

A comparison of intrinsic motivation scores for two groups of pre-adolescent athletes

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Abstract

In order for an individual to successfully learn and execute a new movement skill it is expected that they will not only have achieved a specific level of understanding (i.e., cognition), but they will also have had to maintain a level of interest or enthusiasm. The following is a comparison study designed to evaluate the effect of instruction on intrinsic motivation scores. Specifically, the study used a secondary data analysis approach to determine whether an intrinsic motivation score, derived from an attitude based questionnaire differed in a group of minor hockey players who were taught the basic concepts, and allowed to body check versus a group of minor hockey league players that were not permitted to body check.

Although the results indicate that there was a significant difference in the intrinsic motivation scores between the two cohorts, the researcher suggests that future studies should consider the many limitations and contributing influences, some of which include team dynamics, game and practice schedules, amount of playing time, method of instruction, as well as the psychological constructs such as self-concept, cognitive maturity, age, and issues of socialization. Further, one may question the importance of cognitive maturity within this cohort since below average cognitive maturity levels may suggest a lack of understanding, especially related to the fundamentals of learning a new movement skill which may in turn influence the individuals motives to perform the skill (i.e., intrinsic motivation).

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**“In confrontation between the stream and the rock,
the stream always wins – not through strength but through perseverance.”**

H. Jackson Brown

Introduction

Intrinsic motivation is a construct that has been used to describe the why of an individual's intention to participate in physical activity. According to Hassandra, Goudas, and Chroni (2003) intrinsic motivation exists within the broader construct of motivation; where motivation is comprised of intrinsic motivation and its counterpart, extrinsic motivation. Most often described as a determinant in an individual's desire to participate, intrinsic motivation was defined by Deci and Ryan (1985) as the influence to perform, or participate, merely to achieve the pleasure derived from the process of "engaging in the activity" (Hassandra, et al. p. 212).

Hassandra et al. (2003) stated that intrinsically motivated individuals are driven by the following four factors: perceived competence, perceived autonomy, achievement goal orientation, and perceived usefulness. Perceived competence is positively related to performance of a physical activity. That is, individuals who perceive they are competent at an activity generally enjoy participating in the activity. Perceived autonomy is also positively related to physical activity involvement, whereby an individual that perceives their activities to be self-determined will also be intrinsically motivated in the performance of an activity.

Achievement goal orientation is based on Nicholls' goal perspectives theory (1984) and can be divided into two orientations – *ego-orientation* and *task-orientation*. Each orientation focuses on different goals. The ego-oriented individual attempts to gain superiority over their opponents, team members, coaches. The task-oriented individual attempts to develop themselves while completing the task. Hassandra et al. (2003) stated that the task-oriented individual is more likely to be intrinsically motivated and ego-oriented individuals are less intrinsically motivated. In other words, gaining superiority over others is in itself the extrinsic motivator.

Perceived usefulness is a descriptor of an individual's perception of the value of participating in an event. According to Hassandra et al. (2003), an individual gains intrinsic motivation when they perceive an activity to have benefits to their personal growth and development. Conversely, an individual fails to gain intrinsic motivation when they perceive the activity to have no positive benefits or consequences to their personal growth and development.

Developing an understanding of the variables that influence motivation has been a primary focus in research. Deci and Ryan's (1985) cognitive evaluation theory and Harter's (1981) competence motivation theory are among the most noted. Cognitive evaluation theory applies self-determination, perception of competence, and perception of control in the explanation of intrinsic motivation. The theory proposed that intrinsic motivation will be affected by any event or context that affects their perceptions of self-determination and competence. In other words, events that promote a sense of self-determination and competence tend to enhance intrinsic motivation while events that are perceived as controlling diminish intrinsic motivation.

The competence motivation theory of Harter (1981) proposed that individuals who possess the innate desire to express competence demonstrate it through participation of mastery attempts. Constructs of Harter's model (perceived competence, perceived control, and affect) are influenced by outcomes of the mastery attempt as well as feedback from significant others. Consistent with that reported by Hassandra, et al. (2003), earlier work by Harter reported that children with perceived competence tend to persevere and increase their interest in performing a skill. In contrast, individuals with a low perceived competence lose interest sooner during the performance of a skill. As such, intrinsic

motivation appears to be greater in those individuals that perceive themselves as competent.

As a child ages, their motivation to perform physical skills matures. That is, as their cognition matures the locus of control for an individual's motivation transfers from internal to external then back to internal control (Craig & Kermis, 1995). Similarly, Craig and Kermis suggested that within the cohort of younger children, "parental encouragement, peer competition, and the need for identification can prompt a child to attempt, and then perfect, a certain skill" (p. 356). Often parents and caregivers use extrinsic motivation to enable a child to achieve a level of success while performing a skill, regardless of the child's level of intrinsic motivation. Although extrinsic motivation is occasionally thought to be the bad motivation, it can be helpful in boosting self-confidence in a child, especially when adults use extrinsic motivation in conjunction with verbal encouragement while setting goals that the child can attain.

According to Piaget, children age 7-12, known as the concrete operational stage, are able to logically reason and organize objects into hierarchies of classes and subclasses (Berk, 2003). By age 7 years, children have explored the world through observation, grasping, mouthing and other physical actions, have learned to form concepts and use symbols (e.g., language) to help them communicate, and have limited, sometimes "magical" notions of cause and effect (Craig & Kermis, 1995). Although the concrete operational stage may impede their personal capabilities to mentally examine hypothetical or abstract situations, it provides children with the ability to mentally represent objects or a series of actions or events (Berk). In beginning to understand cause and effect, the ability to mentally represent a series of actions or events is important in measuring

cognitive maturity when learning a new movement skill because movement skills are made up of series of actions. Therefore, in order to learn and successfully execute the new movement skill, the participant is required to piece together the conglomerate of actions into a series to create the fluid movement skill.

With regard to competitive sport, the concrete operational stage can facilitate many movement activities when an individual is formulating strategies to deal with expected actions of an opponent. According to Piaget (as cited in Craig & Kermis, 1995) at ages 7 through 12, children should not only understand the rules of participation, but should also be abiding by those rules. As such, participants within this age cohort may incorporate their knowledge of the rules of participation in formulating strategies and tactics during their development of skills.

As cognition matures, motivation dependency shifts from a point of external control to that of internal control, and a child begins to evaluate their skills analytically, develop control over their emotions, and achieve a higher level of intrinsic motivation. Such stages of development result in self-evaluation and the evaluation of peers, which thereby results in social competitiveness and feelings of competence. Finally, although feelings of uncertainty may also arise during such developmental stages, together with the personal realization of limitations in one's ability or capability to successfully perform a skill, the drive to succeed may be increased internally. Intrinsic motivation to perform a skill is driven by the cognitive development of the child (Harter, 1988). Yet it is important to recognize that such a relationship may be mediated by the individual's level of self-concept (Berk, 2003).

Intrinsic motivation and the introduction of a movement skill.

Hockey Canada has developed a curriculum to introduce the skill of body checking to minor hockey players in an attempt to provide coaches/instructor's with a tool for behaviour modification. The curriculum is based on four progressive steps or stages:

- i) positioning and angling;
- ii) stick checking;
- iii) body contact; and
- iv) body checking.

The objective of each step within the systematic approach to teaching the movement skill of body checking is to prevent the opposition from advancing the puck and setting up to score a goal. Using a systematic approach that explicitly demonstrates to the child that there are four options in their defensive play and that each option has specific appropriate behaviours will provide essential information to enable the child to consider choices in their actions when confronted with the game situation. Therefore, it is expected that the child will develop their own standards of behaviour through the learning process that is facilitated by the coach/instructor's delivery of the body checking curriculum.

Most important, according to Bandura's (1999) revised social-cognitive theory, as children age, they become more selective in what they imitate. Listening, remembering, and the ability to summarize general rules from complex sets of observed behaviours and instructions are the cognitive attributes that enable the child to be selective in their behaviours. The choices made by the child when actively involved in specific game situations are dependent on the processing of instructions and observations, which in turn shape their behaviours. Therefore, given that the child will choose their behaviour based

on observations, practice, and feedback gained during the learning process, it is imperative that the coach/instructor understand the importance of not only delivering the mechanics and tactical purpose of each step, but also imparts the importance of the etiquette of body checking. Parents, coaches, and league officials, must recognize that they are role models by which the minor hockey league player develops specific behaviours, and as such, these individuals must demonstrate respect for one another and convey a positive attitude during the learning process.

Methodology

The purpose of this study was to compare scores on a measure of intrinsic motivation in two samples of minor hockey league players, and to explore the effect of introducing a new movement skill within the selected samples on their intrinsic motivation scores.

Secondary Data Analysis

This study used a secondary data analysis of data from the Ontario Hockey Federation Pilot Study investigating the initiation of body checking. According to Hearst and Hulley (1988) a secondary analysis consists of analyzing an existing dataset to answer new questions that were not foreseen by the original researchers. In the secondary data analysis the researcher has little or no control over the original data set, but the speed and economy of data processing, from the formulation of the emerging question to resolution are of great advantage. Limitations in the processes of secondary analysis may include a lack of familiarity with data, issues of understanding due to the complexity of the data, a lack of control over data quality, and an absence of essential variables. The present study analyzed the original data set on a case-wise basis rather than as an aggregated data set, whereby each individual record was processed as a contributor to the total data set. This approach was useful in determining patterns or associations between characteristics among individuals.

The original data set is from a pilot study intended to measure the effects of introducing body checking at the Atom-age cohort (10-11 years) of players. Previous to the pilot study, body checking was introduced in the Pee Wee-age cohort (12-13 years). The study was among the first natural experimental designs in Canadian ice hockey

research. The study compared selected measures of interest including injury data, motivation to participate, attitude and behaviours in ice hockey, and demographics, in a designated control group versus a designated treatment group of Atom-aged representative level players.

Sample

The sampling frame consisted of Atom-aged (10-11 years old) players recruited from the Ontario Hockey Federation (OHF) and the Ottawa District Hockey Association (ODHA). It must be noted that the actual samples of teams changed from Year 1 through to Year 3, however, several teams remained in the study despite that the team's administration (i.e., coaches, managers, etc.) had changed, which is a consideration in the independence of the data (some participants may have remained in the study for two years of the data collection). The data used in this study are derived from questionnaires collected in 1999-2000 and 2000-2001 seasons. Table 1 illustrates the sample size by league and by year.

Table 1.

Number of complete cases separated by league and by year.

Year	League	
	OHF	ODHA
1999-2000	<i>n</i> =196	<i>n</i> =65
2000-2001	<i>n</i> =316	<i>n</i> =61
<i>N</i> = 648 (Frequency missing = 10)		

Data Collection Procedures

Data collection procedures in the original study required researchers to maintain weekly contact with coaches on the selected teams through various electronic media

(telephone, fax, e-mail, and Internet data capture). All teams provided injury report forms, letters of informed consent (in accordance with the Lakehead University Senate Committee on Research with Human Subjects), and questionnaires about attitude toward ice hockey, and knowledge about body checking. However, for the purposes of the present study, the measures of interest include only: age, attitudes/motivation, and behaviours toward ice hockey. The data for the present study are therefore based on the questionnaire entitled, "Ice Hockey and Me" (Appendix A) designed by Dr. Robert Vallerand of the University of Quebec at Montreal and Dr. David Scott of the University of New Brunswick to evaluate attitude and behaviour of players within the Atom age cohort. The reliability of the questionnaire was not published in the original study and estimates of test/retest stability were not available to the researcher.

Responses to the questionnaire were based on a four point Likert scale with the verbal anchors: *not true*, *bit true*, *true*, and *very true*. The questions used in Year 1 of the original pilot study were re-evaluated and as a result were different from those used in Years 2 and 3. The analyses in the present study are based entirely on data collected from Year 2 and Year 3.

Statistical Analysis

In the present study, data were combined across years the two years of collection and across the leagues (OHF with ODHA) to produce a sample size of 648 participants. The analytical plan to compare intrinsic motivation scores between the two cohorts was as follows:

1. First a principal component factor analysis (PCFA) was used to determine the agglomeration pattern for questions that describe the construct “intrinsic motivation.”
2. The questions describing intrinsic motivation were then identified from the PCFA output and used to produce an intrinsic motivation score. The intrinsic motivation score is an average computed by summing the individual’s responses on the 15 questions that comprise the intrinsic motivation factor and then dividing by 15 (the number of questions that describe the factor) (see Appendix B).
3. The intrinsic motivation scores were then compared between the cohorts of players permitted to body check versus the cohort of players that were not permitted to body check, using a t-test for independent samples.

In addition, a frequency distribution was calculated for each question in the questionnaire. This enabled the researcher to visualize the dynamics of the responses across the four possible response choices and observe patterns within the response set.

Potential Benefits and Risks

Any potential risks associated with this study were not expected to affect the original participants directly, but may influence the stages of secondary data analysis. Although control over data quality is often considered to be a limitation in the process of secondary data analysis, in the present study this consideration is minimized because, the researcher participated in the original study and was involved in the original stages of data collection. Likewise, familiarity and complexity of the data are not major limitations in the data set for the present study for the same reason. Finally, secondary data analyses are

often influenced by the size of the data set. In the present study, the data consists of some 648 records that were easily managed with available resources.

Absence of important variables is not a limitation. There are two procedures in using secondary data that requires the researcher to first develop a question, then seek a data set that answers the emerging question; or second, to acquire a data set and then develop a question that can be resolved by using variables within the original data set (Hearst & Hulley, 1988). The present study is based on the latter approach, which is to develop a question that can be resolved with the measures collected in the original study. The researcher is required to use the set of existing variables and as such no variables can be considered missing.

The benefits of applying a secondary data analysis to the proposed data set include: speed of access to data, economic utilization of existing data, a comparison across years of data collection – which enables sub-group comparisons, and complex evaluation of models using bootstrap techniques applied to data derived from the original sample. The greatest advantages to using a secondary dataset in the present study were the speed at which the study could move forward, the ease of using high quality data, and the amount of time saved for data analysis. Due to limited means of support, student researchers gain the extra time for data management (i.e., organization and familiarity of the data) and analysis - typically areas that are rushed in the preparation of the graduate thesis.

Longitudinal, subgroup, and cross-cultural analysis of the data are not considered in the statistical analysis of the present study. However, an anticipated outcome of the present study is that a longitudinal analysis may emerge that could be used to identify

trends (such as change in behaviour or attitude) over time. For example, the same questions can be asked of the Atom-age players to determine whether the overall attitude toward hockey has changed due to changes in their lives that are both internal and external to the sport. A subgroup analysis would allow the larger dataset to become more manageable in some instances and thereby provide an eventual savings. For example, researchers may consider analyzing the responses across regions which would then increase sample size while adding a level of complexity relative to regional bias. It is also expected that new interpretations will emerge from this secondary data analysis.

Results

Frequency Distribution

The questionnaire responses were first organized using frequency distribution procedures to produce descriptive statistics tables for the total data set. Figure 1 displays the *approximate* pattern of the responses for the total data set. The majority of the items were responded with “true” and “very true” responses while marginal participants responded with “not true” and “bit true” responses.

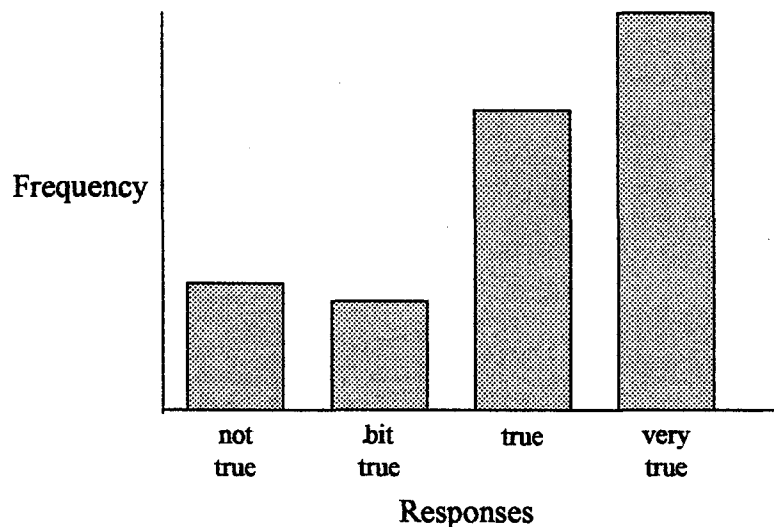


Figure 1. Frequency distribution of the responses to questions that comprise the intrinsic motivation construct.

Frequency distribution tables illustrated for each question or item within the questionnaire enabled the researcher to observe the distribution of responses to each question, identifying specifically the common responses within the data set. An example using question 1 (“I am always excited about hockey”) is presented in Table 2.

Table 2.

Frequency distribution of responses to question 1: "I am always excited about hockey."

Response	Frequency	Percent	Cumulative Frequency	Cumulative Percent
not true	6	0.93	6	0.93
bit true	28	4.32	34	5.25
true	200	30.86	234	36.11
very true	414	63.89	648	100.00

N=648

Principal Component Factor Analysis

The results of the principal component factor analysis of the questionnaire items are presented in Table 3. The results indicate that an intrinsic motivation factor emerged from 15 of the 29 questions. Generally, the questions that load onto the intrinsic motivation factor include statements about sportsmanship, importance of hockey in the child's life, motivation to attend games/practices and awareness of the importance to respect the rules. On advisement from the members of the thesis advisory committee, an arbitrary factor loading cutoff of 0.40 was used to determine the acceptance of an item as a member of the factor.

Table 3.

Organization and factor pattern coefficients for the questionnaire items based on the PCFA.

Questions	Intrinsic Motivation
1. I am always excited about hockey.	0.637
2. Hockey allows me to have lots of fun.	0.649
3. I am happy only when I play hockey.	
4. I can't live without hockey.	0.411
5. Hockey fits well with the other activities in my life.	0.487
6. Something inside of me forces me to play hockey.	
7. Hockey is the only thing that really counts in my life.	
8. I like hockey, but I don't have to play it all the time.	
9. My life without hockey would be boring.	
10. There are other activities that I like in my life besides hockey.	
11. Hockey gives me a chance to learn new and fun things.	0.593
12. Hockey is important to me.	0.619
13. Hockey is interesting for me.	0.679
14. I spend a lot of time playing hockey.	0.567
15. I obey the referee.	
16. In competition, I go all out even if I'm almost sure to lose.	0.543
17. I help the opponent get up after a fall.	
18. I respect the rules.	0.499
19. I don't give up even after making many mistakes.	0.574
20. I really obey all the rules of my sport.	0.483
21. When an opponent gets hurt, I ask to stop the game for help.	
22. I respect the referee even when he or she is not good.	0.436
23. It is important to me to be present at all practices.	0.530
24. During practices I go all out.	0.572
25. I think that it is fun to check the other players.	
26. I hate to be checked by the other players.	
27. I always try to hit the other players hard if I make contact.	
28. I only make contact when the other player is smaller than me.	
29. I think I might get hurt if I try to check another player.	

Next, the researcher organized the questionnaire responses based on the PCFA output to produce an intrinsic motivation score for each player. The computation of the construct scores for intrinsic motivation is presented in Appendix B. The intrinsic

motivation scores were then compared between the sample permitted to body check and the sample that was not permitted to body check. The results of the comparison using a t test for independent samples demonstrate that the two groups were significantly different in their intrinsic motivation scores [Satterthwaite method (unequal variances), $t = 3.70(208)$, $p < 0.0003$]. The average of the ODHA scores was higher than the mean of the OHF scores.

Descriptive statistics, including mean, standard deviation, standard error, and 95% confidence intervals of the estimates, were computed for the intrinsic motivation score for each sample. The results are presented in Table 5 and Table 6.

Table 4.

Frequency distribution of players.

League	Frequency	Percent	Cumulative Frequency	Cumulative Percent
ODHA	126	19.75	126	19.75
OHF	512	80.25	638	100.00

Frequency not reporting league = 10

Table 5.

Average intrinsic motivation construct score (M) and descriptive statistics for the common constructs of the OHF.

n	M	SD	SE	95% confidence		min.	max.
				low	high		
512	29.12	3.38	0.15	28.82	29.41	9.04	36.16

Table 6.

Average intrinsic motivation construct score (M) and descriptive statistics for the common constructs of the ODHA.

<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	95% confidence		min.	max.
				low	high		
126	30.16	2.98	0.27	29.63	30.68	21.42	35.06

Discussion

The results of the comparison of intrinsic motivation scores between the two samples may be dependent on many factors not measured in the present study. Through the application of a principal component factor analysis of the 29 item questionnaire, the researcher was able to construct a score that represented the child's intrinsic motivation to participate in ice hockey and to learn a new movement skill. Results illustrated that the ODHA players had a higher average score for intrinsic motivation than that of the OHF. This difference may be attributed to several factors, not merely the introduction of a new movement skill (i.e., body checking). Despite that the two groups were comparable in age and level of participation (representative level players) and although the OHF were permitted to body check (whereas the ODHA was not) team dynamics, game/practice schedules, social variables, amount of playing time, cultural differences, etc. may have contributed to the average difference scores.

A fundamental factor in understanding an individual's level of intrinsic motivation is their perceived competence. According to Harter's (1978, 1981) competence motivation theory, individuals become intrinsically motivated when they perceive themselves to be competent in performing a skill. This theory also addresses the role of socialization which can influence the development of a child's perception of competence and the effect of these influences on the orientation of motivation. As Harter contends, parental feedback is the primary influence on a child's developing self-perception of competence. Parental comments/actions/behaviours toward a child's performance will be readily perceived as positive, negative, or neutral by the child. A child that perceives positive support for a given behaviour is more likely to perceive themselves as competent to perform that behaviour and in turn become intrinsically

motivated. Conversely, perception of negative parental feedback may cause the child to experience lower self-esteem and lower motivation. In the present study the participants may have demonstrated similar dynamics with regard to parental involvement and the effect on the player's performance.

While previous research has determined that motivation can shift from extrinsic influences to intrinsic influences, this does not preclude that a similar shift could not occur from intrinsic influences to extrinsic influences. In the present study, this latter dynamic may be a function of the events surrounding the presentation of the body checking skill module within the OHF. Since the data to measure intrinsic motivation were collected after the skill module was introduced, it is difficult to determine the role of the timing of the presentation, parental influences, and personal experiences while learning or performing the skill. Although not tested directly, one should consider that the players' attitudes toward learning and performing the skill may have changed, or are in the developing process, due to the realization of ability and effort towards the skill. Considering that the estimate of intrinsic motivation could have been measured immediately before learning the skill, or within a short relative refractory period after being introduced to the skill, responses may have been different. Future research may consider measuring intrinsic motivation throughout a season by collecting survey data at planned intervals.

Deci and Ryan's (1985) cognitive evaluation theory proposes that events that promote a sense of self-determination and competence tend to enhance intrinsic motivation. Simply "making the team" can be a great achievement for any child, especially if they have excelled beyond their local peer group and external peer group.

This event may promote a sense of self-determination and competence thereby enhancing intrinsic motivation. Conversely, events that are perceived as controlling can diminish intrinsic motivation. This consideration may explain why part of the sample scored lower than the average for intrinsic motivation. Players that do not make a team may experience a diminished level of intrinsic motivation due to reduced perceived competence. Events in this study which have a controlling influence may include the game of hockey, the skill of body checking, or issues relating to socialization such as parental influence (mentioned earlier as part of Harter's competence motivation theory, 1978, 1981). A player participating in an activity or event where the activity or event does not benefit the player directly will not develop self-determination or self-competence and may decrease intrinsic motivation as a stimulus for future participation in that activity or event.

Achievement motivation theory of Nicholls' (1984), which is an extension of Bandura's (1978) theory of self-efficacy and Harter's (1978, 1981) competence motivation theory, is defined as a developmentally based theory of perceived ability. That is, the perceived ability of a child is characterized by their developmental level. For instance, some children base their ability on past performances. If a child notices an improvement in their current performance from the previous performance, they may associate improvement with hard work and absolute capacity. The child is said to be task-oriented. The goal of a task-oriented individual is to develop themselves while completing a task, thus increasing intrinsic motivation. Conversely, some children may judge their ability by the performances of their peers (social comparison). In this case, evaluating absolute ability is no longer motivating – the child believes they must

outperform their peers. Attempting to gain superiority over opponents, team members, and coaches is the goal of the ego-oriented individual and usually becomes an extrinsic influence, in turn decreasing or preventing the shift of motivation control from extrinsic to intrinsic. Within the present study, some players scoring above average for intrinsic motivation may demonstrate task-oriented behaviours while those who score below average for intrinsic motivation may be described as ego-oriented individuals.

With regard to future participation, Cox (1998) stated that task-oriented children are more likely to face difficulty or even fail when attempting a task, but will persevere with a determination that generally leads to success. Ego-oriented children, however, are more likely to face difficulty or fail in attempting a task with less determination and may even resort to illegal or unfair means in order to achieve success. Learning a new skill may be a difficult task for all young players, however those who are intrinsically motivated (task-oriented) are more likely to persevere until the task is learned and executed successfully. Conversely, players who are extrinsically motivated (ego-oriented) may not demonstrate the level of perseverance required to successfully overcome a given challenge. Therefore, it is likely that one of two outcomes may occur for the ego-oriented child: i) the child will attribute failure to their ability and “walk away” from the task or ii) the child will continue to perform using inappropriate behaviour to achieve success (e.g., illegal body check to gain possession of the puck). In the latter case, ego-oriented children are likely to use extrinsic influences as their motivation to continue to participate in an activity or event. Such influences may represent positive feedback by the individual.

Social learning theory explains that individuals who receive a reward (e.g., positive feedback), or observe others being rewarded for performing the same behaviour, may use the expectation of reward as their motivation (extrinsic influence). Players may then continue to demonstrate the behaviour for which they are rewarded, whether the behaviour is appropriate or not. Craig and Kermis (1995) suggest that an inappropriate behaviour may be executed as a result of the expression of an emotion which players learn in conjunction with the skills of a sport. For example, aggression is a behaviour that many people associate with hockey. Therefore, through social learning and imitation, a child may believe aggression is an attribute required in learning/executing the skills of hockey. This type of emotion may lead to inappropriate behaviour or may even inhibit the shift of motivation from an extrinsic influence to an intrinsic influence (if the child receives reward for the inappropriate behaviour). It may be expected that the extrinsically motivated individual will continue to mature and experience the necessary developmental shift of motivation required to be successful.

Research cannot merely describe the intrinsic motivation of an individual without considering the influence of self-concept. Such influences include perceived competence, task-orientation versus ego-orientation, social comparison, and social learning – all of which influence a person's motivation. According to Cox (1998), parents, coaches and players (self) represent the three essential groups that are responsible for the development of a child (self) and the orientation of their motivation.

The motives of a young athlete in relation to their sport participation are the motives that lead to intrinsic motivation and self-confidence (Cox, 1998). Numerous investigations have recognized that motives such as learning and improving skills, having

fun, enjoyment of the team atmosphere, becoming physically fit, and being with friends are consistent with the goal of the task-oriented individual. Youth sport programs that are implicitly based on the participant's motives are expected to enhance the development of self-concept and ultimately intrinsic motivation.

The coach, teacher, and organizers of youth sport are responsible for creating an environment conducive to developing self-concept as well as the factors that influence motivation. In teaching a skill to a child during the developmental age, instructors should strive to create the task-oriented environment. Such an environment can be achieved by creating practices that maintain the interest and excitement of the players, involving athletes in decision making, basing rewards on individual gains, and creating an atmosphere of cooperation (Epstein, 1989; Treasure & Roberts, 1995).

Finally, parental influence contributes greatly to the development of a child's self-concept and the orientation of their motivation. According to Ebbeck and Becker (1994) the magnitude of goal orientation by a parent has been suggested to be a direct predictor of the goal orientation of the child. If the parent is more ego-oriented, the child is more likely to be ego-oriented. Similarly, the task-oriented child is more likely to have parents that are task-oriented. Parental support should be enlisted by coaches and teachers to aid in providing an environment that will promote positive experiences for children in the sport domain.

Conclusions and Recommendations

Social comparison, modeling, and parental influences are among the most significant social aspects of a child's life. Sport organizations must be obligated to ensure that coaches, instructors, and officials demonstrate and teach positive attitudes while making available an environment that will encourage learning and fun for children. Positive attitudes toward learning and performing a particular skill must be taught in conjunction with the fundamentals of the skill itself. Creating an environment that promotes good self-concept will stimulate intrinsic motivation of the participants. A child's morals, attitudes, attributes, and values established through social influence will direct their behaviour choices to succeed or fail.

In their attempt to provide adequate preparation for young hockey players, Hockey Canada has produced a systematic curriculum, yet such an endeavour may be unsuccessful if the organization does not recognize the importance of creating an environment that promotes the development of the child's self-concept and intrinsic motivation to learn the skill, while coaches/parents are expected to "lead by example" (e.g., display positive attitude and self-confidence). Developing a child's self-concept in order to create a positive experience and success in learning a skill must be an explicit priority in order to ensure that the skill will be learned and used effectively in the child's future.

Future Research

Future researchers may consider analyzing the proportion of task-oriented to ego-oriented individuals in ice hockey. That is, to determine whether the ego-oriented players are more negative and therefore more likely to perform illegal or unfair play on the ice.

Likewise, future research should explore the relationship between intrinsic motivation and cognitive maturity in the minor hockey league player.

Questions that may arise from this research include:

- How long will an ego-oriented player participate in hockey?
- Is extrinsic motivation enough to keep a player participating at the competitive level?
- Do extrinsically motivated players participate in recreation level ice hockey?
- Are there more extrinsically motivated players because aggression has seeped into the attitudes of players through praise received for aggressive or illegal plays?

From the perspective of social learning theory, parental attitudes and goal orientation may also be of interest. As stated previously, a child's goal orientation is most likely similar to that of their parent. Researching the parent's influence on competitive players versus the parent's influence on recreation players may suggest an optimal social background for the benefit of developing self-concept. Other research questions that may arise include:

- Do parents of children in the competitive leagues have different attitudes and goal orientation than the parents of children in the recreational leagues?
- What are the social differences between the two groups of parents?
- What morals, attitudes, attributes, and values do the parents believe in?

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Appendix A: "Ice Hockey and Me" Questionnaire

1. I am always excited about hockey.
2. Hockey allows me to have lots of fun.
3. I am happy only when I play hockey.
4. I can't live without hockey.
5. Hockey fits well with the other activities in my life (friends, school, etc.).
6. Something inside of me forces me to play hockey.
7. Hockey is the only thing that really counts in my life.
8. I like hockey, but I don't have to play it all the time.
9. My life without hockey would be boring.
10. There are other activities that I like in my life besides hockey.
11. Hockey gives me a chance to learn new and fun things.
12. Hockey is important to me.
13. Hockey is interesting for me.
14. I spend a lot of time playing hockey.
15. I obey the referee.
16. In competition, I go all out even if I'm almost sure to lose.
17. I help the opponent get up after a fall.
18. I respect the rules.
19. I don't give up even after making many mistakes.
20. I really obey all the rules of my sport.
21. When an opponent gets hurt, I ask the referee to stop the game so that he can get help.
22. I respect the referee even when he or she is not good.

23. It is important to me to be present at all practices.
24. During practices I go all out.
25. I think that it is fun to check the other players.
26. I hate to be checked by the other players.
27. I always try to hit the other players hard if I make contact.
28. I only make body contact when the other player is smaller than me.
29. I think I might get hurt if I try to check another player.

Appendix B: Computation of the Intrinsic Motivation Score

$$\begin{aligned} \text{Intrinsic Motivation Score} = & \text{question 1 response (Q}_1\text{)} + Q_2 + Q_3 + Q_4 + Q_5 + Q_6 + Q_7 + \\ & Q_8 + Q_9 + Q_{10} + Q_{11} + Q_{12} + Q_{13} + Q_{14} + Q_{15} + Q_{16} + Q_{17} + \\ & Q_{18} + Q_{19} + Q_{20} + Q_{21} + Q_{22} + Q_{23} + Q_{24} + Q_{25} + Q_{26} + \\ & Q_{27} + Q_{28} + Q_{29} \end{aligned}$$

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