Count	Response
1	56 (Neutral)
1	100 (Strongly agree)

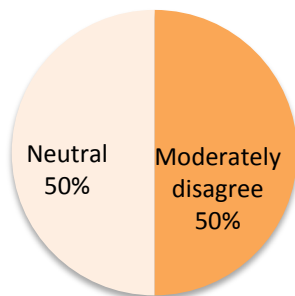
9. Explain your decision on the slider (No responses)

10. The current rules in place at the high school level for boys' ice hockey do well in minimizing head contact and penalizing those who break those rules.



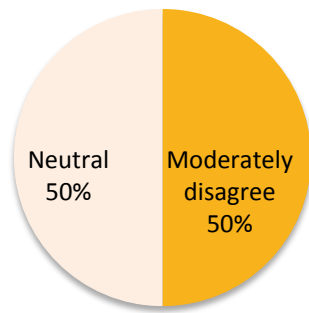
Value	Percent	Count
Slightly disagree	50.0%	1
Moderately agree	50.0%	1
	Totals	2

11. The current rules in place at the high school level for boys' ice hockey could be applied to girls' high school ice hockey.



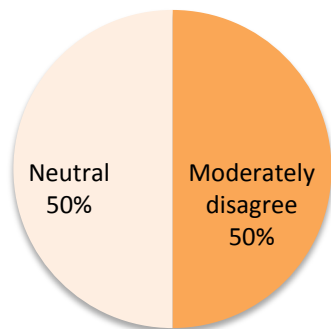
Value	Percent	Count
Moderately disagree	50.0%	1
Neutral	50.0%	1
	Totals	2

12. Body checking should be allowed in girls' ice hockey in Maine at the high school level.



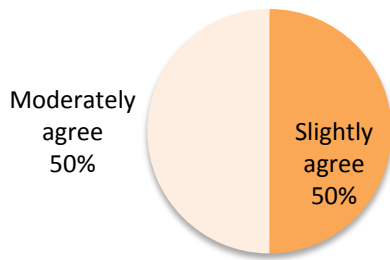
Value	Percent	Count
Moderately disagree	50.0%	1
Neutral	50.0%	1
	Totals	2

13. Body checking should be allowed in girls' ice hockey nationally at the high school level.



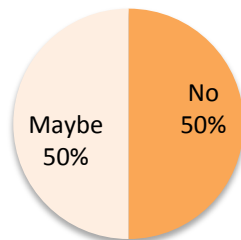
Value	Percent	Count
Moderately disagree	50.0%	1
Neutral	50.0%	1
	Totals	2

14. Allowing body checking in girls' ice hockey in Maine at the high school level would increase injury rates that are not related to concussions and/or head trauma.



Value	Percent	Count
Slightly agree	50.0%	1
Moderately agree	50.0%	1
	Totals	2

15. Would you support a trial year of body checking in girls' high school ice hockey in Maine, if body checking were properly taught under NFHS guidelines, including a) how to prepare and brace for a body check, b) how to properly deliver a body check, and c) what is deemed illegal or legal?

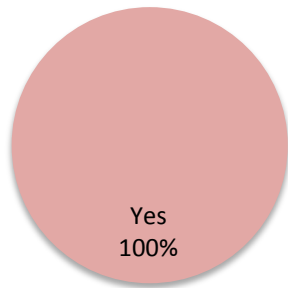


Value	Percent	Count
No	50.0%	1
Maybe, this is what I'd do - Write In (Required)	50.0%	1
	Totals	2

Maybe, this is what I'd do - Write In (Required)	Count
I believe one important factor that needs to be looked at is girls strength specifically neck strength	1

Title: Boys' Head Coach Survey. Respondents: 1

1. Have any of your players sustained a concussion in the past four years (if applicable)?



Value	Percent	Count
Yes	100.0%	1
	Totals	1

2. If yes, in what year did the concussion happen? Mark a concussion with an "I." If multiple concussions for a given year, leave more than one tally. I.e. 2018-19: I 2017-18: II 2016-17: I 2015-16: IIII

	Concussion
Year	Tally Count
2018-19	2
2017-18	3
2016-17	2
2015-16	2

3. To the best of your memory and/or other sources (IMPACT, athletic trainer, assistant coaches), for each tally per year, describe

- a) if the concussion happened in-game or in-practice,
- b) what happened on the play,
- c) if there was a penalty on the play,
- d) duration in which player was NOT cleared to play,
- e) if the player was Junior Varsity or Varsity, and
- f) their position.

Please keep personal identifiers such as names of players out of the survey. If a player sustains multiple concussions over the past four years or within the same year, refer to player such as “Player A” or “Player B.” Example: 2017-18 First Tally: a) in-game. b) The opposing player came down center ice and cross-checked player A in the head while he possessed the puck on a breakout pass. c) There was a major penalty on the play. d) The player missed 4 weeks. e) Varsity. f) Left Wing Second Tally: a) ... b) ... c) ... d) ... e) ... f) ... EXTRA boxes are at the bottom if there are more than 6 instances of concussions in a year.

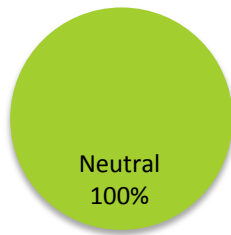
	a) if the concussion happened in-game or in-practice	b) what happened on the play	c) if there was a penalty on the play	d) duration in which player was NOT cleared to play	e) if the player was Junior Varsity or Varsity	f) their position
2018-19 (1st Tally)	in game	?	no	3 weeks	Varsity	F
2018-19 (2nd Tally)	in practice	knee to head	no	4 weeks	Varsity	F

4. The current rules in place at the high school level for boys' ice hockey do well in minimizing head contact and penalizing those who break the rules.



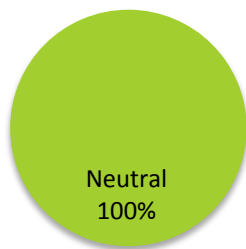
Value	Percent	Count
Slightly agree	100.0%	1
	Totals	1

5. The current rules in place at the high school level for boys' ice hockey could be applied to girls' high school ice hockey.



Value	Percent	Count
Neutral	100.0%	1
	Totals	1

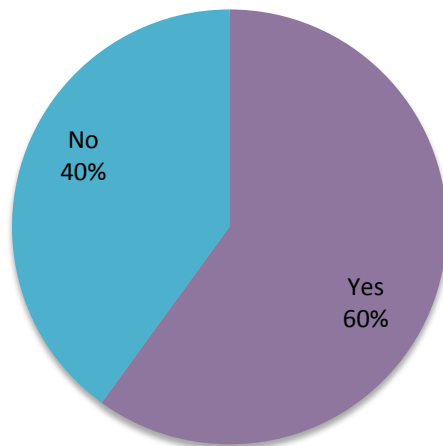
6. Body checking should be allowed in girls' ice hockey in Maine at the high school level.



Value	Percent	Count
Neutral	100.0%	1
	Totals	1

Title: Girls' Head Coach Survey. Respondents: 5.

1. Have any of your players sustained a concussion in the past four years (if applicable)?



Value	Percent	Count
Yes	60.0%	3
No	40.0%	2
	Totals	5

2. If yes, in what year did the concussion happen? Mark a concussion with an "I." If multiple concussions for a given year, leave more than one tally. I.e. 2018-19: I 2017-18: II 2016-17: I 2015-16: IIII

	Concussion
Year	Tally Count (all)
2018-19	3
2017-18	3
2016-17	2
2015-16	2

3. To the best of your memory and/or other sources (IMPACT, athletic trainer, assistant coaches), for each tally per year, please try your best to describe

- a) if the concussion happened in-game or in-practice,
- b) what happened on the play,
- c) if there was a penalty on the play,
- d) duration in which player was NOT cleared to play,
- e) if the player was Junior Varsity or Varsity, and
- f) their position.

Please keep personal identifiers such as names of players out of the survey. If a player sustains multiple concussions over the past four years or within the same year, refer to player such as “Player A” or “Player B.” Example: 2017-18 First Tally: a) in-game. b) The opposing player came down center ice and cross-checked player A in the head while she possessed the puck on a breakout pass. c) There was a major penalty on the play. d) The player missed 4 weeks. e) Varsity. f) Left Wing Second Tally: a) ... b) ... c) ... d) ... e) ... f) ... Extra boxes are at the bottom if there are more than 6 instances of concussions in a year.

First response:

	a) if the concussion happened in-game or in-practice	b) what happened on the play	c) if there was a penalty on the play	d) duration in which player was NOT cleared to play	e) if the player was Junior Varsity or Varsity	f) their position
2018-19 (1st Tally)	game	puck was in her feet near net, opposing player was behind her and went after the puck and hit back of players skates, she fell over backward and hit her head	no	last game of season, took 3 weeks to be cleared	Varsity	Defense
2018-19 (2nd Tally)						
2018-19 (3rd Tally)						
2018-19 (4th Tally)						
2018-19 (5th Tally)						
2018-19 (6th Tally)						
2017-18 (1st)	game	player was tripped on play, and was on her hands and knees and player then cross checked her in the back of the head/neck area, sending her to the ice	yes for tripping, no penalty on the cross check	month +	varsity	forward

Second Response:

	a) if the concussion happened in-game or in-practice	b) what happened on the play	c) if there was a penalty on the play	d) duration in which player was NOT cleared to play	e) if the player was Junior Varsity or Varsity	f) their position
2018-19 (1st Tally)	game	collision	no	10 days	varsity	D
2018-19 (2nd Tally)	game	collision	no	7 days	varsity	F

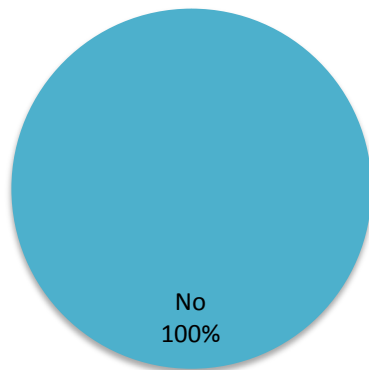
Third Response:

	a) if the concussion happened in-game or in-practice	b) what happened on the play	c) if there was a penalty on the play	d) duration in which player was NOT cleared to play	e) if the player was Junior Varsity or Varsity	f) their position
2018-19 (1st Tally)	in game	hit from behind	yes	2 weeks	varsity	F
2018-19 (2nd Tally)						
2018-19 (3rd Tally)						
2018-19 (4th Tally)						
2018-19 (5th Tally)						
2018-19 (6th Tally)						
2017-18 (1st)	game	collision	yes	4 weeks	varsity	F
2017-18 (2nd)	game	check from behind	yes	season	varsity	F
2017-18 (3rd)						
2017-18 (4th)						

Third Response (Continued):

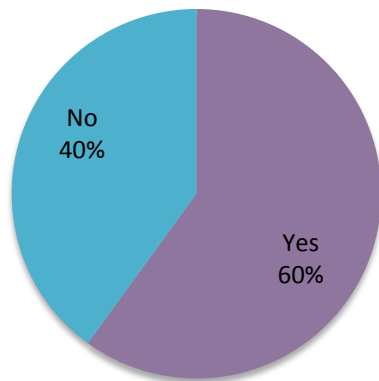
2017-18 (6th)						
2016-17 (1st)	game	collision	yes	1-2 weeks	varsity	F
2016-17 (2nd)	game	collision	yes	1-2 weeks	varsity	F
2016-17 (3rd)	game	trip	yes	3-4 weeks	varsity	D
2016-17 (4th)						
2016-17 (5th)						
2016-17 (6th)						
2015-16 (1st)	practice	collision	no	2 weeks	varsity	F
2015-16 (2nd)	Game	trip	yes	1-2weeks	varsity	F
2015-16 (3rd)	Game	boarding	yes	4-5 weeks	varsity	F
2015-16 (4th)	Game	collision	yes	2-3 weeks	varsity	F

4. The majority of these concussions are a result of an unexpected body check.



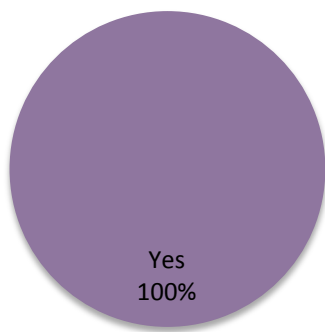
Value	Percent	Count
No	100.0%	4
	Totals	4

5. In your opinion, are instances of self-reported concussions typically higher with girls than boys?



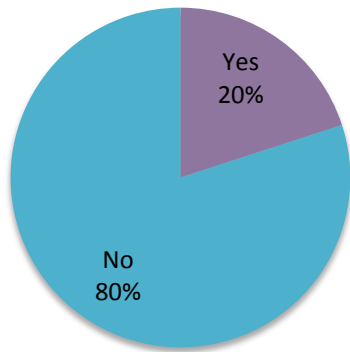
Value	Percent	Count
Yes	60.0%	3
No	40.0%	2
	Totals	5

6. Do you feel that you have sufficient training in identifying concussion symptoms in your players after they sustain hits or any incidental contact to the head?



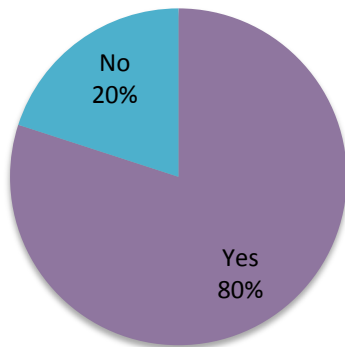
Value	Percent	Count
Yes	100.0%	5
	Totals	5

7. A 2014 NCAA study reported that women's college ice hockey players had the highest rate of self-reported concussions among all collegiate athletes, male and female. Is this surprising to you?



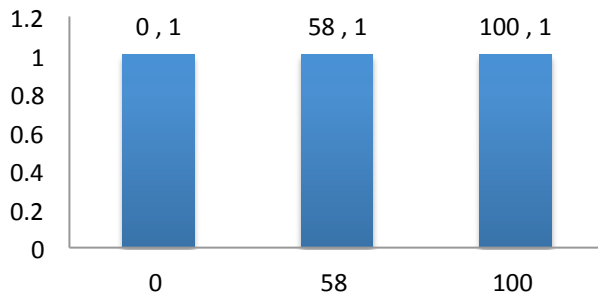
Value	Percent	Count
Yes	20.0%	1
No	80.0%	4
	Totals	5

8. Do you believe that there are inconsistencies between Maine high school hockey referees, and what is deemed physical contact or body checking differs on a referee-to-referee basis?



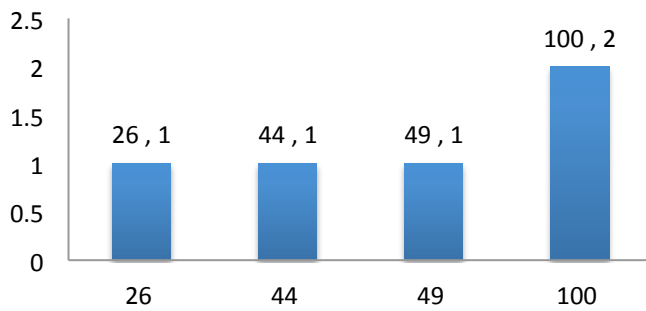
Value	Percent	Count
Yes	80.0%	4
No	20.0%	1
	Totals	5

9. Girls' high school hockey would see fewer instances of concussions if body checking were allowed because girls would be more adequately prepared for the physical contact inherent in the game.



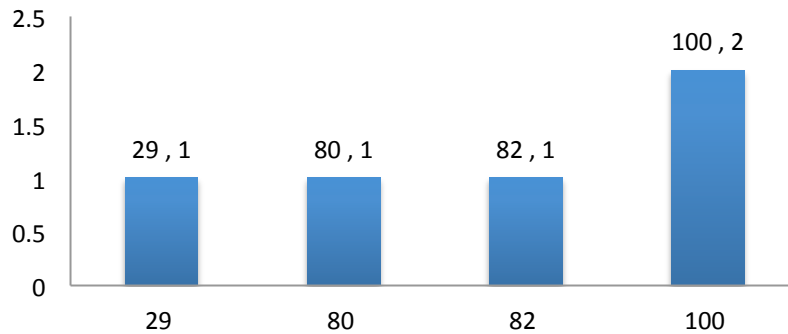
Count	Response
1	0 (Strongly disagree)
1	58 (Neutral)
1	100 (Strongly agree)

10. NFHS rules effectively protect players from head trauma and concussions.



Count	Response
1	26 (Disagree)
1	44 (Slightly disagree)
1	49 (Neutral)
2	100 (Strongly agree)

11. The MPA places a sufficient and effective emphasis on protecting players from head trauma and concussions.

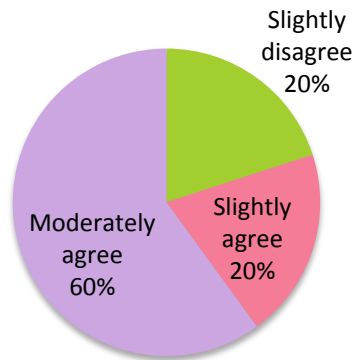


Count	Response
1	29 (Somewhat disagree)
1	80 (Somewhat agree)
1	82 (Somewhat agree)
2	100 (Strongly Agree)

12. Reasons behind the answers:

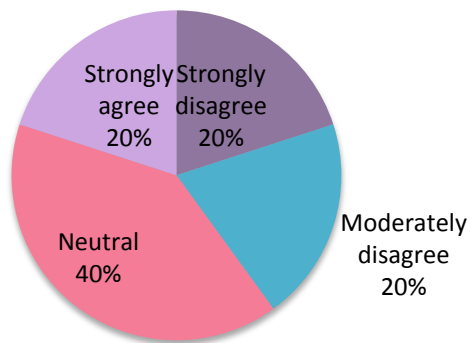
Count	Response
1	It's not the MPA that officiates the league, it's NIHOA that does.
1	Both the MPA and Officials have emphasized the past 8-10 years an extreme crackdown any and all head contact, even accidental.
1	I think the HS rules and the MPA should make head contact a more severe penalty. The other issue in play is the wide range of skills among the girl players
1	MPA can't protect players but stricter penalties are in place
1	Each year the MPA holds a mandatory rules clinic for all head coaches. There is always an emphasis on concussion protocols as well as an emphasis on illegal contact that may result in a concussion symptom.

13. The current rules in place at the high school level for boys' ice hockey do well in minimizing head contact and penalizing those who break those rules.



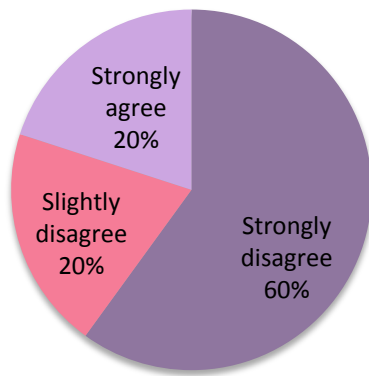
Value	Percent	Count
Slightly disagree	20.0%	1
Slightly agree	20.0%	1
Moderately agree	60.0%	3
	Totals	5

14. The current rules in place at the high school level for boys' ice hockey could be applied to girls' high school ice hockey.



Value	Percent	Count
Strongly disagree	20.0%	1
Moderately disagree	20.0%	1
Neutral	40.0%	2
Strongly agree	20.0%	1
	Totals	5

15. Body checking should be allowed in girls' ice hockey in Maine at the high school level.



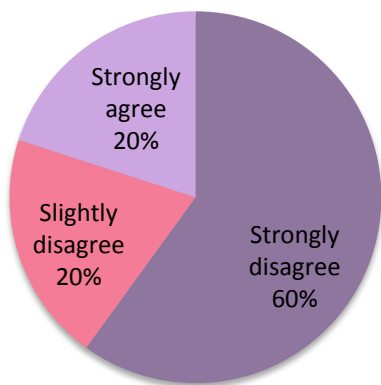
Value	Percent	Count
Strongly disagree	60.0%	3
Slightly disagree	20.0%	1
Strongly agree	20.0%	1
	Totals	5

16. What is your reasoning behind your answers to the previous question?

Count	Response
1	Coming into the program from youth leagues, girls haven't been prepared to check. In addition, there are some new girls learning the sport at the HS stage. Therefore, they aren't ready to engage in learning to body check.
1	Q13: Neutral as question doesn't make sense. Aside from body checking, there are no rulebook differences. Q14: Unquestionably no on multiple levels. First, the game is very immature and aside from the top teams, the majority all have inexperienced players that do not have the skating skills required to protect themselves. Secondly, the current rash of head injuries at Prep and NCAA levels suggest that the girls are more susceptible to concussions (though theories why are varied). Finally, it is not what the girls want. They want to play a hard and physical game, but none that I have coached on teams or in clinics have ever suggested they would prefer a checking game.
1	the boys and girls play by the same rules except on body checking/contact. I do not believe that girls hockey should allow body checking, but that officials need to be better trained on what is body contact and what is body checking

1	there are a lot of girls that can barely skate. bodychecking would be devastating to them and their development as players.
1	If taught at an early age the girls, much like the boys, understand how to correctly incorporate body checking as well as receive the physical contact. There is far too much ambiguity in what is allowed in the girl's game which manifests itself in inconsistent refereeing and presents a danger with regard to concussions.

17. Body checking should be allowed in girls' ice hockey nationally at the high school level.



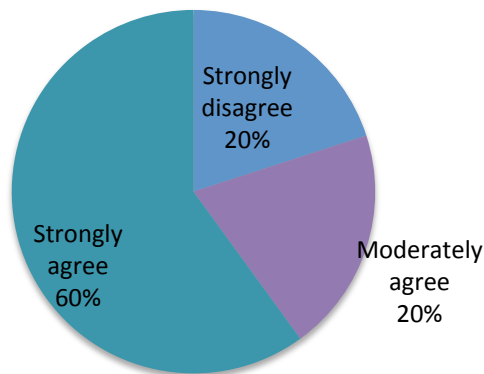
Value	Percent	Count
Strongly disagree	60.0%	3
Slightly disagree	20.0%	1
Strongly agree	20.0%	1
	Totals	5

18. What is your reasoning behind your answer to the previous question?

Count	Response
1	same as #14 (Coming into the program from youth leagues, girls haven't been prepared to check. In addition, there are some new girls learning the sport at the HS stage. Therefore, they aren't ready to engage in learning to body check.)
1	There is no desire or need. Why would we expose immature athletes to potentially more head trauma given the medical research. For the huge majority of HS players, it is the final level of competitive play for them. Why expose them to unnecessary risk when there is absolutely no movement in the women's game to allow for checking. As it is now, the game is a contact sport. We do not need to make it a collision sport.

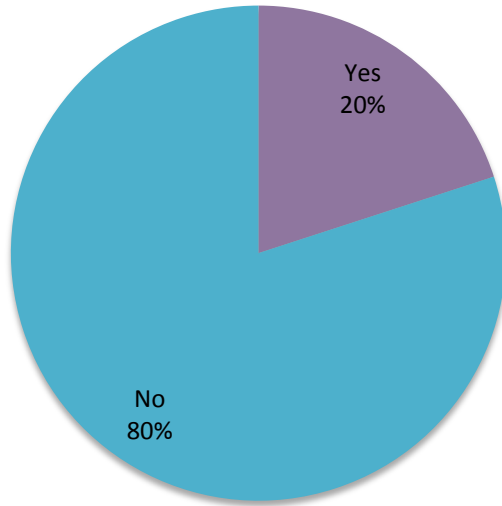
1	I do not feel the girls game should allow body checking. the game just needs to teach the players what is body contact and how to be ready for it and how to make sure your doing it within the rules
1	If properly instructed at the pre- high school level, it prepares the girls for the contact during the high school level and enables the officials to call a consistent game.

19. Allowing body checking in girls' ice hockey in Maine at the high school level would increase injury rates that are not related to concussions and/or head trauma.



Value	Percent	Count
Strongly disagree	20.0%	1
Moderately agree	20.0%	1
Strongly agree	60.0%	3
	Totals	5

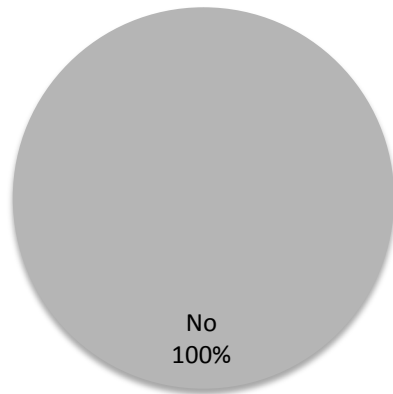
20. Would you support a trial year of body checking in girls' high school ice hockey in Maine, if body checking were properly taught under NFHS guidelines, including a) how to prepare and brace for a body check, b) how to properly deliver a body check, and c) what is deemed illegal or legal?



Value	Percent	Count
Yes	20.0%	1
No	80.0%	4
	Totals	5

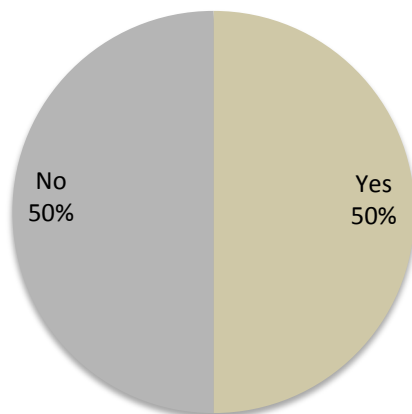
Title: Referee Survey. Respondents: 2.

1. Do you believe that there are inconsistencies between Maine high school hockey referees, and what is deemed physical contact or body checking differs on a referee-to-referee basis in girls' high school hockey?



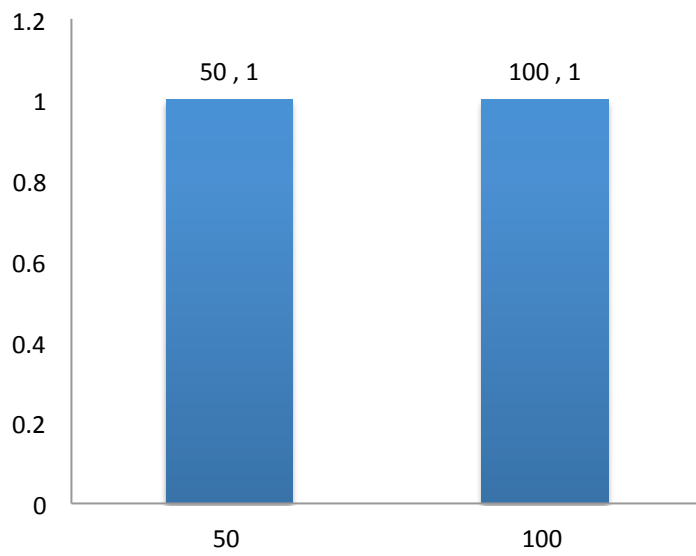
Value	Percent	Count
No	100.0%	2
	Totals	2

2. Different referees lean toward more physicality or less physicality during girls' ice hockey games.



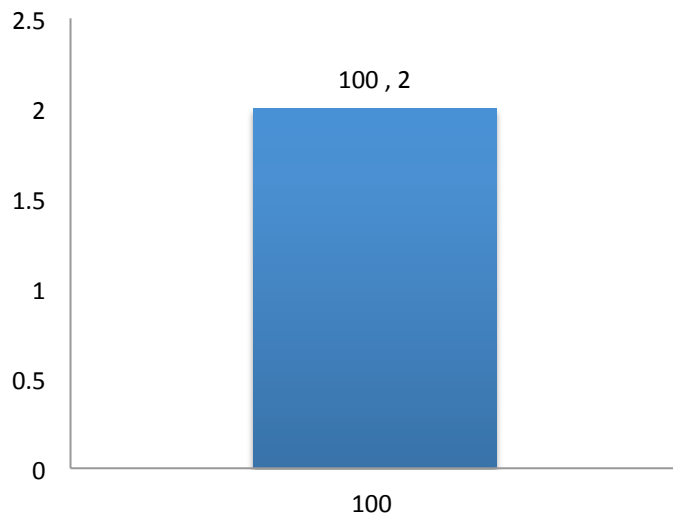
Value	Percent	Count
Yes	50.0%	1
No	50.0%	1
	Totals	2

3. NFHS rules place an emphasis on protecting players from head trauma and concussions.



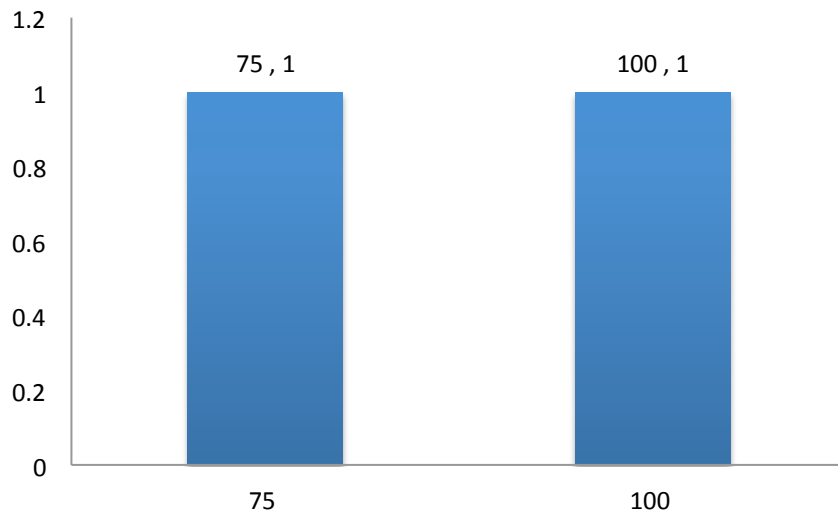
Count	Response
1	50 (Neutral)
1	100 (Strongly agree)

4. NFHS rules are effective in minimizing body checking in girls' ice hockey.



Count	Response
2	100 (Strongly agree)

5. The MPA places sufficient emphasis on protecting players from head trauma and concussions.

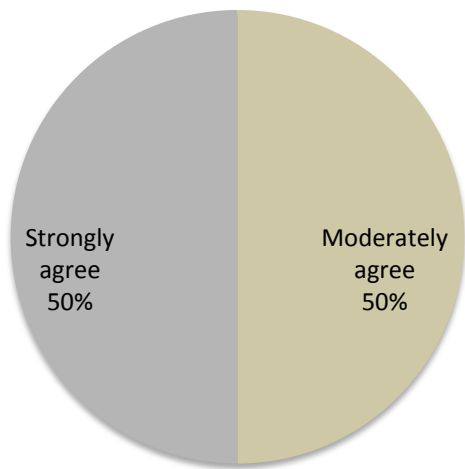


Count	Response
1	75 (Agree)
1	100 (Strongly agree)

6. Explain your decision on the slider:

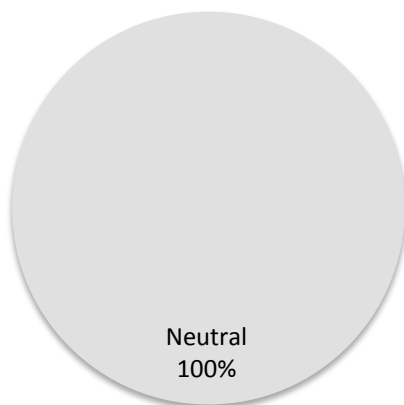
Count	Response
1	Consistent policy and points of emphasis on player safety.
1	The MPA has to react to a situation that has already happened in a game so I'm not sure how much more they can do to protect players for these injuries.

7. The current rules in place at the high school level for boys' ice hockey do well in minimizing head contact and penalizing those who break those rules.



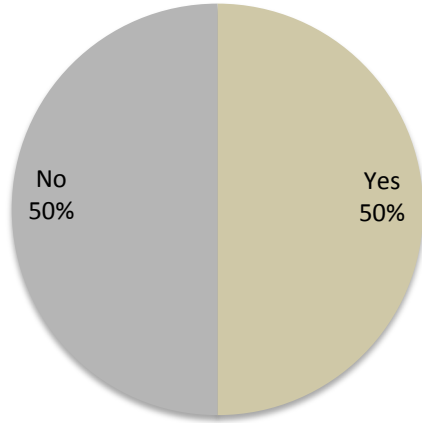
Value	Percent	Count
Moderately agree	50.0%	1
Strongly agree	50.0%	1
	Totals	2

8. The current rules in place at the high school level for boys' ice hockey could be applied to girls' high school ice hockey.



Value	Percent	Count
Neutral	100.0%	2
	Totals	2

9. Would you support a trial year of body checking in girls' high school ice hockey in Maine, if body checking were properly taught under NFHS guidelines, including a) how to prepare and brace for a body check, b) how to properly deliver a body check, and c) what is deemed illegal or legal?



Value	Percent	Count
Yes	50.0%	1
No	50.0%	1
	Totals	2