Children's Persuasive Techniques and Responses to Peer Influence in Risk Situations

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In order to better understand the extent to which peer influence affects children's decision making behaviors in risky situations, a review of the literature examining children's persuasive strategies and their responses to persuasion by peers in risk situations was conducted. This examination of the literature suggests that there may be initial evidence to indicate that children primarily use verbal persuasion techniques, boys' persuasions emphasize fun while girls' emphasize safety, and that children's responses to persuasion from peers is context specific. However, the majority of the studies reviewed suffer from significant methodological problems such as the lack of a control group and low numbers of participants. Further, many of the findings from the studies contradict each other regarding important variables such as the role that friendship quality may play in responses to peer persuasion. Before any firm conclusions can be made about children's responses to peer influence in risk situations, there needs to be a vast improvement in the methodologies of the studies that research this topic. Suggestions for further research are made based on the limitations identified in this literature review.

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Abstract

In order to better understand the extent to which peer influence affects children's decision making behaviors in risky situations, a review of the literature examining children's persuasive strategies and their responses to persuasion by peers in risk situations was conducted. This examination of the literature suggests that there may be initial evidence to indicate that children primarily use verbal persuasion techniques, boys' persuasions emphasize fun while girls' emphasize safety, and that children's responses to persuasion from peers is context specific. However, the majority of the studies reviewed suffer from significant methodological problems such as the lack of a control group and low numbers of participants. Further, many of the findings from the studies contradict each other regarding important variables such as the role that friendship quality may play in responses to peer persuasion. Before any firm conclusions can be made about children's responses to peer influence in risk situations, there needs to be a vast improvement in the methodologies of the studies that research this topic. Suggestions for further research are made based on the limitations identified in this literature review.
Introduction

Each year in the United States, approximately 2,300 children aged 4 to 11 die from injuries, and nearly 3.2 million more are nonfatally injured (Baker, O’Neil, Ginsberg, & Li, 1992). Research indicates that elementary age school children are at their greatest risk for physical injury when with peers, and that peer presence causes both girls and boys to engage in riskier behavior (Morrongiello & Lasenby-Lessard, 2007). Peer presence and persuasion is clearly an important factor in children’s risk making decisions, but what is the nature of peer persuasion, and how do children respond to it?

While the powerful effect that peer and family influences have on adolescents’ risk behavior is well documented, especially in regard to behaviors that affect their health such as smoking and drug use (Brooks, Whiteman, Gordan, & Brook, 1990; Morrongiello & Bradley, 1997; Quine & Stevenson, 1990), there have been surprisingly few studies that have examined the role of peer and family influences on children’s decisions to engage in risk behaviors. Even fewer studies examine children’s responses to peer influence in situations posing an injury risk. The majority of studies that have been focused on the role of peer influence for younger children have examined children’s decisions in nonrisk situations, such as in play settings (Allen, Porter, & McFarland, 2006; Jones, 1985; Miller & Byrnes, 1997; Williams & Shaller, 1993). A number of these studies indicate that interpersonal
influences on decision making operate at very young ages (Jones, 1985; Williams & Shaller, 1993).

Much of the research in this area primarily focuses on the persuasive techniques of children. This research indicates that individual differences in persuasiveness are evident by 4 years of age (Trawick-Smith, 1992), and that persuasive strategies are well developed by age 8 (Levin & Ruben, 1983). These studies have concluded that children are more successful in their persuasions if they are socially competent and use friendly tactics such as requests rather than demands (Trawick-Smith, 1992). There is also an indication in the research that persuaders who use more arguments are more successful in changing other children's behaviors than those who use less (Christiansen & Morrongiello, 1997; Morrongiello & Bradley, 1997; Trawick-Smith, 1992).

One of the most examined variables in the research focusing on children's responses to peer influence concerns the relationship between the persuader and the persuadee (Bigelow, Tesson, & Lewko, 1992; Christiansen & Morrongiello, 1997; Morrongiello & Bradley, 1997; Poulin, Dishion, & Haas, 1999). Though at least one study disputes the quality of the relationship as an important factor (Poulin et al., 1999), the research generally indicates that children are more easily persuaded by those with whom they have higher quality relationships than by acquaintances or unfamiliar children (Bigelow et al., 1992; Christiansen & Morrongiello, 1997; Morrongiello & Bradley, 1997). This is an important finding as the majority of injuries sustained by school-age children occur while away from the home and in the company of peers (Morrongiello, 1997; Morrongiello & Lasenby-Lessard, 2007).
While there are indications that peer influence plays a major role in children’s decision making in injury-risk and non-injury-risk situations, there is an unfortunate lack of quality research examining both the nature of children’s persuasive techniques, and their responses to persuasion. By and large, the studies in this literature review suffer from major methodological problems including the absence of a control group, the use of measurements that are not psychometrically sound, low numbers of participants, and conclusions that are beyond the scope of the methodology. Further, the majority of these studies present children with hypothetical dilemmas under conditions of low emotional arousal, and then ask the children to make and explain their decisions. Such studies are not adequately analogous to real life situations, as children’s risk decisions are not hypothetical and are generally made under conditions of emotional arousal (Gardner & Steinberg, 2005). Due to such problems in the current literature, there are few certain conclusions regarding children’s responses to peer influence in risk situations that can be determined.

Children’s Persuasive Techniques

*Verbal Requests*

The persuasive techniques that children use is not an area well covered in the literature. Few studies exist that have children’s persuasive techniques as the primary focus, and therefore a limited number of conclusions can be ascertained. One of the conclusions from the literature that has been repeated in three separate studies indicates that verbal requests are the most common type of persuasion among children (Jones, 1985; Trawick-Smith, 1992; Williams & Schaller, 1993).
Williams and Schaller (1993) used a naturalistic observation technique to research peer persuasion and children's dominance strategies. Participants were 20 children attending a childcare center in Ohio. There were 10 boys and 10 girls, all of whom were between the ages of 4 and 5. Participants were observed while at play outside at a daycare 3 to 4 hours a week for an hour at a time. Researchers used field notes to record any incidents of dominance or persuasion attempts, specifically noting vocal volume, verbal aggression, physical aggression, and directiveness. The use of theme plays, wherein a child would instigate a game structured in such a way so that the other child was in a subordinate position, was also recorded.

Results of this study showed that all participants used verbal requests more than any other technique. Overall, participants successfully persuaded others to do what they wanted 47% of the time when they used physical techniques, 60% of the time when they used verbal requests, and 79% of the time when theme play was used. Dominant children were identified from examining interactions where there was a domineering attempt and a submissive response. The children who were most likely to obtain submissive responses from others were identified as dominant. Verbal requests from a more dominant child to a less dominant child were the only consistently successful verbal technique. Some gender differences did emerge in success rates of verbal requests. Males were better able to persuade females (83% of the time) than males (55% of the time), while females were slightly more successful in persuading males than females (60% to 57% of the time). Theme play was generally initiated by females over females, and was successful 100% of the time in this study. The success of using theme play initiated by females over males was
lower, but still resulted in a submissive response 71% of the time. There were only four observations of males initiating theme play, and they had a success rate of 50%.

Researchers used a naturalistic observation method in this study, which has higher face validity than self-report measures because it is based on actual observed behavior. It also provided interesting information regarding the most common types of persuasion techniques and responses to them in a natural setting. In the methods section of this article, researchers stated that the observational method allowed the researchers to “become involved in discussions and games” (p. 33). Interacting with the children in this study seems to go against the entire purpose of having a naturalistic study, because you are effectively changing the participant’s behavior, and the researcher’s objectivity. Another possible shortcoming with this study is that researchers recorded observations using field notes instead of recording equipment. The researchers reported that this was done to record exchanges between children that may not be clear on video, and because note taking would be less distracting than video equipment. Still, it further compromises objectivity, and many dominance exchanges may have taken place that the researcher, in a playground of 20 children, may have missed. Furthermore, there is no report of interrater reliability, and it is unclear whether observations were completed by one, or multiple researchers. If there were multiple researchers, the dominance behaviors that were observed (vocal volume, verbal aggressiveness, and directiveness) may have been subjectively interpreted differently by researchers.

While Williams and Schaller’s (1993) study clearly suffered from methodological problems, the finding that children use verbal requests more than
other types of persuasion is supported by a previous study conducted by Jones (1985). This study was a clinical observation study, and did not have the kind of methodological problems which plagued the Williams and Schaller (1993) study. Jones (1985) examined social perspective-taking, friendship, and self-interest reasoning as predictors of appeals and responses to them. The study consisted of a social perspective taking measure, a relationship assessment, and a persuasion task. Participants in the study were 218 children, half of which were randomly selected to be the subjects, and half to be confederates. The subject sample was made up of 33 kindergartners (mean age of 5.5, 16 girls/8 friends and 8 acquaintances, 17 boys/8 friends and 9 acquaintances), 37 second graders (mean age of 7.4, 21 girls/11 friends and 10 acquaintances, 16 boys/8 friends and 8 acquaintances), and 39 fourth graders (mean age of 9.6, 23 girls/13 friends and 10 acquaintances, 16 boys/8 friends and 8 acquaintances). All children were Caucasian and from lower-middle class backgrounds.

Social perspective-taking was measured using the friendship task from Selman’s system for evaluating social perspective-taking (1980). The measure was used to assess the ability to differentiate between self and other, the ability to coordinate these perspectives, and the ability to understand the timeline of relationships. A relationship assessment was also given, and followed a model by Berndt (1981). Children were asked to rank how much they liked same-sex classmates on a scale of 1 to 5. Participants were then randomly assigned to friend or acquaintance conditions.
During the persuasion task, participants were partnered with either a friend or acquaintance and asked to complete a color-by-number task. There was only one color of each crayon, and participants were told that whoever colored the most would win a token. Researchers measured requests (e.g., "May I have it please?")], self-oriented appeals which centered on the needs and wishes of the self (e.g., "I need the crayon, I won't win if you don't give me it, give me the crayon"), and other-oriented appeals that incorporated the other's viewpoint and/or mutual needs (e.g., "You use it awhile, then I'll use it"; "I let you color some; why don't you let me color now?").

Responses to the requests were also observed. Researchers measured responses by recording the number of times one of the children offered a crayon to the other without being asked, the number of seconds of sharing after the crayon had been passed, simple refusals (no, nope, never), and extended refusals. Extended refusals were categorized as delay tactics, personal affronts (stop asking like that, you're mean, etc.), or self interest refusals (no, I want to win). After the session, each child was asked the following two questions: "When you gave the crayon to [partner's name], why did you share it?" and "Sometimes when [partner's name] asked for it, you didn't give it to [him/her]. Why didn't you share then?"

Results of this study showed that verbal requests were the most frequently used and most successful type of persuasive appeal for all ages. There were no significant main effects or interactions when assessing type of persuasive appeal used and age, suggesting that children of all ages used similar appeals when interacting with friends and acquaintances. When assessing response behavior, there was a significant main effects for relationship (F (4, 100) = 2.69, p <.05), simple refusals (F
(1, 103) = 5.62, p < .02), expanded refusals (F (1, 103) = 4.15, p < .04), number of grants (F (1, 103) = 6.69, p < .01), and duration of grants (F (1, 103) = 5.32, p < .02). The results indicate that acquaintances were more likely to receive a simple refusal, whereas friends were more likely to get an expanded refusal. Friends were also granted the crayon more often and for longer periods of time than acquaintances. When looking at type of expanded refusal, researchers found a significant main effect for grade (F (6, 188) = 2.70, p < .02) and delay tactics (F (2, 97) = 4.71, p < .01), showing that fourth graders used delay as a refusal technique significantly more than second graders or kindergarteners.

Finally, researchers examined social perspective taking, friendship, and self-interest as possible predictors for persuasive appeals and responses to appeals. Social perspective taking had significant main effects for grade (F (2, 101) = 36.38, p < .001), and a significant increase in social perspective taking in each grade level. Kindergarteners and fourth graders significantly specified friendship as the reasoning behind sharing among friends (F (2, 97) = 4.73, p < .001). Second graders and fourth graders used self-interest reasoning significantly more than kindergarteners (F (2, 97) = 5.99, p < .004). Other findings showed that children who used self-interest justifications were more likely to respond to requests with simple refusals, and were more likely to be turned down in their appeals to share. Children who were younger, or had high perspective taking skills, had higher proportions of successful appeals.

Jones’ study (1985) was a well-designed observational study that showed many significant results, and had a high number of participants. This study added important information to the literature concerning the most common types of appeals.
used toward friends and acquaintances, and the most common responses to the appeals. Results regarding social perspective-taking, however, should be taken with caution, as social perspective-taking was measured using only the friendship scale of Selman's (1980) system for evaluating social perspective-taking, and it was not reported whether using the friendship scale apart from the rest of the measure was psychometrically sound.

Another study which supports the finding that children use verbal requests more than any other persuasive technique is an observational study by Trawick-Smith in 1992. Though the study had few participants, it also concluded that verbal requests were used more often than other technique, including agonistic behaviors involving the threat or use of force.

*Number of Persuasive Appeals*

Another finding regarding children's persuasive techniques is that children who use more persuasive appeals are more likely to successfully persuade their peers than those who use less (Morrongiello & Bradley, 1997; Trawick-Smith, 1992).

Trawick-Smith (1992) developed a descriptive study to assess persuasion techniques in 4- and 5-year-old children. Participants were three boys and two girls from working class backgrounds who were enrolled in a state-funded childcare center. Researchers videotaped participants playing in groups of three in a laboratory play setting. Six ½ hour play sessions for each participant were selected to be analyzed. The segments were chosen so that each participant was viewed playing with each other child twice. Narratives and behavioral descriptions were written for each time a participant tried to influence the behavior of another child. Both initiating
and responding behaviors were recorded, and specific categories of behavior were created from the analysis. The tapes were also analyzed for any time that there was a conflict involving threats or use of force. From these analyses, persuasive, dominant, and low status participants were identified and compared on several behavioral dimensions.

After analyzing the videotapes, researchers created categories of types of persuasion attempts used, including requests (nicely asking a peer for something), friendly demands (nicely telling a friend to do something), friendly demands with requestive tags (a friendly demand followed by “okay?,” or “allright?”), angry demands, and agonistic demands (angry demands involving threat or use of force).

The responses to the persuaders were also categorized. From this analysis, the following categories were created: compliance, noncompliance, and ignore. Dominant participants were identified by the frequency of their agonistic behaviors that resulted in compliance from the responding participant. Persuasive participants were identified by examining each persuasion attempt, and ranking participants on how successful they were at getting their peer to comply.

Researchers identified two persuasive, two low status, and one dominant participant, and found no gender differences. The persuasive children exercised a broader repertoire of persuasive behaviors and were versatile in applying them. Persuasive subjects were generally successful when using agonistic demands, but chose prosocial techniques the majority of the time. They also used requests less than other children and generally chose a more assertive technique. The dominant child was successful in all but one agonistic exchange, but only had persuasive advantage
over the two low status peers. The dominant child and the low status children were far less active than the persuasive children in trying to persuade others, suggesting that persuasive status may be linked to the number of efforts that one makes to persuade.

Trawick-Smith’s 1992 observational study attempted to create categories of persuasive behavior amongst 4- and 5-year-olds, and gave preliminary evidence that the number of persuasive attempts children make is related to their success in persuading their peers. Both of these findings had not been noted previously in the literature, and may help to direct future research. However, the study suffered from many methodological problems, and with only five participants, no solid conclusions can be inferred from this study. One of the problems was that it was not explained what the children played, or what stimuli was present other than that the participants played in triads in a “specially designed laboratory play setting” (p. 96). Researchers created a category of demand called agonistic behaviors, which involved anger and the use or threat of force, but the extent of the force used during such behaviors is unreported. Interrater reliability was unreported as well, which makes it impossible to know whether the researchers were categorizing persuasive behavior in a consistent manner. The study concluded that “gender did not appear to be related to persuasive status within this play group” (p. 107), which differs from other studies, but with so few participants, no conclusion can reasonably be made. Another problem was that because it was an observational study, results were presented in narrative description and frequency data instead of inferential statistics.
While making any firm conclusions from Trawick-Smith’s (1992) study is impossible due to the vast methodological problems, Morrongiello and Bradley (1997) developed a study which had much better methodology, and supported Trawick-Smith’s finding concerning the relationship between the number of persuasive appeals made, and the success of the persuader. Morrongiello and Bradley (1997) examined the influence of older siblings’ persuasive appeals on younger siblings’ judgments about risk taking. Participants were 80 same-sex siblings “recruited through the schools”, made up of 19 female pairs and 21 male pairs. The mean age of younger siblings was 8.1 (SD = 0.6), and the mean age of older siblings was 11.3 (SD = 0.6). The study consisted of several written measures and a behavioral persuasion task. Participants’ parents filled out the Children’s Injury History Questionnaire (Christiansen & Morrongiello, 1997), which provided information on the amount of and seriousness of previous injuries sustained by participants. The Sibling Relationship Questionnaire- Revised (SIB-R) (Buhrmester & Furman, 1990) was filled out by participants in order to measure how often children direct positive and negative behavior toward their sibling. The SIB-R is a 34-item standardized measure, and has an internal reliability in the range of .64 to .89. The persuasion task involved presenting three detailed black and white line drawings depicting different scenarios to the younger siblings. The scenarios presented were biking through the neighborhood to a friend’s house, sledding down a hill, and crossing a river to get to a tree house. A seven-point danger scale was created for the participants to rate how dangerous they perceived each of the paths to be with seven (“very dangerous”) being the most dangerous, and one (“safe”) to be the least. The tree house scenario was
intended to have a high risk path and a low risk path, the others to have paths of high, moderate, and low risk. Younger siblings were asked which path they would travel on if they were the child in the situation shown on the card. After the younger sibling had made their initial path choice, the experimenter would leave. The child’s older sibling would then enter as a confederate under the guise of waiting for the experimenter to help them with a task. Older siblings were told what path their sibling had chosen, and were told to persuade their sibling to change their path choice using whatever appeals they thought would be effective. The persuasion task was audio taped.

Morrongiello and Bradley’s (1997) study showed many significant results. Initial path selection showed that males were more likely than females to choose higher risk paths ($X^2 = 3.80$, $p<0.05$), consistent with the literature showing that boys have two to four times more injuries than girls (Morrongiello & Lasenby-Lessard, 2007). Interestingly, younger children’s path choices correlated with their danger ratings of each path ($r = -0.37, -0.58, and -0.32$, respectively, for the high risk paths, $p<.001$) while older children did not follow this pattern. This suggests that there are other factors that influence older children’s risk taking behavior. Results also showed that after appeals from older siblings, younger siblings significantly changed their path decisions both from less risky to more risky ($t(31)= 4.31$, $p<0.001$) and vice versa ($t(31)= 7.19$, $p<0.001$). Fifty-five percent of younger children changed their path choice on at least one of the three presented scenarios. There was no significant difference in the rate of decision change for males or females. Positive sibling relationship was predictive of younger children changing their minds. Boys and girls
were equally effective in persuasion, though girls primarily used appeals for safety while boys used appeals for fun. Persuaders who used more arguments were more successful in changing their sibling's minds than those who used less. Sixty-eight percent of children chose paths they believed their parents would allow them to travel. For those who chose high-risk paths, 80% indicated that their parents would not want them to travel that path. Thirty-seven percent of the time there were discrepancies between what the child thought their mother and father would want them to do: 91% of the children said that their fathers would be willing to let the child take a higher risk path.

This study provided valuable information to the literature, supporting previous findings that persuaders who use more arguments are more successful in changing their peers' minds, boys persuasions are focused on fun while girls' are focused on safety, males take more risks than females, and that positive relationships increase susceptibility to persuasion. The study also provided the interesting finding that younger children's risk-decisions correlated to the amount of danger they perceived, while this pattern did not hold for older siblings. The study also gave support to the idea that positive relationships increases susceptibility to persuasion, but this result must be taken with caution. The authors did not provide information regarding the reliability and validity of the SRQ-R, or the validity of the SIB-R, which are the measures that assessed the quality of the siblings' relationships. Other problems with this study include the omission of racial information regarding the participants and recruitment techniques used by the researchers. Another area of improvement would have been if the Children's Injury History Questionnaire had
been completed by participants as well as their parents. This may have provided a more accurate measure, as boys and girls have different rates of reporting injuries to parents (Morrongiello & Lasenby-Lessard, 2007). Also it was not discussed whether those with more previous injuries rated the different paths as more or less dangerous, or if they were less/more prone to persuasion based on previous injury, so it is unclear as to why the Children’s Injury History Questionnaire was given at all.

Gender Differences

There are few studies which examine gender differences in children’s persuasive techniques. Those that have concluded that when attempting to persuade a peer to engage in risk behavior, boys are more likely to base their persuasions on fun and convenience, while girls are more likely to base their persuasions on safety (Christiansen & Morrongiello, 1997; Morrongiello & Bradley, 1997; Morrongiello & Dawber, 2004).

Christiansen and Morrongiello (1997) examined the effect of peer influence on children’s judgments about engaging in behaviors that threaten their safety. The participants in the study consisted of 77 children (39 girls and 38 boys) between 8 and 9 years old. The children were recruited from public schools in Southwestern Ontario and represented a wide range of socioeconomic levels. The study consisted of a parent survey and a persuasion task. The parent survey was the Injury History Questionnaire (Christiansen & Morrongiello, 1997), and was specifically developed for this study to determine whether past injury experiences related to the children’s first path choice during the persuasion task. The Injury History Questionnaire asked parents to report on the frequency and nature of their children’s injuries, especially
those related to snow or ice related injuries, bicycling related injuries, or climbing related injuries. These situations were emphasized as they related specifically to the situations presented in the peer persuasion task. Parents were asked to include injuries that required medical, dental, or home treatments (such as an icepack), and to include injuries that occurred at any time during their child's life.

During the persuasion task, children viewed pictures of three different scenarios. One showed a child needing to cross a river to get to a tree house, one showed a child tobogganing down a hill, and one showed a child riding a bike to a friend's house by a highway. Each scenario had two possible path choices, one of which was more direct but riskier, and one that was less direct and less risky. Children rated how risky each of the paths were on a 7-point Likert scale, and then indicated to the researcher which path they would choose to take if they were the child in the scenario. A same-sex confederate participants earlier identified as someone they play with at school would then enter the room and attempt to persuade the participants to change their path choice. The confederates were told beforehand that they could say anything to try to convince the participants to change their mind. The confederates would then leave, and the participants would make their final decision.

Christiansen and Morrongiello (1997) found some interesting gender differences. First, though girls and boys were approximately equal in effectively influencing their peers to change their path choices, there was a significant sex difference in the type of persuasion used by the confederates. Boys were significantly more likely to persuade using appeals to fun, whereas girls used more appeals to
safety ($F(3, 114) = 3.03, p < .05$) Second, though not reaching the level of statistical significance, girls consistently gave path choices higher danger ratings than boys did. Another finding was that there was a significant correlation between the number of arguments made by the confederate and the number of changes in path decision by the target child ($r(32) = .68, p < .05$), indicating that children who used a greater number of arguments were more successful in changing their friend's mind about what path to take.

This study found that verbal arguments by peers can be effective to persuade elementary-school children to alter their decisions with respect to risk-taking activities, though the success of the confederates to change their peers' minds was situation-dependent. In situations where the choices were between a high level of risk and low risk, the children were less likely to change their minds (endorsing high risk when previously choosing low risk) in response to peer influence. In scenarios depicting choices between low and moderate risk paths, a statistically significant number of children were persuaded by their peers toward greater risk taking ($t(25) = 2.84, p < .05$, $t(27) = 4.16, p < .001$).

Analyses of the Injury History Questionnaire revealed that injury experiences did not relate to initial path decisions in any situation. Additionally, danger ratings for paths in each situation were not significantly related to prior injury history. This suggests that injury experiences, even those situationally specific, did not affect risk-taking decisions in similar situations.

One of the problems in this study is that the Injury History Questionnaire was filled out only by the children's parents, and not the children themselves. There is a
trend for children, especially boys, to underreport their injuries to their parents (Morrongiello, 1997). Therefore, giving this measure to both the children and parents may have given a more accurate description of the nature of their previous injuries. Another issue is that the relationship that the child had to the confederate was not well-controlled in this study and may have a major effect on the amount of influence the confederate had on the subject. Children were asked to make a list of other children with whom they played at school, and were randomly matched up with a child from that list who would act as persuader. This way of choosing confederates assures that the children at least play together at school, but the nature of the relationship between the confederates and the subjects may have varied wildly. It is probable that some of the child dyads were close long-term friends who spent time at each other’s houses regularly, while others may only play together once in a while at recess. A third potential problem with this study is that the decisions the children made about what level of risk they would engage in are hypothetical. There are not actual positive or negative outcomes for which path they chose, so actual risk-taking behavior can not be determined from this study.

Morrongiello and Bradley (1997) also found that girls primarily use appeals for safety while boys use appeals for fun. The authors’ study examined the influence of older siblings’ persuasive appeals on younger siblings’ judgments about risk taking behaviors. The study reported that while boys and girls were equally effective in persuasion, boys primarily used appeals for fun, while girls primarily used appeals for safety. This finding is also supported in a study by Morrongiello and Dawber (2004) which examined factors that related to children’s risk taking decisions. The study
reported that when making a decision concerning risk taking, girls emphasized safety significantly more than boys, and that boys emphasized fun significantly more than girls.

Children's Responses to Persuasion

Context Specific

Children's responses to persuasion from peers is not a subject thoroughly examined in the literature. Few studies examine children's responses to persuasion, and many of those that do exist suffer from methodological problems which weaken their findings. One of the conclusions from multiple studies, indicates that children's responses to persuasion from their peers is context specific (Christiansen & Morrongiello, 1997; Miller & Byrnes, 1997; Morrongiello & Dawber, 2004).

Miller and Byrnes (1997) developed a study consisting of two separate experiments, to examine whether children choose to engage in higher levels of risk when peers are present, and to see if there were any correlations between personality factors and risk taking behavior. The experiments both consisted of behavioral risk measures, and written or verbal personality measures. Participants in Experiment 1 were 131 students drawn from a middle-class parochial school located in suburban Washington, DC. Forty three percent of the children were White, 27% were Hispanic, 18% were Asian, and 12% were African American. There were 41 third graders (M age = 8 years 3 months; 23 girls, 18 boys), 48 fifth graders (M age = 10 years 5 months; 23 girls, 25 boys), and 42 seventh graders (M age = 12 years 5 months; 19 girls, 23 boys).
During the behavioral risk measurements, children were randomly placed into two categories, one with peers present and one with peers absent. In the peers present condition, three same age peers completed the behavioral measurements in front of each other, while in the peers absent condition children completed the measures alone. For the peers present condition, there were seven groups made up of three friends, six groups made up of two friends and one non-friend, and nine groups of three non-friends. There were two skill based risk activities in the study: solving a math word problem, and a physical task involving sliding a penny along a piece of cardboard to try to get it into a slot. Each task had three levels of risk: the math problem had three levels of difficulty, and the slot in the physical task was three different sizes. The children were told about the differing levels of difficulty, and chose which level of risk in which to engage. There were also two chance based activities- pulling a red marble out of a bag of white ones, and pulling a colored card out of a deck of similar cards. Researchers also obtained the children’s mathematics grades and compared them with the level of difficulty the participants chose for the math word problem, in order to determine whether the participants were choosing word problems at their ability level.

Participants were also given several personality measures. Fear of failure was assessed with Sarason, Davidson, Lighthall, Waite, and Ruebush’s (1960) Test Anxiety Scale. Cronbach’s alpha for the participants was .84, indicating that the measure had high internal consistency. To assess ability beliefs, each participant was asked “how good do you think you are in math,” and “how good do you think you are in sports?” The responses ranged from 1 (not so good) to 4 (really good). In order to
assess impulsivity, sixty-five of the participants in the peer absent group were given the Matching Familiar Figures (MFF) test (Kagan, Rosman, Day, Albert, & Phillips, 1964) though the authors conceded that there is a controversy over the meaning and usefulness of the MFF. The authors also created a 10 item measure to assess self sufficiency. Chronbach's alpha was .04, suggesting that the items were not measuring self sufficiency as a unified construct.

Results of the personality measures of Experiment 1 were significant for both peer presence and gender (p<.05). For boys in the peers absent condition, greater risk taking was correlated with being more impulsive and less anxious. For girls in the peers absent condition, greater risk taking was significantly correlated with being less impulsive, and more reflective (p<.01). For boys in the peers-present condition, there was a significant correlation between being more self-sufficient and greater risk taking, while for girls in the peers-present condition, there was a significant correlation between being less self-sufficient and greater risk taking. The behavioral tasks showed main effects of gender (F(1, 119) = 29.44, p < .001), and condition (F(1, 119) = 15.32, p < .001), as well as a significant Gender × Condition interaction (F(1, 119) = 6.04, p < .015). During the risk activities, boys were significantly more likely than girls to choose the very risky option when peers were present (M =2.38, boys; 1.18, girls). When peers were absent, no significant results were found. Results also showed a Grade × Condition interaction (F(2, 119) = 2.87, p = .015). This interaction revealed that peer presence significantly reduced the number of optimal choices in seventh graders (M = 1.76, peers absent; .90, peers present), but did not significantly
reduce number of optimal choices in third (M = 1.10, 1.19, respectively) or fifth graders (M = 1.63, 1.29, respectively).

Researchers found a significant Gender × Condition correlation when assessing whether children were choosing the math word problems at their ability level (r = .35, p < .01, for boys; .24, p < .05, for girls). Results showed that regardless of gender, the presence of peers significantly reduced the number of optimal choices for seventh graders (M = 1.76; peers absent; 1.90 peers present), but did not significantly affect the number of optimal choices for third (M = 1.10, peers absent; 1.19 peers present), or fifth graders (M = 1.63 peers absent; 1.29 peers present).

Overall, children chose the most appropriate option 38% of the time. Finally, researchers examined the effect that a child’s own performance on earlier trials may have had on his or her later choices. Results showed that 31% of the choices made by consistent risk takers were consistent with prior outcomes, while 60% of the choices made by consistent risk avoiders were consistent with prior outcomes. Based on these results, Miller and Byrnes (1997) argued that risk takers base their risk choices on something other than their own or their peers’ success or failure, while risk avoiders base their risk choices on their own and their peers’ success or failure.

While it is one of the few studies examining the effect of peer presence on children’s risk taking behavior, Miller and Byrnes’ (1997) study suffers from several methodological problems. Significant results are reported from examining the personality measures, but the quality of the measures is low. The article admits that the MFF is controversial, and only 65 of the participants were asked to fill it out. The sensation-seeking scale created by the authors has a Chronbach’s alpha of .04,
suggesting that it had poor internal consistency. Researchers reported the Test Anxiety Scale had a Chronbach's alpha of .84, suggesting it measured a single factor, but no further psychometrics about the measure are reported. The behavioral risk activities in this study do not simulate real life risky situations, which may have played a major role in the insignificance of having peers present. Also, this article did not state whether the peers were allowed to or encouraged to talk with the participant, or to try to encourage the participant to take a less/more risky choice.

Finally, results were poorly written and confusing even upon close examination.

Participants in Experiment 2 were 115 students, made up of 34 fourth graders (M age = 9 years 2 months; 20 girls, 14 boys), 42 sixth graders (M age = 11 years 2 months; 22 girls, 20 boys), and 39 eighth graders (M age = 13 years 3 months; 18 girls, 21 boys). This study included rating scales, a competitiveness scale, a sensation-seeking scale, and a peer nomination measure. To assess risk taking behavior, participants were presented with six risk taking scenarios, and asked to respond in writing as if they were actually in them. Participants chose a low-risk, medium-risk, or high-risk option. Four scenarios were skill-based, and included a spelling task, a task which asked participants to imagine they were playing basketball, and two social risk tasks which involved getting a group of unfamiliar children to let the participant join an ongoing activity. The remaining two scenarios were chance-based, and included trying to choose a movie that their friends would all like, and a dice game. Researchers created rating scales that asked participants how good they would feel if they were successful at the individual tasks, and how bad they would feel if they failed. For the skill-based tasks, participants were also asked how good
they were at the tasks, and how much they enjoyed them. Responses were rated on an anchored 4-point Likert scale. A competitiveness scale was created by presenting participants with five scenarios and asking if they would choose to be competitive in that scenario. Scenarios included playing basketball, sharing ideas for a science project, letting a classmate see your homework, winning prizes for a fundraiser at school, and studying extra for an examination. Cronbach’s alpha was .34 for these items, implying that the scale had poor internal consistency and that results should be taken with caution. To assess sensation-seeking, participants all completed 15 items from Zuckerman’s Sensation-Seeking Scale (Horvath & Zuckerman, 1993). The scale has three subscales (Thrill and Adventure Seeking, Experience Seeking, and Boredom Susceptibility), and 5 items were chosen from each subscale. Finally, there was a peer nomination scale at the end of the booklet that asked participants to nominate up to three peers of the same gender who were good examples of risk takers.

The results of this experiment showed main effects of gender (F(1, 109) = 12.47, p < .001), and task (F(5, 545) = 12.98, p < .001) as well as significant Gender × Task interactions (F(1, 545) = 2.35, p < .04). Regarding the main effect of gender, boys chose the riskiest option on an average of 3.45 tasks (58%), and girls chose it on an average of 2.32 tasks (39%). In regard to the main effect of task, no grade differences emerged for very risky choices on the spelling task, but there were significant increases with each grade level for the basketball task (29%, 50%, and 69%, respectively). For the dice and movie tasks, children in the sixth and eight grades selected the riskiest option significantly more often than the fourth graders. Interestingly, for the two social tasks, the fourth grade participants were significantly
more likely to choose the riskiest option than were children in the older two grades. Choosing the riskiest option for the skill-based scenarios was associated with higher ratings of ability, greater interest in the activity, higher competitiveness scores, an interest in thrill and adventure seeking, and a greater number of peer nominations ([β] ranging from .18 to .22).

In Experiment 2, researchers attempted to improve on and contribute to the results from Experiment 1, but the study suffered from just as many methodological and interpretive problems. To assess risk taking, scenarios were presented and participants were asked what level of risk they would participate in if they were in that situation. Participants were informed that higher points would be awarded for riskier behavior. Because there was no observational measure to compare actual to imagined success at the risk behavior, awarding points for riskier behavior may have encouraged participants to indicate that they would engage in higher risk behavior than they actually would have. In an effort to improve their measurement of sensation-seeking from Experiment 1, researchers chose items from Zuckerman’s Sensation-Seeking Scale, but it is not clear whether the measure is psychometrically sound when only some of the items are used.

Results of Experiment 1 showed that there were significant effects of peer presence for 7th graders but not 3rd or 5th graders, entertaining the possibility that older children are more sensitive to peer presence. Instead of examining this further, Experiment 2 omits the peer present condition.

Miller and Bynes (1997) argued that the general trends across the two experiments suggest that age and gender effects on risk-taking appear to be context specific. They further conclude that characteristics such as overconfidence,
competitiveness, insensitivity to outcomes, and sensation seeking appear to have more influence on risk-taking than gender or age. However, due to many methodological problems, it is important to interpret the results with caution.

Though Miller and Byrnes (1997) study was fraught with problems, the finding that children’s responses to peer presence is context specific was also found in a Christiansen and Morrongiello (1997) study which examined the effect of peer influence on children’s judgments about engaging in behaviors that threaten their safety. Additionally, Morrongiello and Dawber (2004) concluded that children’s responses to peer presence was context specific in a study that examined how the quality of the relationship between children affects the receptiveness to peer influence. Clearly, this is a finding which needs to be investigated further in order to strengthen the literature.

**Peer Presence**

In situations where children are confronted with risk situations that pose a threat of injury, the literature indicates that children are more likely to make riskier decisions when their peers are present (Christiansen & Morrongiello, 1997; Gardner & Steinberg, 2005; Morrongiello & Bradley, 1997; Morrongiello & Dawber, 2004). In order to better determine how the nature of the relationship between children affects the receptiveness to peer influence in an injury risk situation, Morrongiello and Dawber (2004) created a study focusing on a population of same-sex best friends. Participants in the study were required to have a same-sex best friend for at least 1 year (M= 3.2 years, SD= 2 years) and had to be between the ages
of 7 and 10 (M= 9.2 years, SD= 1.1 years). A total of 40 pairs of best friends participated, with equal numbers of boys and girls.

This study consisted of written measures, verbal measures and a persuasion task. The children were all given the Friendship Quality Questionnaire- Revised (FQQ), developed by Parker and Asher in a 1989 study (as cited in Morrongiello & Dawber, 2004). The FQQ contains 41 items that assess six different aspects of friendship quality, and then results in an overall score that assesses the quality of the friendship. The FQQ showed high internal consistency in this study (alpha= 0.84), as previously noted in the Parker and Asher’s study (as cited in Morrongiello & Dawber, 2004). Experimenters read the items out loud and participants circled their responses on a 4-point Likert scale. In order to gather information about the children’s friendship history and risk-taking as a dyad, researchers created the History of Shared Experiences Questionnaire, which asked participants how long they had been best friends, and the kinds of things they do together. They were also asked how often they engage in risky behavior together, and whether one of the children is the predominant initiator of risky play. Drawings were created to represent potentially risky situations that children engage in frequently. Pictures were detailed black-and-white pictures depicting crossing a stream, riding a bike, roller blading, tobogganing down a hill, ice-skating on a lake, and tumbling down a hill. For each drawing there was a low-risk path, a medium-risk path, and a high-risk path. The high-risk path was the shortest path, the medium-risk path was a medium length path, and the low-risk path was the longest. The participants were all asked the following questions: a) Which path would he/she choose, and why? b) Which path would his/her friend
probably choose? c) Which path would his/her mom want him/her to take? and d) Which path would his/her dad want him/her to take? Children were also asked to give ratings on a visual analog scale of how dangerous and how much fun each path would be to travel. Children marked their answers on a scale alongside drawings of four progressively fuller glasses. To assess for different experience levels, children were also given a 5-point Likert scale experience questionnaire to assess how much they engaged in each activity depicted in the drawings.

After one participant had filled out the FQQ, experience questionnaire, and the drawing questions (including fun and danger ratings), the participant’s friend would try to influence the participant to change his/her path choice. Before the session, the participant’s friend was told to say anything he/she thought may get the participant to change his/her path choice. The participant was not told that his/her friend knew his/her path choice, or that his/her friend had been asked to get him/her to change his/her mind. The participant and friend then met with a researcher who held up a drawing and asked the persuader, “(Which way do you think (participant’s name) should go?” and “Why do you think he/she should go that way?” This was repeated with all three drawings, and then the participant was asked to give his/her final path choice.

Results of this study showed that children were more likely to make risky decisions in response to peer persuasion. Participants who attempted to persuade peers to a less risky path were no more likely to be successful than unsuccessful in these attempts, regardless of level of experience with the activity (p > .05). Participants who attempted to persuade peers to a more risky path, were successful
more often than not ($\chi^2 = 9.59, p < .05$). Overall, regardless of gender and activity, children were successful in persuading their friends 50% of the time. Importantly, as this study focused on the quality of friendship as a variable in the vulnerability to peer influence, success scores (i.e., 0–3 successful persuasive efforts) positively correlated with quality-of-friendship scores ($r(38) = .39, p < .05$).

Results of this study showed some significant gender effects for children’s initial path choices. Boys selected significantly higher-risk paths than girls ($F(1, 78) = 14.30, p < .01, \eta^2 = .16$ ($M = 1.98$ and $1.68$, $SD = 0.69$ and 0.61, respectively). Girls emphasized safety significantly more than boys, ($F(1, 238) = 13.41, p < .001, \eta^2 = .53$), while boys emphasized convenience significantly more than girls ($F(1, 238) = 4.86, p < .05, \eta^2 = .20$). These findings are consistent with boys more often selecting higher risk paths and girls more often selecting lower risk paths. Another significant gender difference in this study is the correlation between risk behavior and the path that participants believed their parents would want them to take. For girls, this correlation was significant ($r(38) = .71$ and $.72$), while for boys it was not. The authors suggested that this indicates that boys are less likely than girls to be deterred from risk taking based on what they believe their parents would want them to do.

The study also found significant results based on personal experience levels for the scenarios presented to them. Children focused on safety most for activities for which they had less experience, and competence or ability to manage risk for activities with which they had more experience. Consequently, the study found a significant main effect for experience level ($F(1.92, 149.71) = 20.42, p < .001, \eta^2 = .21$), which indicated that children selected higher risk paths for high-experience
activities, compared to the paths selected for the moderate- and low-experience activities. Participants also significantly perceived activities with which they had high experience as posing less danger. There was also a significant interaction between children's perception of how fun they perceived a path to be and their experience with the activity ($F(3.67, 285.47) = 16.03, p < .001, \eta^2 = .76$), indicating that riskier paths appeared to be more fun with activities that they had more experience in.

Though this study was successful in building off of similar studies to better assess how friendship quality affects peer influence, it had some shortcomings that lessen the quality of the results. There are a fairly low number of participants in this study, and racial demographics and SES of the participants were left unreported, which limit the external validity. Furthermore, while there were multiple information gathering measures involved, there was only a single measure that assessed how children responded to risk situations and their responses to peer influence in that scenario. Finally, the most egregious problem in this study is the lack of a control group. Though the researchers administered the FQQ and found that quality of friendship correlated with vulnerability to peer influence, it would have been much a much stronger study if there had been a control group of children who were exposed to peer influence from other children who they did not consider to be their best friend. The comparison of the best friend influenced group and the non-best friend influenced group would have generated more reliable, scientifically sound results.

Another study which found that participants took greater risks when peers were present was conducted by Gardner and Steinberg (2005). This study included a
methodology which examined risk taking behavior in the moment. The study examined how peer presence and advice influences risk taking, risk preference, and risky decision making. While this study focused on risk-taking behavior of adolescents and adults, it is included in this literature review both because of the lack of studies on this topic that focus on children and a unique research design.

Participants were 306 individuals recruited from fliers, contact in college classes, community centers, day camps, and community organizations, as well as word of mouth. Participants were put into three groups: adolescents, youths, and adults. One hundred six participants were adolescents (54 girls and 52 boys), ages 13 to 16 (M age = 14.01, SD = 1.02). One hundred five participants were youths (53 women and 52 men) ages 18 to 22 (M age = 18.78, SD = 1.07), and 95 participants were adults (48 women and 47 men) ages 24 and older (M age = 37.24, SD = 12.37). This study consisted of two questionnaires, and one behavioral task measuring risk-taking. Participants were randomly assigned to complete the measures alone, or in the presence of two same-aged peers.

The behavioral risk taking task in this study was a videogame called “chicken,” in which participants have to decide whether to stop at a stoplight that has turned from green to yellow. Players accrue more points the farther the car goes before stopping, but if the car goes through the light after it turns red the player looses all their points. In the peers present condition, peers were told that they could call out advice about whether to allow the car to keep moving or to stop it. The player was instructed that he or she could choose whether to follow the advice of his or her peers.
In order to determine risk preference, participants were given a shortened, modified version of the Benthin Risk Perception Measure (BRPM) (Benthin, Slovic, & Severson, 1993). This measure is rated on a 4-point scale that ranges from 1 (risks are much greater than benefits) to 4 (benefits are much greater than risks), and presents participants with 5 scenarios including having sex without a condom, riding in a car driven by someone who has been drinking, trying a new drug that one does not know anything about, breaking into a store at night and stealing something that one really wants, and driving over 90 miles per hour on the highway at night.

Participants in the sole participant condition read the scenarios from index cards and indicated their choices on a response card displaying the 4-point scale. Group condition participants followed the same procedure but were told that they could discuss each question. However, they were instructed that they did not need to reach a consensus and that each could make a final decision at any time.

To measure risky decision making, participants completed the Youth Decision-Making Questionnaire (YDMQ) (Ford, Wentzel, Wood, Stevens, & Siesfeld, 1990). Participants were presented with five hypothetical dilemmas, including decisions about allowing friends to bring drugs into one’s home, stealing a car, cheating on an exam, shoplifting, and skipping work without an excuse.

Decisions about each dilemma were made within the context of three different scenarios, one in which no negative consequences would occur, one in which negative consequences may occur, and one in which negative consequences would definitely occur. For each dilemma, participants were asked to decide what they would do “if they were really in that situation” on a 4-point scale that ranged from 1
(definitely making the risky decision) to 4 (definitely not making the risky decision).

Similar to the BRPM procedure, those in the sole participant condition completed the measure on their own, and those in the peers present condition were told that they may discuss each question, but did not have to reach a consensus and could reach a final decision at any time.

Results of this study indicated that all age groups showed significant effects of peer presence on all three measures, as they took more risks during Chicken (F(1, 284) = 15.05, p < .0001, r_{effect size} = .224), gave more credence to the benefits than the risks on the BRPM (F(1, 288) = 3.662, p = .057, r_{effect size} = .112), and were more likely to indicate riskier choices on the YDMQ (F(1, 288) = 6.308, p < .05, r_{effect size} = .146.). There was a significant effect of age on the behavioral risk taking task, and on the YDMQ (F(1, 284) = 18.79, p < .0001, r_{effect size} = .249; and, F(1, 288) = 24.599, p < .0001, r_{effect size} = .281, respectively), showing that younger participants took greater risks during Chicken and indicated riskier courses of action on the YDMQ. While peer presence was a significant factor in all age groupings, the study showed that it was not an equal influence for all age groups. Peer presence influenced younger participants to take risks at a significantly higher level during Chicken (F(1, 284) = 4.801, p < .05, r_{effect size} = .129) and on the YDMQ (F(1, 288) = 4.943, p < .05, r_{effect size} = .130), though not on the BRPM.

The study found limited gender differences, and reported no significant differences between males and females on risk taking or risky decision making. The study did report however, that younger males focused significantly more on the benefits of risky decision making than younger females. Among older individuals,
males and females gave very similar ratings to the benefits of risky decisions as measured by the BRPM ($F(1, 288) = 11.089, p < .01, r_{\text{effect size}} = .193$).

Gardner and Steinberg (2005) also reported several significant ethnic differences. Interestingly, non-White participants took significantly greater risks during Chicken ($F(1, 284) = 11.67, p < .01, r_{\text{effect size}} = .199$), but White participants indicated significantly higher levels of risky decision making as measured by the YDMQ ($F(1, 288) = 6.645, p < .01, r_{\text{effect size}} = .150$). Ethnic differences also varied by age, as non-White adolescents took significantly more risks as measured by Chicken, and indicated a greater risk preference as measured by the BRPM than White adolescents ($F(1, 284) = 9.03, p < .01, r_{\text{effect size}} = .176$, $F(1, 288) = 3.922, p < .05, r_{\text{effect size}} = .116$, respectively). Though not reaching the level of significance, non-White adults were more likely to make risky decisions on the YDMQ than White adults, while among adolescents White participants were more likely to make risky decisions on the YDMQ. There were also ethnic differences in responses to peer presence in risk taking as measured by Chicken, ($F(1, 284) = 4.383, p < .05, r_{\text{effect size}} = .123$), and risk preference as measured by the BRPM ($F(1, 288) = 6.517, p < .05, r_{\text{effect size}} = .149$), with non-White participants showing greater influence from peer presence in both cases. Finally, the study found significant Age × Condition × Ethnicity interaction effects on risk taking ($F(1, 284) = 4.011, p < .05, r_{\text{effect size}} = .118$), and risk preference ($F(1, 288) = 5.961, p < .05, r_{\text{effect size}} = .142$), which indicated that peer effects were greater for non-White adolescents on the risk preference measure and the behavioral risk taking measure, while conversely, peer effects on risk taking behavior were greater for White than non-White adults.
Gardner and Steinberg’s study (2005) was comprehensively done, and had some significant benefits over other studies assessing individual’s reactions to peer presence and peer pressure. The use of multiple measures, large sample size, and detailed analyses of age, gender, and ethnicity, allowed a large amount of quality information to be learned from the results. The primary strength of this study was in the inclusion of Chicken as a behavioral measure of risk, as it allows risk to be measured in the moment instead of having an unlimited amount of time to decide what one would do in a given situation. Additionally, Chicken requires participants to make actual decisions in a risky situation, rather than simply requiring participants to report what they would do in a hypothetical risky situation.

Problems in this study include the possibility that Chicken may be measuring reaction time for some of the participants instead of risk taking behavior. Another possibility is that the higher risk taking behavior of youth and particularly the adolescents could be explained by the fact that they have had less driving experience than those participants in the adult group. Participants in the group condition completed the measure in the presence of two peers who were told that they could call out advice about whether to allow the car to keep moving or to stop it, and the player was instructed that he or she could choose whether to follow the advice of his or her peers. In real world risk situations, people are not prepped beforehand that they are going into a situation where they will be faced with peer pressure. Also, reinforcing the point that they have the choice of whether or not to listen to their peers (awareness raising) is unlike a real world risk situation, and limits the external validity. Another important factor that was not addressed in this study is the nature of
the peer pressure. Perhaps the results could be explained due to different styles or intensities of the peer pressure that the confederate displayed. Because participants in each group were only in the presence of similar aged people, the results may indicate that adolescents and youths have more persuasive or effective peer pressure techniques. Further, it is not reported whether peers were in mixed race groups. Perhaps White and non-White participants would react differently to pressure/presence from peers of the same or different racial groups. The inclusion of the Youth Decision Making Questionnaire raises the question of whether it is an appropriate measure for the youths and adults in this study, and whether comparisons of the age groups through this measure are valid. A final critique of this study has to do with the make-up of the age brackets and whether it is appropriate to compare the groups. While the adolescent and youth groups were well defined and had age standard deviations of 1.02, and 1.07 respectively, the adult age group were comprised of individuals aged 24 or older, and had a standard deviation of 12.37.

While Gardner and Steinberg’s (2005) study focused on adolescents and adults, and Morrongiello and Dawber’s (2004) study lacked a control group, the finding that children are more likely to make riskier decisions when in the presence of a peer is supported by two more studies. In a study which examined the effect of peer influence on children’s judgments about engaging in behaviors that threaten their safety, Christiansen and Morrongiello (1997) concluded that children made significantly riskier decisions when peers were present. Morrongiello and Bradley (1997), concluded similarly in a study that focused on the influence of older siblings’ persuasive appeals on younger siblings’ judgments about risk taking.
Friendship Quality and Responses to Persuasion

Friendship quality has been examined in several studies as a potentially important variable in children's responses to peer persuasion both in injury and non-injury risk situations (Allen et al., 2006; Bigelow et al., 1992; Jones, 1985; Morrongiello & Bradley, 1997; Morrongiello & Dawber, 2004; Poulin et al., 1999). Results have been contradictory, however, and methodological problems plague both the studies that conclude that friendship quality makes a difference, and those that conclude that friendship quality does not make a difference, such that no dependable conclusions can be inferred.

A study which reported that friendship quality effects how children respond to others was developed by Bigelow et al. (1992). This study examined the differences in how children respond to friends, close friends, non-friend peers (referred to as "other kids") siblings, teachers, and parents. Participants in this study were 659 children between the ages of 9 and 13, comprised of 329 males and 340 females. The participants in this study were recruited from both public and private schools in Ontario and represented a mix of blue collar and middle class families. The Social Rules Checklist was created for this study, which is a 56-item test that measures how often certain social rules are used when engaging with parents, teachers, siblings, close friends, other friends, and "other kids." The development of the checklist was based on a comprehensive social rules inventory derived from a previous study (Tesson, Lewko, & Bigelow, 1987), which involved recursive interviews with 320 children in grades one through eight, to ask which social rules they use with their parents, peer group, and relationships with adults. The measure examines compliance,
autonomy, social facilitation, information management, prosocial behaviors, loyalty, managing feelings and conflict management. Pilot testing showed that children were struggling with the length of the test, so the researchers halved the test into form A and form B. Researchers created the two halves by grouping items conceptually, though form A assessed all eight of the social rules, and form B assessed seven of them. Participants filled out either form A or form B of the measure in their classrooms after having the written instructions explained to them by the experimenter.

Results showed that there were no significant differences in the responses between the Social Rules Checklist form A and form B, though it was not reported whether the forms were psychometrically equivalent to each other. There were also insignificant results in children’s responses to different relationships regarding their autonomy and conflict management styles; however, the researchers found significant relationship differences for all other social rules examined. For compliance, means were highest for mothers, fathers, and teachers ($p<.01$), and close friends ($p<.05$), and were lowest for “other kids”. Girls rated using compliance more to get along with mother, father, and teacher (.029), than to get along with their sisters, whereas boys did not. Boys and girls rated using compliance to get along with their siblings equally (.87). Girls rated compliance for siblings and close friends equally. Boys complied with parents and siblings more than “other kids”. Girls complied more with close friends and other friends than “other kids”. In regard to social facilitation, the close friend relationship had a significantly higher mean than any of the other 8 relationships ($F(7,67) = 37.08, P < 0.0001$). The relationship differences for
information management showed that parents and close friends were rated significantly higher than other kids and teachers. There was also a significant relationship effect for prosocial behavior ($F(7,71) = 29.08, P<0.00$), that showed that close friends, mothers, and fathers had significantly higher ratings than other kids. Loyalty results were only available from the Social Rules Checklist form B, but showed significant relationship effects ($F(7,66) = 35.58, P<0.0001$). Boys were more loyal to their brothers than their sisters at ages 9, 10, and 13, while girls were more loyal to their brothers at age 11. Boys were significantly more loyal to their mother at ages 9, 10, 12 and 13 than girls. Boys were also significantly more loyal to teachers at ages 10 and 12 than girls. There were also significant results in managing feelings ($F(7,80) = 26.13, P<0.001$), showing means that were significantly higher for parents and close friends than for other relationships.

The overall patterns of the results show that social rules normally associated with close friendships (prosocial behavior, loyalty, managing feelings, and information management) were also highly associated with parent-child relationships. Compliance was equally high for parental relationships as for relationships with close friends. With the exception of conflict management, close friends scored higher on measures than “other kids”.

This study would have been more valuable if participant demographics had been reported in more detail. Racial information, the number of participants in each age group, and the gender of participants in each age group could have provided additional results, and given more information about the results that were reported. The major problem however, is in regard to the Social Rules Checklist, which is the
sole measure employed in this study. This measure was created by the researchers, and while the process of the creation of the measure is detailed, there is no information about the reliability or validity of the measure apart from the finding that there were not significant differences between form A and form B. Because this is the only measure used in this study and the psychometrics of the measure are unreported, the usefulness of the results are questionable at best.

Another study which indicated that friendship quality has an effect on responses to peer persuasion was developed by Allen et al. (2006). Though this study focused on adolescents, it is included in this literature review due to the limited number of studies in this area which focus on children. This study examined vulnerability to peer persuasion in a risk situation. The hypothesis was that adolescents who were easily swayed by their peers in a hypothetical discussion would also be more vulnerable to a broad array of negative behavioral and psychological outcomes. The study consisted of a behavioral measure and several written and oral measures. Participants in this study were 177 seventh and eighth grade children (age M= 13.36, SD= .66), 154 of whom completed the follow up work 1 year later. One hundred one participants were Caucasian, 52 were African-American, and 24 were identified as “other.” All were from middle or working-class families.

There were two waves of data collection in this study. In the first wave, target adolescents came in for two visits, the first with their parents and the second with their named closest peer. During the second wave (approximately 1 year later), adolescents came in for two visits, the first with just the adolescent and the second with their named closest peer. Also at each wave, an additional person in the
adolescent's circle of four closest friends came in without the adolescent to complete measures.

The behavioral task occurred during the first wave of data collection, and measured susceptibility to peer pressure. Adolescents were presented with a hypothetical scenario depicting an emergency on the moon where there is only room for seven out of twelve fictional characters to return to Earth. Adolescents and their close friend would separately choose their characters and then come together for a limit of 8 minutes to decide together who to bring. Additionally, to measure susceptibility to peer influence, participants filled out a four-point scale that was modeled after Harter's Self-Perception Profile for Adolescents (Harter, 1988). Cronbach's alpha for this measure was 0.83, suggesting that the measure had high internal consistency. In order to measure externalizing behavior during the first wave of data collection, the adolescents' mothers filled out a short form of the externalizing scales from the Child Behavior Checklist (Achenbach, 1991; Achenbach & Edelbrock, 1981) which is an approach validated by Lizotte, Chard-Wierschem, Loeber, and Stern (1992). The amount of negative peer influence that participants were subjected to by their friends on a day-to-day basis was assessed in both waves of data collection, and was measured by a seven item questionnaire asking the extent to which each close friend reported influencing target teen to engage in negative behaviors such as picking fights, smoking, getting bad grades, cutting class, and making fun of other kids. Each question was rated on a four point scale. Cronbach's alpha was 0.70 for wave one and 0.72 for wave two, suggesting that the measures had good internal consistency. Popularity of the participants was assessed in both waves.
of data collection using a nomination sociometric measure. Each adolescent, their closest friend, and two other friends nominated up to 10 peers in their grade that they would most like to and least like to spend time with on a Saturday. Target adolescents rated their close friendship competence using the close friendship scale from the Self-Perception Profile for Adolescents (Harter, 1988). Close friends also rated the target adolescents' close friendship capacity using a modified version of this instrument. Cronbach's alpha for the combined scale was .60. The stability of the participants close friendships was assessed by determining whether the target adolescent chose and was able to recruit the same person to be their "closest peer" during both waves of the study. Participants' depressive symptoms were assessed using the Child Depression Inventory (Kovacs & Beck, 1977), which is a well-validated measure. Cronbach's alpha was 0.84. Also in both waves of data collection, adolescent sexual experience was assessed by asking participants to report whether they had ever engaged in consensual sexual intercourse. Finally, researchers asked target participants and their peers about drug and alcohol use by presenting an unnamed four item measure designed to assess the extent to which alcohol and substance use caused problems for the target adolescents.

Allen et al. (2006) supported the finding that friendship quality effects responses to persuasion. Results showed that participants changed their position on who to bring on the spaceship 51% of the time, and were able to change their friend's position 49% of the time. Though the adolescents were given 8 minutes to complete the decision making process, most discussions were resolved in 3 minutes, indicating that adolescents changed their positions relatively quickly. There were no significant
differences across participant gender, income level, or race in this study, which is inconsistent with the other studies in this literature review. Susceptibility to peer influence was also not significantly related to depressive symptoms or to negative influence from peers.

Allen et al. (2006) did, however, obtain several significant findings linking susceptibility to peer influence to many different factors. Participants with lower competencies in close friendships ($\beta = -.24, p < .003$, $\Delta R^2 = .05$) were more susceptible to peer influence, as well as those who had been sexually active ($\beta = .43$, $\chi^2 = 5.76, p < .02$). Mothers of participants who were more susceptible to peer influence reported significantly higher levels of externalizing behavior in their children ($\beta = .18, p < .03$, $\Delta R^2 = .03$, total $R^2 = .05$). Researchers also created a hierarchical regression to predict susceptibility to peer influence through examining externalizing behavior, drug and alcohol use, and history of sexual activity. This model turned out to be highly significant ($R^2 = .11$, multiple $R = .33$, $p = .001$), with emphasis on externalizing behavior, and drug and alcohol use. In the assessment of friendship stability ($\beta = -.23$, $\chi^2 = 5.79, p < .02$), researchers found that participants who were one standard deviation above the mean in susceptibility to peer influence were only 65% as likely to bring the same peer into the second wave of the study. The mean level of friendship stability as a sample was 31%; therefore, participants who were one standard deviation above average only brought in the same peer 20% of the time. From these results, the researchers concluded that “overall, adolescents who are able to successfully establish autonomy, and even leadership roles, in close friendships with peers appear to be progressing along a positive
developmental trajectory associated with a range of positive psychosocial outcomes" (Allen et al., 2006, p. 170).

While Allen et al.'s study (2006) attempted to draw important connections between susceptibility to peer pressure and a range of negative psychosocial outcomes, their study suffered from methodological problems which rendered their conclusions beyond the scope of the results. One of the major methodological concerns is the failure to report what measurement tools were used to assess participant and peer drug and alcohol use. One of the measures of susceptibility to peer influence was a shortened version of Harter's Self-Perception Profile for Adolescents (Harter, 1988), but the validity of using the shortened version is not reported. In regard to the measurement of sexual experience, participants reported to researchers whether they had engaged in consensual intercourse. Not only is constraining the definition of sexual experience to intercourse likely overlooking much of the sexual experiences of these seventh and eighth graders, but it omits any possible results from lesbian participants. The study reported that participants were given 8 minutes together to decide who to bring on the spaceship during the behavioral task, but usually resolved it in about 3 minutes. While the researchers interpret this to show how easily the adolescents were swayed to change their decisions, it also may indicate that participants were not engaged in the task, or that they felt no connection to the fictional characters from which they had to choose. This design issue would have been improved if the participants had some affinity toward the characters they were choosing from, such as if the characters had been described in enough detail to make participants care about them, or using celebrities, friends,
family members, etc. Further, this task is very abstract, and unlike any real-world situation that the participants would ever engage in, limiting the external validity of the measure. Researchers also made some overarching conclusions in their discussion, claiming that susceptibility to peer influence from a close friend predicted future susceptibility to negative peer pressure, increases in depressive symptoms, and was related to decreases in popularity, none of which was significantly related as measured in this study. Finally, the results section of the article as confusing and poorly written, even seemingly contradictory in some instances.

The finding that friendship quality has an effect on responses to peer persuasion is also supported in studies from Jones (1985), Morrongiello and Bradley (1997), and Morrongiello and Dawber (2004). To make this conclusion firmly is difficult however, as these studies all suffer from methodological problems. Additionally, a study by Poulin et al. (1999) concluded that friendship quality did not have an effect on participants influence from peers.

In 1999 Poulin et al. examined whether friendship quality is correlated with deviant behavior in antisocial male adolescent friendships. Participants in the study were 206 boys from ten different schools with high levels of reported delinquency. The boys participated in the Oregon Youth Study, which was a longitudinal study begun in 1983 by Deborah Capaldi. This study focused on data from the boys obtained at ages 9-10, 13-14, and 15-16. The participants were 99% Caucasian, primarily of lower socioeconomic status, and had a relatively high percentage of unemployed parents. This study consisted of a peer interaction task and three written measures.
Antisocial status was assessed at ages 9-10 by using the antisocial construct score developed by Walker, Shinn, O'Neil, and Ramsey (1987). This score combines parent, teacher, and child report of antisocial behavior. Forty boys were selected as antisocial at age 9-10 and 40 boys of the remaining 166 participants were randomly selected to be the normal group. The peer interaction task took place when the boys were between 13 and 14 years old. Each boy was asked to nominate "the kid with whom you spend the most amount of time" (Poulin et al., 1999) to participate with him in the study. The boys were videotaped in a 25-minute session, during which they were asked to: (a) plan an activity together (something they could potentially do together within the next week); (b) solve a problem that occurred for the study boy within the last month (related to getting along with parents); (c) solve a problem that occurred for the study boy within the last month (related to getting along with peers); (d) solve a problem that occurred for the friend within the last month (related to getting along with parents); and (e) solve a problem that occurred for the friend within the last month (related to getting along with peers). Researchers coded parts of the dyad's discussion that they labeled as "rule-break" topics. Behaviors coded as rule-break were gross activities (e.g., mooning the camera), obscene gestures, and behavior that was inappropriate to the task. Discussion topics coded as rule-break were vandalism, stealing, drug use, victimization of women or minorities, and getting into trouble at school. The duration of each rule-break for the study boy and his friend was averaged to create an average duration of rule-break talk for the dyad. In order to give their impressions of the friendship quality, coders for the peer interaction task gave a rating on a four point scale answering the items "the friendship seemed to be
close," and "showed empathy, support, concern for friend." Coders answered each question for both the study boy and the friend separately. Before the peer interaction task, the study boy and his friend were also administered various unreported assessments by an interviewer. This interviewer was then asked to rate the quality of the boys' friendship on five items (e.g., "The two boys seemed to mutually enjoy their friendship," "The two boys seemed distant, as though they didn't know each other") on a scale from 1 (not true) to 4 (very true).

Participants were all given the Friendship Quality Questionnaire (FQQ) (Achenbach, 1991). This measure is made up of three scales. The positive scale assessed trust and satisfaction with the friendship, the negative scale assessed disharmony in the friendship, and the evaluation scale assessed each boy's evaluation of their friend's character. To get a measure of self-reported delinquency, both the study boy and his friend completed the Elliott, Huizinga, and Ageton (1985) scale of delinquent behavior at age 13-14, and at age 15-16 only the study boy completed the scale. This scale assesses the frequency of various minor delinquent behaviors.

Results of this study showed many significant findings. Participants who were identified as antisocial at age 9-10 perceived more negative dimensions in their friendships than normative boys as measured by the FQQ (F (1, 70) = 5.99, p < .05), and reported significantly lower friendship evaluation scores (F (1, 70) = 5.36, p < .05). Results revealed that the friends of antisocial boys also perceived more negative dimensions in their friendships than friends of normative boys did (F (1, 69) = 8.67, p < .01), and reported a significantly lower evaluation score as well (F (1, 69) = 21.19, p < .001). Antisocial participants perceptions of friendship quality did not
significantly correlate with their friends' perceptions of the friendship quality, suggesting that the boys in such dyads perceive the quality of their relationship differently from each other. Correlations among the boy's self-reported delinquency at age 13-14 and 15-16, the friend's self-reported delinquency at age 13-14, the duration of rule-breaking talk, the boy's perception of the friendship, and the friend's perception of the friendship were examined. Results of these correlation showed that a high level of rule-breaking talk in the dyad predicted an increase in the study boy's delinquent behavior. Also, the friend's self-reported delinquency at age 13-14 did not predict change in study boy's delinquency 1 year later. Finally, the study boy's perception of the friendship and the friend's perception of the friendship did not contribute to the prediction of the boy's self-reported delinquency at age 15-16.

Overall results from this study showed that boys identified as antisocial had lower quality friendships, perceived the quality of their friendships differently from their friends, and that there were no correlations found between friendship quality and deviant behavior in friendships with at least one member identified as antisocial. The authors argue that these results give credence to the hypothesis that friendship quality does not have an impact on the development of deviant behavior. There were some problems however, with the methodology of the study that bring question to the quality of the results. One problem was that the study reported that interviewers administered various assessments to assess relationship quality, but never reported which assessments were used. The study would have been more complete if the participants had been reevaluated for antisocial behavior at age 13-14 before the peer interaction task, as they may have changed their antisocial behavior from the time
they were evaluated at 9-10. Further, it would have been more informative if the peer interaction task had been set up as a persuasion task so that the susceptibility to anti-social or "rule break" behavior could have been better measured.

Discussion

In regard to persuasive techniques used by children, the current literature suggests that children use verbal requests more than physical intimidation or any other technique (Jones, 1985; Trawick-Smith, 1992; Williams & Schaller, 1993). While there are contradictions in the literature concerning gender differences, it appears that when attempting to persuade a peer to engage in risk behavior, boys are more likely to base their persuasions on fun and convenience, while girls are more likely to base their persuasions on safety (Christiansen & Morrongiello, 1997; Morrongiello & Bradley, 1997; Morrongiello & Dawber, 2004). There have also been repeated findings that children who use more requests are more likely to successfully persuade their peers (Morrongiello & Bradley, 1997; Trawick-Smith, 1992).

The general trend across the articles examined in this literature review indicates that children's responses to persuasion from peers appear to be context specific (Christiansen & Morrongiello, 1997; Miller & Byrnes, 1997; Morrongiello & Dawber, 2004). When children are confronted with peer presence or persuasion in risk situations that do not pose a threat of injury, studies suggest that boys may choose riskier options than girls (Miller & Byrnes, 1997), and that children who have lower competence in close friendships are more easily persuaded (Allen et al., 2006). The studies that have been done in this area also conclude that there are correlations
between susceptibility to peer persuasion and aspects of children’s behavior such as drug use, sexual activity, or externalizing behavior (Allen et al., 2006; Miller & Byrnes, 1997), but major methodological problems prevent making firm conclusions regarding such correlations.

In situations where children are confronted with risk situations that pose a threat of injury, the literature indicates that children are more likely to make riskier decisions when their peers are present (Christiansen & Morrongiello, 1997; Gardner & Steinberg, 2005; Morrongiello & Bradley, 1997; Morrongiello & Dawber, 2004). Children are also more likely to make riskier decisions when their peers are attempting to persuade them to do so, but this finding is context-specific and based on perceived level of risk (Christiansen & Morrongiello, 1997). When children were pressured by peers to change from a low-risk to a high-risk activity, they were less likely to succumb to peer pressure than when being persuaded from a low-risk to a moderate-risk activity.

Friendship quality has been examined in several studies as a potentially important variable in children’s responses to peer persuasion both in injury and non-injury risk situations (Allen et al., 2006; Bigelow et al., 1992; Jones, 1985; Morrongiello & Bradley, 1997; Morrongiello & Dawber, 2004; Poulin et al., 1999). Results have been contradictory however, and methodological problems plague both the studies that conclude that friendship quality makes a difference, and those that conclude that friendship quality does not make a difference, such that no dependable conclusions can be inferred.
Overall, the literature examining children's persuasive techniques as well as their responses to persuasion from their peers yields few quality results. Many studies that have been done in this area suffer from major methodological problems such as the lack of a control group, failure to report psychometrics of measurements used, failure to report the names of measurements used in some cases, low numbers of participants, evaluating children's responses based on hypothetical situations that are not analogous to real life situations, a slew of potentially confounding variables, and conclusions that are beyond the scope of the methodology. While there have been a few studies that have been well executed, they are few in number and need to be replicated and expanded upon before any certain information can be concluded from them.

Creating studies that can adequately assess children's responses to peer persuasion in situations posing a threat of risk is a difficult task, as researchers are ethically prohibited from putting children in situations involving actual risk. Fortunately, there have been some studies (for example, Gardner & Steinberg's 2005 study, or Christiansen & Morrongiello's 1997 study) which have come up with creative methodologies that future studies should build upon in order to improve the state of the literature.

Multiple studies have indicated that friendship quality may significantly affect children's responses to peer influence in risk situations, but none have had solid enough methodologies in order to prove or disprove this hypothesis. This is an important area for future research to examine, and will help to determine whether reactions to peer influence are more relational, situational, or intrapersonal. Many of
the studies examined in this literature review focused on gender differences, but few have looked at cultural differences. Of the two studies reviewed here that did, one found several significant differences (Gardner & Steinberg, 2005), and one found no significant differences (Allen et al., 2006). This is clearly an opportunity for future research, and would help to greatly broaden our understanding of children’s responses to peer influence. Another finding from this literature review is that the studies have focused either on children’s responses to peer presence, or peer persuasion. An interesting future study could examine whether children’s reactions to peer presence differ from their reactions to peer persuasion by using comparison groups, with participants in a peer persuasion condition, a peer presence condition, or a no-peer control group. Finally, another direction for future research would be to build upon previous studies such as Allen et al.’s 1997 study, or Miller and Byrnes 1997 study, which examined children’s reactions to peer influence as a function of their personality. Future studies could improve this area of the literature by giving multiple well validated personality measures, and correlating the results with participant’s reactions to peer influence in risk situations that are analogous to real life situations.

A well-designed experiment that examined children’s responses to peer influence could combine the strengths of Gardner and Steinberg’s 2005 study (decision making in the moment) with the strengths of Christiansen and Morrongiello’s 1997 study (risk situations that are analogous to real-life decisions with which children are faced). The study could create a video-game representation of the scenarios outlined in Christiansen and Morrongiello’s 1997 study, such as
crossing a river to get to a tree house via a convenient but high risk path, or an inconvenient low risk path. Changing the picture scenarios into a video game allows researchers to see participants' decisions in the moment instead of what their reported hypothetical decisions would be in such a situation. Participants would be told that points were rewarded based on how quickly they reached the tree house, but that no points would be awarded if their character fell in the river. This would give motivation and consequences for risk-taking behavior more similar to real life situations than in previous studies. Participants would be split into three groups: a peer present group where the study child was paired with a friend who observed but made no comments, a peer pressure group where the study child was paired with a friend who would attempt to persuade the participant to choose a certain path, and a control group where the child was not paired with a friend. This design would allow researchers to compare children's reactions to peer presence and their reactions to peer pressure. As friendship quality has been hypothesized to have an effect on peer persuasion, it would be important to give a well-validated measure of friendship quality such as the Friendship Quality Questionnaire (Achenbach, 1991) to make sure that the participants in both experimental groups were paired with friends with whom they were similarly close. It would be ideal to have participants be of elementary school age, have both genders represented, and to have members from different racial/cultural groups. A study such as this would build on previous research design, help to clarify contradictory findings from previous studies, and improve the state of the literature by creating a relevant and well-designed methodology.
Unintentional injuries are a leading cause of injury and death among children, and studies have suggested that children are at greater risk for injury when they are in the presence of peers (Wilson, Baker, Teret, Shock, & Garbarino, 1991). Strangely, the nature of children's persuasive techniques, as well as children's responses to peer influence in risk situations, is a topic that is not well covered in the literature. A greater understanding in this area may assist in developing models that could help children to resist peer pressure in risk situations. Such models may help children to become more autonomous in making their own risk-taking decisions, and ultimately, safer.
References


