Playing Tough and Clean Hockey:

Developing Emotional Management Skills to Reduce Individual Player Aggression

EXECUTIVE SUMMARY

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Overview

A few years ago the NHL marketed the slogan "hockey, the coolest game on ice" which is reflective of how youth ice hockey players feel about the sport. It is a fast, physical, intense sport played in a team environment that can provide many beneficial life lessons such as how to be a good teammate and a leader. However, with the physical play of maturing youth and the turbulent emotional changes occurring at the same time some negative consequences exist. The most serious consequence is injury. Higher rates of injury are a by product of the game as youth ice hockey players grow and checking is allowed, however, many of these injuries could be avoided if violent and aggressive hockey were reduced and young players were taught to play tough and clean hockey.

So, how does one reduce violent or dirty and aggressive hockey? There are several strategies that have been implemented including harsh penalties, appropriate teaching of body checking and receiving a check, and Fair Play rules (some Canadian leagues use these rules). These strategies have merit and should continue to be used; yet, we are not dealing with an important factor of aggressive behavior – emotion. Emotions such as frustration and anger are precursors to aggressive behavior. Therefore, a program to help youth players manage their emotions and regulate their own behavior on the ice is needed. The Playing Tough and Clean Hockey Program fills this need by teaching players to be emotionally tough and helping them to transfer program skills and lessons to the ice.

In this study the Playing Tough and Clean Hockey Program was evaluated using a single-subject baseline/treatment design with four players between the ages of 12 and 14. Participants completed post-game reports about their in-game emotions and aggressive feelings as well as their aggressive behaviors. In addition, video of games were analyzed by the investigative team to chart the frequency of aggression and percentage retaliation in the two study phases. It was predicted that the program would enhance participants' ability to control their emotions and be emotionally tough and reduce their dirty and aggressive play.

Results revealed that the most aggressive player made the greatest positive gains during the program. He was able to significantly decrease his aggressive play, retaliations, and major aggressive behaviors. The other three participants also reduced their dirty and aggressive play by improving in their unique way. All four participants enhanced their emotional control and toughness to varying degrees. Thus, there was support for both predictions made prior to the study. Finally, each participant felt he improved as a player after completing the program.

These results indicate that players can learn to manage their emotions and reduce aggressive behavior. Moreover, they also can learn to play tough and clean hockey via off-ice training that is transferred to on-ice practices and games. An important next step will be to implement the Program in three different ways; (1) to a larger population including in team settings, (2) to the

most dirty and aggressive players, and (3) to all members of the hockey community including parents, coaches, and administrators so everyone can begin to alleviate aggressive behavior. It is also important that this information begin to be disseminated to members of the hockey community to broaden the impact of the Program.

The Problem of Aggression in Youth Ice Hockey

Ice hockey is a fast-paced, high-intensity, physical game played in a confined space leading to much contact. Without a doubt, hockey elicits much passion and emotion from its participants. Although the emotion of the game is one of the reasons players enjoy hockey, with this passion and emotion has come aggressive behavior (i.e., the intent to harm another human being). Previous research with two teams of 13-14 year old hockey players showed that players were aggressive ***9.6 and 7.5 times per game***, respectively (Lauer, Carson, Cornish, & Gould, 2003). With the potential disastrous consequences of aggression, the rate of aggression in adolescent hockey players is disconcerting.

Aggression in youth ice hockey is a growing concern. Illegal and "dirty" acts occur too frequently in many leagues, especially in the older age groups. The consequences of aggression can be as routine as a penalty or as catastrophic as a spinal cord injury. Aggression increases the chances of being injured for the aggressor and the receiver (Lorentzen, Werden, & Pietila, 1988; Widmeyer & McGuire, 1993; Tator, Carson, & Cushman, 2000), may catalyze off-ice incidences such as parent and spectator fights, and may be learned by players from watching others and being reinforced for being aggressive.

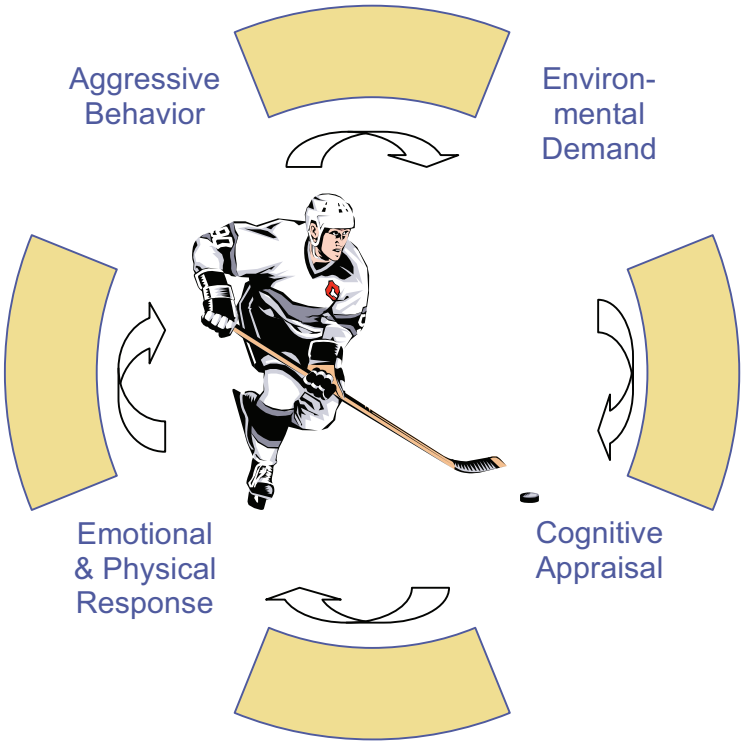
Two other major consequences of aggression have been rarely discussed. First, dirty and aggressive play by aggressive players may push other players out of the game because it takes the fun out of playing and/or creates fear. Second, players that rely on dirty and aggressive tactics most likely are not developing their skills to the extent other players are that are focused on the puck and playing the game. To ensure the continued growth of hockey in the United States and to protect our youth from injury and negative experiences in hockey, a need exists to reduce aggression. This study met this need with the development of the "Playing Tough and Clean Hockey Program" curriculum and an evaluation of its effectiveness.

The Proposed Remedy: The Playing Tough and Clean Hockey Program

Aggression has many sources and often single events are the result of multiple antecedents. Emotion, however, is a mediating variable between the source of aggression and the actual aggressive behavior. Hockey players frequently talk about the importance of emotion in hockey and how one must control his or her emotions to perform and stay out of the penalty box.

The conceptual model of emotion and aggression presented below is the framework for which the Playing Tough and Clean Hockey Program was developed. This model of emotion was influenced by the work of Lazarus (2000) and what has been labeled the cognitive-motivational-relational theory.

Figure 1: Model of Emotion and Aggression



Essentially, a player is confronted with a demand (e.g., checked from behind). At this point, the player appraises the situation (e.g., that was unfair and dangerous, I want revenge). If the appraisal suggests that the opponent was attempting to injure, then the player will have a physical response (e.g., increased heart rate, breathing) and emotional response (e.g., anger, frustration). This then often leads to aggressive behavior, which finally feeds back into the environment make it more likely that further aggression will occur.

"You don't want to retaliate, and that's where controlling emotions comes into play…"

(Ex-Phoenix Coyotes Coach Bob Francis, ESPN.com, Oct. 18, 2003)

The Playing Tough and Clean Hockey Program is designed to intervene with thought and emotion management strategies to break this cycle perpetuating aggression. The goal of the program is to reduce aggressive behaviors and increase tough and clean behaviors (e.g., legal checking, no retaliation) in youth ice hockey players. This is achieved by enhancing ***emotional toughness*** or the ability to have a positive response (e.g., back-check) in a negative situation and when feeling negative emotions (Lauer et al., 2003).

Emotional Toughness is the ability to respond positively in a negative situation.

Playing Tough and Clean Hockey Program Structure and Techniques

As written above, the program is a multi-modal integration of thought and emotion management techniques. Players attend nine one-on-one sessions to enhance the following areas of their development:

- Recognition of the differences between dirty and aggressive and tough and clean behaviors;
- Enhance empathy, compassion, and respect for opponents;
- Develop emotional control and emotional toughness skills using controlled breathing, centering, and cognitive restructuring;
- Channel and refocus emotions using a ***3 R's (Respond, Relax, Refocus) on-ice routine***;
- Transfer emotional toughness skills to games using for example visualization, imagery, and simulation;
- Self-regulate emotional toughness and aggressive/tough and clean behavior via goal setting, reflection, and many other self-regulation strategies; and,
- Transfer skills and lessons learned in the program to players' lives outside of hockey.

Players receive a Playing Tough and Clean Hockey Program handbook when they enter the program. Sessions follow this handbook while allowing for much individualization in the nature of the issues discussed as well as in the way participants' use the techniques. For example, each player develops their own personal 3 R's routine based on their past history of aggression and personality. These three steps include self-talk cues and images and centering (see example below). Players perform the 3 R's on the ice during play and on the bench with the purpose of cooling their emotions and getting their mind on playing hockey instead of hurting someone.

The 3 R's
Respond – "No problem"
Relax - Center
Refocus – "Back in the play."

The Study's Purposes

The primary purpose of this study was to conduct the 'Playing Tough and Clean Hockey Program' with aggressive ice hockey players and examine its influence on the emotional control, emotional toughness, and aggressive behavior of participants. The secondary purpose of this study was to conduct a formative or process evaluation (e.g., examine program implementation, player learning and use of the program and skills) of the program. Much of the program evaluation will not be reported in this document due to the sheer amount and depth of results, however, these results can be obtained from the first author or by visiting www.educ.msu.edu/ysi.

Hypotheses

The first hypothesis was that players participating in the program will feel increased emotional control and emotional toughness following implementation of the program. The

second hypothesis was that players will exhibit fewer acts of aggression following the program's implementation.

How the Study was Conducted

Study Design

A single subject, multiple baseline AB (baseline, program) design was used to examine the effects of the program on the emotional control, emotional toughness, and aggression in four youth ice hockey players. Players were observed in the baseline period and provided the program in the program period. The program lasted nearly the entire season from October to March and involved the observation of over 20 games for each player.

Figure 2: Study Design

Participant	A – Baseline Period	B – Program Period
1	Games 1-8	Games 9-20
2	Games 1-12	Games 13-22
3	Games 1-12	Games 13-22
4	Games 1-12	Games 13-22

Notes: The games listed are those videotaped. Due to time restrictions the baseline was not staggered for Participants 2-4.

Data Sources

Multiple data sources were collected in this program evaluation. The two main sources of data collected throughout the season were:

- Post-game self-report emotion and feeling state log, and,
- Videos of participant's games.

Interviews pre- and post-program, tests of participant's understanding of the program, and evaluation questionnaires were conducted. In addition, two external ice hockey psychology experts reviewed the program prior to its implementation.

Procedures

Participants were contacted through local hockey associations. After discussions with coaches, parents, and players about the selection criteria for the study (intense, physical player who takes penalties and is willing to commit to a season-long program) four players were selected. The lead investigator met with each participant several times during the baseline period to conduct

interviews, schedule the program, and collect post-game reports. Participants completed post-game reports after every game (obtained over 30 reports per player). Video taping of games by research team members as well as parents began in October, and with a staggered program start, the intervention began in late December or early January. The lead investigator met nine times with each player during the program period until the end of the season (March).

Data Analysis

Post-game logs were analyzed using descriptive statistics and correlations. The data was graphed and visually inspected for trends across the season.

Videos were independently coded by two investigators both who were experienced as hockey coaches, players, and directors of programs (one investigator was also an official). The two investigators met and came to consensus on each possible act of aggression. The data was graphed and visually inspected for trends across the season. Effect sizes were calculated as well.

Study Results

In general, all four participants attended the nine sessions and were committed to the program (although one player while meeting the commitment requirements was less committed than the others). The results are presented for each participant in the study. Only the most important results are presented due to the length of the report.

Participant 1 (P1)

P1 was a 12 year-old defenseman playing up an age group. He was selected because he had a tendency to retaliate to opponent's aggression either directed at him or at a teammate. At the beginning of the season P1 was not very assertive but became more so as the season progressed. His goal was to play tough and clean hockey.

Purpose 1, Research Question 1: Enhance emotional toughness and control. P1 perceived an improvement following the implementation as evidenced by comparing his baseline versus program mean self-ratings of emotional control, emotional toughness, and tough and

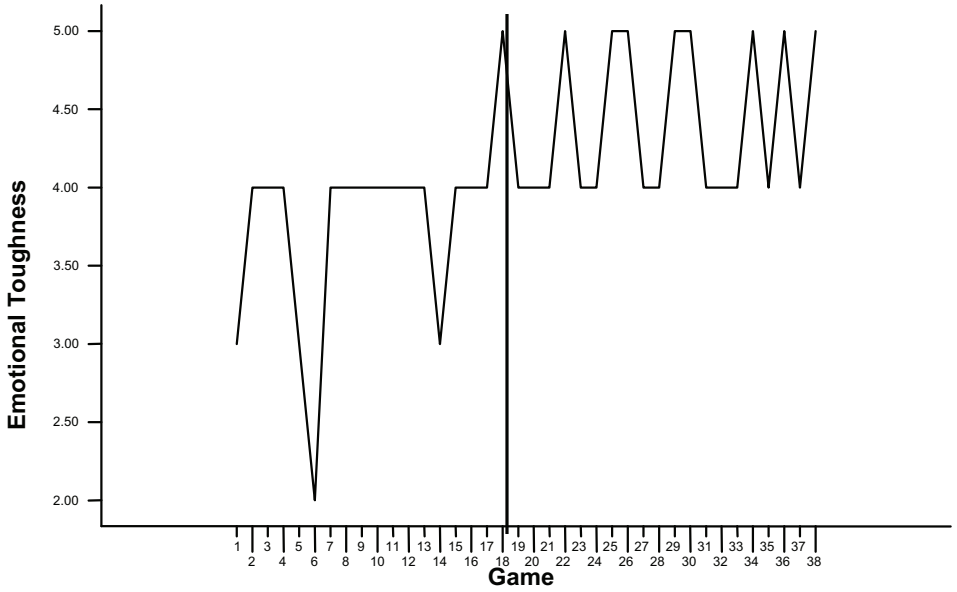
Table 1: Participant 1 Post-Game Reports of Performance, Emotions, and Feeling States by Phase

	Baseline Mean	Baseline SD	**Program Mean**	Program SD
Emotional Control	**3.47**	0.72	**4.52**	0.51
Emotional Toughness	**3.71**	0.59	**4.43**	0.51
Tough & Clean Play	**3.18**	0.93	**4.29**	0.85
Temper Control	**3.65**	0.61	**4.57**	0.51
Individual Performance	**3.06**	0.90	**3.38**	1.02
Dirty & Aggressive Play	**2.29**	0.99	**1.33**	0.58

Note: Higher scores on first four variables indicate a greater ability to manage those feelings and behaviors (Likert scale from 1-5). Higher means on dirty and aggressive play indicate aggressive play (Likert scale from 1-5). Baseline n = 17, Program n = 21.

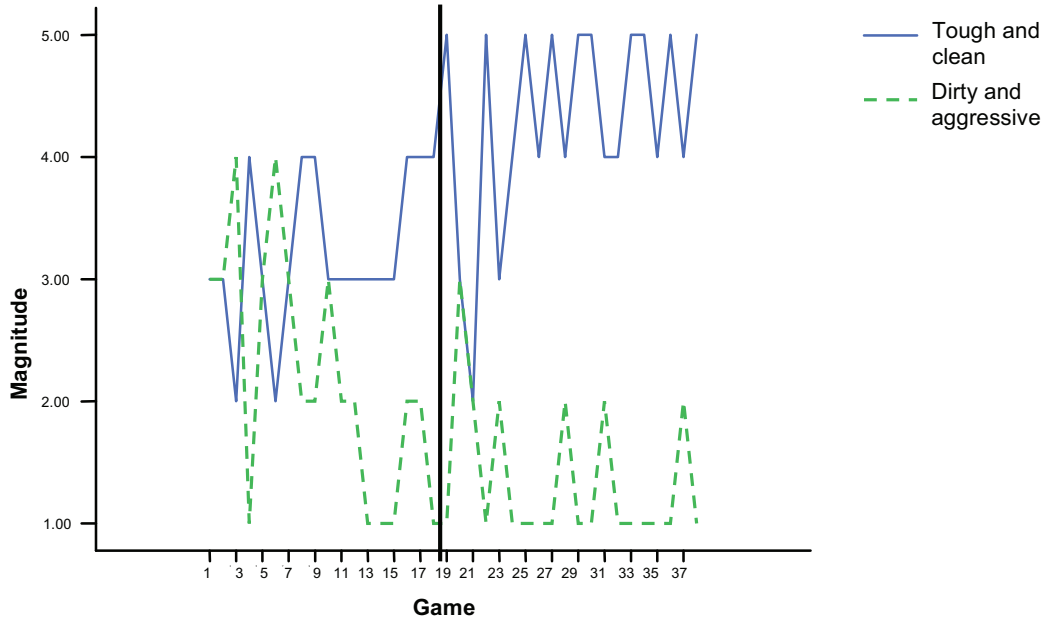
clean play, and temper control. Therefore, P1 felt he improved his ability to manage his emotions and play tough and clean hockey while reducing his aggressive play.

Figure 3: Participant 1 Self-Report of Emotional Toughness during Baseline and Program Phases



Note: Ability to be emotionally tough in adverse situations was rated on a scale of 1 = unable, 3 = sometimes, 5 = always.

Figure 4: Participant 1 Self-Report of Magnitude of Tough and Clean and Dirty and Aggressive Play



Note: Tough and clean play was rated on a scale of 1 = not tough and clean to 5 = much more tough and clean. Dirty and aggressive play was rated on a scale of 1= much less aggressive to 5 = much more aggressive.

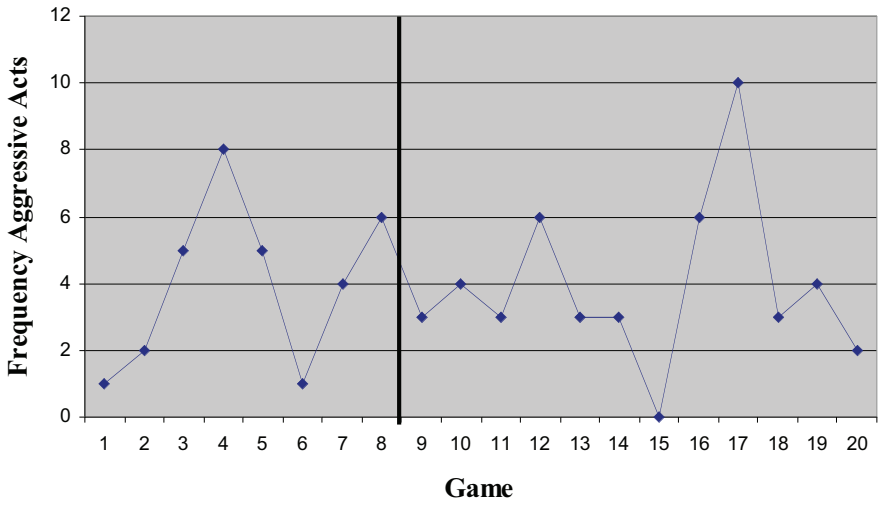
Purpose 1, Research Question 2: Reduce dirty and aggressive play. P1 showed marked improvement in his percent retaliation to opponents' aggressive behaviors (38.46% to 17.65%) from baseline to program (see Table 2). He also dropped his mean aggression slightly despite being much more physically involved in the play. Figure 5 reveals how P1 was able to stabilize his aggressive behavior below four acts per game for most of the program period.

Table 2: Participant 1 Aggressive Acts by Phase of Study

Study Phase	Aggressive Acts	Mean Aggress.	Critical Incidences	Retaliation	% Retaliation	Rate of ***Major*** Aggress/ Game
Baseline	32	4.0	26	10	38.46%	1.25
Program	**47**	**3.92**	**68**	**12**	**17.65%**	**1.00**
Season Totals	79	3.95	94	22	23.40%	1.10

Note: In the baseline **8** games were viewed, in the program phase **12** games were viewed.

Figure 5: Participant 1 Aggressive Acts per Game, Baseline and Program Phases



Note: Program phase began after the eighth game (denoted by full line).

Participant 2 (P2)

P2 was a 14 year old center who was the model of tough and clean hockey. He was included in the study because we felt he could obtain his goal of being more physical while remaining a clean player.

Purpose 1, Research Question 1: Enhance emotional toughness and control. Inspection of Table 3 reveals that P2 had little to no room for improvement in emotional control and toughness. He did improve his perceptions of tough and clean play, and reduced dirty and

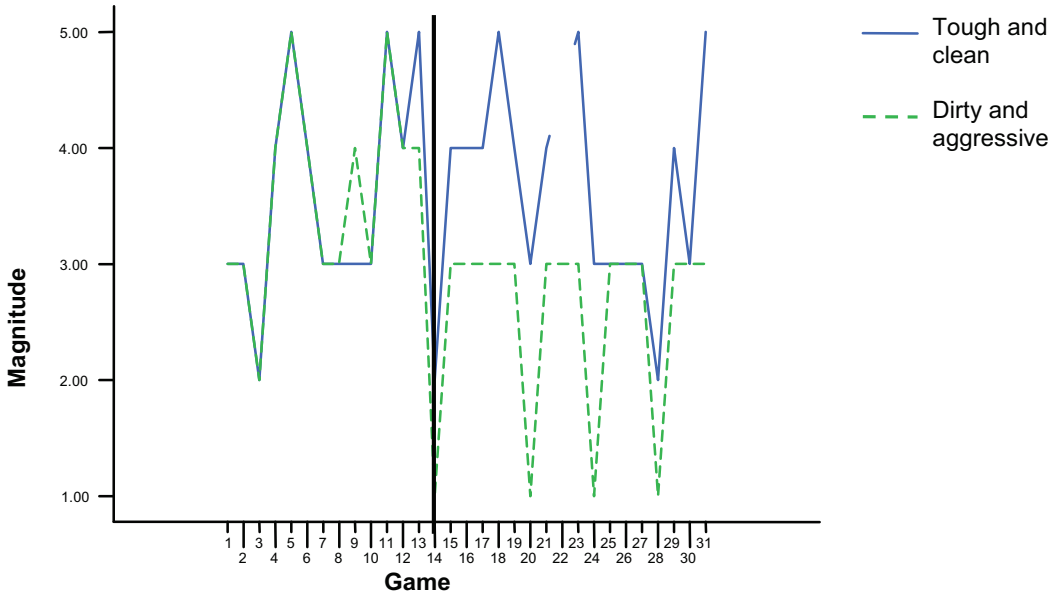
aggressive play. Figure 6 reveals how P2's reports of tough and clean and dirty and aggressive play were changed in the desired directions from the baseline to program phase of the study.

Table 3: Participant 1 Post-Game Reports of Performance, Emotions, and Feeling States by Phase

	Baseline Mean	Baseline SD	**Program Mean**	Program SD
Emotional Control	**5.00**	0.00	**4.76**	0.75
Emotional Toughness	**4.71**	0.83	**4.94**	0.24
Tough & Clean Play	**3.50**	1.02	**3.69**	0.87
Individual Performance	**3.36**	1.08	**3.53**	1.01
Dirty & Aggressive Play	**3.43**	1.09	**2.65**	0.79

Note: Higher scores on first four variables indicate a greater ability to manage those feelings and behaviors (Likert scale from 1-5). Higher means on dirty and aggressive play indicate aggressive play (Likert scale from 1-5). Baseline n = 14, Program n = 17.

Figure 6: Participant 2 Self-Report of Magnitude of Tough and Clean and Dirty and Aggressive Play



Note: Tough and clean play was rated on a scale of 1 = not tough and clean to 5 = much more tough and clean. Dirty and aggressive play was rated on a scale of 1= much less aggressive to 5 = much more aggressive.

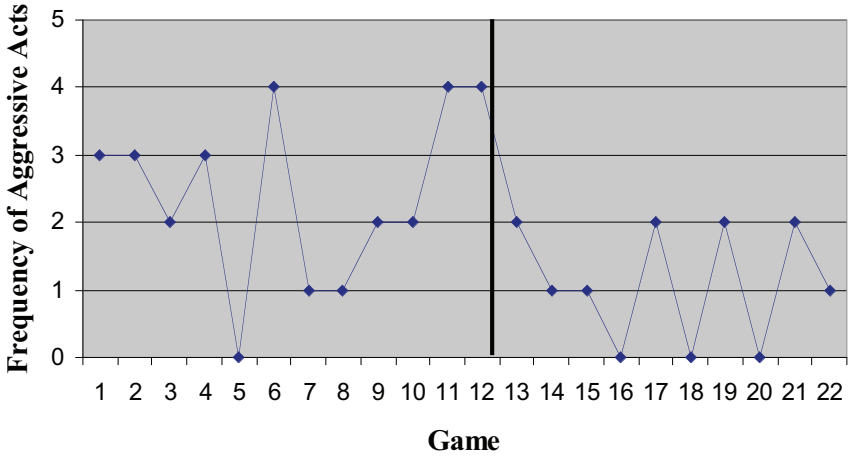
Purpose 1, Research Question 2: Reduce dirty and aggressive play. P2 was not a dirty aggressive player as evidenced by him retaliating only one time (on video) for the whole season! Most of P2's aggression was of the minor variety (e.g., slashing) which he reduced from baseline to program. Hence, even though P2 had little room to reduce his major aggressive behavior he did reduce minor aggressive acts. Figure 7 reveals that P2 never had more than 2 aggressive

Table 4: Participant 2 Aggressive Acts by Phase of Study

Study Phase	Aggressive Acts	Mean Aggress.	Critical Incidences	Retaliation	% Retaliation	Rate of ***Minor*** Aggress/ Game
Baseline	29	2.42	53	1	1.89%	1.75
Program	**11**	**1.10**	**75**	**0**	**0.00%**	**0.70**
Season Totals	40	1.82	128	1	0.80%	1.27

Note: In the baseline **12** games were viewed, in the program phase **10** games were viewed.

Figure 7: Participant 2 Aggressive Acts per Game, Baseline and Program Phases



Note: Program phase began at the thirteenth game (denoted by full line).

Participant 3 (P3)

P3 was a 14 year old center/defenseman who had a tendency to play emotional hockey and retaliate when he was frustrated or angry. He was very committed to the program and often used his emotional toughness skills in other life situations. P3's goal was to stop retaliating and to control his temper and emotions.

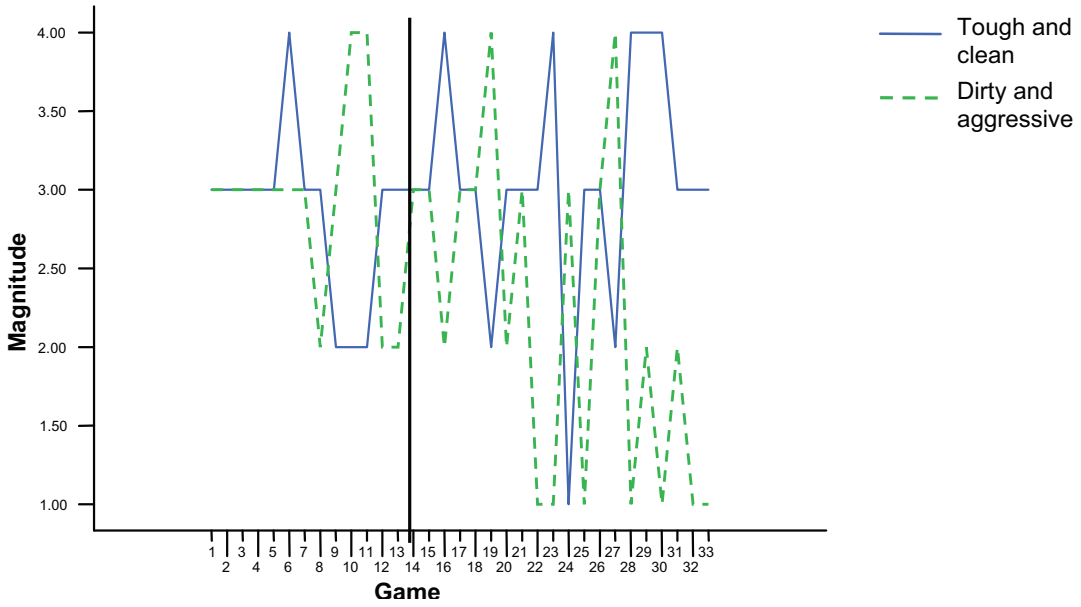
Purpose 1, Research Question 1: Enhance emotional toughness and control. P3 did not report large gains in any of the variables in Table 5, but did perceive a reduction in dirty and aggressive play (2.92 at baseline to 2.20 at program). However, all variables were headed in the predicted direction, and although the results are not of great magnitude, P3 felt that he made significant improvements in his ability to manage his emotions. Specifically, P3's self-reported tough and clean and dirty and aggressive play seemed to be headed in the desired direction in the last five games of the season as shown in Figure 8.

Table 5: Participant 1 Post-Game Reports of Performance, Emotions, and Feeling States by Phase

	Baseline Mean	Baseline SD	**Program Mean**	Program SD
Emotional Control	**2.62**	0.96	**2.75**	0.72
Emotional Toughness	**2.92**	0.49	**3.15**	0.67
Tough & Clean Play	**2.85**	0.55	**3.05**	0.76
Individual Performance	**2.62**	0.51	**3.00**	0.79
Dirty & Aggressive Play	**2.92**	0.64	**2.20**	1.06

Note: Higher scores on first four variables indicate a greater ability to manage those feelings and behaviors (Likert scale from 1-5). Higher means on dirty and aggressive play indicate aggressive play (Likert scale from 1-5). Baseline n = 13, Program n = 20.

Figure 8: Participant 3 Self-Report of Magnitude of Tough and Clean and Dirty and Aggressive Play



Note: Tough and clean play was rated on a scale of 1 = not tough and clean to 5 = much more tough and clean. Dirty and aggressive play was rated on a scale of 1= much less aggressive to 5 = much more aggressive.

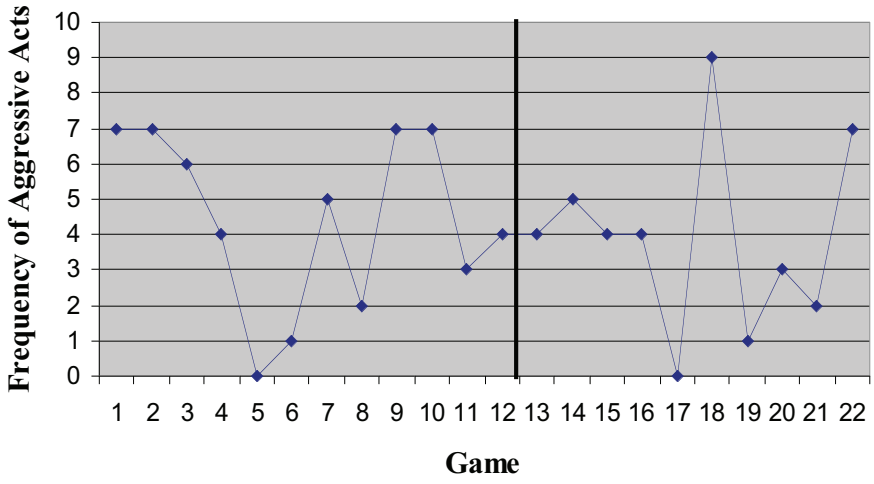
Purpose 1, Research Question 2: Reduce dirty and aggressive play. Again, P3 was making small improvements, but not to the degree he was suggesting in his feedback to the lead investigator. P3 did drop his mean aggression by .52 and retaliated approximately 4% less during the Program. He also decreased his rate of major aggression during the Program (see Table 6). Unfortunately, P3 had two games during the Program where he reverted to aggressive play which influenced greatly the Program mean (see Figure 9). Hence, it is not possible to conclude that the program was effective with this player.

Table 6: Participant 3 Aggressive Acts by Phase of Study

Study Phase	Aggressive Acts	Mean Aggress.	Critical Incidences	Retaliation	% Retaliation	Rate of ***Major*** Aggress/ Game
Baseline	53	4.42	45	8	17.70%	2.25
Program	**39**	**3.90**	**51**	**7**	**13.73%**	**1.70**
Season Totals	92	4.18	96	15	15.63%	2.00

Note: In the baseline **12** games were viewed, in the program phase **10** games were viewed.

Figure 9: Participant 3 Aggressive Acts per Game, Baseline and Program Phases



Note: Program phase began after the twelfth game (denoted by full line).

Participant 4 (P4)

P4 was a 14 year old defenseman who was the most aggressive player in the program. He had a tendency to retaliate and displayed the most major aggressive acts. P4 was also the least committed to the Program. A previous coach placed him in the role of enforcer during peewees where he learned to play aggressively. P4's goal was to play tough and clean hockey so he would not have a reputation as a dirty player. By reducing his aggressive play he would achieve his goal of being recruited by coaches at more competitive levels.

Purpose 1, Research Question 1: Enhance emotional toughness and control. Similar to P3, P4 enhanced his emotional control and toughness, tough and clean play, and performance but not to a great magnitude (see Table 7). However, he had a marked drop in reporting dirty and aggressive play (3.55 at baseline to 2.92 at program).

Table 7: Participant 4 Post-Game Reports of Performance, Emotions, and Feeling States by Phase

	Baseline Mean	Baseline SD	**Program Mean**	Program SD
Emotional Control	**3.92**	1.00	**4.17**	0.86
Emotional Toughness	**3.17**	0.39	**3.44**	0.51
Tough & Clean Play	**3.11**	0.60	**3.28**	0.46
Individual Performance	**3.33**	0.89	**3.50**	0.71
Dirty & Aggressive Play	**3.55**	0.69	**2.92**	0.55

Note: Higher scores on first four variables indicate a greater ability to manage those feelings and behaviors (Likert scale from 1-5). Higher means on dirty and aggressive play indicate aggressive play (Likert scale from 1-5). Baseline n = 12, Program n = 18.

Purpose 2, Research Question 2: Reduce dirty and aggressive play. P4 was the most aggressive player in the study and made the greatest gains. He decreased his mean aggression from 6.75 (baseline) to 4.90 (program). Moreover, he retaliated only 12.8% of the time during the program compared to 32.1% during the baseline phase. P4 also a great reduction in major aggression as indicated by Table 8. Figure 10 on the next page depicts P4's improvement during the program.

Table 8: Participant 4 Aggressive Acts by Phase of Study

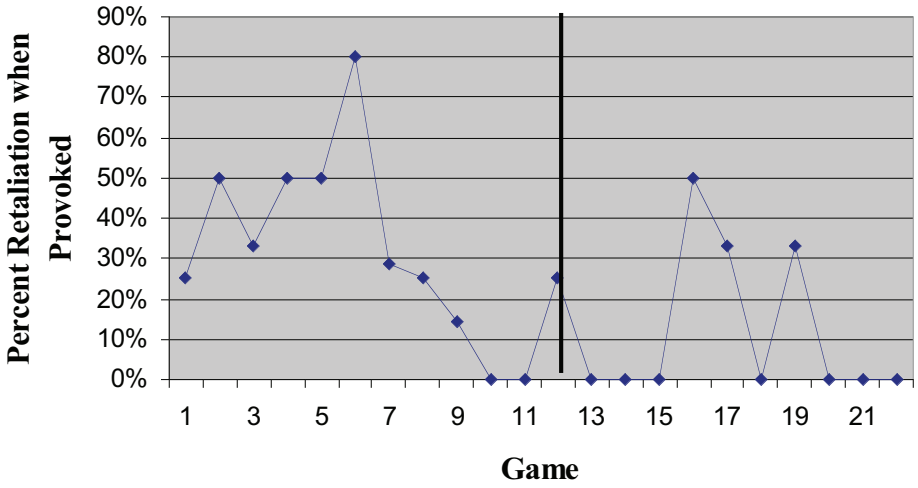
Study Phase	Aggressive Acts	Mean Aggress.	Critical Incidences	Retaliation	% Retaliation	Rate of ***Major*** Aggress/ Game
Baseline	81	6.75	53	17	32.08%	4.58
Program	**49**	**4.90**	**39**	**5**	**12.80%**	**2.70**
Season Totals	130	5.91	92	22	23.90%	3.73

Note: At baseline **12** games were viewed, and **10** were viewed at the program phase.

Interpretation of Results

When looking at these results across the four participants, 3 of 4 players definitely improved in the predicted directions (all in their own unique ways, however) while it was too early to tell with the fourth player. Based on the data P3 did not show marked improvements in his aggressive play. However, there was some reason to be encouraged over his last five games. P1 and P4 had large reductions in retaliatory behavior while P2 who was a tough and clean player at baseline, reduced his minor aggressive penalties. P1 also reported gains in emotional toughness, control, and tough and clean play. P2, P3, and P4 also reported gains in these variables, but not to the same magnitude. Finally, each participant felt that they played better hockey once the program was implemented.

Figure 10: Participant 4 Percentage of Retaliations to Being Provoked (Critical Incidences)



Note: Program phase began after the twelfth game (denoted by a bold vertical line).

The summary results figure (Figure 11 on page 16) can be inspected in two ways. First, looking across participants one sees the direction of change denoted by plus and minus symbols. Emotion management variables were hypothesized to increase after program implementation, and aggressive behavior decrease. Overall, participants were changing in the direction forwarded in Hypotheses 1 and 2 except for one case. P2 had a lower score on emotional toughness during the program, but his baseline score was nearly a mean of 5.0 thus allowing no room for improvement. Therefore, his lower score during the program was still very high. Second, this figure can be inspected by looking within the participants to examine the magnitude of change. Participants varied widely on the magnitude change, yet all were moving in the directions hypothesized.

At the end of the program each participant completed a program evaluation. Each participant felt the program made him a better player (M = 4.0, on a scale of 1 = very ineffective, 4 = very effective). Moreover, the participants transferred lessons learned in the program to situations outside of hockey. For example, P3 used breathing and centering prior to school exams, and the 3 R's to focus during the exam. Finally, each participant recommended the program to other players "Because it makes you a better player and person" and "It helped me a lot and I would think it could help other people."