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CHILDREN'S RESPONSES TO COOPERATIVE AND COMPETITIVE
GAMES: A PERSON $\times$ SITUATION ANALYSIS

Thomas D. Mulderink

156 Pages

This dissertation examined the relations among goal structure, task-completion order, time, and individual differences in agreeableness for school-aged children completing a tower building task. The tower building task (Graziano, Hair, & Finch (1997) allows for the study of in-game behavior during competitive and cooperative tasks with a similar structure. Children completed a total of 13 trials (six per goal structure plus a final trial) under two different goal structures to observe changes in both prosocial and destructive behaviors over time. Results revealed that children engage in more destructive behaviors over time under competitive goal structure conditions after working together relative to groups that completed contrient goal structure conditions without prior cooperative experiences. Additionally, individuals low in agreeableness engage in significantly more peer-directed negative vocalizations in contrient trials only if they worked cooperatively prior to the experience relative to their peers, suggesting that individuals high in agreeableness may be less inclined to target peers when frustrated by a shift in task demands.

KEYWORDS: Agreeableness, Competition, Cooperation

CHILDREN'S RESPONSES TO COOPERATIVE AND COMPETITIVE
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THOMAS D. MULDERINK

A Dissertation Submitted in Partial
Fulfillment of the Requirements
for the Degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

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CHILDREN'S RESPONSES TO COOPERATIVE AND COMPETITIVE
GAMES: A PERSON $\times$ SITUATION ANALYSIS

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CHAPTER I

STATEMENT OF PROBLEM

Social interactions are a dynamic process, even at early ages, with various individual differences, cognitive processes, and the situations themselves interacting to influence behavior. Likewise, social goals and motivations are intimately tied to interpersonal outcomes. Some individuals are highly motivated to develop and maintain positive relations with others, whereas others have little regard for their standing with their social partners. This individual difference has been labeled agreeableness in the personality literature, one of the five core dimensions of personality (Graziano & Eisenberg, 1997). Interestingly, researchers have suggested that agreeableness finds its origins in the self-regulatory component of temperament, namely effortful control (Ahadi & Rothbart, 1994; Jensen-Campbell, Rosselli, Workman, Santisi, Rios, & Bojan, 2002). A link between agreeableness and effortful control is interesting when considering some of the traits of individuals high in agreeableness in social situations. For example, individuals high in agreeableness often make excuses for the behaviors of others and focus on positive attributes (Graziano & Tobin, 2013). Engaging in behaviors that are consistent with an agreeable personality (i.e., making excuses for negative behaviors of others, focusing on positive behaviors) regularly appears to have a large influence on how personality is evaluated.

Agreeableness is arguably the largest of the five dimensions of personality (Digman & Takemoto-Chock, 1981). In addition to describing individual differences in the motivation to maintain positive relations, agreeableness is often described by the terms likeability, pleasantness, cooperation, empathy, and friendly compliance (Digman & Takemoto-Chock, 1981; Graziano, Habashi, Sheese, & Tobin, 2007; Graziano & Tobin, 2002). As previously mentioned, agreeableness is closely linked with self-regulation processes, such that this factor may be related to the ability to regulate emotions in the service of maintaining positive relations with others (Ahadi & Rothbart, 1994; Tobin, Graziano, Vanman, & Tassinari, 2000). The development of agreeableness also is linked to an individual's environment and socialization processes, something that sets agreeableness apart from the other dimensions of personality (Bergeman et al., 1993).

It is not surprising that the environment and socialization play a pivotal role in the development of agreeableness when looking through an evolutionary lens. Agreeable characteristics allow for individuals to develop better relationships with other members of their group (Hogan, 1983). This motive can be a beneficial tool in regard to sustaining genetic viability. Individuals who are better able to secure resources through cooperation and communal living may have been better able to ensure their offspring lived to reproductive age. Likewise, those who are more highly agreeable were likely better able to thrive in communal settings by minimizing the negative products of conflict and negotiating positive outcomes amongst group members (Jensen-Campbell & Graziano, 2001). Further, research shows that high and low agreeable individuals differ in their use

of conflict resolution strategies, such that individuals low in agreeableness are more likely to endorse the use of power assertion tactics to handle interpersonal conflict than are their peers. Likewise, individuals low in agreeableness are more likely to elicit conflict from others than are their high agreeable peers.

Another important component regarding environmental demands and our responses to social interactions specifically relate to the goals inherent in a given situation. Two broad social interactions in which individuals can find themselves are cooperative situations or competitive situations. Cooperation is often described as two or more individuals working together to achieve a common goal. In contrast, competition is described as two or more individuals attempting to overtake another individual or group in order to achieve an alternative, often conflicting, goal (Deutsch, 1949). These situations are experienced at an early stage in development. Children begin to develop the ability to play cooperatively with others and they start to seek out more social forms of play in toddlerhood (Eckerman, Whatley, & Kutz, 1975; Eckerman & Stein, 1982; Ross, 1982). When engaging in social forms of play, children inevitably encounter playmates that have interests that directly conflict with their own. For example, two children in a daycare setting may vie for access to the same toy, but only one can play with it at a given time. Within the demands of the situation, the children must determine a course of action to achieve their respective goal (i.e., to access the toy). As play activities become more complex, the rules for the situation become more concrete such that a given situation has demands in place that set the children up to work together or against one another to achieve their goals.

Situational demands that dictate how individuals must respond in order to achieve their goals are referred to as goal structures. As Graziano, Hair, and Finch (1997) note, goal structures influence how members of a group will behave. Promotive goal structures likely will produce more cooperative behaviors as the goals of the members are shared such that the individuals have to work together in order to succeed. An example of a promotive goal structure task is the “knot game” wherein all participants link arms and hold hands to create a knot. For the participants to be successful, all participants must work together to unknot their limbs. Conversely, contrient goal structures produce competitive behaviors as the goals of the members of the group are incompatible such that one member must fail in order for the other member to achieve his or her goal. A simple example of a contrient goal structure task is a simple foot race wherein all other competitors have to lose in order for victor to be crowned. The demands inherent within these situations require that in order to achieve the desired goal, individuals must comply with the constraints of the situation (i.e., work together with other group members in promotive situations or work against other members in contrient situations). Although situations can evoke certain behaviors from individuals, they are not simply passive participants to the experience. As children develop and are exposed to these various goal structures, they are also developing essential skills that are required to navigate their social worlds successfully.

At a young age children develop the skills to manage emotions and display them appropriately, a skill often termed emotion regulation (Gross, 1998). Some individuals tend to be temperamentally more reactive to situations than others, often leading to more

difficulty in social situations (Eisenberg, Fabes, Bernsqueig, Karbon, Poulin, & Hanish, 1993). As such, it is no surprise that individuals who are better able to regulate their emotions, especially their strong emotions, tend to have more positive social interactions. Although emotions have the potential to be damaging to our social relations, they also have the potential to be used positively, as those that are better regulators tend to be more liked by their peers (John & Gross, 2004; Lopes, Salovey, Côté, & Beers, 2005). Emotion regulation displays become particularly relevant when considering that displaying certain types of behaviors, such as inhibiting negative reactions to a bad meal hosted by a friend, are essential in order to comply with social convention.

As previously mentioned, situational factors also have an influential role in regard to emotion regulation. Situations often demand that the individual alter his or her emotional displays in order to maintain social harmony. Display rules describe the conventions for expressing emotions in socially appropriate ways (Saarni, 1979). These rules, dictated by culture and learned through socialization, allow a person to maintain positive social relationships when receiving socks for their birthday or a friend cooks a terrible meal. However, activating display rules requires a certain degree of control, which does not come easily to some. Specifically, the temperamental factor of effortful control is theorized to play a pivotal role in the activation of display rules. Effortful control, or the ability to inhibit a dominant response in favor of a subdominant response, is strongly related to the appropriate display of emotions as well as the suppression of inappropriate emotional displays (Eisenberg, Fabes, Guthrie, & Reiser, 2000; Keiras, Tobin, Graziano, & Rothbart, 2005; Rothbart & Bates, 1998). As such, effortful control

allows individuals to respond to situations flexibly, such that they can achieve their goals even when their initial reaction to the situation may be in conflict with these goals.

Graziano and Tobin (2013) note that individuals who are highly agreeable are more likely to approach situations that are conducive to the development of positive relations. It is likely that highly competitive situations may initially be aversive to individuals high in agreeableness as these situations may be somewhat difficult to navigate while maintaining positive relations with others. Not surprisingly, middle school children who are high in agreeableness report more distress during interpersonal conflict, yet their teachers reported that these adolescents experience less distress. Initially, persons high in agreeableness likely will experience distress during interpersonal conflict, which they experience directly (and therefore are able to report). What observers see is the end of the process, the resolution of the conflict once the individual has resolved his or her distress. These findings are interesting and represent an important piece of the puzzle, specifically, time. Graziano and colleagues (Graziano & Habashi, 2010; Graziano & Tobin, 2009, 2013) provide a useful model to understand this process, by applying Solomon's (1980) opponent-process model of motivation to agreeableness. Essentially, the initial personal distress experienced by high agreeable individuals (process A) is replaced by the desire to perform activities that will maintain positive social relationships (process B) over time.

The present study examined the relations among agreeableness, goal structures, and children's emotional and behavioral responses to both contrient and promotive tasks. The present study closely followed the procedures used in a study that replicated the

Graziano et al. (1997) tower-building study with a younger sample (Tobin, Schneider, Graziano, & Pizzitola, 2002). The results of these studies help inform the expected hypotheses of the present study that aims to replicate and further expand on past research. Overall, in the present study, I explored these relations at both the individual and group level.

Conceptually, the present study is a 2 (agreeableness: high v. low) x 2 (goal-structure: contrient vs. promotive) x 2 (order: contrient-promotive vs. promotive-contrient) x 2 (sex: male v. female) design. Agreeableness, order, and sex were between-subject variables. Goal-structure condition was a within-subject variable. Following the Graziano et al. (1997) paradigm, children completed a tower-building task in same-age, same-sex triads. Within these triads, children completed 13 total trials of the tower building task (six contrient, seven promotive – with the final trial always being promotive). Children were in the second through fifth grades. Triads were randomly assigned to order condition such that half of the participants completed promotive trials first, whereas the other half completed the contrient trials first. Hierarchical linear modeling was used to test the hypotheses at the individual and group levels.

Participants were recruited from before- and after-school programs throughout the central Illinois area. To assess agreeableness, both parents and teachers completed nine agreeableness items from the *Big Five Inventory* (BFI; John & Srivastava, 1999). During the tower-building task, each participant's behavior was coded live for the following behaviors: the number of times the participant knocked down the blocks, the frequency that positive and negative vocalizations were made, the number of straightenings made,

the number of times the blocks fell, the final pattern of the blocks at the end of the task, and behavioral displays of positive affect, negative affect, positive sportsmanship, and negative sportsmanship. The final three behavioral displays were rated on a 5-point, Likert-type scale.

Based on past research, it was anticipated that children in promotive trials would engage in more straightenings and have larger towers relative to contrient trials, whereas contrient trials were expected to produce more knockdowns relative to promotive trials (Tobin et al, 2002). It was also anticipated that more positive vocalizations would occur during the promotive trials relative to contrient trials. Contrient trials were hypothesized to produce more negative vocalizations. Overall it was hypothesized that promotive trials would produce more prosocial behaviors (i.e., straightenings, positive vocalizations, positive affective, positive sportsmanship), whereas contrient trials were expected to produce more destructive behaviors (i.e., knockdowns, negative affect, negative vocalizations, negative sportsmanship).

Another purpose of the present study was to investigate individual differences in agreeableness as a predictor of children's behavior during promotive and contrient games. It was expected that children higher in agreeableness would exhibit more cooperative behavior than their peers lower in agreeableness regardless of the goal structure condition. It was hypothesized that individuals high in agreeableness would engage in fewer destructive behaviors during the contrient trials relative to their low agreeable peers, and that they would engage in more prosocial behaviors during promotive trials than their low agreeable peers. It was anticipated that high agreeable

individuals would have more difficulty transitioning from promotive to contrient goal structures relative to their transitions from contrient to promotive goal structures. In contrast, individuals lower in agreeableness were hypothesized to have relatively stable performance regardless of presentation. Furthermore, based on the opponent-process theory (Graziano & Tobin, 2013), it was also hypothesized that individuals high in agreeableness who began the study with contrient trials would experience a much larger rebound effect relative to their peers once they began promotive trials. As such, it was hypothesized that individuals high in agreeableness, relative to their peers, would more quickly display prosocial behaviors during promotive tasks when the promotive trials were presented after a series of contrient trials.

CHAPTER II

LITERATURE REVIEW

Cooperation and Competition

Cooperation and competition are fundamental aspects of the human experience. Even at an early age children are placed in conditions in which they must compete for or share access to resources with others. Often these situations require an individual to either work with others to meet a goal or work against others to gain access to resources. These exchanges can be as simple as sharing toys and other resources or as complex as participating in a team sport, which covers aspects of both cooperation (working with your teammates) and competition (working against members of the other team). Deutsch (1949) explains that cooperation is generally viewed as a group of individuals working together in order to achieve a common goal. Conversely, competition is viewed as an individual or group attempting to overtake another individual or group for access to resources or achieving conflicting goals (Kelley & Thibaut, 1969; Tauer & Harackiewicz, 2004). While themes of cooperation and competition appear throughout many aspects of human interaction, play-based cooperative and competitive behaviors are some of the earliest examples of these interactions.

Cooperative and competitive behaviors often are linked to different types of play observed throughout childhood. During the second year of life, children begin to spend more time engaging in social forms of play than they spend engaging in solitary play (Eckerman, Whatley, & Kutz, 1975). Moreover, research has demonstrated that once children have acquired language and functional gross-motor skills they are able to engage in many meaningful social interactions such as holding a conversation, cooperating, and developing friendships (Eckerman & Stein, 1982; Ross, 1982). More complex forms of play emerge throughout early childhood. Specifically, Howes (1988) explains that relatively stable forms of cooperative and social play emerge throughout the preschool years. It is important to note, however, that development is not the only factor involved in cooperative and competitive behaviors in childhood as factors such as culture and personality also play a pivotal role.

As is the case with many social phenomena, culture plays an important role in cooperative and competitive behaviors for children and adults alike. Research has demonstrated differences in cooperative behaviors among groups of children from differing cultural histories (Madsen, 1967; Miller & Thomas, 1972; Shapira & Madsen, 1969). For example, Domino (1992) demonstrated group differences in a study comparing game choices of Chinese and American children. By using the Social Values Task wherein children choose the number of tokens given to themselves as well as an unspecified partner, Domino demonstrated that Chinese children more often favored the use of equality responses during the game, whereas American children more often provided individualistic and competitive choices.

In addition to cultural influences on the use of competitive and cooperative behaviors in play, sex also plays an important role in children's use of competitive and cooperative behaviors. Ensor, Hart, Jacobs, and Hughes (2011) demonstrated that in the face of losing a board game to a same-sex peer, boys engage in more aggressive behaviors than girls. Other studies have demonstrated a similar pattern of more negative or aggressive behaviors from boys when a confederate child makes provocative comments to the participant (Underwood, Hurley, Johanson, & Mosley, 1999). Moreover, Underwood, Scott, Galperin, Bjornstad, and Sexton (2004) found that 10-, 12-, and 14-year-old boys are more socially exclusive and verbally aggressive and assertive relative to girls when playing a board game with a friend and an unfamiliar and difficult play partner.

Cooperative and competitive behaviors are intimately linked to human evolution. Competition for resources and mates is at the heart of major evolutionary theories and a driving force behind a number of daily human experiences from business and politics to romance and even territorial disputes. Group living is an essential component of human survival as well, such that some have suggested that coordinated group living may have been the primary survival strategy for our species (Caporael & Brewer, 1995; Simon, 1990; Wilson, 1997). Contrary to popular notions of evolution, it has been suggested that successful species survival can be more accurately attributed to the ability to organize and function in groups as opposed to survival of the fittest (Wilson, 1997). Furthermore, features of cooperation such as reciprocity and third-party altruism are regularly observed in adults. Similarly, research has demonstrated that these components of cooperative

human behavior are also present in young children (Olson & Spelke, 2008). Although humans all clearly have the capacity for both competitive and cooperative behavior, there is evidence to suggest that situations have a large influence on our cooperative behaviors, often eliciting or inhibiting these behaviors.

Goal Structure and Personality

As Deutsch (1949) indicates, situations often influence behaviors in terms of distributing resources among individuals. Furthermore, patterned contingencies, or goal structures, affect social behaviors in group situations, dictating the ways in which group members likely will behave (Graziano et al., 1997). As Graziano and colleagues explain, promotive goal structures dictate that the members of the group must achieve their goals as a group. In other words, if one individual does not achieve their goal, none of the group members achieve their goals. Conversely, contrient goal structures dictate that an individual cannot achieve a goal unless other members fail to achieve their goals. There is substantial evidence to support these claims, with studies demonstrating that individuals operating under promotive goal structures have higher rates of productivity, communicate in ways more favorable for group performance, and have greater allocation of labor tasks relative to individuals operating under contrient goal structures (Aronson & Gonzalez, 1988; French, Brownell, Graziano, & Hartup, 1977; Graziano, French, Brownell, & Hartup, 1976). Although situations are powerful influences on human behavior, situations alone do not determine the outcomes for individuals. Individual differences in personality also play an important role in behavioral responses to

cooperative and competitive situations. Among these personality differences, agreeableness is particularly relevant to behavior during these situations.

Agreeableness

Agreeableness, the personality dimension describing individual differences in the motivation to develop and maintain positive relationships with others, is arguably the largest dimension of the five-factor approach to personality (Digman & Takemoto-Chock, 1981; Graziano & Eisenberg, 1997; Graziano & Tobin, 2009, 2013).

Interestingly, some researchers contend that it is also the least understood of the five personality factors (Havill, Besevegis, & Mouroussaki, 1998; Graziano & Tobin, 2013; Jensen-Campbell & Graziano, 2001). Agreeableness has been defined as individual differences in likeability, pleasantness, and harmoniousness in regard to relations with others (Graziano & Tobin, 2002). Agreeableness is conceptually thought to involve social interaction, which is often manifested in behaviors such as cooperation and empathy (Graziano, Habashi, Sheese, & Tobin, 2007; Graziano et al., 1997), friendly compliance (Digman & Takemoto-Chock, 1981), and even likeability (Hogan, 1982). Furthermore, several items from the California Child Q-Sort (CCQ) strongly correlate with agreeableness, namely ratings of warm and responsive, helpful and cooperative, develops genuine and close relationships, and tends to give, lend, and share (van Lieshout & Haselager, 1994; John, Caspi, Robins, Moffitt, & Stouthamer-Loeber, 1994).

The agreeableness dimension of the five-factor model has been linked to social motivation, particularly in regard to how individual differences in prosocial motivation

may influence the expression and acceptance of prejudices (Graziano & Eisenberg, 1997; Graziano, Bruce, Sheese, & Tobin, 2007). Graziano and Tobin (2002) report that individuals high in the agreeableness tend to be better liked and more popular with their peers which is, to some degree, due to their willingness to excuse the less favorable behaviors of others. However, it is important to distinguish agreeableness from the term, “compliance,” which is a process-based term regarding social influence wherein an individual chooses to accept influence in order to receive a favorable reaction from an individual or group (Kelman, 1958). Although agreeableness is often used interchangeably with compliance in lay terms, there is no evidence to suggest that individuals high in agreeableness are more responsive to social influence than others (Graziano & Tobin, 2002).

Two major themes relating to interpersonal behavior are particularly relevant when differentiating compliance and agreeableness: agency and communion (Wiggins, 1991). These two dimensions of interpersonal behavior often are discussed when reviewing agreeableness, particularly as communion is conceptually similar to agreeableness. Wiggins (1991) describes the dimension of communion as the “condition of being part of a larger spiritual or social community, and its manifestation in striving for intimacy, union, and solidarity with that larger entity” (Graziano & Eisenberg, 1997; p. 801). Agency is defined as “...being a differential individual, and its manifestation in striving for mastery and power” (Graziano & Eisenberg, 1997; p. 801). It is essential to highlight that these two dimensions are not bipolar ends of a single dimension, but rather orthogonal dimensions, such that a given individual can fall anywhere along each of the

two dimensions respectively without being influenced by their standing on the other dimension. Furthermore, researchers suggest that both dimensions are important to effective group functioning (Raven & Rubin, 1983). Graziano and Eisenberg (1997) pose the interesting question of where agreeableness would fall on the agency-communion circumplex. Based on the work of McCrea and Costa (1989), Graziano and Eisenberg suggest that the agreeableness dimension of personality represents a low-agentic – high-communal orientation. Although Agreeableness and communion share many features, the two are not identical. Specifically, Graziano and Eisenberg (1997) suggest that the dimension of communion tends to focus more so on the relations between two individuals, while being less than adequate to describe more enduring dispositions and interpersonal elements, such as styles of cognition and affect, that apply to descriptions of agreeableness.

This connection between personality and behavior also maps onto theories about the evolutionary origin of socially promotive behaviors. Some theorists suggest that it is evolutionarily advantageous to develop behaviors consistent with an agreeable personality. Specifically, people may have developed agreeable characteristics in order to allow them to develop better relationships with other group members (Hogan, 1983). Agreeableness is an individual difference that would allow individuals to thrive in communal group living contexts, by working cooperatively to secure and distribute resources. Additionally, those individuals who did not cooperate with the group may have been excluded from the group, which effectively would lead to receiving fewer rewards (Graziano et al., 1997). Jensen-Campbell and Graziano (2001) further suggest that

individuals with agreeable traits may capitalize on group living situations by minimizing the negative influences of conflicts and negotiating positive outcomes.

To further support the notion that agreeableness is beneficial to group relationship building, there is evidence to suggest that agreeableness may be related to prosocial behaviors and motives such as altruism, helping, and empathy (Graziano, Habashi, et al., 2007). Graziano and colleagues found that individuals who rated themselves as low on the agreeableness dimension of personality were less likely to show empathy toward a victim relative to their high agreeable peers. As such, this evidence suggests that individuals low in agreeableness may be less likely to express compassion for victims. These findings suggest that prosocial motivation may be a key feature of the agreeableness dimension of personality.

Origins of Agreeableness

Agreeableness, as a personality dimension, may be somewhat different than other dimensions in regard to development. Specifically, research has demonstrated that up to 50% of the variance in the other four factors of personality (e.g., extraversion, conscientiousness) can be explained by genetic factors (Dunn & Plomin, 1990; Plomin, DeFries & McClearn, 1990). Agreeableness is unique in that there is evidence to suggest that this dimension is more directly influenced by socialization relative to the other factors in the Big Five. Specifically, evidence from an adoption/twin study demonstrated that shared environment had an important impact on agreeableness, while no evidence for genetic effects was demonstrated (Bergeman et al., 1993). Likewise, several studies have

supported this finding by demonstrating that parenting behaviors early in childhood predict later empathic concern (Koestner, Franz, & Weinberger, 1990; Graziano & Eisenberg, 1997; West & Graziano, 1989).

Agreeableness appears to be highly influenced by environmental factors, yet there also appears to be a biological basis to important factors related to this dimension, specifically empathy and prosocial behaviors. Empathy has been suggested to be the biological substrate upon which altruism develops (Batson, 1983; Graziano, 1994; Hoffman, 1981). Furthermore, empathy has been both empirically and conceptually linked to prosocial behaviors including altruism (Batson, 1987; Eisenberg & Fabes, 1991; Hoffman, 1984). Researchers have found further evidence to suggest heritability may play some role in these factors related to agreeableness. Several twin studies have demonstrated high heritability estimates for self-reported empathy and prosocial behavior (Loehlin & Nichols, 1976; Matthews, Batson, Horn, & Rosenman, 1981; Rushton, Fulker, Neal, Nias, & Eysenck, 1986; Bergeman et al., 1993). Some theories of the development of agreeableness suggest that people may be biologically predisposed to developing a more or less agreeable personality (Tellegen et al, 1988; Rushton et al., 1986).

In terms of development, there is some evidence that agreeableness emerges from temperamental systems involved in self-regulation (Rothbart, Derryberry, & Posner, 1994). Specifically, Rothbart and colleagues suggest that the development of agreeableness is linked to effortful control (Ahadi & Rothbart, 1994; Rothbart, Ellis, Rueda, & Posner, 2003). Agreeableness has been referred to as the ability to inhibit

negative affect, aggression, and unpleasant behaviors (Graziano & Eisenberg, 1997; Havill, Besevegis, & Mouroussaki, 1998). From a theoretical perspective, children high in agreeableness are more likely to inhibit negative affect and disagreeable behaviors to maintain or establish stronger and more positive social relationships. In a study examining the relations between personality and emotional expression at 18 months during the Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978), Abe and Izard (1999) found that children who displayed full-face negative expression during the strange situation were less likely to have high ratings of agreeableness at 3.5 years of age. Abe (2005) examined prosocial behaviors, regulatory behaviors, and picking up toys within the laboratory. Children's prosocial behavior was measured by presenting the child with toys and telling him/her that another child did not have toys with which to play. Children's regulatory behaviors were measured by placing the child's mother at a nearby table and telling the child to play with some toys but not to disturb the mother. The child was then asked to pick up the toys while the child's mother sat nearby. The researchers found that agreeableness was inversely related with negative affect when picking up toys. These results suggest that children high in agreeableness are more likely to inhibit negative affect and disagreeable behaviors. Furthermore, agreeableness was negatively related to children's verbal interactions and proximity towards his or her mother during the toy playing session suggesting a connection to regulation processes.

As suggested previously, one particular component of self-regulatory systems that is useful when discussing agreeableness is temperamental effortful control. Temperament describes individual differences in self-regulation and reactivity, which are

based on the individual's biological makeup and influenced over time by genetics, development, and experience (Rothbart & Derryberry, 1981). Three broad dimensions of temperament were identified: extraversion/surgency (activity level, positive anticipation, high intensity pleasure/sensation seeking, impulsivity, smiling and laughter, and low shyness), negative affectivity (fear, anger, shyness, sadness, frustration, low soothability), and effortful control (attentional shifting and focusing, inhibitory control, low intensity pleasure, and perceptual sensitivity) (Rothbart, Ahadi, Hershey, & Fisher, 2001). The temperamental dimension of effortful control plays a pivotal role in social behavior. Effortful control is defined as the ability to inhibit a dominant or prepotent response in favor of performing a less dominant one (Rothbart & Bates, 1998). There are a number of ways in which this process can manifest behaviorally, from mitigating a negative reaction to an undesired gift to asking for a toy from a peer as opposed to simply taking it. Effortful control may be the foundation for certain aspects of personality as some individuals tend to be more motivated than others to develop and maintain positive interactions with others. It is theorized to be the basis for agreeableness as a personality dimension. People who desire to establish positive relationships will inevitably have to inhibit a dominant response in order to enact a response that is more socially appropriate.

Several theorists have made the case that the processes involved in effortful control are developmentally linked to the agreeableness and conscientiousness dimensions of the five-factor model of personality (Ahadi & Rothbart, 1994; Graziano, 1994; Graziano & Eisenberg, 1997). Specifically, Ahadi & Rothbart (1994) suggest that effortful control is foundational in the developmental system underlying these two

dimensions of personality, namely agreeableness and conscientiousness. Jensen-Campbell and colleagues (2002) explore this connection between the processes involved in effortful control and the agreeableness and conscientiousness dimensions of the five-factor approach to personality. Based on their results, it appears that both agreeableness and conscientiousness were associated with effortful control processes in adults. Specifically, agreeableness was associated with performance on the Stroop task, a measure of effortful control wherein participants are asked to read the word written on a card. The word is the name of a color, but the word is written in a color that is not the word they are intended to read. For example, the word blue is written on a card in green ink. Participants must inhibit the dominant response of reading the word “blue” in favor of saying the ink color “green.” Likewise, both agreeableness and conscientiousness were associated with performance on the Wisconsin Card Sort Task, wherein participants match cards on the computer and must use feedback to determine the rules of matching. These results suggest that effortful control processes may be involved in two of the five dimensions of personality.

Further research linking Agreeableness and regulation processes also suggests that Agreeableness may be linked to individual differences in the ability to regulate emotions in order to maintain these smooth relations with others (Graziano, Habashi et al., 2007; Tobin & Graziano, 2011; Tobin, Graziano, Vanman, & Tassinary, 2000). Ahadi and Rothbart (1994) suggest that agreeableness may be more specifically related to the regulation of anger. In a three-study set, Tobin et al. (2000) found that individuals high in agreeableness experienced more emotions in response to emotionally evocative,

negative slides, and they also exerted greater efforts to control their negative emotional reactions. Further supporting the link between agreeableness and regulation of behaviors, Tobin and Graziano (2011) explored agreeableness in relation to children's reactions to desirable and undesirable gifts. In their study, children were asked to help the researcher rate gifts in the order of most to least desired. These prize ratings were used to determine the reward for assisting the researcher with a task. After the first round of helping the researcher with a book-rating task, children received a wrapped gift containing their most desired prize. After completing a second round of a book-rating task, each child was presented with his or her least desired prize. Reactions to both gifts were recorded and coded to provide a measure of their emotional reactions. Interestingly, the researchers found no evidence of differences in regard to positive affect between individuals low and high in agreeableness; however, children high in agreeableness displayed less negative affect when presented with an undesirable gift relative to their peers low in agreeableness. Based on these results, it appears that agreeableness may be particularly important in the suppression of negative emotions rather than producing greater positive emotions.

Agreeableness and Behavioral Regulation

These results suggest that the motives involved in agreeableness manifest themselves in avoiding or inhibiting the display of negative emotions, but not necessarily in efforts to display positive emotions. Thus, it appears that agreeableness plays an important role in displays of emotions, especially negative emotions (Ahadi & Rothbart; 1994; Tobin & Graziano, 2011). Of particular relevance when considering displays of

emotions is the concept presented by Eisenberg et al. (2000), namely emotion-related behavior regulation. They define emotion-related behavior regulation or what they term, behavioral regulation, as “the process of initiating, maintaining, inhibiting, modulating, or changing the occurrence, form, and duration of behavioral associates of emotion, including observable facial and gestural responses and other behaviors that stem from, or are associated with, internal emotion-related psychological or physiological states and goals” (Eisenberg et al., 2000; p. 138). Behavioral regulation includes the control of facial, gestural, or other overt behaviors associated with emotion-related states or goals. Behavioral regulation efforts may manifest themselves differently in various social situations depending on individual differences in agreeableness.

Conflict is a good example of situations that require behavioral regulation. When individuals who are high in agreeableness enter into a social situation, they do so with the expectation that others will be pleasant and likeable (Graziano & Tobin, 2013). Part of the reason individuals who are high in agreeableness are well liked by their peers is because they project positivity onto others, often making excuses for the shortcomings of others (Graziano, Bruce et al., 2007; Graziano & Tobin, 2002). It is possible that situations in which conflict exists could potentially be a threat to their motivation to be understanding and excusing of others. As such, it is likely that individuals low in agreeableness would find conflict situations as less distressing than their peers high in agreeableness, as they are not particularly motivated to develop positive relations, they would not feel distressed when this goal is blocked. That said, it does not mean that individuals who are highly agreeable will undoubtedly buckle under the pressure of a

conflict situation. Likely, there are individuals who are highly agreeable and are successful in navigating social situations in which conflict exists (Graziano & Tobin, 2013). When directly polled, Graziano et al. (1996) found that middle school students high in agreeableness reported more distress when experiencing interpersonal conflict, yet teachers reported these individuals as experiencing less distress during conflict. Herein lies the importance of time in understanding how individuals high in agreeableness handle conflict, such that the focus is on the process of handling the conflict and not simply the resolution (Graziano & Tobin, 2013).

Individuals high in agreeableness tend to give others the benefit of the doubt to explain the negative behaviors of others and attempt to develop positive social relationships. In life, it is not always possible to have smooth and positive interactions with others. Graziano et al. (1996) found that conflict resolution tactics differ between individuals high and low in agreeableness. While both groups supported negotiation as a method to handle interpersonal conflict, individuals low in agreeableness viewed power assertion tactics as more acceptable relative to their high agreeable peers. Graziano et al. (1996) also found that individuals high in agreeableness tend to see less conflict during social interactions, like others more and rate them more positively relative to their low agreeable peers. Interestingly, the results of this study demonstrated that participants low in agreeableness tend to elicit more conflict from their partners relative to those participants working with participants high in agreeableness.

In another study investigating individual differences in agreeableness and conflict resolution tactics, Jensen-Campbell and Graziano (2001) used both hypothetical

situations and weekly self-report logs of children sixth through eighth grades. Participants were asked to read 12 conflict vignettes and evaluate the appropriateness of different resolution tactics. Participants also were asked to complete Rochester Interaction Records (RIR) for several days in order to assess their perceptions of daily conflict based on their actual experiences. Agreeableness ratings were based on both teacher and self-report measures. The results of the conflict vignettes in the study suggest that individuals high in agreeableness report that compromise and other constructive tactics were more appropriate means to negotiate conflict relative to their peers than are low in agreeableness. Likewise, individuals high in agreeableness reported that the use of destructive tactics were less appropriate relative to their peers that are low in agreeableness. Furthermore, the results of the RIR suggested an inverse relation between teacher-rated agreeableness and self-reports of anger and hurt feelings. These results are consistent with previous reports suggesting that individual differences in agreeableness are connected to interpersonal conflict. Furthermore, these results suggest that both self- and teacher-rated agreeableness was positive correlated with interpersonal adjustment. One interesting finding from this study is the relatively low correlation between self- and teacher-rated agreeableness. While the researchers indicated that this finding may be related to the differences in rating others and ratings of one's self, other studies suggest that differences in teachers ratings of students behaviors may be related to something else altogether (Graziano et al., 1996).

As suggested by Graziano and Tobin (2013), teachers observing the behaviors of high agreeable middle school students may be focusing solely on the end of the conflict

(i.e., the resolution) without focusing on the process, which unfolds over time (Graziano et al., 1996). To help understand this process, these authors presented an adapted version of Solomon's opponent-process model of motivation (Solomon, 1980). The first process, Process A, is the automatic process. This process happens at the initial presentation of the evocative stimulus producing an unconditioned response. Process B therefore is a conflicting, or opponent, process that is activated much more slowly yet tends to persist longer than Process A that comes on more intensely but with a shorter duration. Looking at this model through the lens of conflict it would perhaps unfold as follows: upon being presented with a conflict scenario, highly agreeable individuals immediately experience personal distress in response to the perceived threat (Process A); however, shortly after the activation of Process A their concern or motivation to maintain the positive relations (Process B) would begin to overrun the initial personal distress, provided escape from the situation is not possible. As such, once a conflict scenario is introduced cooperative or prosocial behaviors may increase over time in individuals high in agreeableness as they adjust to overcome this initial process. As a result of this change in behavior over time, what may be observed at the end of a sequence of events (the conclusion) may not provide all the relevant information regarding the processes at work throughout the entire interaction.

Graziano et al. (1997) provide the most relevant evidence linking agreeableness to cooperative and competitive responses. The authors investigated these relations by systematically coding participants' behaviors in response to cooperative and competitive situations. Graziano et al. (1997) presented triads of college students with a series of tasks

with different goal structures. Specifically, triads of participants were asked to build block towers during 13 15-second trials in order to earn prizes at the end of the session. Each triad was presented with either cooperative or competitive rules for the game. Specifically, during contrient goal structure trials, participants were told that prize tokens would only be awarded to the participant with the most blocks in the tower at the end of each trial. Conversely, during promotive goal structure trials participants were told that tokens would be distributed equally to all participants in the group based on the total number of blocks placed at the end of the trial. There were four total group compositions based on participants' ratings of agreeableness: A+A+A+, A+A+A-, A+A-A-, and A-A-A- (High Agreeable Participant = A+, Low Agreeable Participant = A-). This design allowed the researchers to investigate the influence of others' agreeableness on behaviors during the task. These researchers found agreeableness to be negatively related to competitiveness in groups. Likewise, participants high in agreeableness also were more likely to have positive expectations about the group interactions. Overall, the results suggest that competitiveness mediates the relation between agreeableness and cooperation, such that participants low in agreeableness view themselves as less interdependent with their group members and use more competitive behaviors during trials than their peers high in agreeableness. Another interesting finding for participants high in agreeableness is that as the number of partners high in agreeableness increased, performance during contrient goal structures also increased; however, as the number of partners high in agreeableness increases, performance in promotive goal structures decreased.

Tobin, Schneider, Graziano, and Pizzitola (2002) replicated the tower-building study of Graziano et al. (1997) and French et al. (1977) in order to examine these phenomena in children while simultaneously investigating carryover effects. Specifically, this study looked at changes in performance during the tower building task during contrient followed by promotive trials as well as promotive followed by contrient trials. The results suggest that agreeableness is related to a tendency to be influenced by goal structures such that low agreeable children have more stable performance across goal structures while high agreeable children had more discrepant performance across goal structure. Interestingly, this effect was stronger for triads of girls than for triads of boys. While this study focused on game behaviors such as straightenings and knockdowns of blocks, there was less focus on behaviors related to emotional reactions that occur throughout the game. It appears that agreeableness interacts with goal structures or other situational constraints rather than simply dictating behavior. In other words, while individuals high in agreeableness may be dispositionally predisposed to develop and maintain positive relations with others and avoid competitive interactions, they may exhibit behaviors inconsistent with their disposition (i.e., socially deconstructive) when working with others who do not share their disposition or when placed in situations with a contrient goal structure.

Overall, it has been demonstrated that cooperation and competition are fundamental components of the human experience that both arise out of biological necessity and the nature of group living. Although successfully coordinated group living is essential for human society, there are individual differences in how well people

navigate their social environment. One important feature involved in maintaining successful social relations with others is the personality dimension of agreeableness. While there likely is a biological component to the development of agreeableness, this dimension is influenced more highly by the environment than other personality dimensions. Of specific interest is the degree to which agreeableness is related to behavioral regulation, specifically in service of behaving in situationally appropriate ways when faced with competition or cooperation. Of particular interest is how agreeableness is related to behavior over time in these situations. As Graziano and Tobin (2013) suggest, individuals may react differently over time when confronting situations that are contrary to personality, specifically focusing on individual differences in agreeableness. The present study investigated how individuals behave over time while participating in a social task with shifting demands through the lens of the personality dimension of agreeableness.

Present Study

The present study examined the relations among agreeableness, goal-structures and the order of their presentation, and children's emotional and behavioral responses to both contrient and promotive tasks. Specifically, the present study investigated whether agreeableness predicted performance and change in performance over time in games contingent upon the rules (goal structure) of the game (competitive or cooperative rules) and the order these rules were presented (contrient or promotive goal structures first). Using a tower-building task adapted from Graziano et al. (1997), groups of children were asked to play a game in groups of three. Triads were asked to complete 13 trials of the

tower building task, with participants earning tokens during these trials. At the end of all 13 trials, children traded these tokens for prizes. When completing contrient trials, only the participant who had the most blocks in the tower earned tokens. In contrast, tokens were equally divided among all children during promotive trials based on the total number of blocks in the tower at the end of each trial. Thus, the present study replicated past research by examining these relations while expanding on past research by exploring the nature of agreeableness in different contexts.

Based on past research, it was anticipated that children in promotive trials would engage in more straightenings and have larger towers relative to contrient trials. Likewise, it was anticipated that contrient trials would produce more instances of knocking down blocks during the tower building task relative to promotive trials. Although Tobin et al. (2002) found no differences in vocalizations across goal structures, it was anticipated that participants would have more positive vocalizations during the promotive trials relative to contrient trials. Similarly, it was hypothesized that contrient trials would result in more negative vocalizations relative to promotive trials. The present study differentiated the type of vocalizations used during the tasks in order to better represent the content of what is expressed verbally throughout the trials. Furthermore, we anticipated that overall promotive trials would produce more prosocial behaviors (i.e., straightenings, positive vocalizations, positive affective, positive sportsmanship), whereas contrient trials would produce more destructive behaviors (i.e., knockdowns, negative affect, negative vocalizations, negative sportsmanship).

To assess individual differences, one parent and one teacher per child provided ratings of the child's personality. Specifically, parents and teachers completed all or a portion of the Big Five Inventory (BFI; John & Srivastava, 1999) to provide a measure of agreeableness. (Teachers were only asked to complete the agreeableness items.) To observe how individual differences in personality were influenced by unique setting demands, the present study used the tower building task from Graziano et al. (1997). The tower building task allowed for a unique look at both cooperative and competitive behaviors in a play situation, which allowed for an expansive study of play behaviors in these children. Agreeableness was targeted for this study specifically because of its inherent relation to the desire to develop positive social relations. It was predicted that individuals high on this dimension would have difficulty switching from tasks that align with their strengths (i.e., promotive situations) to those that require them to engage in ego-dystonic behavior (i.e., contrient situations); however, it is entirely plausible that these individuals would have more highly developed coping strategies in order to adjust flexibly to the demands of tasks in order to maintain positive social relations.

Based on previous research, both sex and order effects were expected as well. Specifically, it was hypothesized that girls would display more prosocial behaviors relative to boys when all other factors were held constant. Likewise, it was expected that girls would exhibit fewer destructive behaviors relative to boys. These hypotheses are consistent with previous research using the tower-building task (Graziano et al., 1997; Tobin et al., 2002). In regard to order effects, a main effect for order was anticipated such that contrient trials presented first would likely yield more destructive behaviors relative

to those that follow promotive trials. The effect for promotive trials was somewhat less clear, as it is possible carryover effects may influence the behaviors of certain individuals more so than others during promotive trials occurring after contrient trials.

Another purpose of the present study was to investigate individual differences in agreeableness as a predictor of children's behavior during promotive and contrient games. In general, it was expected that children higher in agreeableness would exhibit more prosocial behavior than their peers regardless of the goal structure condition. Although a main effect for goal structure was anticipated, it was also expected that high agreeable individuals would engage in fewer destructive behaviors during the contrient trials relative to their low agreeable peers but more prosocial behaviors during promotive trials than their low agreeable peers, thus indicating an interaction between goal structure and agreeableness. It was also anticipated that the order in which promotive trials were completed would interact with individual differences in agreeableness. Specifically, it was anticipated that high agreeable individuals would have more difficulty transitioning from promotive to contrient relative to performance transition from contrient to promotive. Behaviorally, it was expected that individuals high in agreeableness would show a marked decrease in the number of prosocial behaviors during contrient trials that follow promotive trials (a four-way interaction between agreeableness x goal structure x order x time). Over time, it was expected that prosocial behaviors would increase, albeit to a lesser extent than seen in promotive trials. It was hypothesized that low agreeable individuals would have relatively stable performance regardless of order. Furthermore, based on the opponent-process theory, another plausible hypothesis was that individuals

high in agreeableness who begin the study with contrient trials would experience a much larger rebound effect in regard to displays of prosocial behaviors relative to their peers once they begin promotive trials (Graziano & Tobin, 2009, 2013). As such, it was hypothesized that individuals high in agreeableness would display more prosocial behaviors during promotive tasks relative to their peers when promotive trials are presented second.

A third hypothesis is that I will find a significant agreeableness by goal structure by order by time interaction, such that high agreeable individuals who are experiencing contrient trials second will display a non-linear trend in regard to destructive behaviors during contrient trials such that they will initially engage in relatively few destructive behaviors over the course of the first trials before gradually increasing to the level of their low agreeable peers. Low agreeable individuals are anticipated to increase the use of destructive behaviors gradually over time in contrient conditions whereas their high agreeable peers will be reluctant to engage in destructive behaviors initially, as these are ego-dystonic (contrary to the individual's personality) behaviors. By applying the opponent process theory, it was hypothesized that individuals high in agreeableness would increase their use of destructive behaviors as doing so would be more socially appropriate in the context despite being difficult. A plausible alternative possibility is that for high agreeable individuals under contrient goal structures that occur following a block of promotive goal trials is that participants high in agreeableness may initially follow a similar upward trend to low agreeable individuals in regard to destructive behaviors before gradually decreasing over time whereas their low agreeable peers continue to

increase the use of destructive behaviors over time. Again, based on the opponent-process theory, high agreeable individuals' initial increase in destructive behaviors represents Process A, wherein high agreeable individuals are responding to a threat (the ego-dystonic goal structure) with destructive behaviors (as modeled by their lower agreeable peers) before gradually decreasing the use of these behaviors once Process B, their motivation to maintain positive relationships with others, rebounds from the initial shock of the rule change.

CHAPTER III

METHOD

Overview

The present study used a 2 (agreeableness: high v. low) $\times$ 2 (goal-structure condition: contrient vs. promotive) $\times$ 2 (order: contrient-promotive vs. promotive-contrient) $\times$ 2 (sex: male v. female) design. Agreeableness, order, and sex were between-subject variables. Goal-structure condition was a within-subject variable. Triads were randomly assigned to order condition such that some participants received the contrient trials first, whereas others received the promotive trials first. Operationally, hierarchical linear modeling was used to test the hypotheses at the individual and the triad/group level. In all analyses, agreeableness was treated as a continuous variable.

Participants

A total of 303 (165 female) elementary school students recruited from elementary schools and throughout the community in central Illinois. In addition to child participants, a total of 127 parents (representing 114 children who completed the tower-building task in the present study) and 9 before/after school staff and 36 classroom teachers participated in the present study (completing a total of 269 teacher/staff ratings). Children from grades second through fifth were selected because this age range was optimal to target a specific range of development where effortful control processes were largely

developed yet children were still developing their skills in using these processes to navigate their social environment.

Children were recruited from various before- and after-school care programs throughout the community. Specifically, before and after school programs in central Illinois were contacted to solicit interest in participating in the present study. All children who participated in this study were enrolled in the general education program. Participants were enrolled in the second through fifth grades, ranging in age from 7 to 11 years. As indicated, participants in this age range were selected as they have moved beyond the major developmental milestones for effortful control processes but are still developing the skills to successfully inhibit their behavior in social contexts. Participants were excluded from data analysis if they have any special education needs or were non-English-speaking children. Although consent was obtained for some children who were non-English speaking and/or were receiving special education or other special services, their data were not included in the analyses for the present study.

Access to Child Participants

IRB approval was obtained in order to contact various before- and after-school care programs throughout Central Illinois. Specifically, programs associated with two school districts in the central Illinois area were contacted first in order to gain access to families involved in these programs. Other social organizations for groups of girls and boys and two local parks and recreation departments were contacted to obtain a sufficient sample. Finally, three school districts outside of the immediate area were contacted to

participate in the present study; however, one of these school districts opted out of the study due to administrative issues. Upon receiving administrative permission to send out consent forms and collect data in these programs, individual programs, schools, and sites were contacted to begin the process of data collection. All available sites within each of the school districts were contacted. Parents received a letter requesting participation in the study once the staff consented to participate in the present study. Attached to each letter was a consent form asking parents to allow the collection of questionnaire data from teachers, staff members, and parents as well as to allow the child to participate in the tasks with two same-sex peers. All questionnaire materials were sent home to parents after they provided consent to participate. Graduate and undergraduate research assistants delivered the forms to the teachers and staff. Teachers were asked to allow parents to return parent-report questionnaires to the school with the child for collection by the researchers. Parent questionnaires were provided to families up to three times throughout the study in order to increase our response rate for parental questionnaires.

Once parental consent was obtained for the child participants, the child participants were informed of the nature of the study during the tower-building task and were asked to provide verbal assent to participate during this portion of the data collection process. The assent procedures were read as follows: “We are doing a research project to help us find out about how different kinds of children play together with different rules. We would like you to be in this study. In it, we will ask you to play some games with two other children your age. We will also ask you to answer some questions about yourself and your partners during the game. We will also ask your parent/guardian

and your teacher to answer some questions about what you are like and how you see the world. The games will take about a half hour to play, and you will earn small prizes for playing them. Taking part in this study is your choice. Nothing bad will happen to you if you decide not to play or to quit. Would you like to play the games?” If a child declined to participate, she or he was escorted back to the classroom and another student was then selected to participate. Children who declined to participate were given another opportunity to participate on another day. Only one participant refused to participate in the tower-building task.

Task

A tower-building task adapted from French, Brownell, Graziano, and Hartup (1977) and Graziano et al. (1976, 1997) was used for the present study. Participants in each triad were asked to build towers with 3-in colored blocks. Each participant in the group had a set of 10 blocks with a unique color (Yellow, Black, and Grey) and a unique wristband of the same color to aid with data collection. Participants completed the task while seated on a 4 ft × 4 ft black felt game board. Three 1-ft squares were outlined on the felt board such that the inner most edges of the three squares created a triangle in the center of the board. This center triangle is where participants built a single tower during each trial. Participants completed a total of 13 trials. That is, triads were randomly assigned to complete either six contrient trials or six promotive trials, followed by six trials of the opposite goal structure (promotive or contrient), before completing a final trial of the promotive condition. This final promotive trial was included to increase the likelihood that all participants concluded the study with a positive perception of the

experience. As a result, participants completed a total of 13 trials of the tower-building task.

Procedure

Between one and two tower-building stations were arranged in the room where the study took place depending on the setting (i.e., in school, after school program). For participants who completed the tasks at school, the tasks were stationed somewhere in the school with reduced foot-traffic in order to avoid outside interference during the task. The tower-building stations consisted of an equilateral triangle (approximately 12 in. per side) and three adjacent squares on a large piece of black felt. Participants were positioned outside the triangle and behind the squares. The towers were built inside the triangle during the game. The sets of blocks were placed inside of the adjacent squares. Figure 1 illustrates the layout of the game board as used for the purposes of the present study. Participants were each seated next to or behind the square containing their blocks on the game board. At each station, a lead researcher oversaw the groups, read the instructions, and took the children to the prize table at the end of the task. Individual research assistants were assigned to each member in the group to code interactions among group members. Thus, there was a 1:1 ratio of participants and researchers. In addition, 14.9% of all observation trials were simultaneously coded by two researchers in order to establish inter-rater reliability of the observations.

Figure 1. Tower-Building Task Game Board Layout

Participants were randomly assigned to groups of three, in same-sex, same-age triads. For each child, one teacher or one child care staff member completed the nine agreeableness items from the *Big Five Inventory (BFI)*; John & Srivastava, 1999) to provide a measure of each participant's agreeableness. Groups of children were randomly assigned to a trial order, such that they received contrient-promotive or promotive-contrient trials. One or more research assistants were assigned to each participant in the triad to collect behavioral observation data during the tower-building task. Multiple observers were used to assess inter-observer agreement. The research assistants distributed colored wristbands to the members of the triad, such that each person in the triad wore wristbands that matched the unique color of his or her blocks. This

arrangement enabled the research assistants to code the performance variables efficiently. A lead experimenter, who oversaw each session, read the rules of the game to the participants. Up to two groups played the game simultaneously, one group at each station in the room, in order to maximize the efficiency of each session. Participants were able to see and hear the other participants in the room; however, as demonstrated by Graziano et al. (1997), the design of the task and speed with which it was administered minimized the intergroup interaction and influence on behavior. Only 20 out of the 101 groups participated at the same time that another group completed the task.

Each triad participated in thirteen 15-second trials, as was done in Graziano et al. (1997). The triads were randomly assigned to be read the rules either for the cooperative or the competitive goal structure at the beginning of the first trial, depending on the random assignment of the order condition. The triads performed the task within either a contrient or promotive goal structure for the first six trials. After this, the other goal structure was introduced and another six trials were conducted. The triad members were read a list of the following explicit rules, which were used in Graziano et al. (1997) based on the modified rules from Graziano et al. (1976): (a) There will be a series of trials; (b) each trial will last 15 seconds; (c) the blocks must remain in your home squares before starting the task (game), in one flat layer; and (d) we want you to build a tower as tall as you can. Participants were instructed to build one tower as a group in both goal structure manipulations. Trials that ended with more than one tower built resulted in no tokens awarded for that trial. See appendix A for a complete list of rules.

The goal structure was manipulated with instructions. Each triad was given one of two goal-structure manipulations: (a) during the promotive goal-structure trials, participants were told that prize chips would be awarded equally to each person in the group on the basis of the total number of blocks still standing in the tower at the end of the 15 seconds. (b) During the contrient trials, participants were told that the prize chips would be awarded only to the child with the most blocks still standing in the tower at the end of the 15 seconds. Participants were also told that in the event of a tie based on number of blocks on the tower, no prize chips would be distributed. As previously indicated, triads were randomly assigned to complete six trials of either contrient or promotive, followed by six promotive or contrient trials, respectively. All children finished the task by completing a final promotive trial in order to increase the likelihood that participants left the task with a positive disposition.

Following these goal-structure manipulations, participants were given additional rules that applied to all of the conditions: (a) only one tower can be built. If more than one tower is left standing at the end of the 15 seconds, then no prize chips will be awarded. (b) Chips can be redeemed at the end of the session for prizes. Various prizes are available with varying chip values. (c) The tower must remain standing by itself at the end of the 15 seconds. No hands can be on the tower at the end of the 15 seconds. (d) Participants can have one hand on the blocks in their home square before the beginning of the trial. (e) The tower must remain standing until the experimenter tells you to remove the blocks.

The first purpose of the present study was to examine agreeableness and individual differences in use of in-game strategies. Specifically, children's behavior was coded live during the game looking for the following behaviors: block straightenings, positive vocalizations, negative vocalizations, neutral vocalizations, frequency of tower falls (unintentional), frequency of knockdowns, overall positive affect, overall negative affect, and sportsmanship. Data were collected for each of the 13 individual trials during the game by an independent coder. As previously indicated, 14.9% of all observations were double-coded in order to establish inter-rater reliability and insure quality behavioral observations. Observations were collected from highly trained graduate and undergraduate research assistants. Research assistants were initially required to successfully complete (answer 80% of the items or more correctly) a short 13-item quiz over the primary information regarding the present study before being able to begin collecting data. Additionally, all research assistants completed a "live" competency wherein they scored the performance of a recorded confederate completing the tower building task. A master coding sheet was completed by the lead researcher in order to provide a basis for research assistant scores to be compared. Research assistants were required to have a Cohen's Kappa of 0.60 or greater when compared to a master coding sheet in order to begin collecting live data. The results of research assistant's observations of the live coding competency indicated that research assistant's Cohen's Kappa scores for the video scoring competency ranged from 0.64 to 0.98 with a mean of 0.76.

Predictor Variables

The Big Five Inventory (BFI; John & Srivastava, 1999) was administered to parents and teachers to assess the child's personality. Classroom teachers were asked to complete only the nine agreeableness items of the BFI in order to provide agreeableness levels for each child participant. In addition to teacher scores, parents were asked to complete the full BFI inventory for their children in order to provide a comprehensive report of the participant's personality. Parents and teachers completed the BFI items in paper-pencil format. Teachers were provided the questionnaires after parental consent was obtained. The teacher/staff ratings of agreeableness ($M=4.12$, $SD=0.83$) had a Cronbach's α of .96. The corresponding alpha for parent ratings of agreeableness ($M=3.43$, $SD=0.62$) was .86.

Additionally, a group familiarity variable was included in order to allow for some control regarding the participants' familiarity with their peers. This variable relied on setting data to determine the how well individuals within the same group knew each other. That is, groups that consisted of children from the same classroom or organization were considered familiar and those from different classrooms or organizations were considered unacquainted. This variable was dummy coded for the purposes of the present analyses.

Criterion Variables

Research assistants coded individual performance of a specific participant's behavior throughout the completion of the tower building task. (a) For each participant,

the number of positive vocalizations made during each trial was recorded. Specifically, a frequency count of each vocalization made was collected focusing on three specific types of vocalizations: positive peer-directed (defined as a word or series of words [exclamations and nonsense words were not included] that are supportive, affirmative, or encouraging directed toward a peer during the tower building task), positive self-directed (defined as words or a series of words that are supportive, affirmative, or encouraging that are directed toward themselves), and positive task-directed (defined as words or a series of words that are supportive, affirmative, or encouraging that are directed toward the tower building task). These vocalizations were also summed across goal structure (contrient or promotive). (b) For each participant, the number of negative peer-directed (defined as a word or series of words [exclamations and nonsense words will not be included] that are insulting, damaging, or critical that are directed toward a peer during the tower building task), self-directed (defined as a word or series of words that are insulting, damaging, or critical that are directed toward the themselves), and task-directed (defined as a word or series of words that are insulting, damaging, or critical that are directed toward the tower building task) vocalizations made during each trial were recorded. These vocalizations were summed across goal structure (contrient or promotive). (c) For each participant, the number of straightenings completed was scored per trial. Straightening is defined as touching a block on the tower other than the block being added to the tower. Duration of straightening was not assessed. Separate straightenings were tallied when a participant took his or her hand away from the tower between straightening attempts. (d) For each participant, the number of times that he or

she knocked blocks off the tower was summed across condition (contrient or promotive). (e) For each participant the number of times the towers fell was scored per trial as well as summed across goal structure (contrient or promotive). (f) For each individual/triad, the total number of blocks standing in a tower per trial was recorded. (g) Finally, during live coding, research assistants rated the child's emotional reactions during each trial of the game. Specifically, research assistants provided ratings of each child's emotional reaction to each round of the game. Ratings were scored on a 5-point, Likert-type rating scale for the following domains: Positive affect, negative affect, positive sportsmanship, and negative sportsmanship. Raters were asked to provide a rating that reflected the behavior throughout the trial; however, raters were also able to provide an additional rating per trial if a child displayed a significant change in rating throughout the trial. For example, a child may have behaved such that they would earn a score of 1 for negative sportsmanship throughout the task for the majority of the trial before suddenly cheating at the end of the trial, which would result in a score of 5. To reflect potential changes in behavior displays a column 'a' and column 'b' was provided for ratings of positive affect, negative affect, positive sportsmanship, and negative sportsmanship. Additionally, raters were asked to provide an overall positive behavior score and an overall negative behavior score reflecting a subjective assessment of each individual's displays of both positive and negative behaviors. See Appendix D for a complete coding rubric used by research assistants for providing scores for each child per trial.

In order to assist with the interpretation of the data, behaviors were categorized into two groups: destructive behaviors and prosocial behaviors. Theoretically, it was

assumed that these behaviors, while different, were functionally similar to one another such that analyses could be reviewed and discussed as groups. Destructive behaviors included knockdowns, negative affect, negative sportsmanship, and overall negative behavior. For the final hypotheses, negative vocalizations (peer-, self-, and task-directed) were also considered destructive behaviors. Prosocial behaviors included straightenings, positive affect, positive sportsmanship, and overall positive behavior. As with destructive behavior, positive vocalization (peer-, self-, and task-directed) were considered prosocial behaviors for the final hypotheses. It was also assumed that tower height was a measure of prosocial behavior as taller towers reflected successful groups.

CHAPTER IV

ANALYSIS OF THE DATA

Reliability of Behavioral Observations

For the present analyses, 14.9% of behavioral observations were conducted by two observers simultaneously recording the behaviors of a single individual to allow for the examination of the reliability of observational coding. As shown in Table 1 and Figures 2 through 12, intraclass correlations for the variables of interest suggest that observers may not have been using the observational coding system similarly; however, it is important to consider the frequency with which each behavior occurred. Specifically, behaviors that occurred more frequently (e.g., falls, knockdowns, and straightenings) had significant interclass correlations. In contrast, very low frequency behaviors (e.g., positive and negative vocalizations or ‘b’ variables for both sportsmanship and affect ratings) had unacceptably low intraclass correlations because they happened so infrequently.

Table 1

Behavioral Observation Intraclass Correlations

Behavioral Observation Codes	Intraclass Correlation
Knockdowns	0.80
Negative Affect (a)	0.54
Negative Affect (b)	0.22
Negative Sportsmanship (a)	0.74
Negative Sportsmanship (b)	0.51
Overall Negative Behavior	0.64
Negative Vocalization (Peer)	0.61
Negative Vocalization (Self)	0.14
Negative Vocalization (Task)	0.02
Straightenings	0.86
Positive Affect (a)	0.54
Positive Affect (b)	0.13
Positive Sportsmanship (a)	0.45
Positive Sportsmanship (b)	0.00
Overall Positive Behavior	0.49
Positive Vocalization (Peer)	0.38
Positive Vocalization (Self)	0.29
Positive Vocalization (Task)	0.00
Falls	0.84
Total Tower Height	1.00

Figure 2. Histogram of Frequencies for Overall Negative Behaviors and Overall Positive Behaviors

Figure 3. Histogram of Frequencies for Falls and Knockdowns

Figure 4. Histogram of Frequencies for Negative Affect (a) and Negative Affect (b)

Figure 5. Histogram of Frequencies for Negative Sportsmanship (a) and Negative Sportsmanship (b)

Figure 6. Histogram of Frequencies for Negative Peer-Directed Vocalizations and Negative Self-Directed Vocalizations

Figure 7. Histogram of Frequencies for Negative Task-Directed Vocalizations

Figure 8. Histogram of Frequencies for Positive Affect (a) and Positive Affect (b)

Figure 9. Histogram of Frequencies for Positive Sportsmanship (a) and Positive Sportsmanship (b)

Figure 10. Histogram of Frequencies for Positive Peer-Directed Vocalizations and Positive Self-Directed Vocalizations

Figure 11. Histogram of Frequencies for Positive Task-Directed Vocalizations

Figure 12. Histogram of Frequencies for Straightenings and Total Tower Height

Tests of Hypotheses

Hypotheses were tested using hierarchical linear modeling. This type of modeling was best suited for examining these data because they are not only matched to an individual, but nested within a particular group (triad) as well. Growth curve modeling (GCM) was used to examine changes in children's behaviors over time. These behaviors included observations of discrete behavior including positive vocalizations (peer, self, and task-direct), negative vocalizations (peer, self, and task-direct), knockdowns, straightenings, and Likert-type ratings of affect and sportsmanship (both positive and negative) as global ratings at the end of each trial. This type of analysis was used because it allows for the examination of particular patterns of change over time as well as allowing for individual differences in patterns of change. Both slopes and intercepts were modeled using GCM. GCM requires that a model for each outcome variable be created in a step-wise fashion until a best-fitting model is found. For each outcome variable, the

trend for change over time is modeled and then independent variables are included in the model to examine any differences amongst individuals' patterns (Kahn & Schneider, 2013). Due to the nature of the analyses used for the present results, degrees of freedom and p-value information were not provided because it is not possible to know these values when conducting multilevel analyses. For the purposes of interpreting these results, t-values greater than $|2|$ were considered significant. Effect sizes were not provided for the present results because there is no consensus about how to measure them for hierarchical linear modeling.

Hypothesis 1: Tower height will be greater for Promotive trials relative to Contrient trials.

To test the first hypothesis that predicted mean tower height would vary between goal structures such that promotive trials would have larger towers than contrient trials, multilevel modeling with a single predictor (goal structure) was conducted. As previously discussed, the nested nature of the data required that analyses factored in both the individual and group (triad) levels in the analyses. As seen in Figure 13, participants under contrient goal structure conditions built smaller towers ($M = 2.75$) compared to towers built under promotive goal structure conditions ($M = 5.31$), $t = 20.76$. These results support the hypothesis that participants build taller towers under promotive conditions relative to contrient conditions.

Figure 13. Main Effect of Goal Structure for Tower Height

Hypothesis 2: Participants will display more positive vocalizations during Promotive trials relative to Contrient trials.

To test the second hypothesis that mean positive vocalizations vary between goal structures such that participants will display positive vocalizations of all type (peer-, self-, and task-directed) more frequently in promotive trials relative to contrient trials, a comparison of means was conducted using multilevel modeling as described previously. As seen in Figure 14, participants under contrient goal structure conditions displayed less frequent positive peer vocalizations ($M = 0.01$) relative to their behavior during promotive goal structure conditions ($M = 0.02$), $t = 2.90$. Similarly, participants under contrient goal structure conditions displayed less frequent positive task-directed vocalizations ($M = 0.004$) relative to their vocalizations during promotive goal structure conditions ($M = 0.01$), $t = 2.89$. In contrast and contrary to the present hypothesis,

participants under contrient goal structure conditions displayed more frequent positive self-directed vocalizations ($M = 0.02$) relative to their behavior during promotive goal structure conditions ($M = 0.01$), $t = -4.08$. These results suggest that while participants engage in more positive peer- and task-directed vocalizations under promotive conditions, they engage in more frequent positive self-directed vocalizations under contrient conditions.

Figure 14. Main Effect of Goal Structure for Positive Vocalizations

Hypothesis 3: Participants will display more negative vocalizations during Contrient trials relative to Promotive trials.

To test the third hypothesis that mean negative vocalizations will vary between goal structures such that participants will display negative vocalizations of all type (peer-, self-, and task-directed) more frequently in contrient trials relative to promotive trials, a comparison of means was conducted using multilevel modeling as described previously.

As seen in Figure 15, participants under contrient goal structure conditions displayed more frequent negative peer-directed vocalizations ($M = 0.13$) relative to their displays during promotive goal structure conditions ($M = 0.05$), $t = -8.67$. Similarly, participants under contrient goal structure conditions displayed more frequent negative task-directed vocalizations ($M = 0.03$) relative to their vocalizations during promotive goal structure conditions ($M = 0.01$), $t = -4.23$. In contrast, there was no evidence of a significant difference between the negative self-directed vocalizations of participants under contrient goal structure conditions ($M = 0.01$) and their vocalizations under promotive goal structure conditions ($M = 0.003$), $t = -1.77$. These results suggest that participants engage in more frequent negative peer- and task-directed vocalizations under contrient conditions. Negative self-directed vocalizations occur relatively infrequently under either goal structure.

Figure 15. Main Effect of Goal Structure for Negative Vocalizations

Hypothesis 4: Participants will display more prosocial behaviors (i.e., straightenings, positive affect, positive sportsmanship, and overall positive rating) during Promotive trials relative to Contrient trials.

To test the fourth hypothesis that mean prosocial behaviors will vary between goal structures such that participants will display prosocial behaviors (positive affect, positive sportsmanship, overall positive rating, and straightenings) more frequently in promotive trials relative to contrient trials, multilevel modeling was again implemented. Participants under contrient goal structure conditions also had fewer straightenings on average ($M = 0.42$) relative to their straightenings during promotive goal structure conditions ($M = 0.52$), $t = 4.81$. As shown in Figure 16, participants under contrient goal structure conditions had lower ratings of positive sportsmanship ($M = 1.23$) relative to their sportsmanship during promotive goal structure conditions ($M = 1.41$), $t = 12.33$. Contrary to my hypothesis, participants under contrient goal structure conditions were rated as higher in displays of positive affect ($M = 2.24$) relative to their displays of positive affect during promotive goal structure conditions ($M = 2.18$), $t = -2.75$. Finally, there was no evidence of significant differences between participant's contrient goal structure overall positive behavior ratings ($M = 2.09$) and their promotive goal structure overall positive behavior ratings ($M = 2.11$), $t = 1.12$. These results suggest that prosocial behaviors such as straightening and positive sportsmanship are more likely under promotive goal structure conditions. Conversely, positive affect was observed more frequently under contrient goal structure conditions relative to promotive conditions.

Figure 16. Main Effect of Goal Structure for Prosocial Behavior

Hypothesis 5: Participants will display more destructive behaviors (i.e., knockdowns, negative affect, negative sportsmanship, and overall negative rating) during Contrient trials relative to Promotive trials.

The fifth hypothesis that destructive behaviors across trials would vary between goal structures such that participants would engage in destructive behaviors more frequently in contrient trials relative to promotive trials, was also explored using multilevel modeling. For the purposes of the present analyses, destructive behaviors included knockdowns, negative sportsmanship, negative affect, and overall negative behaviors. Consistent with my hypothesis, participants under contrient goal structure conditions engaged in more frequent knockdown behaviors ($M = 0.08$) than they did during promotive goal structure conditions ($M = 0.01$), $t = -10.10$, as shown in Figure 17. Participants under contrient goal structure conditions also were rated as displaying more negative affect ($M = 1.49$) relative to their displays of negative affect during promotive

goal structure conditions ($M = 1.21$), $t = -14.97$. Likewise, participants under contrient goal structure conditions received higher ratings of negative sportsmanship ($M = 2.49$) relative to their sportsmanship during promotive goal structure conditions ($M = 1.41$), $t = -29.02$. Participants under contrient goal structure conditions received higher ratings of overall negative behavior ($M = 2.29$) relative to their behavior during promotive goal structure conditions ($M = 1.30$), $t = -27.97$. Participants under contrient goal structure conditions engaged in more frequent knockdown behaviors ($M = 0.08$) than they did during promotive goal structure conditions ($M = 0.01$), $t = -10.10$. These results support the hypothesis that participants engage in more knockdowns during contrient trials relative to promotive trials. These results indicate that participants are more likely to engage in destructive behavior under contrient goal structure conditions relative to promotive goal structure conditions.

Figure 17. Main Effect of Goal Structure for Destructive Behaviors

Hypothesis 6: Girls will display more prosocial behaviors (i.e., straightenings, positive affect, positive sportsmanship, and overall positive behavior rating) relative to boys.

Multilevel modeling was again employed to test the sixth hypothesis that mean prosocial behaviors would vary between sex such that girls will display prosocial behaviors (positive affect, positive sportsmanship, overall positive behavior rating, and straightenings) more than boys. A significant mean difference in frequency of straightenings was observed; however, the results were in the opposite direction of my hypothesis: Girls were observed to engage in less frequent straightenings than boys, as shown in Table 2. Beyond this unexpected sex difference, there was no evidence of significant differences between girls and boys for mean positive affect, mean ratings of positive sportsmanship, and mean overall positive behavior. These results suggest that, contrary to expectations, boys are more likely to engage in straightening behaviors than girls. Otherwise, no significant sex differences were observed.

Table 2
Means and t-values for Sex Differences

Outcome Variable	Girl <i>M</i>	Boy <i>M</i>	<i>t</i> -value
Positive Affect	2.29	2.12	-1.39
Positive Sportsmanship	1.30	1.26	0.82
Overall Positive Behaviors	2.16	2.02	-1.29
Straightenings	0.42	0.52	4.81*
Negative Affect	1.31	1.40	1.50
Negative Sportsmanship	1.86	1.66	1.52
Overall Negative Behaviors	1.55	1.69	1.87
Knockdowns	0.03	0.03	1.13

* indicates significant difference between girls and boys

Hypothesis 7: Boys will display more destructive behaviors (i.e., knockdowns, negative affect, negative sportsmanship, and overall negative rating) relative to girls.

To test the seventh hypothesis that mean destructive behaviors would vary between sex such that girls would display less destructive behaviors relative to boys, a comparison of means was conducted as described previously. For the purposes of the present analyses, destructive behaviors included knockdowns, negative sportsmanship, negative affect, and overall negative behaviors. As shown in Table 2, analyses revealed no evidence of significant differences between girls and boys for mean knockdowns, mean negative affect, mean negative sportsmanship, and mean overall negative behavior. Taken together, there was no evidence of significant sex differences in destructive behaviors.

Hypothesis 8: Participants will display more destructive behaviors (i.e., knockdowns, negative affect, negative sportsmanship, and overall negative rating) when contrient trials precede promotive trials compared to contrient sessions that come after promotive sessions (i.e., an effect for order).

To test the eighth hypothesis that mean destructive behaviors would vary across participants based on which goal structure is presented first, contrient or promotive, (i.e., mean differences for order) multilevel modeling was conducted as described previously. For the purposes of the present analyses, destructive behaviors included negative sportsmanship, negative affect, and overall negative behaviors. Figure 18 shows that participants who experienced contrient goal structure conditions first received lower ratings of negative affect on average ($M = 1.27$) relative to those participants who experienced promotive goal structure conditions first ($M = 1.43$), $t = 2.81$. Participants who experienced contrient goal structure conditions first received lower ratings of

negative sportsmanship on average ($M = 1.75$) relative to those participants who experienced promotive goal structure conditions first ($M = 2.14$), $t = 3.03$. Participants who experienced contrient goal structure conditions first received lower ratings of overall negative behavior on average ($M = 1.47$) relative to those participants who experienced promotive goal structure conditions first ($M = 1.74$), $t = 3.71$. Finally, no evidence of a significant difference was found between participants who experienced contrient goal structure conditions first ($M = 0.02$) and those who received promotive goal structure conditions first ($M = 0.06$) for mean knockdowns, $t = 1.87$. These results suggest that, contrary to hypotheses, participants who received promotive goal structure trials first received higher ratings across all three destructive behavior measures with no differences found for knockdowns.

Figure 18. Main Effect of Condition (Order) for Destructive Behaviors

Hypothesis 9: Agreeableness will predict displays of prosocial behaviors (i.e., positive affect, positive sportsmanship, overall positive rating, and straightenings).

Multilevel modeling was used to test the ninth hypothesis that agreeableness would predict displays of prosocial behavior. This analysis allowed for the comparison of individuals across the full dimension of agreeableness while controlling for variation in agreeableness at the triad level because these data are nested. Results revealed no evidence that individual-level agreeableness alone predicted prosocial behaviors. Specifically, teacher rated agreeableness was not a significant predictor of mean positive affect ($t = -0.81$), mean positive sportsmanship ($t = -0.15$), mean overall positive behavior ($t = -0.37$), or mean straightenings ($t = -0.67$). Similarly, there was no evidence that parent ratings of agreeableness predicted mean positive affect ($t = 0.55$), mean positive sportsmanship ($t = 0.06$), mean overall positive behavior ($t = 1.14$), or mean straightenings ($t = -1.47$). These results did not support my hypothesis that individual-level agreeableness would predict prosocial behaviors.

Hypothesis 10: Agreeableness will be inversely related to displays of destructive behaviors (negative affect, negative sportsmanship, overall negative rating, and knock downs).

Multilevel modeling was also used to test the tenth hypothesis that agreeableness would be inversely related to displays of destructive behavior. Results indicated no evidence that agreeableness alone predicted destructive behaviors. Specifically, there was no evidence that teacher rated agreeableness was a significant predictor of mean negative

affect ($t = -0.96$), mean negative sportsmanship ($t = -1.37$), mean overall negative behavior ($t = -1.71$), or mean knockdowns ($t = 1.57$). A similar pattern of results was found for parent-rated agreeableness. I found no evidence that it was related to mean negative affect ($t = -0.95$), mean negative sportsmanship ($t = -1.18$), mean overall negative behavior ($t = -0.99$), or mean knockdowns ($t = -0.34$). These results suggest that, despite predictions, individual-level agreeableness alone was not a significant predictor of destructive behavior.

Testing Hypotheses with Interaction Terms

Using multilevel modeling, I examined agreeableness, goal structure, order, time, and the interactions among these variables as predictors of prosocial and destructive behaviors. In this approach, I added one predictor and their associated parameters one at a time until I obtained the best-fitting and most parsimonious model for the data for each of the outcome variables. The results for each of these models are presented here.

I began assembling each of the models by determining the fixed effect of goal structure. After determining the fixed effect of goal structure the fixed effects of time (trial) were added, as participants were observed 12 times throughout the tower-building task (i.e., six trials of promotive and six trials of contrient). The final promotive trial, which was held at the end of the game, regardless of the triad's assigned order, was removed for the purposes of the present analyses. First the linear effect of time was added, followed by the quadratic effects of time until the higher-order polynomial no longer added significantly to the prediction of the outcome variable. Cubic and quartic effects of time were not included as, theoretically, these effects were not expected for the

present analyses. Next, polynomials of the random effects of time were added one at a time in like fashion, until the model fit failed to improve significantly. In almost every model, allowing the random intercepts and random effects of time to correlate improved model fit. Due to observations being nested within participants and participants were nested within triads, random effects of time were estimated separately between participants and between triads. In general, allowing slopes to vary between participants and also between triad improved model fit for the majority of the constructs measured.

Next, I examined if there was an interaction between time and goal structure present for each model. Following this step, I tested for the effect of order (promotive first and contrient first) and its interaction with time and goal structure as well as a three-way interaction between time, goal structure, and order. Finally, the effect of teacher-rated agreeableness and its interaction with time, goal, and order as well as its interactions including a four-way interaction of teacher-rated agreeableness, trial, order, and goal structure were tested. For the present analyses, only complete cases were included such that only participants with all relevant data (trial, goal, order, and teacher-rated agreeableness) were included in the analyses ($n=269$). Follow-up analyses were conducted on parent-rated agreeableness in the same manner used for teacher agreeableness; however, the results from these data should be interpreted with caution as low completion rates for these questionnaires may affect the conclusions drawn from these models.

Due to the overall low rates of vocalization produced by participants throughout the trials of the task the data obtained for the six vocalization variables (positive and

negative peer-, self-, and task-directed vocalizations) resulted in variables with low variability and high rates of zeros for each variable. Analyses initially followed the same format as described above for the non-vocalization criterion variables; however, the inclusion of random slopes resulted in models that failed to converge, effectively leaving these results uninterpretable. In these cases, binomial regression was attempted with these data such that the data were transformed in to a series of one of two possible outcomes (“occurrence” or 1, and “nonoccurrence” or 0). The goal of these analyses was to determine the probability of the occurrence of the vocalization relative to the predictor variables. Unfortunately, this model similarly failed to converge.

A third type of analysis was then implemented that is specifically intended to be used with data with excessive zero counts, namely zero-inflated Poisson regression. Zero-inflated Poisson regression allows excess zeros to be modeled independently from the count variables, as it is theorized that the excessive zeros are generated by a separate process than the count values. As with binomial regression, the zero-inflated Poisson regression produced models also failed to converge, thus making the data uninterpretable. The analyses presented for the present study relied on Growth Curve Modeling used for the non-vocalization variables; however, in order to allow for the analyses to converge appropriately, random slopes were not included in these models. Findings for each outcome variable that was examined are presented in the following descriptions and tables.

Hypotheses 11: Agreeableness and its interactions with goal structure, order, and time will predict prosocial behaviors.

Straightenings

Overall, there was no evidence of a significant four-way interaction including agreeableness, goal structure, order, and time or three-way interactions with agreeableness for straightenings. As shown in Figure 19 and Table 3, a significant goal by condition interaction revealed that when promotive trials were presented first significantly fewer straightenings occurred during contrient trials relative to other conditions. Contrient and promotive trials that occurred first were not significantly different in regard to straightenings. Additionally, a significant main effect for trial indicated that, when all other variables are held constant, straightenings occurred more frequently over time. Further analyses revealed that including agreeableness, both teacher and parent rated, did not improve model fit over the presented model. The present model failed to support the hypothesis that agreeableness would predict the frequency of straightenings contingent on goal structure and order over time. Similarly, there was no evidence that the inclusion of the group familiarity variable improved the model fit for straightenings.

Figure 19. Best Fitting Model for Straightenings

Table 3

Fixed Effects of Straightenings

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	0.37	0.05	7.15
Goal	0.21	0.05	4.03
Trial	0.03	0.01	2.72
Condition	-0.06	0.07	-0.87
Goal*Trial	0.0001	0.01	-0.07
Goal*Condition	-0.17	0.07	-2.52

Positive Affect

Overall, there was no evidence of a significant four-way interaction including agreeableness, goal structure, order, and time or three-way interactions with agreeableness for positive affect. As seen in Figure 20 and Table 4, a significant three-way interaction between trial, goal structure, and order suggested that participants who

experienced promotive trials first initially experienced a gradual increase in positive affect over time. Once the transition was made to contrient trials, participants initially experienced a spike in their positive affect before leveling off to similar rates of their peers. Participants who experienced contrient trials first experienced an increase in positive affect before leveling off and decreasing by the end of the contrient trials. Despite the change to the promotive goal structure at the halfway point, participants continued to have low levels of positive affect over time. Analyses revealed that including the quadratic effect of time significantly improved model fit and therefore this transformation of time was included in the present model. Including agreeableness, both teacher and parent rated, did not improve model fit over the presented model, thus failing to support the hypothesis that agreeableness predicts positive affect in relation to time, order, and goal structure. Likewise, including the group familiarity variable did not improve the model fit for positive affect.

Figure 20. Best Model Fit for Positive Affect

Table 4

Fixed Effects of Positive Affect

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	2.04	0.12	17.66
Goal	0.14	0.10	1.48
Trial	0.08	0.03	2.51
I(Trial ²)	-0.01	0.004	-2.50
Condition	0.47	0.16	2.95
Goal*Trial	-0.07	0.04	-1.68
Goal*I(Trial ²)	0.01	0.01	0.85
Goal*Condition	-0.57	0.13	-4.47
Trial*Condition	-0.10	0.03	-3.76
Goal*Trial*Condition	0.17	0.03	5.27

Positive Sportsmanship

Overall, there was no evidence of a significant four-way interaction including agreeableness, goal structure, order, and time or three-way interactions with

agreeableness for positive sportsmanship. As seen in Figure 21 and Table 5, a significant two-way interaction between goal and trial indicated that positive sportsmanship increased over time only when participants were experiencing promotive goal structure conditions. A trial by order interaction revealed a significant increase in positive sportsmanship over time for participants who completed contrient trials first relative to promotive-first groups. A significant agreeableness by order interaction indicated that, when presented contrient trials first, low agreeable individuals had higher ratings of positive sportsmanship relative to their high agreeable peers. Conversely, when promotive trials were presented first, high agreeable individuals had higher ratings of positive sportsmanship relative to their low agreeable peers. Additionally, a significant goal by agreeableness interaction did not improve model fit. A quadratic transformation of positive sportsmanship did not improve the model fit significantly so it was not included in the model. Further analyses revealed that including parent- and teacher-rated agreeableness did not improve model fit over the presented model. Similarly, the inclusion of the group familiarity variable did not improve the model fit for overall positive sportsmanship.

Figure 21. Best Fitting Model for Positive Sportsmanship

Table 5

Fixed Effects of Positive Sportsmanship

	Estimate (<i>b</i>)	Standard Error (σ_b)	<i>T</i>
(Intercept)	1.49	0.20	7.39
Goal	0.17	0.08	2.27
Trial	0.03	0.03	0.99
Condition	-0.41	0.25	-1.60
Teacher Agreeableness	-0.07	0.05	-1.50
Goal*Trial	0.02	0.01	2.21
Goal*Condition	-0.08	0.09	-0.88
Trial*Condition	-0.03	0.01	-2.57
Trial*TA	-0.004	0.01	-0.76
Condition*TA	0.12	0.06	2.09

Note. Teacher agreeableness is abbreviated as TA.

Overall Positive Behavior

Overall, there was no evidence of a significant four-way interaction including agreeableness, goal structure, order, and time or three-way interactions with agreeableness for overall positive behavior. As seen in Figure 22 and Table 6, a significant three-way interaction between trial, goal structure, and order demonstrated that participants who experienced promotive trials first received higher rating of overall positive behavior on average than their peers who experienced contrient trials first. Likewise, ratings of positive behavior had a greater slope for participants who experienced promotive trials first. Once the goal structure was manipulated, participants who experienced contrient trials first maintained their level of positive affect throughout the remaining trials of the game. Their peers who switched to contrient trials maintained their high levels of overall positive behavior initially before quickly dropping to comparably low levels of overall positive behavior. Further analyses revealed that including agreeableness, both teacher and parent rated, did not improve model fit over the

presented model indicating that this hypothesis was not supported for overall positive behavior. Additionally, including the quadratic transformation for time did not improve model fit. Similarly, the inclusion of the group familiarity variable did not improve the model fit for overall positive behavior.

Figure 22. Best Fitting Model for Overall Positive Behavior

Table 6

Fixed Effects of Overall Positive Behavior

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	1.99	0.11	18.37
Goal	0.12	0.09	1.39
Trial	0.01	0.02	0.41
Condition	0.40	0.15	2.63
Goal*Trial	-0.01	0.02	-0.47
Goal*Condition	-0.44	0.12	-3.65
Trial*Condition	-0.08	0.02	-3.46
Goal*Trial*Condition	0.13	0.03	3.98

Positive Peer-Directed Vocalizations

Beyond these aspects of prosocial behavior, we also examined these predictors in relation to three different types of vocalizations during the task. Although we found no evidence of a four-way interaction with agreeableness for positive peer-directed vocalizations, a significant three-way interaction between teacher-rated agreeableness, goal, and trial revealed that children high in agreeableness engaged in more frequent positive peer-directed vocalizations over time during promotive trials relative to their low agreeable peers who engaged in less frequent positive peer-directed vocalizations over time, as seen in Figure 23 and Table 7. In contrient trials, participants high in agreeableness appear to engage in less frequent positive peer-directed vocalizations over time, whereas their low agreeable peers engage in more frequent positive peer-directed vocalizations over time. Order did not appear to influence the use of positive peer-directed vocalizations. The inclusion of both the parent agreeableness and group familiarity variables did not produce a significant improvement in model fit over the presented model. As with other vocalization-based outcome variables allowing for slopes to vary between individuals and between triad resulted in a failure of model convergence and therefore random slopes were removed from the model.

Figure 23. Best Fitting Model for Positive Peer-Directed Vocalizations

Table 7

Fixed Effects of Positive Peer-Directed Vocalizations

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	0.01	0.03	0.25
Goal	0.12	0.04	2.98
Trial	0.01	0.01	1.34
Condition	-0.002	0.01	-0.23
Teacher Agreeableness	0.001	0.01	0.14
Goal*Trial	-0.03	0.01	-2.17
Goal*Condition	0.02	0.01	2.07
Trial*TA	-0.003	0.02	-1.25
Goal* TA	-0.03	0.01	-2.94
Goal*Trial*TA	0.01	0.003	2.18

Note. Teacher agreeableness is abbreviated as TA.

Positive Self-Directed Vocalizations

We found no evidence of a four-way interaction with agreeableness for positive self-directed vocalizations, but a significant parent-rated agreeableness by condition by trial interaction was found. Results for the contrient first condition revealed that, over time participants high in agreeableness engaged in more frequent positive self-directed vocalizations relative to their low agreeable peers who engaged in less frequent positive self-directed vocalizations over time, regardless of goal structure, as shown in Figure 24 and Table 8. No evidence was found for significant differences between individuals high and low in agreeableness for those in the promotive first condition. Additionally, a significant parent-rated agreeableness by trial by goal interaction emerged suggesting that, during promotive goal structure trials (regardless of order) children high in agreeableness made fewer positive self-directed vocalizations than their low agreeable peers, who made more frequent positive self-directed vocalizations during this goal structure condition. These interactions provide some support my hypothesis. The

inclusion of both teacher-rated agreeableness and group familiarity did not improve model fit over the present model. As with other vocalization variables, random slopes were excluded from the model due to model convergence issues when this was included.

Figure 24. Best Fitting Model for Positive Self-Directed Vocalizations

Table 8

Fixed Effects of Positive Self-Directed Vocalizations

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	0.14	0.07	2.07
Goal	-0.11	0.09	-1.26
Trial	-0.05	0.02	-2.49
Condition	-0.11	0.09	-1.17
Parent Agreeableness	-0.04	0.02	-2.02
Goal*Trial	0.06	0.03	2.07
Goal*Condition	0.07	0.12	0.57
Trial*Condition	0.05	0.03	1.74
Goal*PA	0.03	0.02	1.39
Trial* PA	0.02	0.01	2.67
Condition* PA	0.05	0.03	1.74
Goal*Trial*Condition	-0.04	0.04	-1.03
Goal*Con* PA	-0.04	0.03	-1.13
Trial*Con*PA	-0.02	0.01	-2.22
Goal* Trial *PA	-0.02	0.01	-2.31
Goal*Trial*Con*PA	0.02	0.01	1.48

Note. Parent agreeableness is abbreviated as PA. Condition is abbreviated as Con

Positive Task-Directed Vocalizations

We found no evidence of a four-way interaction or three-way interactions with agreeableness for positive task-directed vocalizations, but a significant goal by condition interaction was found. Results revealed that for promotive goal structure conditions participants engaged in more frequent positive task-directed vocalizations when promotive trials were presented first. When promotive trials were presented following a block of contrient goal structure trials, no evidence of significant differences emerged relative to contrient goal structure conditions. There was no evidence of a significant difference for contrient goal structure, regardless of the order in which these trials were presented. For positive task-directed vocalizations, there was no evidence that the inclusion of teacher and parent agreeableness as well as group familiarity improved

model fit over the presented model. Thus, the main hypothesis was not supported by this model. Finally, allowing for random slopes resulted in model convergence failure and as a result this was not included in the present analyses.

Figure 25. Best Fitting Model for Positive Task-Directed Vocalizations

Table 9

Fixed Effects of Positive Task-Directed Vocalizations

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	0.001	0.01	0.18
Goal	0.01	0.01	1.44
Trial	0.001	0.001	1.20
Condition	0.001	0.01	0.12
Goal*Trial	-0.002	0.001	-1.54
Goal*Condition	0.01	0.01	2.05

Hypothesis 12: Agreeableness and its interactions with goal structure, order, and time will predict destructive behaviors.

Knockdowns

We found no evidence of a four-way interaction or three-way interactions with agreeableness for knockdowns; however, a significant goal by trial interaction revealed that participants engaged in more frequent knockdowns during contrient trials over time relative to promotive trials. Additionally, a significant goal by condition interaction revealed that participants who experienced trials under promotive goal structure conditions first engaged in more frequent knockdowns during contrient trials relative to their peers who experienced contrient trials first. No evidence of a significant difference was observed between promotive goal structure conditions contingent on the order these trials occurred. A quadratic transformation for knockdowns was not included in the model because the linear trend was a better fit for these data. Further analyses revealed no evidence to suggest that including agreeableness, either teacher or parent rated, improved model fit over the presented model. The present model failed to support the main hypothesis that agreeableness would predict the frequency of knockdowns contingent on goal structure and condition over time. There was no evidence to support that the inclusion of the group familiarity variable did improved the model fit for knockdowns.

Figure 26. Best Fitting Model for Knockdowns

Table 10

Fixed Effects of Knockdowns

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	0.003	0.02	0.11
Goal	-0.001	0.03	-0.05
Trial	0.02	0.01	2.36
Condition	0.08	0.03	2.23
Goal*Trial	-0.02	0.01	-2.11
Goal*Condition	-0.08	0.04	-2.21

Negative Affect

We found no evidence of a four-way interaction or three-way interactions with agreeableness for negative affect. As shown in Figure 27 and Table 11 a significant interaction between goal structure and condition (order) indicated that children who experienced promotive goal structure conditions first had higher ratings of negative affect

in contrient trials only. Additionally, children who began with contrient trials had lower ratings of negative affect relative to contrient trials that occurred after a block of promotive trials. A main effect for trial suggested that time (trial) influenced ratings of negative affect such that ratings increased over time; however, this effect was also moderated by goal structure such that children during contrient goal structures experienced a greater increase in negative affect over time relative to promotive goal structures. Participants who experienced the contrient goal structure after completing promotive goal structure trials had significantly higher ratings of negative affect over time relative to participants who experienced these trials first. Analyses revealed no evidence that including the quadratic effect of time significantly improved model fit and therefore this was omitted from the present model. Analyses of both teacher- and parent-rated agreeableness did not provide evidence to suggest that agreeableness significantly improved model fit for negative affect. Thus, the main hypothesis that agreeableness would be a significant predictor of negative affect under specific constraints regarding time, order, and goal structure was not supported. Finally, there was no evidence that including the group familiarity variable improved the model fit for negative affect.

Figure 27. Best Fitting Model for Negative Affect

Table 11

Fixed Effects of Negative Affect

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	1.10	0.07	16.78
Goal	0.10	0.06	1.57
Trial	0.08	0.01	7.41
Condition	0.36	0.09	4.18
Goal*Trial	-0.05	0.01	-3.54
Goal*Condition	-0.45	0.08	-5.81

Negative Sportsmanship

We found no evidence of a four-way interaction or three-way interactions with agreeableness for negative sportsmanship. A significant three-way interaction between goal, trial, and condition, as shown in Figure 28 and Table 12, indicated that negative sportsmanship gradually increased before leveling off at the end of the contrient trials;

however, when these trials occurred following a block of promotive trials, ratings of negative sportsmanship were greater on average. Relatively little difference between participants was observed in promotive trials, regardless of their order of presentation. Because including the quadratic transformation of this variable improved the model fit, it was included in the model to represent a non-linear trend in the data over time. Further analyses revealed no evidence to support that including agreeableness, both teacher and parent rated, improved model fit over the presented model. These results failed to support the main hypothesis that agreeableness is a significant predictor of negative sportsmanship by itself or in interaction with order, time, and goal structure. Similarly, no evidence was found to support that the inclusion of the group familiarity variable improved the model fit for overall negative sportsmanship.

Figure 28. Best Fitting Model for Negative Sportsmanship

Table 12

Fixed Effects of Negative Sportsmanship

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	1.45	0.14	10.22
Goal	0.13	0.17	0.76
Trial	0.36	0.05	7.05
I(Trial ²)	-0.03	0.01	-4.11
Condition	0.93	0.19	4.86
Goal*Trial	-0.39	0.07	-5.43
Goal*I(Trial ²)	-0.03	0.01	2.57
Goal*Condition	-1.32	0.23	-5.83
Trial*Condition	-0.05	0.05	-1.08
Goal*Trial*Condition	0.18	0.06	2.773

Overall Negative Behavior

We found no evidence of a four-way interaction or three-way interactions with agreeableness for overall negative behavior. As seen in Figure 29 and Table 13 a significant interaction between goal structure and order indicated that when contrient trials occurred after promotive trials, ratings of overall negative behavior were considerably greater relative to contrient trials presented first. Promotive trials produced relatively comparable levels of overall negative behavior, regardless of order. Additionally, a significant interaction between goal structure and trial demonstrated that overall negative behavior increased over time only during contrient conditions. We found no evidence to suggest that adding agreeableness, both teacher and parent rated, improved model fit over the presented model. Thus, the main hypothesis was not supported in regard to overall negative behaviors. Additionally, there was no evidence that including the quadratic transformation for time improved model fit. Finally, there

was no evidence that the inclusion of the group familiarity variable improved the model fit for overall negative behavior.

Figure 29. Best Fitting Model for Overall Negative Behavior

Table 13

Fixed Effects of Overall Negative Behavior

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	1.29	0.09	14.03
Goal	0.10	0.10	1.04
Trial	0.12	0.02	5.42
Condition	0.58	0.13	4.51
Goal*Trial	-0.14	0.03	-4.57
Goal*Condition	-0.80	0.14	-5.87

Negative Peer-Directed Vocalizations

Beyond these aspects of destructive behavior, we also examined these predictors in relation to three different types of vocalizations during the task. As shown in Figure 30

and Table 14 a significant four-way interaction between teacher-rated agreeableness, goal structure, order, and trial supported the present hypothesis. Specifically, when children completed contrient trials following a block of promotive trials significant differences between individuals emerged over time contingent on their level of agreeableness with individuals lower in agreeableness exhibiting more frequent peer-directed negative vocalizations over time relative to their peers. A similar difference for agreeableness was not observed when contrient trials were not preceded by a block of promotive trials. Further analyses revealed that including parent agreeableness in the model did not improve the fit of the present model. Additionally, we found no evidence that the inclusion of the group familiarity variable improved model fit over the presented model. Finally, allowing slopes to vary between individual and triad caused the model to fail to converge and as a result random slopes were excluded from the present model.

Figure 30. Best Fitting Model for Negative Peer-Directed Vocalizations

Table 14

Fixed Effects of Negative Peer-Directed Vocalizations

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	0.11	0.10	1.03
Goal	-0.08	0.12	-0.65
Trial	-0.03	0.31	-0.97
I(Trial ²)	-0.01	0.03	-2.24
Condition	-0.002	0.14	-0.02
Teacher Agreeableness	-0.02	0.02	-0.97
Goal*Trial	-0.00001	0.04	0.00
Goal*I(Trial ²)	-0.004	0.003	1.10
Goal*Condition	-0.07	0.17	-0.42
Trial*Condition	0.18	0.04	4.57
Goal*TA	0.02	0.03	0.79
Condition*TA	0.02	0.03	0.50
Trial*TA	0.003	0.01	0.46
Goal*Trial*Condition	-0.19	0.06	-3.43
Goal*Con*TA	0.01	0.04	0.15
Goal*Trial*TA	-0.01	0.01	-0.69
Trial*Con*TA	-0.03	0.01	-4.02
Goal*Trial*Con*TA	-0.39	0.01	2.96

Note. Teacher agreeableness is abbreviated as TA. Condition is abbreviated as Con

Negative Self-Directed Vocalizations

We found no evidence of a four-way interaction or three-way interactions with agreeableness for negative self-directed vocalizations. A significant goal by condition interaction suggested that the use of negative self-directed vocalizations increased significantly (relative to promotive trials) in contrient trials for participants who completed contrient trials after a block of promotive trials. Figure 31 and Table 15 show that when contrient trials were completed before promotive trials, there was no evidence of a significant difference between the two goal structures in regard to negative self-directed vocalizations. There was no evidence that including either teacher- or parent-rated agreeableness improved model fit over the present model. Thus, the present model

failed to support the main hypothesis that agreeableness would predict negative self-directed vocalizations contingent on goal structure and condition over time. Likewise, there was no evidence that the group familiarity variable improved model fit either. Allowing for slopes to vary between individuals and between triads resulted in failure of convergence for the model.

Figure 31. Best Fitting Model for Negative Self-Directed Vocalizations

Table 15

Fixed Effects of Negative Self-Directed Vocalizations

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	0.003	0.003	0.87
Goal	-0.002	0.004	-0.46
Trial	-0.001	0.001	-0.83
Condition	0.01	0.003	2.92
Goal*Trial	0.001	0.001	1.30
Goal*Condition	-0.01	0.004	-2.56

Negative Task-Directed Vocalizations

As seen in Figure 32 and Table 16 a significant three-way teacher-rated agreeableness by trial by order demonstrated that little variability in task-directed vocalizations was observed across goal structures when contrient trials were presented first across all levels of agreeableness based on teacher/staff ratings. Conversely, when promotive trials were presented first, task-directed vocalizations increased steadily over time for individuals low in agreeableness but remained relatively stable for their high agreeable peers. This effect was observed across goal structures. Interestingly, a slightly different pattern was observed when parent ratings of agreeableness were introduced into the model. As displayed in Figure 33 and Table 17, a significant four-way interaction between parent-rated agreeableness by goal by trial by order revealed that when promotive trials followed a contrient block, differences between individuals based on agreeableness emerged such that individuals low in agreeableness increased the frequency with which they produced negative task-directed vocalizations, whereas their high agreeable peers produced relatively stable numbers of negative vocalizations. Interesting differences emerge across contrient goal structures based on the order of their presentation such that no differences emerged across agreeableness in contrient conditions for participants who received contrient trials first; however, when contrient trials preceded a block of promotive trials, individuals low in agreeableness increased their frequency of negative task-directed vocalizations over time relative to their high agreeable peers. There was no evidence that the inclusion of the group familiarity variable led to significant improvement in model fit over the presented models.

Additionally, allowing for slopes to vary between individuals and between triads resulted in failure of convergence for the model.

Figure 32. Best Fitting Model for Negative Task-Directed Vocalizations (Teacher-Rated Agreeableness)

Table 16

Fixed Effects of Negative Task-Directed Vocalizations Including Teacher Agreeableness

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	0.003	0.05	0.09
Goal	0.003	0.01	0.27
Trial	-0.002	0.01	-0.27
Condition	0.04	0.06	0.56
TeacherAgreeableness	-0.0003	0.01	-0.03
Goal*Trial	0.0003	0.003	-0.10
Goal*Condition	-0.03	0.02	-1.97
Trial*Condition	0.04	0.01	3.18
Trial*TA	0.001	0.002	0.57
Condition* TA	-0.001	0.02	-0.04
Goal*Trial*Condition	-0.003	0.01	-0.71
Trial*Con* TA	-0.01	0.003	-2.84

Note. Teacher agreeableness is abbreviated as TA. Condition is abbreviated as Con

Figure 33. Best Fitting Model for Negative Task-Directed Vocalizations (Parent-Rated Agreeableness)

Table 17

Fixed Effects of Negative Task-Directed Vocalizations Including Parent Agreeableness

	Estimate (b)	Standard Error (σ_b)	T
(Intercept)	0.01	0.06	0.14
Goal	-0.04	0.08	-0.54
Trial	0.00	0.02	0.00
Condition	0.07	0.08	0.87
ParentAgreeableness	-0.002	0.02	-0.13
Goal*Trial	0.05	0.03	1.97
Goal*Condition	-0.05	0.01	-0.44
Trial*Condition	0.04	0.03	1.72
Goal*PA	1.28	0.02	0.57
Condition* PA	-0.02	0.02	-0.89
Trial* PA	-0.00	0.01	0.00
Goal*Trial*Condition	-0.19	0.04	-2.25
Goal*Con* PA	-0.08	0.03	0.41
Trial*Con*PA	-0.01	0.01	-1.35
Goal* Trial *PA	-0.01	0.01	-1.75
Goal*Trial*Con*PA	0.02	0.01	2.00

Note. Parent agreeableness is abbreviated as PA. Condition is abbreviated as Con.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The present study expands on previous research investigating the relation between agreeableness and displays of both prosocial and destructive behavior in the context of social games. By placing children in a situation that uniquely evoked both cooperative and competitive behaviors, this study explores how individual differences in agreeableness may influence behavior over time. By using the foundation laid out in Graziano et al. (1997) and Tobin et al. (2002), the present study used a tower-building task designed to shift goal structure to elicit behaviors from participants across several trials. Additionally, the order in which two particular goal structures (contrient and promotive) were presented was randomized to determine the extent to which past experiences influenced behavior under particular goal structure conditions. Initial analyses demonstrated that the goal structure manipulations were robust. Participants engaged in more frequent positive peer-directed and task-directed vocalizations under promotive goal structure conditions relative to contrient goal structure conditions. Likewise, consistent with hypotheses, participants had higher ratings of positive sportsmanship and more frequent straightenings under promotive goal structure conditions relative to contrient.

Across multiple measures, a similar pattern of results was obtained for destructive behaviors in the present study. Specifically, participants who began in promotive trials

engaged in more destructive behaviors only when they transitioned to contrient trials. This pattern suggests that beginning in a cooperative situation can create group dynamics that yield more negative emotions, and a tendency to cheat and blame others relative to the dynamic that forms when groups initially began interacting competitively. These findings suggest that the influence of goal structure is robust, as demonstrated by Graziano et al. (1997), yet it is also considerably more complex when considering the other variables explored in the present study. That is, these findings are influenced by experiences with opposite goal structures during subsequent trials. Although evidence suggests that promotive goal structures enhance productivity and group performance (Aronson & Gonzalez, 1988), less is known about the delicate interplay between goal structures when contingencies are not held constant. The complex interplay between these variables over time is made even more interesting when agreeableness is included as a predictor, especially for negative peer-directed vocalizations.

The findings for the negative peer-directed vocalization variable revealed that agreeableness played an important role in predicting change over time under particular conditions. Specifically, children low in agreeableness had a significant increase in their use of negative peer-directed vocalizations over time during contrient trials only when these trials followed a block of promotive trials. Individuals high in agreeableness appeared to engage in negative peer-directed vocalizations less frequently than individuals low in agreeableness with less variability across trials regardless of their order of presentation. Interestingly, individuals high in agreeableness do not appear to be as influenced by order as individuals low in agreeableness are, at least in respect to negative

peer-directed vocalizations. Although this finding does not support the application of opponent-process theory to agreeableness as predicted, the finding is nonetheless interesting regarding the role agreeableness plays in predicting behavior.

These findings suggest that individuals low in agreeableness engage in far more negative peer-directed vocalizations relative to their peers in contrient trials only when these trials are presented after a block of promotive trials. Individuals low in agreeableness may be especially reactive to the promotive then contrient order. These individuals appear to be more apt to blame or insult others while under competitive conditions, but only when they had previously experienced a period of cooperative play. Although everyone is likely to engage in more destructive behaviors when switching to a competitive task after completing a cooperative task, individuals low in agreeableness are much more likely to target their peers verbally when in this situation relative to individuals high in agreeableness. These findings illustrate a core difference between individuals high and low in agreeableness as their interactions unfold over time in a typical setting. Although individuals high in agreeableness may be equally frustrated by the change as individuals low in agreeableness, only the low agreeable participants take their frustration out on their peers.

Findings regarding the suppression effect observed for negative peer-directed vocalizations mirror previous research on agreeableness. Previous research demonstrated that agreeableness is a potent factor in the suppression of negative emotions, rather than the amplification of positive emotions. Tobin and Graziano (2011) demonstrated this pattern of emotional displays when children were presented a disappointing gift. That is,

children lower in agreeableness displayed more negative emotion than their peers higher in agreeableness following the receipt of an undesired gift; however, they found no evidence that children high in agreeableness displayed more positive emotions than their peers. Similarly, research has shown that individuals higher in agreeableness reported using more positive conflict resolution strategies relative to their peers lower in agreeableness (Field et al., 2014). Additionally, Gadke, Tobin, and Schneider (2015) demonstrated similar findings that suggest children higher in agreeableness endorsed fewer power assertion tactics in response to a series of conflict resolution vignettes and they displayed more adaptive behaviors relative to their peers lower in agreeableness. Taken together with the present findings, individuals higher in agreeableness appear to suppress negative behaviors particularly when these negative behaviors are directed toward others or may directly influence a social relationship. Current findings are consistent with the finding of Graziano et al. (1996) that suggest individuals high in agreeableness appear to give others the benefit of the doubt.

More evidence to support the finding that agreeableness is a potent factor in the suppression of negative emotions rather than the engagement of positive emotions were findings regarding agreeableness and prosocial behaviors. Contrary to the hypotheses, high agreeable individuals did not display more prosocial behaviors relative to their low agreeable peers, regardless of goal structure. However, holding all other factors constant, low agreeable individuals were no more likely to engage in destructive behaviors than their high agreeable peers, either. These results likely reflect the power of the goal structure in influencing behavior. Specifically, as Graziano et al. (1997) describe, the goal

structure is intended to evoke behavior from participants irrespective of their individual differences. While it was reasonable to hypothesize that goal structures might allow individuals to behave more strongly in ways that are consistent with their personality, it is not surprising to see their less inclined peers behave accordingly when the situation demands. Interestingly, for all Likert-rating based behavioral measures, no significant effects for agreeableness were observed with the exception of positive sportsmanship. The results of the teacher-rated agreeableness by condition interaction are interesting in that low agreeable, not high agreeable, children engaged in more positive sportsmanship if they were presented contrient trials first, regardless of goal structure. For high agreeable individuals, this effect was not seen. It is possible that low agreeable children, undeterred by the influence of shifting from a contrient goal structure to a promotive goal structure, were able to engage in more significant positive sportsmanship behaviors in order to benefit themselves in regard to earning more tokens during the game. This finding could potentially have been a type 1 error as well; thus, it presents an avenue for further research.

Further agreeableness related findings revealed that, in regard to negative task-directed vocalizations, low agreeable individuals increased the frequency of negative task-directed vocalizations over time, regardless of goal structure, if they started under promotive goal structure conditions. This is unsurprising, given the assumption that a promotive goal structure would be ego-dystonic to low agreeable individuals. Over time these low agreeable children appear to become frustrated by the promotive goal-structure

situation and continue to be frustrated even when the switch to a potentially more favorable goal structure is introduced.

Including parent-rated agreeableness in the analysis revealed that when completing a block of contrient trials after promotive trials, individuals low in agreeableness engage in more frequent negative task-directed vocalizations over time relative to their peers. Similarly, when completing a block of promotive trials after completing a block of contrient trials, low agreeable individuals engage in more frequent negative task-directed vocalizations over time relative to their peers. This effect may reflect a tendency in low agreeable individuals to blame situations or activities when challenged. It is plausible that when low agreeable individuals enter into a contrient situation after working in promotive situations, the promotive experience requires cognitive resources to maintain sufficient performance and the required switch may be viewed as frustrating, such that low agreeable individuals are upset about the effort they put forward in the previous round. Likewise, when going to a promotive block from a contrient block, low agreeable individuals may experience frustration due to a previously acceptable set of rules being replaced by less acceptable rules. Potentially this frustration, as a result, may have led participants to blame the game. It is important to note that the amount of data available for parent-rated agreeableness was significantly lower than those obtained from teachers, such that only 127 parent forms were returned compared to 269 teachers completed the questionnaires distributed for the present study. Despite multiple attempts to collect a larger sample of questionnaire, only a portion of families completed the agreeableness items. This small sample of parent reports affected the predictive

power of parent-rated agreeableness for the purposes of the present study. Follow-up studies would benefit from obtaining more parent-ratings of agreeableness to explore these relations further.

The findings for negative peer-directed and task-directed vocalizations represent a complex pattern of relations among agreeableness, goal structure, and presentation order. Interestingly, previous research has demonstrated that when failure occurs during a cooperative task, participants tended to blame their peers; however, when failure occurred during a competitive task participants blamed the situation or the task itself (Wolosin et al., 1973). The present results suggest that, in the presence of a competitive task, low agreeable individuals tend to engage in both peer- and task-directed negative vocalizations more frequently. It is plausible that the order of presentation (promotive then contrient) may have contributed to the increased negative peer-directed vocalizations observed during contrient trials, such that past experience with the partners in a cooperative setting carried over to the contrient setting in regard to their attributions of blame. More research is necessary to explore fully the details of the complex relations between goal structures and order as well as what individual differences may play a role.

To add further support for the increase in destructive behavior following completion of promotive tasks a main effect for goal structure in regard to knockdowns, participants were significantly more likely to engage in knockdowns under contrient goal structures relative to promotive goal structures; however, this relation was moderated by order such that when participants had to work cooperatively first, they engaged in more knockdowns when required to compete (under contrient goal structures) relative to

contrient trials not preceded by anything. This effect was seen across the other three destructive behaviors (negative affect, negative sportsmanship, and overall negative behavior), such that, there were significant differences between goal structures in the predicted direction. These results indicated that destructive behaviors were more likely in contrient conditions, such that the effect was more pronounced when contrient conditions followed a block of promotive conditions. The results suggest that providing a promotive block of trials prior to a block of contrient trials resulted in participants engaging in higher frequency destructive behavior relative to contrient trials that did not follow another block of trials. This effect appears to be pervasive across a number of the destructive behaviors coded throughout the tower building task. Future research would benefit from exploring the degree to which the increased destructive behavior effect is dependent on the nature of the first task being promotive. Follow-up studies can evaluate the influence that completing a neutral task first has on destructive behaviors.

Previous research demonstrated that strategy manipulations can have a similar influence on goal structure in regard to aggression during games. Eden and Eshet-Alkalai (2014) demonstrated that when children completed digital games using a collaborative game strategy they repressed aggressive behaviors; however, when competitive strategies were used, aggressive behaviors increased across all subjects. These findings are similar to what was observed with destructive behaviors in the present study such that participants increased their destructive behaviors over time during contrient trials; however, this effect was significantly more pronounced when the contrient trials followed a block of promotive trials. It is possible that, due to the shifting task demands required in

the present study, participants experience greater cognitive load when shifting from promotive to contrient tasks. Previous research demonstrated that increased cognitive load was associated with poorer performance during games (Logie et al., 1989). The high cognitive load associated with task shifting may contribute to the increased destructive behaviors observed, as previous research has demonstrated that cognitive load can also increase aggressive behaviors (Vasquez, 2009).

A robust effect for condition was observed across a number of destructive behaviors, but no statistically significant differences were observed between boys and girls in regard to ratings of positive affect, positive sportsmanship, and overall positive behavior ratings during the tower building game despite hypotheses to the contrary. Interestingly, a statistically significant difference between boys and girls was observed for straightenings; however, this finding was in the opposite direction as predicted indicating that boys engaged in more frequent straightening behaviors relative to girls. Previous research suggests that boys may be more likely to cooperate in larger groups, provide more help to strangers, and have a stronger preference for coordinated social play (Eagly & Crowley, 1986; Benenson et al., 1997; Gabriel & Gardner, 1999). These studies suggest that the sex differences seen in cooperation may not be as simple as one sex engaging in more cooperation than the other. Additionally, sex differences in regard to spatial engineering may also play an important role in regard to straightening behaviors. Numerous studies have identified a sex difference in performance of spatial tasks, such that boys tend to outperform girls on these tasks (Sherman, 1967; Saeger & Hart, 1978).

It is possible that boys engaged in more straightening behaviors relative to girls due to sex differences in spatial engineering rather than differences in cooperation.

Interestingly, the results of the present study failed to produce evidence to support the hypothesis that boys would display more destructive behaviors relative to their female peers. Based on these results, it appears that within the context of the tower-building task, boys and girls are equally likely to resort to using destructive tactics and displaying negative reactions. Consistent with these results, Balliet and colleagues (2011) found via a meta-analysis on sex differences in cooperation that boys and girls do not differ in their overall amounts of cooperation. Consistent with their meta-analytic findings, we found no evidence of sex differences, suggesting that boys and girls are equally responsive to goal structures, with the exception of straightening behaviors.

The data on negative vocalizations and destructive behaviors are relatively well defined, but the data are less clear in regard to positive vocalizations and prosocial behaviors. The results suggest that individuals low in agreeableness made significantly more positive peer-directed vocalizations over time relative to their high agreeable peers during contrient trials. Even more unexpected is the finding that individuals low in agreeableness initially had more frequent positive peer-directed vocalizations under promotive conditions relative to their peers; however, over time high and low agreeable individuals engaged in similar levels of the behavior. As previously hypothesized, low agreeable individuals may find conflict situations less distressing than their high agreeable peers (Graziano & Tobin, 2013). As such, switching to a competitive task may not deter them from engaging in behaviors that may potentially increase the enjoyment of

the game. Previous research has suggested low agreeable individuals tend to be more competitive and potentially increasing the difficulty of the game by improving their competition's skill may actually appeal to low agreeable participants (Costa & McCrae, 1993). Further research is needed to better understand the relations between agreeableness and positive vocalizations under competitive and cooperative conditions.

Further, our results suggested that individuals high in agreeableness made more positive self-directed vocalizations during contrient trials over time relative to their low agreeable peers. Conversely, individuals low in agreeableness made more frequent positive self-directed vocalizations over time relative to their high agreeable peers under promotive goal structures. Research on self-presentation strategies suggests that participants may engage in more of these self-presentation strategies when faced with the threat of being perceived negatively under a stressful situation (James & Collins, 1997). It is possible that, due to the cooperative nature of promotive goal structure conditions, individuals low in agreeableness experienced greater stress resulting in more instances of positive self-vocalizations. Furthermore, the results suggested that individuals high in agreeableness who completed contrient trials first engaged in more frequent positive self-directed vocalizations relative to their low agreeable peers who engaged in less frequent positive self-directed vocalizations over time. As suggested above, research on impression management suggests that participants may engage in more self-presentation strategies when confronted with a stressful situation (James & Collins, 1997). It is possible that, in order to help cope with the difficult situation (i.e., the contrient condition), individuals high in agreeableness engage in more positive self-talk over time,

whereas their low agreeable peers do not require this strategy. It is important to note that the results for positive self-vocalizations rely on parent-rated agreeableness which comprised a smaller portion of the sample relative to teacher-rated agreeableness. As such, these results should be interpreted with caution.

As noted previously, there was unexpectedly little variation in regard to all vocalizations tallied for the present study. These low frequencies likely had a large influence on the results of the present study when considering the results for vocalization data. Several factors may have contributed to the limited frequency of vocalizations. First, all observations took place with at least one adult research assistant observing the behavior of a particular child. Coupled with all observations occurring in a setting typically associated with structure and rules (i.e., school or day care), it is possible that students did not engage in rates of vocalizations that would potentially occur in a natural setting. Likewise, children were participating in a game that they had just learned. This unfamiliar situation may have influenced the frequency of vocalizations made. Based on the analyses conducted, it appears that the familiarity of the group did not influence the use of these vocalizations (or other behaviors); however, as will be discussed in the limitations section, there are potential alternatives to assessing group familiarity that may provide a more accurate measure.

Interestingly, results for positive affect ratings indicated that children received higher ratings of positive affect during contrient trials relative to promotive trials. This finding is not surprising, as previous research has demonstrated that participants reported increased positive affect when competing (Wittchen et al., 2013). Although this result is

contrary to the present hypotheses, it also only illustrates a fraction of the results. When participating in a block of promotive trials, positive affect increases steadily over time; however, when promotive trials occur after a block of contrient trials, positive affect ratings decrease over time. Similarly interesting findings were observed for contrient trials such that when completing contrient trials first, positive affect increases slightly over time before leveling off and even decreasing toward the end of the block. For those participants who completed contrient trials after a block of promotive trials positive affect began at a significantly higher rate, before rapidly declining over time. It is possible that children are initially amused by sudden shift in rules that a promotive first order presents but over time they are less pleased with this condition. Likewise, previous research suggests that we feel more empathy toward our in-group relative to our out-group in competitive tasks (Cikara et al., 2014). It is possible that, although the contrient goal structure may be more enjoyable, participants empathize when their former collaborators fail to win tokens. As a result, participants experience less positive emotion over time as a result. Although no significant differences were observed between goal structures alone in regard to overall positive behavior ratings, results suggest that, similarly to positive affect, children saw a rapid decline in overall positive behavior during contrient trials only when these trials followed a block of promotive trials. Further research could reveal the specific components involved in both the sudden increase in positive affect and behavior followed by a gradual decline under post-promotive contrient conditions.

Coupled with the results for destructive behavior, it is plausible that the initial increase in destructive behavior during contrient trials presented second may directly

impact the enjoyment experienced during these trials. Although previous research has shown participants may experience more positive affect under competitive conditions, this subjective experience of positive affect is likely influenced by a number of factors, including strategy and potentially cognitive load (Eden and Eshet-Alkalai, 2014; Logie et al., 1989; Wittchen et al., 2013). Children may start out enjoying the change, but the increase in insults, blame, and other negative behaviors sours the experience for these children. When agreeableness is factored in, despite the decline in positive affect across levels of agreeableness, only those low in agreeableness appear to be motivated to target their peers specifically.

Limitations

A major limitation to the present study was the low response rate of parents in completing questionnaires. Despite being provided copies of questionnaires up to three times, only 127 parent questionnaires were returned. This lower response rate for parents likely influenced the ability to draw accurate conclusions about results relying on parent report. Fortunately, a significantly higher completion rate for teacher ratings (269 questionnaires returned) was obtained; however, as is typically observed, parents likely provide a unique insight into a child's personality that cannot be obtained from teacher report alone. It is likely that the low completion rate was somewhat dependent on the indirect nature that the questionnaires were administered. That is, questionnaires were sent home via the child after receiving parent consent for the child to participate. It is possible that the paperwork did not reach parents or was lost amid other paperwork provided from the school. Additionally, the majority of the data were collected toward

the end of the academic school year. It is possible that the documents for the research project became lost among a myriad of other documents that were being sent home at the time. Future attempts to replicate the present paradigm may benefit from collecting questionnaire data directly from parents or provide access to questionnaires via multiple formats (i.e., both paper and pencil or electronically) in order to increase the completion rate.

Another limitation of the present study has to do with the low variability in vocalization data observed throughout the tower building task. The majority of trials occurred without any instances of vocalizations. When vocalizations did occur, they occurred infrequently. While attempting to analyze the data the limited variability caused considerable issues, as described previously. Although a solution was reached, it would be beneficial to determine methods to improve variability in regard to vocalizations made. For example, it is possible that the low variability was influenced by the nature of the task itself, such that participants may have been reluctant to engage in behaviors they typically would have because they knew they were being watched by an adult. Future studies would benefit from providing explicit guidelines to the children regarding talking. It is possible that having a simple rule such as “it is okay to talk” or “you may need to talk in order to work with your group” may increase the frequency of vocalizations made throughout the game. Additionally, it may be fruitful to code vocalizations that occur between trials as well as within them. Anecdotally, many participants would converse between rounds, but they stopped talking once the game began again. Logistically, it would have been difficult for research assistants to collect these data and account for their

content and timing during the game. Downtime between trials was also intentionally limited in order to insure time effects were not influenced by other factors. Future studies, perhaps in lab-based environments, may benefit from video recording the entire game, which would allow observers to record both within- and between-trial data, as noted previously.

In addition to focusing on what is actually said throughout the entire task, information on the private speech of the participants may have also yielded important information for the purposes of the present study. Private speech is typically used to describe thinking done by an individual, thus making it a variable that cannot be directly observed (Hardy, Gammage, & Hall, 2001). Current trends in the field focus on using questionnaires and frequency count measures to gauge participants' private speech (Brinthaup, Hein, & Kramer, 2009). Furthermore, assessing the content of self-talk could also provide helpful information about participants' motivations and emotions throughout the game. The present study would have benefitted from a measure of private speech in light of the modest interpersonal communication observed.

Another major limitation of the present study has to do with potentially poor interrater reliability. Despite having extensively trained each research assistant and providing two levels of competency to complete before being able to collect data, the intraclass correlation data for behavioral observation codes range from excellent to poor. Only five of the recorded behaviors had acceptance reliability. Specifically, the intraclass correlations (ICC) for vocalizations data as well as 'b' ratings for several of the affect and sportsmanship variables would be considered poor. It is likely that these low ICC for

these variables are the result of the variables themselves. As mentioned previously, students engaged in very few instances of vocalizations. This low amount of variability likely affected the ICC for these variables. Likewise, data were often not recorded for the ‘b’ variable of the behavioral ratings, which again influenced the low ICC for these variables. One way to potentially combat this issue, as was done in the present study, is to only report the most extreme level of a behavior observed during a trial. Rather than include both an ‘a’ and ‘b’ rating, having coders focus on the extreme of the behaviors observed. This approach has the added benefit of reducing the demand on the observers, allowing them to focus their efforts on coding other behaviors. Likewise, future research would greatly benefit from video recording the games rather than using live coders as this method would allow for potentially greater accuracy from coders, increase the amount of data that are double coded, and possibly even reduce the effect that adult presence has on child behavior by removing the number of adults present during the game. Likewise, video recording would allow for coding of behaviors that occur between rounds and before the game begins, both of which could provide potentially useful information.

Finally, more knowledge about prior relationships between participants would have been ideal. Due to time limitations and administrative constraints, completing a brief assessment regarding the relationships among all members of a triad was not possible. As such, group familiarity assessments relied on setting data to determine the relationship between individuals such that groups consisting of children from the same classroom or organization were considered familiar and those from different classrooms or organizations were considered unacquainted. More information regarding whether the

children in each triad play together and how regularly they play together could potentially provide valuable information regarding how the factors explored in the present study interact to influence outcomes and performance.

Future Directions

The present study allowed for the examination of individual-level outcomes of participants who competed in a game in which their performance was uniquely tied to the performance of others. One of the most interesting findings from the present study has to do with the significant order by goal structure interactions. Specifically, the present study has substantial evidence to suggest that switching from a promotive goal structure to a contrient goal structure has a significant influence on destructive behavior. Unfortunately, there is little research available on the influence of this type of shift can have on performance. Future studies should focus on these variables in order to better understand the nature of this relation between order and goal structure. One potential avenue for future research would be to include a third “neutral” goal structure. This addition would allow researchers to investigate the degree to which the content (or rules) of the goal structure that preceded the present trial influences the behaviors during the game. Comparing promotive-contrient groups to neutral-contrient groups may provide insight into the active component potentially responsible for the behavior changes observed in the present study.

Another aspect of the study not explored due to sample size limitations was how group-level variables influenced both individual and group level outcomes. Questions investigating group-level agreeableness and its influence on both group and individual

level outcomes may provide meaningful insight into the nature of agreeableness in relation to group functioning. It is worth exploring how a high agreeable individual's performance differs contingent on the overall level of agreeableness of his or her group-mates in future research. Future studies can explore these relations as well as other group level factors to determine what, if any, influence these may have on child outcomes. Based on the present results, it is likely that the lower agreeable groups, like lower agreeable individuals, would engage in higher frequency negative peer-directed vocalizations during contrient trials following a block of promotive. However, further findings may reveal that a high agreeable individual placed in a low agreeable group may behave much differently in these situations than her/his low agreeable peers in a similar situation.

Another potential use of the design used in the present study is to conduct trials with confederates, such that experimenters are able to shift the group dynamics in such a way as to explore the influence that these in-group dynamics have on in-game outcomes. Using this paradigm, researchers could intentionally manipulate the presence of prosocial and destructive behaviors in an effort to determine how participant's behavior changes as a function of the behavior of his or her peers. Likewise, a design with confederates would allow investigators to explore how individual differences in agreeableness might predict how individuals would react to particular situations, such as a particularly competitive teammate or when placed in a group with two individuals who know one another and intentionally scheme to work cooperatively with one another during contrient rounds to split the winnings while excluding the true participant.

In the present study, the age range of 7 to 11 years was purposely targeted for several reasons. Specifically, children in this age range are still learning to navigate their social environment, which was expected to yield variability in responding to different goal structure conditions. This age range, while still young, also allowed researchers to avoid unintentionally attributing behaviors to unassessed but relevant factors such as effortful control, which is largely established by six years of age (Rothbart, Posner, & Kieras, 2006). Within this age range, I was also able to examine children's agreeableness as it interacts with situational influences on behavior by assessing personality through adult reports. I found no evidence of age effects in this study, but it may be beneficial to examine this age range relative to children over the age of 11 years in future research. Additionally, researchers have demonstrated that agreeableness in childhood is a potent predictor of agreeableness in adulthood, suggesting a great deal of stability with this personality dimension over time (Shiner, Masten, & Roberts, 2003). Future studies could explore task performance across multiple age groups to determine other factors beyond agreeableness that may influence performance.

Another interesting potential future direction would be to explore the tower building paradigm digitally. An electronic presentation potentially has numerous benefits in that the design could potentially be collected much more quickly and could be set up to complete the game over the internet allowing for a larger sample size to be collected much more efficiently. A digital setup would also allow for confederates to be non-human programs such that set responses would be programmed into the game in order to observe how the participant would respond. Likewise, a digital paradigm would

potentially remove any unwanted effects that may be produced from having live behavioral coding conducted throughout the game. Advances in facial recognition technology could potentially make it possible for emotional reactions to be coded live via a video camera while the child plays the game, allowing for less subjective ratings of emotional reactions to the game. More research using the tower building task in its current format would likely be necessary in order to justify the time and resources needed to develop a digital format for the task; however, the results of the present study as well as past research has demonstrated that it is an effective paradigm for studying behavior in the context of social games.

Another interesting future direction for the present research would be to explore how completing cooperative and competitive tasks before switching to another type of task can influence performance in non-game settings. Specifically, it would be interesting to observe what influence manipulating the goal structure of academic group tasks has on individual- and group-level performance based not only on emotional and behavioral outcomes, but also on academic performance. For example, if particular academic tasks are inherently competitive, does it benefit student performance to have them experience working together on a similar task first or are students better to work against one another from the outset? Additional studies could investigate manipulations in the goal structures themselves, such as having contrient tasks wherein all group members could still earn tokens, but only the child with the best performance won the majority of the points. These subtle manipulations applied to more naturalistic settings could potentially provide

important insight into how the structure of a task can influence the outcomes of group performance.

These additional research questions will be important future methods of studying group and individual functioning in the context of shifting goal structures. The present study was able to build on previous research by examining the role agreeableness plays in predicting behavioral outcomes during shifting goal structures. Although the influence of agreeableness was not as compelling as initially predicted, the insights provided demonstrate that agreeableness does predict individual differences in responding contingent on setting manipulations. Furthermore, the present study provided interesting answers concerning how children respond differently in group situations contingent on both past experiences and changes in goal structure. The major finding of this study suggests that, for all individuals, when competition is inevitable it is perhaps best to avoid setting up contrived situations in which the individuals must work cooperatively first. Overall, participants tended to engage in more destructive behaviors during contrient goal structure conditions only after completing a block of cooperative trials. However, only low agreeable individuals were more likely to verbally target their peers after this transition.

These findings can be used to help inform parents and teachers how to best structure activities in order to produce optimal group cohesion, especially when the task is inherently competitive. Potentially by moving competitive tasks before cooperative tasks, parents and teachers could effectively reduce tensions during competitive tasks, thus potentially allowing for a more positive learning experience for all participants.

Likewise, allowing the schedule of tasks to be altered can allow for children lower in agreeableness to have more positive peer experiences by avoiding the increase in negative peer-directed vocalizations that can arise during a promotive-contrient goal structure schedule. Furthermore, school psychologists, who are often tasked with helping develop social skills programming, can use this information to develop more successful interventions for allowing children to develop coping skills when faced with loss. Specifically, the results of the present study suggest that children taking part in a competitive game will likely experience more negative affect if they complete cooperative tasks with their competitors first. By using this information, school psychologists can structure opportunities for students to cope with milder forms of frustration (competition alone) before coping with more extreme frustration (competition after cooperation).

Children are often confronted with situations in which they have to work with their peers for both common and conflicting goals. As we have demonstrated through the present study, children perform differently during both promotive and contrient tasks as a result of past experience and personality. Specifically, the present study demonstrated a counterintuitive finding that interactions can be more negative when a competitive task follows a cooperative task compared to when a cooperative task follows a competitive task. Furthermore, this study demonstrated that, consistent with past research, individuals low in agreeableness have more difficulty suppressing their negative vocalizations toward their peers during post-promotive contrient trials. Looking forward, this study suggests that the situational demands and sequencing of goal structures can influence performance

during games. It will be important in future studies to explore how goal structure can influence performance in academic tasks. Likewise, collecting information on participants' private speech as well as vocalizations made between trials could potentially provide additional insight into the mechanisms that influence group performance.

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APPENDIX A

RULES FOR THE TOWER BUILDING TASK

1. We are going to play a game with several rounds.
2. Each round will last 15 seconds.
3. The blocks must stay in your home square in one flat layer before each round begins.
4. We want you to build a tower as tall as you can.
5. The tower must be standing by itself at the end of the 15 seconds. No hands may be on the tower at the end of the 15 seconds.
6. You may have one hand on the blocks in your home square before each round begins.
7. Read condition manipulation.

Promotive condition: “Prize Chips will be given out equally to all children in the group based on the total number of blocks in the tower at the end of the 15 seconds.”

Contrient condition: “Prize Chips will be given only to the child with the most blocks in the tower at the end of the 15 seconds. If there are any ties for the most blocks in the tower and there is no clear winner, then no prize chips will be given out.”

8. Only one tower may be built. If more than one tower is standing at the end of the 15 seconds, no prize chips will be given.
9. At the end of the game, chips may be traded in for prizes.
10. Please leave the tower standing until I tell you to take down the blocks.
11. Are there any questions? --> Answer any questions. Make sure everyone knows what’s going on!
12. When everyone understands the rules, start the first round by saying, “READY...SET ...GO!”

13. After first six rounds state, “Now we are going to change the rules. This time...”
Read the instructions for the other manipulation condition (e.g., promotive, contrient).
14. After the second set of six rounds, run one more round using these instructions:
“Now we are going to build one last tower. <<Repeat Promotive instructions.>>
Build the tower as tall as you can.”
15. Wait for other groups to finish the game. (Don’t let kids play with blocks.)

APPENDIX B

BEHAVIOR CODING SHEETS

CID: _____ Color: _____ Triad: _____ Sex: _____ Date: _____ Time: _____ Others: _____ Color: _____ Coder: _____ Location: _____ Others: _____ Color: _____ IRR Coder: _____											
PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask	PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask
Straight		Knock		Fall		Straight		Knock		Fall	
Neg Affect ____/____		Neg. Sportsmanship ____/____				Neg Affect ____/____		Neg. Sportsmanship ____/____			
Pos Affect ____/____		Pos. Sportsmanship ____/____				Pos Affect ____/____		Pos. Sportsmanship ____/____			
Overall Pos _____		Overall Neg _____				Overall Pos _____		Overall Neg _____			
Trial 1						Trial 2					
PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask	PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask
Straight		Knock		Fall		Straight		Knock		Fall	
Neg Affect ____/____		Neg. Sportsmanship ____/____				Neg Affect ____/____		Neg. Sportsmanship ____/____			
Pos Affect ____/____		Pos. Sportsmanship ____/____				Pos Affect ____/____		Pos. Sportsmanship ____/____			
Overall Pos _____		Overall Neg _____				Overall Pos _____		Overall Neg _____			
Trial 3						Trial 4					
PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask	PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask
Straight		Knock		Fall		Straight		Knock		Fall	
Neg Affect ____/____		Neg. Sportsmanship ____/____				Neg Affect ____/____		Neg. Sportsmanship ____/____			
Pos Affect ____/____		Pos. Sportsmanship ____/____				Pos Affect ____/____		Pos. Sportsmanship ____/____			
Overall Pos _____		Overall Neg _____				Overall Pos _____		Overall Neg _____			
Trial 5						Trial 6					
PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask	PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask
Straight		Knock		Fall		Straight		Knock		Fall	
Neg Affect ____/____		Neg. Sportsmanship ____/____				Neg Affect ____/____		Neg. Sportsmanship ____/____			
Pos Affect ____/____		Pos. Sportsmanship ____/____				Pos Affect ____/____		Pos. Sportsmanship ____/____			
Overall Pos _____		Overall Neg _____				Overall Pos _____		Overall Neg _____			
Trial 7						Trial 8					

CID: _____ Color: _____ Triad: _____ Sex: _____ Date: _____ Time: _____ Others: _____ Color: _____ Coder: _____ Location: _____ Others: _____ Color: _____ IRR Coder: _____													
PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask		PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask	
Straight		Knock		Fall			Straight		Knock		Fall		
Neg Affect ____/____		Neg. Sportsmanship ____/____					Neg Affect ____/____		Neg. Sportsmanship ____/____				
Pos Affect ____/____		Pos. Sportsmanship ____/____					Pos Affect ____/____		Pos. Sportsmanship ____/____				
Overall Pos _____		Overall Neg _____					Overall Pos _____		Overall Neg _____				
Trial 9							Trial 10						
PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask		PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask	
Straight		Knock		Fall			Straight		Knock		Fall		
Neg Affect ____/____		Neg. Sportsmanship ____/____					Neg Affect ____/____		Neg. Sportsmanship ____/____				
Pos Affect ____/____		Pos. Sportsmanship ____/____					Pos Affect ____/____		Pos. Sportsmanship ____/____				
Overall Pos _____		Overall Neg _____					Overall Pos _____		Overall Neg _____				
Trial 11							Trial 12						
PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask		PV-Self	PVPeer	PVTask	NV-Self	NVPeer	NVTask	
Straight		Knock		Fall			Straight		Knock		Fall		
Neg Affect ____/____		Neg. Sportsmanship ____/____					Neg Affect ____/____		Neg. Sportsmanship ____/____				
Pos Affect ____/____		Pos. Sportsmanship ____/____					Pos Affect ____/____		Pos. Sportsmanship ____/____				
Overall Pos _____		Overall Neg _____					Overall Pos _____		Overall Neg _____				
Trial 13							Trial 13						
Notes:													

APPENDIX C CODING RUBRIC

Positive Affect				
1. No evidence	2. Slight pleasure; may or may not smile slightly; hopeful look	3. Somewhat pleased; perhaps some smiling	4. Pleased; consistent smile, laughter due to enjoyment of the game	5. Intense pleasure; Positive verbal exclamation; Broad smile; celebratory gestures; positive verbalization
Negative Affect				
1. No evidence	2. Slight displeasure; Slight lip corners turned down, lower lip depressed; head tipping down; slouching	3. Somewhat displeased; head in hands (only if obviously sad); arms crossed (if other signs)	4. Definitely displeased; vocalization (e.g. "dam it!")	5. Intense Displeasure (crying, intense frown, furrowed brow, shouting)
Positive Sportsmanship				
1. No evidence	2. "we won;" "it's a tie," "it's gonna be a tie", smiling at partners	3. "We're both going to win!"; happy for both players (verbal only), non-specific feedback for partners,	4. Obviously happy for partner's success; high five/pat on back single partner, compliment partners' behavior specifically after partner wins,	5. Obvious expressions of empathy and concern for game partner; reassuring partner after their own victory (you'll win next time), high five both partners, says "I'll do better next time" after loss
Negative Sportsmanship				
1. No evidence	2. Slight frown when other wins; no regard for partner – or expressing affect without regard for partner's feelings; "I win" or "I'm gonna win"	3. Obvious disappointment about losing (clear frown, "dang it!"), groaning, some minor lack of engagement	4. Complaining about losing (e.g., "But I want to win!" or "I don't want to lose!"), "that wasn't fair", knock down blocks, playing much less actively after a loss, accusing other of cheating, blaming others for loss	5. Crying, whining, vocals, taunting (e.g., "I'm still going to win; I want you to lose!"); bragging, attempting to cheat (multiple hands on blocks, knock down blocks, double stacking blocks), refusing to play, naming calling,
Overall Positive				
1. no positive behaviors	2. Minimal positive behaviors	3. Some positive behaviors	4. Frequent positive behaviors	5. Constant positive behaviors
Overall Negative				
1. no negative behaviors	2. Minimal negative behaviors	3. Some negative behaviors	4. Frequent negative behaviors	5. Constant negative behaviors