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This investigation assessed the processes by which anxious solitary children (i.e., those who are shy and play alone at elevated rates) were excluded, victimized, and accepted by their familiar peers. Peer sociometric nominations were conducted with 688 third grade children of diverse socioeconomic and racial/ethnic backgrounds. A subset of 163 of these children, approximately half of whom were identified as anxious solitary by their peers, was observed at free play during recess with familiar peers for a total of 25 minutes each. These observations were analyzed sequentially to establish child behavior that coincided with, preceded, and followed peer exclusion, victimization, and acceptance. Anxious solitary children compared to control children exhibited behavior at different frequencies and durations, received different responses from peers to the same behavior, and responded differently to the same type of peer treatment. Thus, the anxious solitary children's behavior and the peer responses they receive function under different contingencies than those of their non-anxious solitary peers.

ANXIOUS SOLITARY CHILDREN AT RECESS: NATURALISTIC OBSERVATION OF SEQUENTIAL PEER EXCLUSION, VICTIMIZATION, AND ACCEPTANCE PROCESSES

by

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CHAPTER I

INTRODUCTION

Much of the literature on peer exclusion, victimization, and acceptance focuses on relations between child behavioral characteristics and peer maltreatment concurrently or over long assessment intervals (e.g., annual or biannual), but does not examine the directional relations between child behavior and peer treatment within real time interaction (Cillessen, Van Ijzendoorn, Van Lieshout, & Hartup, 1992; Gazelle & Ladd, 2003). Evidence for the moment-to-moment relation between child behavior and peer treatment is crucial to determining the extent to which children experience negative peer treatment as a result of child or peer behavior. This study investigated the directionality of relations between specific child behavior and peer treatment by observationally examining how exclusion, victimization, and acceptance occur in naturalistic interactions among familiar peers and how these processes differ for anxious solitary (AS) children versus other children.

Anxious Solitude and Peer Treatment

AS children desire peer interaction, but have social evaluative fears which inhibit their social behavior (Coplan, Gitlin-Weiner, Sandgrund, & Schaefer, 2000; Gazelle & Ladd, 2003; Rubin, 1982). They display onlooking and unoccupied solitary behavior, collectively referred to as 'reticence,' as well as wariness and social anxiety with familiar peers (Coplan, Rubin, Fox, & Calkins, 1994). On average, AS children are at elevated

risk for peer exclusion and victimization and experience less acceptance from their classmates (Cillessen et al., 1992; French, 1988, 1990; Gazelle & Ladd, 2003; Gazelle etal., 2005; Gazelle & Rudolph, 2004). This negative treatment contributes to internalizing symptoms and increased stability in anxious solitude over time (Gazelle & Ladd, 2003; Gazelle & Rudolph, 2004). Understanding processes underlying moment-to-moment interactions is important in determining why these children experience different rates of negative treatment.

Peer exclusion is conceptualized as a type of peer maltreatment that is often somewhat subtle and can involve either directly refusing to allow a child to participate or passively ignoring a child. Exclusion may occur more frequently and have longer durations than other types of peer maltreatment, such as victimization, which often occurs in brief incidents (Gazelle, 2008; Sandstrom & Cillessen, 2003), thus it is important to investigate these maltreatments separately. In all children, exclusion has been linked to negative social and academic outcomes over time (Buhs & Ladd, 2001; Buhs, Ladd, & Herald, 2006). AS children are at particularly elevated risk for exclusion, and over time exclusion has been linked to the maintenance and exacerbation of internalizing symptoms and social avoidance in these children (Gazelle & Ladd, 2003; Gazelle & Rudolph, 2004). AS children may exhibit unique frequencies or durations of behavior that lead to peer exclusion or peers may respond differently to their behavior. Observations of behavioral processes are necessary for understanding why AS children are at risk for this maltreatment.

Victimization is any type of physical or verbal teasing or aggression directed toward a specific child. It is the most concrete and overt form of peer maltreatment experienced in middle childhood, and occurs approximately every seven minutes on the elementary school playground (Craig & Pepler, 1997). Chronic victimization has been linked to negative social, emotional, and academic outcomes for school aged children (Buhs et al., 2006; Hodges & Perry, 1999; Perry, Kusel, & Perry, 1988). Because AS children are at elevated risk for victimization among both familiar and unfamiliar peers (Gazelle, 2008; Gazelle et al., 2005), they may also be at elevated risk for these negative outcomes. Children may exhibit particular behaviors that lead to victimization, or peers may be more likely to victimize certain children. It is important to investigate how victimization occurs within an interaction and identify how this process differs for AS versus other children.

Acceptance has been operationalized in observational studies as successful group entry, and is also commonly assessed attitudinally through sociometric "liked most" nominations. In behavioral investigations, 81% of entry bids by sociometrically average children are accepted by peers (Putallaz & Wasserman, 1989); however AS girls experience less behavioral acceptance than their peers when making entry attempts (Gazelle et al., 2005). Whereas in the majority of observational research acceptance has focused on entry behavior, peer acceptance (or lack of acceptance) can also occur within ongoing group interaction. AS children may experience lower rates of ongoing acceptance within an interaction as well. Evidence suggests that children with social anxiety disorder (who exhibit social behavior similar to AS children) receive less positive

responses from peers than non-clinical controls within a social interaction (Spence, Donovan, & Brechman-Toussaint, 1999). An important distinction within interaction is that peers can either actively engage a child in direct interaction or passively allow a child to participate without direct verbal or gestural give-and-take. Behavioral observations can clarify differences in entry versus ongoing acceptance and identify when and under what circumstances AS children receive less acceptance and than their peers.

Gender may influence peer interaction in general and the effects of anxious solitude on peer interaction in particular. Boys tend to engage in rough-and-tumble play in large groups, whereas girls tend to prefer more intimate, dyadic friendships (Humphreys & Smith, 1987; Maccoby, 1990). This may affect the pattern of behavior leading to one on one peer treatment. There are no differences between boys and girls in the frequency of unoccupied and onlooking solitary play (Coplan & Rubin, 1998; Coplan et al., 1994; Rubin, 1982). However, different types of solitary behavior have been linked to maladjustment for boys and girls (Coplan, Gavinski-Molina, Lagace-Seguin, & Wichmann, 2001), although these results vary based on age and outcome of interest. On average, AS boys are at greater risk than girls for peer maltreatment in middle childhood, perhaps because AS behavior is a greater violation of gender norms for boys than girls during this period (Gazelle & Ladd, 2003; Morison & Masten, 1991; Rubin, Chen, & Hymel, 1993). However, within same-sex playgroups of both familiar and unfamiliar peers, fourth grade AS girls also experience more maltreatment than their non-AS peers (Gazelle et al., 2005). Anxious solitude may lead to different child behavior and peer

responses for boys and girls and therefore they may experience different sequences and degrees of peer treatment.

AS children may receive more peer maltreatment because they exhibit higher frequencies, longer durations, or different sequences of certain behaviors. Alternately, AS children's behavior may function under different contingencies than that of peers. AS children may receive different responses from peers when they exhibit similar behavior, or they may respond differently to the same type of peer treatment. Sequential analysis of observed peer and child behavior can determine the direction of relations between child behavior and peer exclusion, victimization, and acceptance. Thus, this study will examine (1) the behavioral processes through which both negative and positive peer interactions unfold from the interplay between child behavior and peer treatment, (2) how these processes differ for AS versus non-AS children, and (3) if these differences are qualified by gender.

Frequency and Duration of Behavior

It is possible that peer behavior is a response to child behavior, and peers may respond negatively when children exhibit unusual frequencies or durations of behavior. In free play settings, AS children, as compared to their peers, exhibit more solitary unoccupied and onlooking behavior (e.g., standing close to peers and watching their activity without attempting to join in), and this behavior may lead to maltreatment (Coplan et al., 1994). AS children also exhibit longer durations of onlooking and unoccupied solitude, and spend less time in social interaction (Asendorpf, 1991; Coplan et al., 1994). Although onlooking and unoccupied solitude are often combined into

reticence, alternating between them versus engaging in one type of behavior for a long duration could differentially influence peer response. Thus, they are examined separately in the current investigation. The peer treatment that AS children receive may be a result of the frequency or duration of behavior they exhibit, or the sequences in which these behaviors occur.

Currently there is little observational evidence for the specific behavioral processes of peer exclusion. Exclusion is often the peer response to children who attempt to enter a group by hovering and onlooking but do not use any other behavioral tactic (Dodge, Schlundt, Schocken, & Delugach, 1983). Since AS children are known for their long periods of onlooking behavior (Coplan, Prakash, O'Neil, & Armer, 2004; Coplan et al., 1994) this may lead them to be rapidly excluded because peers assume they will not follow onlooking with social engagement. Exclusion could also last longer for AS children because rather than attempting to engage peers, they rarely draw attention to themselves and therefore escape peers' notice for longer durations. In contrast, for non-AS children exclusion may be more linked to other maltreatments such as victimization because peers may be responding to a specific behavioral incident rather than ongoing solitude. Onlooking behavior and long durations of solitary play may lead to AS children's exclusion (Coplan et al., 2004; Gazelle & Ladd, 2003; Gazelle & Rudolph, 2004; Rubin, 1982).

Observational evidence suggests that particular types of behavior, such as submissiveness, put children at increased risk for peer victimization. Playgroup studies have demonstrated that boys who display low rates of initiating conversation or

attempting to persuade peers and submissiveness to others' social initiatives are more likely to become victimized among unfamiliar peers (Schwartz, Dodge, & Coie, 1993). AS children exhibit onlooking and unoccupied solitude more frequently, initiate conversations with peers less frequently (Asendorpf, 1991; Gazelle et al., 2005; Sandstrom & Cillessen, 2003; Spence et al., 1999), and sociometric evidence suggests that AS children are perceived by their peers as less able to defend themselves (Gazelle, 2008; Stewart & Rubin, 1995). Thus, the combination of unique behavior and peer expectations could lead AS children to appear submissive and, as a result, experience higher rates of victimization than their peers. It is even possible that some of the children in previous studies who exhibited submissive behaviors and were more victimized by unfamiliar peers could in fact be unidentified AS children (Schwartz, Chang, & Farver, 2001; Schwartz et al., 1993). AS children's onlooking and unoccupied solitary behavior and long durations of solitude may make them appear unassertive and submissive, and could lead to victimization.

Several observational studies have investigated behavior leading to acceptance upon group entry. Hovering or onlooking is often the initial entry tactic; although, children are unlikely to be accepted unless they follow this with a group oriented statement or behavior (Dodge et al., 1983; Putallaz, 1983; Putallaz & Wasserman, 1989). However, engaging in hovering or onlooking for long periods of time, as AS children may do, decreases chances of acceptance (Dodge et al., 1983). It is only through employing onlooking as a transition to other behavior that children achieve acceptance. Children with social anxiety disorder initiate fewer social interactions than their peers

(Spence et al., 1999), and the combination of long durations of onlooking and fewer overt entry attempts could contribute to AS children's lower rates of behavioral acceptance in response to group entry attempts. Additionally, because they are expected to be alone, it is possible that AS children may also need to make more overt entry attempts before peers acknowledge and accept them. AS children's behavior could also lead to shorter periods of ongoing acceptance. Non-AS children tend to maintain ongoing peer interaction for longer periods of time than AS children (Asendorpf, 1991), and control children spend more time than children with social phobia engaging in interaction with peers (Spence et al., 1999). AS children are less likely than peers to exhibit the sequences of behavior that are most likely to lead to acceptance. In combination with longer durations of solitary play this may lead to lower rates of group entry and ongoing peer acceptance. However, sequential observations are needed to identify the direct influence that this behavior has on peer treatment.

Behavioral Contingencies

Because peer interaction is a function of both the child and the peer, it is possible that rather than resulting simply from the frequency and duration of child behavior, peer treatment arises from child behavior functioning under different contingencies for AS versus non-AS children. Peers may respond differently to the same type of behavior from different children or conversely, children may exhibit different behavioral responses to the same type of peer treatment. Thus both child and peer behavior could function under different contingencies for AS children and this could lead to more negative peer treatment.

Peer Behavioral Contingencies

When children display a behavior, peers may respond negatively or positively based on their history with a child. Familiar peers have experience with AS children's behavioral patterns, including the frequency and duration of behavior they exhibit and their typical responses to peer treatment, as well as knowledge about their reputation and social status. This knowledge may lead peers to respond differently to AS versus non-AS children's behavior. For example, peers may interact with non-AS children for longer before responding negatively to their behavior. Peer responses to child behavior could affect a child's likelihood of interacting with peers in the future, thus could contribute to AS children's solitude.

Though peers may often respond to solitude with exclusion, as it is easy to ignore, peer behavior contingent to specific types of solitude may differ for AS versus non-AS children. In particular, peers may respond to onlooking with exclusion more often for AS children. Non-AS children may use onlooking to gather information about a group activity before joining in, whereas AS children may not subsequently make the transition to peer interaction. The different function of onlooking may be perceived by peers and lead AS children to be excluded immediately upon onlooking, whereas non-AS children may be given a chance to engage with others before being excluded. Thus, AS children may receive more rapid and negative peer responses to the same behavior.

Direct victimization could be a response from peers to a specific negative child behavior, or it may be initiated by peers when children are playing independently or positively engaging with them. Victimization has been linked to aggression for some

children (Craig, Pepler, & Atlas, 2000; Kochenderfer-Ladd, 2003; Schwartz et al., 2001; Xu, Farver, Schwartz, & Chang, 2003), and victimization may often be a reaction to children's aggressive behavior. In contrast, the victimization could also be initiated by peers in response to neutral or positive child behavior. Peers respond more negatively to AS girls' entry attempts (Gazelle et al., 2005), thus AS children may be more likely to experience victimization when they try to engage with peers. Alternatively, timing of peer response, rather than the behavioral trigger may be what differentiates the victimization of AS children from their peers. Peers may give non-AS children an opportunity to engage with them following an entry bid, whereas AS children may be victimized immediately upon entry because peers expect them to rapidly return to solitude. Therefore, they do not have the opportunity to interact positively before maltreatment. Peers may victimize a child in response to negative or positive child behavior, but both the behavioral contingency and timing of maltreatment may depend on which child is exhibiting the behavior.

Positive peer treatment could also function under different contingencies for AS children. For many children, entry seeking eventually leads to peer acceptance, however this contingency may not hold for AS children because peers respond less positively to their entry bids (Gazelle et al., 2005; Spence et al., 1999). Instead, AS children may engage with peers most when they are approached and do not have to initiate the interaction. AS children may also need to make more effort to obtain an interaction. Based on previous experience, peers may expect onlooking to lead to engagement for control children, thus they may passively accept them in response without the child even

needing to make an overt entry bid. In contrast, AS children may need to be more actively engaged to obtain even passive acceptance. Within ongoing acceptance, demonstration of interest or engagement with peers may also determine how actively and for how long the child is accepted. Because AS children find social interaction stressful, they may be more passive during interaction, and therefore peers may make fewer attempts to actively engage them in ongoing interaction. Peer acceptance is an ongoing process, thus peer treatment in both initial and ongoing acceptance needs to be investigated, and differences in these behavioral contingencies for AS versus non-AS children may be key to understanding their lower rates of acceptance.

Child Behavioral Contingencies

The same peer treatment could lead to a variety of behavioral responses from children, and these differing responses may influence further peer treatment. Social anxiety may make AS children particularly sensitive to negative social cues, and this could influence their behavior. In particular, negative treatment could lead AS children to play alone when social interactions are stressful, whereas non-AS children may respond to negative peer treatment by moving on to interactions with other peers.

In response to exclusion, children can either make an attempt to initiate interact with peers, or remain solitary and not pursue interaction. Within an interaction, most children tend to move from solitude to engagement with peers, and therefore would be expected to follow exclusion with peer interaction (Asendorpf, 1991). In contrast, AS children's social anxiety may lead them to subsequently be unlikely to make an entry bid or attempt to be accepted by peers, thus exclusion could lead to continued solitary

behavior in these children. Indeed, chronic exclusion has been linked to social avoidance over time in AS children, and the same process may be at work in real time interaction (Gazelle & Rudolph, 2004). Because exclusion could lead children to behave in different ways, child behavioral contingencies proximal to exclusion are important to investigate.

Chronic victimization can predict and exacerbate maladaptive child characteristics over time, and experiencing victimization may similarly lead to changes in child behavior within an interaction. Specifically, victimization can lead to increases in internalizing symptoms, as well as externalizing symptoms and aggression (Hodges, Boivin, Vitaro, & Bukowski, 1999; Kochenderfer-Ladd, 2003). This suggests two possible directions for maladaptive behavioral responses to victimization. Some children may passively accept the maltreatment, which could be demonstrated by submissive and solitary behavior, and this may be linked to internalizing problems. Children may also have aggressive and externalizing responses, and instead fight back or defend themselves. AS children may be more likely to display the former, therefore while being victimized they may be more passive and after victimization their social evaluative concerns may prevent further peer interactions and lead to solitude (Gazelle & Rudolph, 2004). In contrast, non-AS children may have a more active response to victimization and therefore engage with the bully or be aggressive. Alternatively, a more constructive response to victimization may be attempting to engage different peers as a means of avoiding the bully. However, social anxiety may prevent AS children from engaging in this more positive response. Peer victimization may lead to solitude in AS children, whereas for non-AS children it

may lead to aggression, engagement with the bully, or constructive interaction with other peers.

Children may respond to acceptance with either continued peer interaction or solitude. When most children have achieved entry into a group they are likely to remain with the same peers, thus maintaining acceptance. However, sequential evidence suggests that AS children sustain acceptance for shorter durations than their peers (Asendorpf, 1991). AS children transition from solitary to social activities randomly and thus revert back to solitude more frequently than peers. Within an ongoing interaction, if peers passively accept AS children, due to high levels of social anxiety they may not attempt to actively engage others and may instead return to solitude. In contrast, non-AS children may attempt to get peers' active acceptance by engaging them in conversation. Despite sequential observations of group entry, there has been limited investigation of children's ongoing behavior in response to peer treatment, and this information could help identify how AS children respond to peer maltreatment.

There are multiple pathways through which child behavior and peer treatment may be linked. It is necessary to sequentially analyze these observed patterns to establish when and under what circumstances AS children receive different frequencies, durations, and sequences of peer treatment and exhibit different behavior. Because neither child nor peer behavior happens in isolation, mutual reciprocal influences between these actors need to be considered. The interplay between children and their peers may lead to continuity in peer treatment and may explain the unique behaviors exhibited by AS children. Conversely, if peer behavior changes, change in child behavior may result, thus

these exchanges could enable AS children to receive more positive peer treatment. Looking at child behavior before, during, and after peer treatment can help to identify the sequence of behavior that result in exclusion, victimization, and acceptance for AS children and their peers. Additionally, investigating the causes of poor peer relations for AS children can lead to identification of specific social behaviors that could be targeted for intervention with AS children.

The Present Study

Design

Children were observed during recess with their familiar peers to investigate naturalistic exclusion, victimization, and acceptance processes for AS children. Sociometric measures were taken from a large screening sample in the fall and spring of third grade. A subset of this sample, approximately half of whom were AS and the remainder of whom were demographically matched controls, was subsequently observed at recess for a total of 25 minutes across at least three days. Both child behavior and peer treatment was coded in 30s observe, 30s record intervals. The observations were then analyzed sequentially to investigate the temporal ordering of peer interaction processes.

Hypotheses

Frequency, duration, and behavioral sequences. All children were expected to be more likely to transition between onlooking and unoccupied solitude than between these states and directed solitude. Active and passive interactive behavior (child engagement and peer acceptance) were expected to be unrelated for all children, thus children were expected to exhibit one type for long durations, but not transition between the two. AS

children were expected to have higher frequencies of both onlooking and unoccupied solitary behavior, and exhibit these behaviors for longer durations. It was hypothesized that AS children would experience more negative peer treatment, thus have both higher frequencies and longer durations of exclusion, and higher frequencies of victimization. Control children were expected to have higher frequencies and longer durations of active and passive engagement with peers, as well as higher frequencies and longer durations of active acceptance.

Sequential relations between child and peer behavior. Sequential relations between child and peer behavior were hypothesized for all children, but hypotheses were also made about relations that would occur primarily for AS or primarily for control children. Preceding, concurrent to, and following exclusion both AS and control children were expected to engage in solitary play because it is easily ignored by peers. All children were expected to be aggressive before and concurrent to victimization. Before, during, and after active acceptance, all children were expected to be actively engaged in peer interaction. Likewise, all children were all expected to be passively engaged before, during, and after passive acceptance. Processes of active and passive acceptance were expected to be similar, but active engagement was expected to occur only with active acceptance and passive engagement was expected to occur primarily with passive acceptance.

It was expected that peers would have different responses to AS children's behavior, and AS children would also respond differently to peer treatments. AS children were expected to be more likely than control children to be excluded before, during, and

after to onlooking solitude because they may be less likely than their peers to follow this behavior with a transition to engagement with others. AS children were expected to be more likely than peers engage in onlooking before victimization, marking them as particularly easy targets. Concurrent to victimization, AS children were expected to seek entry into a group or be passively engaged with peers. Thus, they may continue to remain with peers who are victimizing them, but do not actively engage in the interaction. Following victimization, AS children were expected to rapidly return to any type of solitude. AS children were expected to be more passively accepted in response to active engagement, and to be more likely than controls to be alone following either type of acceptance.

There were also patterns that were expected to be unique to control children. Following exclusion, control children were expected to be more likely to be actively engaged with peers because they transition more easily into peer interaction. They were also expected to be more likely to be actively engaged or aggressive concurrent to victimization, thus to be more likely to defend themselves against the bully. Following victimization, control children were expected to continue to be actively engaged with peers. Lastly, control children were expected to be more likely than AS children to be actively accepted when they sought entry into a group.

CHAPTER II

METHOD

Participants

A screening sample of 688 children (*M* age at the outset of the study = 8.66 years, *SD* = .50) participated in sociometric peer nominations in the fall of their third grade year. This sample was comprised of 80% (688/856) of the children in 46 public elementary school classrooms. Girls and boys were approximately equally represented (51.5% female (*n* = 354), 48.5% male (*n* = 334)). The sample was diverse with regard to socioeconomic status, with 30% of children receiving free or reduced school lunch. The sample was also diverse in regard to race/ethnicity (62% European American, 20% African American, 16% Latino, and 2% Asian American). Third grade children were selected because this is the earliest age that AS behavior has been assessed reliably with sociometric measures, and there is evidence that AS children encounter peer difficulties by this age (Gazelle & Ladd, 2003; Younger, Schwartzman, & Ledingham, 1985, 1986). There has been little observational research on AS children at this age, as many studies of solitary play have focused on preschool children, so this study begins to address the knowledge gap about solitary play in middle childhood.

A subgroup of participants (*n* = 163) was selected from the screening sample to be observed at recess between the fall sociometric and the end of the school year. Fifty-eight of these children scored at or above one standard deviation on sociometric peer

nominations of anxious solitude averaged across the fall and spring of third grade. The remaining participants (n = 105) were controls matched without regard to behavioral factors (with the exception that they scored < 1 *SD* on anxious solitude) on the basis of gender, age, race, free or reduced lunch status, and classroom. Selected children did not differ from non-selected children in the screening sample in regard to age (selected M = 8.70 years, SD = 0.55, non-selected M = 8.65 years, SD = 0.48, t = 0.94, *ns*) or free or reduced lunch status (selected 31%, non-selected 29%, $\chi^2 = 0.23$, *ns*). The selected sample had slightly more girls (59%) than boys (41%) in comparison to non-selected screening children (female 49%, male 51%, $\chi^2 = 4.74$, $p < .05$). The race/ethnicity of the selected sample was similar to the composition of the screening sample except that marginally more Latino ($\chi^2 = 3.53$, $p < .10$) and significantly fewer African American children ($\chi^2 = 6.19$, $p < .05$) were selected (selected vs. non-selected: 64% vs. 61% European American, 14% vs. 23% African American, 21% vs. 15% Latino, and 2% vs. 2% Asian American). Because children were selected based on elevated anxious solitude scores (or having similar demographics to children with elevated anxious solitude scores), discrepancies between screening and selected samples are due to differences in the prevalence of anxious solitude in this sample. In particular, life stress due to immigration may contribute to the high rates of anxious solitude in Hispanic/Latino children.

Measures

Sociometric Peer Nominations

Screening children with informed parental consent obtained prior to the study participated in peer nominations administered simultaneously to children in each class in the fall and spring of third grade. Participants selected peers from a roster of classmates. Nominations were unlimited, and cross-sex nominations were allowed to maximize reliability and validity (Foster, Bell-Dolan, & Berler, 1986; Terry & Coie, 1991). Questions were adapted from previous studies (Gazelle & Ladd, 2003) and assessed sociometric status and a variety of social behaviors.

The three nominations for anxious solitude were classmates who (1) "…act really shy around other kids. They seem to be nervous or afraid to be around other kids and they don't talk much. They often play alone at recess;" (2) "… watch what other kids are doing but don't join in. At recess they watch other kids playing but they play by themselves;" and (3) "…are very quiet. They don't have much to say to other kids." The three-item composite had adequate reliability between the fall and spring assessments (α = .76 - .86) and 6-month stability (r = .72, p < .001).

Nominations for sociometric peer exclusion were children who (1) "…get left out when others are talking or playing together. They don't get invited to parties or chosen to be on teams or to be work partners" and (2) "…when they ask if they can play, other kids say 'no' and won't let them play." This composite demonstrated adequate reliability (α = .73 - .83) and stability (r = .68, p < .001).

Nominations for victimization were children who (1) "…get picked on and made fun of by other kids. They get teased or get called names" and (2) "…get hit, pushed or kicked by other kids." The second item was only available in the spring, but the construct showed adequate reliability ($\alpha = .60$) and stability ($r = .60$, $p < .001$).

Nominations for acceptance were children who peers "…like to play with a lot" (stability $r = .53$, $p < .001$). Because of the multiple-informant nature of sociometric peer nominations, even single items are reliable for this type of measurement (Coie, Dodge, & Kupersmidt, 1990).

Behavioral Observations

The *Peer Interaction Observation System* (PIOS, Gazelle, 2008) was developed for this study based on two existing observation scales: the Play Observation System (POS, Rubin, 2001) and a group-entry system developed by Putallaz and Wasserman (1989). The PIOS was designed to capture both child behavior and peer treatment through live coding in a naturalistic recess setting. Solitary child behavior ratings (i.e., onlooking, unoccupied, directed) were drawn from the POS. However, adjustments were made because these children were substantially older (the POS was developed for preschoolers) and coding was conducted live rather than via videotape. The observation interval was lengthened from 10s to 30s to accommodate live coding. Peer treatment codes were adapted from the system developed by Putallaz and Wasserman with the addition of several new distinctions, such as passive and active acceptance, to capture wider variability in peer behavior. Bivariate relations between sociometric and observational measures were calculated in order to establish convergent validity for the

PIOS by demonstrating that observer-rated child behavior is correlated with conceptually related behavior that peers have noted to occur on a regular basis (see Table 1).

Selected children were observed during recess free play in live 30s observe, 30s record intervals between the fall sociometric and the end of third grade. All children were observed for five 5-minute sessions across at least three days for a total of 25 minutes of recess observation, thus there was no incomplete data. Mutually exclusive child behavior and peer response were coded simultaneously based on behaviors with the longest duration in the 30s interval. However, several systematic exceptions were made for behaviors that can have particularly short durations, such as victimization. In order to assess inter-rater reliability for the three coders, 24% of observations were coded simultaneously by two observers (see Table 2 for operational definitions, means, and Cohen's kappas for each code). There were no significant differences in the likelihood of child or peer behaviors being coded in each of the five intervals. Thus, each behavior was equally likely to happen in any interval within the five minute observation period.

Solitary child behavior. *Alone directed* behavior was coded when the child was alone and actively engaged in an activity (e.g., swinging on the swings or playing with a ball). *Alone onlooking* behavior was coded when the child was alone and placed him/herself within 10 feet of peers and visually focused on their activity without making any overt attempt to join in. *Alone unoccupied* behavior was coded when the child was alone and not involved in a purposeful activity (e.g., staring into space, wandering aimlessly).

Interactive child behavior. The composite *active with others* was comprised of time in which the child interacted with either peers or peers and adults and actively engaged in a give-and-take of verbal or gestural communication (e.g., having a conversation or actively participating in a game). *Passive with others* involved time that was spent in the company of peers or peers and adults during which the child did not actively interact with the other individuals, but was engaged in the same activity (e.g., swinging on the swings with another child without talking to him or her). *Entry-seeking* combined two codes and involved the child approaching an individual or group to join in an ongoing activity, or making an attempt to initiate or change the ongoing activity of an individual or group. Both codes involved the target child getting peers' attention in attempt to change or join in the activity, therefore they were combined. *Aggression* was coded when the target child engaged in any act of physical or verbal violence directed toward other children.

Peer behavior. Exclusion was a composite of two codes and involved the child being actively left out or explicitly refused participation in an activity (e.g., being told that he or she can't play), or being passively ignored or not acknowledged by peers. *Victimization* was a composite of four codes. It was coded when the child was the target of verbal teasing; physically hit, pushed, or otherwise aggressed against; generally rejected from a group or individual; or approached by peers with negative intent. *Active acceptance* was a composite of two codes and involved peers actively interacting with the child in a give-and-take of verbal and gestural communication or initiating a positive interaction with the child. *Passive acceptance* was coded when peers allowed the child to

participate in an activity, but there was no verbal give-and-take with the target child. Several other child and peer codes were used in observations but will not be individually analyzed in this study due to low frequencies.

CHAPTER III

RESULTS

Group Differences in Behavioral Frequencies

To assess the presence of group differences in the frequency of child behavior and peer treatment, a score was calculated for each child indicating the proportion of intervals that a child or peer behavior occurred (# of intervals code was observed / total # observational intervals, see Table 1 for means and standard deviations). Next, independent group *t*-tests were conducted to assess for group differences in AS versus control children and boys versus girls.

As expected, compared to controls, AS children were significantly more likely to engage in solitary onlooking (M = .08 vs. .03; t = -4.42, p < .001), and unoccupied behavior (M = .08 vs. .04; t = -3.06, p < .01) and less likely to actively engage with peers (M = .44 vs. .55; t = 3.37, p < .01). AS children experienced significantly more peer exclusion than control children (M = .31 vs. .18; t = -4.42, p < .001), and were significantly less likely to be actively accepted (M = .43 vs. .56; t = 4.09, p < .001). Boys were significantly more likely than girls to experience victimization (M = .03 vs. .01; t = -3.06, p < .01).

Sequential Analyses

To investigate sequences of child and peer behavior and the interaction between child behavior and peer treatment, sequential analyses were conducted using General

Sequential Querier for Windows 5.0 (GSEQ, Bakeman & Quera, 2009). Analyses were computed to test the likelihood of a target behavior in one interval before, the interval concurrent to, and one interval after each given behavior. Although children were observed in sequences of five intervals, the maximum length of each sequence was set at three intervals because several behaviors had low frequencies, thus could not have been analyzed two intervals before or after the given behavior. Additionally, because of the interval nature of the data (one behavior was coded per 30s, with 30s of record time in between), behaviors may have been lost between lags, thus interpretation would have been more difficult for findings further than one interval away from the given behavior.

Adjusted residuals were used to establish whether the relation between target and given behavior was more or less likely than expected by chance (as calculated by the overall frequency of each behavior). Adjusted residuals can be affected by cell size and, therefore are not useful for determining group differences or the magnitude of effect (Bakeman & Gottman, 1997). Instead, the test statistic Yule's *Q*, which is a transformation of the odds ratio, was used. Yule's *Q* ranges from -1 to +1, with 0 indicating no relation, similar to a Pearson's correlation. This index is a function of the odds ratio, therefore a child would receive the same rank ordering on both indices (Bakeman, 2000; Bakeman & Gottman, 1997). However, Yule's *Q* was selected over the odds ratio because it is better able to correct for behavior with very low frequencies. A 2 (AS vs. control) by 2 (sex) analysis of variance (ANOVA) was conducted on the Yule's *Q* for each set of target and given behaviors to investigate group differences.

To determine the sequence and duration of behavior within the actor, sequential analyses were conducted exclusively with child behavior, then exclusively with peer behavior. Analyses were conducted to test for every behavior preceding and following every other behavior as given. For analyses within an actor, concurrent relations were not tested because identical given and target behaviors always co-occur concurrently. Although every sequence was tested, only half are reported because the sequences for each behavior as a given and a target are redundant. For example, the results for onlooking solitude at lag -1 given unoccupied solitude (onlooking before unoccupied) are identical to the results for unoccupied solitude at lag 1 given onlooking (unoccupied following onlooking).

Next, analyses were used to identify child behavior that was more or less likely to occur before, during, and after peer exclusion, victimization, and active and passive acceptance in order to investigate the interaction between child and peer behavior. Although peer treatment given child behavior could also have been examined, the results for the adjusted residuals, Yule's *Q*, and the ANOVA would be identical. Thus, if interested in the sequence of onlooking followed by victimization, one could test onlooking at lag -1 given victimization, or victimization at lag 1 given onlooking. Child behavior given peer treatment was used for these analyses because it was more relevant to the questions of interest.

Sequences of Child Behavior

To determine the sequence and duration of specific child behaviors, each child behavior was examined in the lag before and after every other observed child behavior.

Adjusted residuals are presented in Table 3, and observed and expected frequencies, and Yule's *Q*s are presented in Table 4.

Duration of child behavior. Adjusted residuals demonstrated that all child behaviors were more likely than chance to be exhibited continuously for all children. Thus, if a child engaged in a given behavior in one interval, they were more likely than chance to continue engaging in that behavior in subsequent intervals. Comparison of Yule's Q demonstrated that contrary to expectations, control children were more likely than AS children to exhibit sequential intervals (therefore longer durations) of alone onlooking (M = .84 vs. .68; $F(1, 159) = 7.61$, $p < .01$) as well as alone directed behavior (M = .92 vs. .84; $F(1, 159) = 4.02$, $p < .05$).

Sequences exhibited by all children. Although all solitary behavior was less likely to occur before or after active engagement with peers, the three types of solitude did not always display the same patterns. As predicted, alone onlooking behavior was more likely than chance to be followed by solitary unoccupied behavior, and unoccupied behavior was likely to be followed by onlooking for all children. Both unoccupied and onlooking solitude were also more likely than chance to be followed by entry seeking. In contrast, solitary directed and unoccupied behavior were unlikely to be followed by passive engagement, whereas this relation did not exist for onlooking solitude. Children were less likely than chance to be alone directed, but not alone onlooking or unoccupied, following passive engagement.

Adjusted residuals also demonstrated that active and passive engagement show similar patterns but are independent processes. As predicted, all children were unlikely

to be actively engaged before or after passive engagement, and unlikely to be passively engaged before or after active engagement. Children were unlikely to seek entry following both active and passive engagement with peers. They were less likely than chance to be actively, but not passively, engaged following entry seeking.

Sequences exhibited by AS children. Between groups comparisons of Yule's *Q* demonstrated that several sequences of behavior were unique to AS children. AS, rather than control children were more likely to follow onlooking with entry seeking behavior (M = .40 vs. .14; $F(1, 159) = 4.32$, $p < .05$), contrary to hypotheses. AS children were also more likely than their peers to onlook after alone directed behavior (M = .05 vs. -.02; $F(1, 159) = 4.64$, $p < .05$), as well as active engagement with peers (M = -.57 vs. -.60; $F(1, 159) = 4.61$, $p < .01$). After onlooking, AS children were more likely than control children to be passively engaged with peers (M = .01 vs. -.20; $F(1, 159) = 8.74$, $p < .01$).

Sequences exhibited by control children. Several patterns of solitary behavior were unique to control children. Control children were more likely than AS children to transition from onlooking into alone directed behavior (M = .12 vs. -.03; $F(1, 159) = 10.50$, $p < .01$) or from onlooking to active engagement (M = -.54 vs. -.65; $F(1, 159) = 10.59$, $p < .01$).

Gender differences in sequences of child behavior. Most behavioral differences between girls and boys in sequences related to entry seeking. Girls were more likely than boys to be actively (M = -.06 vs. -.19; $F(1, 159) = 4.19$, $p < .05$) and passively (M = .01 vs. -.16; $F(1, 159) = 4.22$, $p < .05$) engaged with peers after seeking entry into a group. An interaction for passive engagement demonstrated that AS girls were most likely (M =

.12), and control boys were least likely to be passive after entry seeking (M = -.34; F(1, 159) = 5.17, p < .05). In contrast, boys were more likely than girls to be alone directed after seeking entry (M = .30 vs. .06; F(1, 159) = 4.31, p < .05).

Sequences of Peer Treatment

Peer behavior before and after every other type of peer treatment was examined to determine the sequence of peer behavior. Table 5 presents the direction of significant adjusted residuals, and Table 6 presents frequencies and Yule's *Q*s for AS and control children.

Duration of peer treatment. As with child behavior, all peer treatments were likely to be continuous and occur in more than one sequential interval. Between group comparisons demonstrated that unexpectedly, control children were more likely than AS children to experience longer durations of exclusion (M = .83 vs. .80; F(1, 159) = 8.15, p < .01).

Sequences of treatment for all children. All children were less likely than chance to be actively or passively accepted before or after exclusion. Children were less likely than chance to be actively accepted following victimization. Active and passive acceptance were clearly independent, as children were less likely than chance to be passively accepted before or after active acceptance, and unlikely to be actively accepted proximal to passive acceptance.

Sequences of treatment for AS children. There were no sequences of peer treatment that AS children were significantly more likely than control children to experience.

Sequences of treatment for control children. There were several sequences of peer treatment that control children were more likely to experience. As predicted, control children were more likely than AS children to be actively accepted before (M = -.60 vs. -.64; $F(1, 159) = 6.14$, $p < .05$) and after exclusion (M = -.64 vs. -.67; $F(1, 159) = 6.37$, $p < .05$). Exclusion was more likely to be followed by victimization for control versus AS children (M = .12 vs. -.14; $F(1, 159) = 5.27$, $p < .05$).

Gender differences in sequences of peer treatment. Gender differences in peer treatment sequences all pertained to victimization. Girls were more likely than boys to experience longer durations of victimization (M = .92 vs. .63; $F(1, 159) = 10.91$, $p < .01$). Girls were also more likely to be victimized following active acceptance (M = 0 vs. -.18; $F(1, 159) = 12.33$, $p < .01$), and more likely to be passively accepted following victimization (M = .22 vs. .09; $F(1, 159) = 13.69$, $p < .001$). In contrast, boys were more likely than girls to be victimized after passive acceptance (M = -.23 vs. -.32; $F(1, 159) = 13.63$, $p < .01$) and exclusion (M = .09 vs. -.11; $F(1, 159) = 13.39$, $p < .001$). Following victimization, boys were more likely to be excluded (M = -.31 vs. -.16; $F(1, 159) = 9.94$, $p < .01$), but also more likely to be actively accepted (M = -.07 vs. -.53; $F(1, 159) = 12.76$, $p < .01$).

Child Behavior Given Peer Treatment

In order to assess the interaction between child behavior and peer treatment, child behavior before, during, and after each peer treatment was assessed. Significant adjusted residuals are presented in Table 7, and frequencies and Yule's *Q*s are presented in Table 8.

Sequences of child behavior and peer treatment for all children. Adjusted residuals demonstrated that all children showed some similarities in their behavior proximal to peer maltreatment (see Figure 1). As predicted, children were more likely to than chance to be alone directed, onlooking, and unoccupied before, during, and after exclusion. Likewise, they were less likely than expected by chance to be actively or passively engaged with their peers proximal to exclusion. Children were also likely to seek entry into a group following exclusion. All children were more likely than chance to be aggressive before, during, and after victimization. Children were likely to be actively engaged with peers concurrent to and following victimization, and victimization was more likely than chance to occur concurrent to entry seeking.

General sequences for all children were found for positive peer treatment as well. As predicted, all children were less likely than chance to be engaged in any type of solitary behavior and unlikely to be passively engaged with peers before, during, or after active acceptance. They were more likely to be actively engaged with peers before, during, and after active acceptance. Additionally, children were likely to be actively accepted concurrent to entry seeking, but unlikely to seek entry after being actively accepted. As hypothesized, passive engagement with peers was more likely than chance to occur before, during, and after passive acceptance. Children were unlikely to be alone directed or unoccupied proximal to passive acceptance. Onlooking was unlikely to occur concurrent to passive acceptance; however it was not related to passive acceptance before or after the treatment. Children were unlikely to be actively engaged with peers while

being passively accepted, and also unlikely to seek entry concurrent to or following passive acceptance.

Sequences of child behavior and peer treatment for AS children. AS children experienced unique sequences of child and peer behavior for negative and positive peer treatment (see Figure 2). As expected, AS children were more likely than control children to be onlooking concurrent to exclusion (M = .98 vs. .96; $F(1, 159) = 11.66$, $p <$ .01), and they were also more likely to be excluded concurrent to alone directed behavior (M = .95 vs. .93; $F(1, 159) = 4.79$, $p < .05$). AS children were more likely to be victimized concurrent to seeking entry into a group (M = .66 vs. .14; $F(1, 159) = 4.17$, $p < .05$), as hypothesized. They were also more likely to be victimized following onlooking solitude (M = -.06 vs. -.14; $F(1, 159) = 6.74$, $p < .05$).

Results from positive peer treatments demonstrated that AS children did not always have negative peer experiences. AS children were more likely than control children to be actively accepted following active engagement (M = .55 vs. .53; $F(1, 159) = 3.45$, $p < .05$) and surprisingly, following onlooking as well (M = -.44 vs. -.49; $F(1, 159) = 12.38$, $p < .01$). As predicted, AS children were more likely than control children to be passively accepted concurrent to (M = -.30 vs. -.55; $F(1, 159) = 4.20$, $p <.05$) and after active engagement (M = .10 vs. -.07; $F(1, 159) = 5.61$, $p <.05$).

Sequences of child behavior and peer treatment for control children. Control children also exhibited sequences of child and peer behavior that were unique to them (see Figure 3). Whereas AS children were excluded *concurrent* to onlooking, control children were more likely to be excluded *after* solitary onlooking (M = .61 vs. .47; $F(1,$

159) = 15.09, $p < .001$). They were also more likely than peers to be excluded after alone directed behavior ($M = .80$ vs. .69; $F(1, 159) = 5.10$, $p < .05$). As expected, control children were more likely than AS children to recover from exclusion and become actively engaged with peers following exclusion ($M = -.79$ vs. -.83; $F(1, 159) = 6.29$, $p < .05$). However, control children were also significantly more likely to be alone onlooking ($M = .65$ vs. .56; $F(1, 159)$ 7.46, $p < .01$) and directed ($M = .82$ vs. .72; $F(1, 159) = 4.97$, $p < .05$) following exclusion. Like exclusion and onlooking, the sequences of victimization and entry seeking occurred with different timing for AS and control children. Control children were more likely to be victimized after entry seeking ($M = .12$ vs. -.36; $F(1, 159) = 5.19$, $p < .05$), whereas AS children were victimized concurrent to entry seeking. Control children were more likely to be victimized following ($M = .32$ vs. -.04; $F(1, 159) = 4.80$, $p < .05$) and concurrent to ($M = -.13$ vs. -.69; $F(1, 159) = 8.32$, $p < .01$) alone directed behavior. They were also victimized concurrent to alone onlooking ($M = .13$ vs. -1; F (1, 159) = 20.49, $p < .001$), whereas AS children were more likely to be victimized following onlooking.

Sequences of child behavior in relation to positive treatment also differed for control children. Active acceptance was more likely to occur concurrent to onlooking for control versus AS children ($M = -.93$ vs. -.98; $F(1, 159) = 10.16$, $p < .01$), although this behavior was unlikely in both groups. Control children were more likely to onlook after being actively accepted ($M = -.53$ vs. -.54; $F(1, 159) = 5.76$, $p < .05$). They were also more likely to be onlooking before ($M = -.18$ vs. -.21; $F(1, 159) = 7.63$, $p < .01$),

concurrent to (M = -.83 vs. -.93; $F(1, 159) = 5.37$, $p < .05$), and following passive acceptance (M = -.02 vs. -.12; $F(1, 159) = 4.18$, $p < .05$).

Gender differences in sequences of child behavior and peer treatment. Similar to child and peer behavior alone, gender differences in sequences of interaction between children and their peers occurred in entry seeking and victimization. Girls were more likely than boys to be victimized after alone directed behavior (M = .32 vs. .08; $F(1, 159) = 13.53$, $p < .001$), active engagement (M = -.06 vs. -.27; $F(1, 159) = 14.00$, $p < .001$), and passive engagement with others (M = .10 vs. -.68; $F(1, 159) = 8.07$, $p < .01$). Girls were more likely than boys to be passively engaged concurrent to (M = -.10 vs. -.37; $F(1, 159) = 9.21$, $p < .001$) and after victimization (M = .35 vs. .03; $F(1, 159) = 8.89$, $p < .01$). Interactions demonstrated that AS girls were most likely, and control boys least likely to be passively engaged concurrent to ($F(1, 159) = 13.88$, $p < .001$) and after victimization ($F(1, 159) = 4.69$, $p < .05$). Concurrent to victimization, girls were also more likely to be onlooking (M = -.24 vs. -.35; $F(1, 159) = 11.11$, $p < .01$), alone unoccupied (M = -.18 vs. -.51; $F(1, 159) = 5.09$, $p < .05$), and entry seeking (M = .43 vs. .39; $F(1, 159) = 20.31$, $p < .001$). Following victimization, girls were more likely to respond with alone directed solitude (M = .01 vs. -.08; $F(1, 159) = 7.85$, $p < .01$). For entry seeking, girls were more likely than boys to be actively accepted following entry seeking (M = .09 vs. -.12; $F(1, 159) = 6.49$, $p < .05$). AS girls were particularly likely to be actively accepted following entry seeking (M = .09) and AS boys were least likely (M = -.23; $F(1, 159) = 6.49$, $p < .05$).

Boys were more likely than girls to be victimized following alone onlooking (M = .07 vs. -.21; $F(1, 159) = 6.74$, $p < .01$) and entry seeking behavior (M = .03 vs. -.13; $F(1, 159) = 5.19$, $p < .05$). Boys were more likely to be alone directed concurrent to victimization (M = -.19vs. -.62; $F(1, 159) = 10.84$, $p < .01$), and control boys were particularly likely to be victimized while alone directed ($F(1, 159) = 2.98$, $p < .05$). Boys were more likely than girls to respond to victimization with active engagement (M = -.20 vs. -.34; $F(1, 159) = 13.98$, $p < .001$) and entry seeking (M = .45 vs. -.40; $F(1, 159) = 9.75$, $p < .01$). Boys were more likely than girls to be entry seeking before (M = .26 vs. -.10; $F(1, 159) = 6.49$, $p < .05$) and concurrent to exclusion (M = .03 vs. -.21; $F(1, 159) = 4.61$, $p < .05$).

CHAPTER IV

DISCUSSION

This study provides evidence that AS and control children exhibit similar types of behavior, but they do so at different frequencies and durations, and their behavior functions under different contingencies. Certain child behaviors consistently led to negative and positive peer treatment for all children. However, peers responded with different timing and contingencies when AS versus other children exhibited certain behavior, suggesting that AS children's maltreatment could be due to different peer responses to their behavior. In addition, AS children had different responses to the peer treatment they received, and their responses to negative and positive behavior from peers could also contribute to their maltreatment.

Frequency and Duration of Child and Peer Behavior

Comparison of the rates of child behavior demonstrated that AS children were more likely than control children to be alone onlooking and unoccupied, and less likely to be actively engaged. However, all children engaged in the same types of behavior to some extent. AS children were more excluded by peers and less likely to be actively accepted, but both groups experienced all types of peer treatment. Whereas individual behaviors were similar in both AS and control children, AS children exhibited more solitary behavior and received more negative and less positive treatment from peers.

All behaviors, both child and peer, were likely to be continued across intervals, demonstrating that children often engaged in behavior or received peer treatment for longer than each 30 second interval. Of particular interest was the continuity of peer acceptance for all children. Although previous work focused on acceptance in response to group entry (Dodge et al., 1983; Putallaz, 1983), this study provided evidence that acceptance was clearly an ongoing process which was likely to be continuous. There were no group differences in the duration of positive peer treatment, thus AS and control children were equally likely to be continuously accepted by their peers. However, group differences in the frequency of active acceptance suggest that although AS children are equally likely to experience subsequent intervals of acceptance, they may have a harder time achieving initial acceptance.

Surprising group differences emerged for durations of solitude and exclusion. Contrary to expectations, control children exhibited longer durations of onlooking and alone directed behavior than AS children. This may be a result of engagement in one type of solitude with a specific goal in mind (e.g. onlooking to identify what other children are doing, directed because they are engaged in reading a book), therefore they may more continuously engage in a single type of solitude. In contrast, AS children may switch between types of solitude because they desire peer interaction but are inhibited by their anxiety, thus they engage in each type for fewer sequential intervals. Additionally, although control children experienced lower frequencies of exclusion than AS children, they experienced longer durations of exclusion. This could be a result of their longer durations of specific types of solitary behavior. Alternatively, control children may be

excluded for longer durations because their exclusion is more linked to other maltreatments such as victimization. When peers exclude control children it may be explicit and intentional, and therefore could occur for more sequential intervals. In contrast, when AS children are excluded it may be because they are not demonstrating to peers that they want to join in, thus are ignored only as long as they play alone.

Sequences of Child Behavior

AS and control children exhibited some consistent sequences of both solitary and interactive child behavior, however there were also group differences in behavioral sequences. Similar sequences of onlooking and unoccupied solitude emerged across both AS and control groups. Alone onlooking and unoccupied behaviors were consistently highly related to each other, and children frequently transitioned between the two. Both behaviors were similarly likely to be followed by entry seeking, demonstrating that this type of solitude may be accompanied by social interest. This provides evidence that reticence, a composite of onlooking and unoccupied behaviors (i.e., Coplan et al., 1994), may be an accurate way to group children's solitary play behavior. However, reticence was clearly distinguishable from directed solitary behavior, which was independent and unrelated to the other types of solitude. Directed solitude also tended to relate to peer behavior in different ways than onlooking and unoccupied solitude. Thus, reticence and solitary directed behavior may have a different meaning or serve a different function for all children. Solitary directed behavior may be a result of engagement in a solitary activity, whereas children may engage in reticence when they are alone but desire peer

interaction. This demonstrates that although they exhibit solitary behavior at different rates, AS and control children exhibit it in similar ways.

Both groups also showed similar trends in interactive behavior. As predicted, entry seeking was likely to follow onlooking, demonstrating that children may use onlooking as a means of gathering information about a group before attempting to join in. These entry attempts were likely to be followed by engagement with peers, suggesting that entry attempts were often successful. After children were either actively or passively engaged, they were unlikely to attempt to enter another group. Instead, once engaged with peers, children tended to continue in the same type of engagement, suggesting that they prefer to remain in interaction rather than risk solitude. As found in previous studies (Dodge et al., 1983), onlooking was the first step in initiating peer interaction, and this study adds to this evidence by demonstrating that engagement with peers, once obtained, is ongoing.

Although AS and control children demonstrated similar patterns of reticent behavior, AS children also engaged in some unique sequences of solitary behavior. AS children were more likely than their peers to transition from active engagement to onlooking behavior, supporting previous findings that they are more likely to transition from interaction with peers to solitude (Asendorpf, 1991). Thus, AS children may have particular trouble sustaining peer interaction. They were also more likely to transition from alone directed to onlooking behavior, demonstrating that a solitary activity may hold their attention momentarily, but their ongoing focus during free play was other children. Surprisingly, onlooking before entry seeking was more likely to occur for AS

than control children, perhaps because AS children made more obvious entry attempts following onlooking. In contrast, control children may have transitioned to active engagement after onlooking without a direct or overt entry attempt. Thus, control children may make more seamless transitions into active engagement with peers. AS children were also more likely to be *passively* engaged with others following onlooking. Although AS children transition from engagement to solitude, the focus of their solitude is clearly other children, demonstrating that it is social anxiety, rather than social disinterest, that drives their solitude. They also have a more difficult time entering a group, as they need to make more overt entry attempts and are more passively engaged once they are with peers.

Control children also exhibited unique sequences of behavior. They were more likely to follow solitary onlooking behavior with directed behavior, thus when they were unable to obtain peer interaction in response to onlooking, they may have found an independent activity rather than continuing to watch others. However, control children also had more success at using onlooking to enter interaction, as they were more likely to be actively engaged with peers following onlooking. Thus, they may be more effective than AS children at using onlooking as a means of observing peer interaction and using that information to assimilate into the interaction (Dodge et al., 1983; Putallaz & Wasserman, 1989). In contrast to AS children who transition from engagement in a solitary activity or with peers to onlooking, control children transitioned out of onlooking to either an independent activity or engagement with peers.

Sequences of Peer Treatment

AS and control children experienced many similar sequences of peer treatment. All children were less likely than chance to be either actively or passively accepted before, during, and after exclusion. Thus, not only was exclusion continuous but it may have been difficult for children to achieve acceptance after they were excluded. Victimization unlikely to occur following active acceptance, thus once children were able to achieve peer acceptance they were somewhat protected from victimization. Although active and passive acceptance were similarly related to exclusion, children were unlikely to transition between active and passive acceptance, demonstrating that they are independent processes that are not interchangeable.

Although analyses of the frequencies of peer treatment demonstrate that AS children receive more exclusion and less active acceptance than their peers, they were not more likely to experience any unique sequences of peer treatment. This suggests that the elevated rates of maltreatment may be due either to different child behaviors or to different contingencies in the interaction between AS children and their peers, rather than resulting entirely from peer behavior.

In contrast, there were several peer treatment sequences that were more likely to occur for control children. As expected, control children were more likely than AS children to be actively accepted before and after exclusion. Although AS children were not excluded for as many continuous intervals as control children, acceptance was better able protect control children from peer exclusion. Control children were also more likely than AS children to be victimized following exclusion, perhaps because exclusion is a

rarer incident for these children, and thus more related to overt and direct maltreatment. AS children are excluded on a regular basis, thus the maltreatment may be less overt and escalates to victimization less frequently. However, because AS children are anxious about interacting with their peers, being ignored may be perceived by AS children as just as harsh as more direct maltreatment. Alternatively, it may also be a relief for AS children, because they no longer have to cope with the anxiety that accompanies interaction. These sequences demonstrate that control children were more accepted before and after exclusion, but exclusion also escalates to victimization more frequently for them.

Peer Behavioral Contingencies

Peer behavioral contingencies were demonstrated by peer responses to child behavior. In most cases, similar peer behavior sequentially followed both AS and control children's behavior; however, there were differences in the likelihood of these contingencies occurring.

General patterns can help to identify child behavior that can protect or put a child at risk for peer maltreatment. For all children, exclusion commonly followed all types of solitary behavior, as expected. Additionally, peers were unlikely to exclude a child who was actively or passively engaged, thus engagement could protect children from exclusion. In contrast, children may put themselves at risk for maltreatment when they make an entry attempt, as they were likely to be victimized concurrent to entry seeking. Aggression may also put children at risk for victimization as it was likely to precede and co-occur with the harsh maltreatment. Thus, engagement protects children from

exclusion, solitude may put children at risk for exclusion, and entry seeking and aggression may make children vulnerable to victimization.

Behaviors that were likely to precede positive peer treatment can help determine what leads to acceptance for all children. Children were most likely to be actively accepted in response to active engagement with peers and were unlikely to be accepted following any type of solitude or passive engagement with peers. Thus, children were most actively accepted when they were already actively interacting with their peers. In contrast, passive acceptance was most likely to occur when children were passively, but not actively, engaged with peers. This provides further evidence that passive acceptance occurs under different circumstance and thus is qualitatively different from active acceptance. As with active acceptance, passive acceptance was unlikely to follow alone directed or unoccupied behavior, however onlooking and passive acceptance were only negatively related concurrently. Thus passive acceptance may be more interchangeable with onlooking behavior than active acceptance is and children transition more frequently between onlooking and passive acceptance. In summary, trends for all children show that active and passive acceptance occur when children are engaged with peers and are unlikely when children are alone. However, passive acceptance may be more interchangeable with onlooking than active acceptance.

AS children often received negative treatment in response to and concurrent to their behavior. AS children were more likely than control children to be excluded concurrent to onlooking, and victimized while seeking entry into a group. These findings demonstrate that the negative responses AS children receive are often immediate thus

they do not have the opportunity to engage peers positively before maltreatment. AS children were also more likely to be victimized after onlooking behavior. Peers may find onlooking particularly annoying from AS children because they engage in it more frequently. However, because AS children also often transition from onlooking to other types of solitude, peers may ignore it for one interval then subsequently victimize children when the behavior continues, as they may find longer durations of onlooking more annoying. AS children are at risk for maltreatment both concurrently and subsequently when they engage in onlooking and entry seeking.

Control children experience similar behavioral sequences of maltreatment, however the timing of maltreatment differed from that of AS children. Whereas AS children were excluded concurrent to onlooking, control children were excluded in the interval following onlooking. Although peers respond to control children's onlooking with exclusion eventually (in the following interval), they were more likely to respond to AS children's onlooking with exclusion in the moment. Peers may note control children onlooking and give them an opportunity to enter the group, and when the children choose not to, peers may subsequently ignore them. When peers notice AS children onlooking they may be less likely to give them the opportunity to join in, and instead assume they will continue to be alone and immediately exclude them. Likewise, control children were more likely to be victimized in the interval following entry seeking, whereas AS children were victimized concurrently. This demonstrates that victimization occurs immediately upon group entry for AS children, whereas control children may be given an opportunity to interact with peers, and are subsequently victimized only when they are unsuccessful at

engaging others. In contrast to the delayed patterns with exclusion, control children were victimized concurrent to onlooking, whereas AS children were more victimized following onlooking. Peers may identify onlooking as a sign of submissiveness in control children and therefore be less tolerant of it (Schwartz et al., 1993; Schwartz et al., 1998), whereas AS children's onlooking is somewhat expected and unless it continues, it is less likely to lead to direct maltreatment. Thus, the timing of peer maltreatment in relation to specific child behaviors differs for AS and control children.

There were also behaviors that functioned under different contingencies, as opposed to different timing, for control children. Control children were more likely than AS children to be excluded and victimized concurrent to and following alone directed behavior. Although concurrent behavior may be a response to, rather than a trigger of maltreatment, solitary directed behavior also preceded this maltreatment, suggesting that within the interval the child behavior preceded the peer treatment. It may be that because solitude is rarer for control children, it is more noticeable than it would be for AS children. Thus, alone directed behavior may be used by peers to identify children as potential victims of maltreatment. However, since AS children are less likely to be maltreated in response to directed behavior, alone directed behavior may be more protective than other types of solitude in which they engage. The timing of negative responses to child behavior and peers' negative responses to directed solitude differentiated the maltreatment of AS and control children.

AS and control children showed differences in the peer contingencies of interactive behavior as well. AS children were more likely than control children to be

actively accepted following active engagement with peers. They may appear more normative when engaging in an interaction than they do while attempting to enter one, and thus are more accepted subsequently. However, peers were also more likely to respond to AS children's onlooking with active acceptance. It is possible that peers may have more positive responses to AS children's onlooking behavior because they do not have the expectation that it will lead to interaction. Alternatively, because AS children spend more time onlooking, they may increase the likelihood of onlooking being followed by acceptance. For passive acceptance, AS children were more likely than control children to be passively accepted both concurrent to and following active engagement with peers, suggesting that peers respond less actively to AS children's active attempts to engage them. The frequencies demonstrated that AS children were less actively engaged than their peers, thus peer expectations of AS children's behavior may lead them to only passively respond to their active engagement. These passive responses could also have an impact on AS children's perception of their own social skills because even when they receive positive peer responses to their engagement, the feedback they receive is less actively positive. Thus AS children may struggle to obtain acceptance when not already engaged, and have a particularly difficult time obtaining active acceptance.

Differences in frequency of acceptance suggest that control children experience higher frequencies of acceptance, and peers also respond more positively to their behavior sequentially. Although rare, control children were more likely than AS children to be accepted concurrent to onlooking, suggesting that within an interval, their

onlooking is more successful at achieving peer acceptance, although the specific sequence cannot be determined. In contrast, AS children were most likely to be actively accepted once they were already engaged. Thus, AS children may need more time and overt entry attempts in order to obtain active acceptance. Although all children were likely to transition between passive acceptance and onlooking, control children were more likely than AS children to be passively accepted following and concurrent to onlooking. Control children may assimilate into passive group interaction through onlooking more easily than AS children because peers may expect them to use onlooking to transition into peer interaction. In contrast, peers do not expect AS children to make the same transition, thus they respond more positively to control children's onlooking. This difficulty obtaining even passive acceptance could contribute to AS children's difficulties in gaining acceptance.

Child Behavioral Contingencies

There were many similarities in the way that AS and control children responded to peer treatment. For all children, exclusion was likely to be followed by any type of solitary behavior, however it was also followed by entry seeking, demonstrating that children often make attempts to end exclusion by making an entry bid. Children often responded to victimization with active engagement, which suggests that they may be able to either engage the bully or find other peers to interact with following victimization. However, because this coding system did not identify the peers with whom the child interacted, it was not possible to differentiate between these possibilities. All children were likely to respond to victimization with aggression, thus it is also possible that some

children responded by engaging negatively with the bully. Children responded to active peer acceptance with further active engagement with peers and were unlikely to follow it with solitary play. Children were also unlikely to seek entry after active acceptance, demonstrating that they prefer to remain in an interaction rather than initiate a new interaction. Passive acceptance was most likely to be followed by passive engagement for all children, and was unlikely to be followed by alone directed or unoccupied behavior. Thus once children were passively accepted, they tended to continue engaging in the interaction passively. In response to negative treatment, children attempt to remedy the situation by entry seeking after exclusion or engaging others after victimization. Once they have been accepted by a group, they prefer to remain with peers and continue to engage them.

AS children's response to peer treatment could be the result of high levels of social anxiety, and could also influence the subsequent opportunities they have to confirm or disconfirm their social fears. Although AS children were not significantly more likely than control children to exhibit any specific behavioral response to any of the peer treatments, the behaviors that control children exhibited (and therefore AS children were unlikely to exhibit) are of interest.

Control children's responses to peer maltreatment, in particular exclusion, demonstrate that they may have a more constructive response than AS children. Control children were more likely than AS children to be actively engaged with peers following exclusion, suggesting that exclusion does not prevent them from subsequently engaging with peers. When AS children are excluded they may believe that peers are specifically

and intentionally ignoring them, thus they find exclusion (which is a confirmation of their social fears) very distressing. In contrast, when control children are excluded they may believe that peers are simply preoccupied with their activity, thus there is nothing specific to them that would inhibit them from subsequently joining in. Control children were more likely to respond to exclusion with onlooking, perhaps because this behavior serves to segue into peer interaction, thus it was the first step of finding a group of peers with whom to engage. Control children also responded to exclusion with directed solitary behavior, which preceded exclusion as well, thus some control children may simply be engaged in solitary activity, and as a result be ignored by peers, without being upset by this process. Alternatively, control children may be better than AS children at using directed behavior as a distraction from the distress caused by exclusion. There were no group differences in child behavior following victimization, demonstrating that both AS and control children respond in similar ways to direct verbal and physical maltreatment.

As with negative peer treatment, AS children were not more likely to exhibit any responses to positive peer behavior. However, control children's responses to positive peer treatment may give insight into how they behave following acceptance. Control children were more likely than AS children to be onlooking in response to active acceptance. Because AS children are alone more often, their onlooking may be more likely to be preceded by some type of solitude rather than interaction. In contrast, control children spend more time engaging with others, thus their infrequent onlooking may simply be more likely to follow active acceptance because they display it at higher frequencies. It is also possible that when control children respond to active acceptance

with onlooking behavior it may be an attempt to transition to a different group. Control children were more likely than AS children to respond to passive acceptance with onlooking behavior, possibly because they are less satisfied with this type of interaction than AS children might be, and therefore prefer to return to onlook another group in seek of more active engagement. They may also be more likely to respond with onlooking because they may make a slower transition into solitude, therefore passive acceptance is a transitional phase of leaving group interaction. This difference coincides with the child behavior sequence suggesting that control children were more likely to transition between passive engagement and onlooking. Although control children were more likely to be onlooking after active and passive acceptance, it may be due to their higher frequency of acceptance or different methods of transitioning between interactions.

Gender

All of the gender differences in this study occurred for victimization and entry seeking. Girls were more likely to be victimized following active acceptance and engagement, as well as following and concurrent to passive engagement with peers. Overall prevalence rates suggested that boys were more victimized than girls, but behavioral sequences of victimization also differed for boys and girls. Boys were more likely to be victimized in response to onlooking, perhaps because onlooking is a greater violation of gender norms. They were also victimized in response to entry seeking, suggesting that they may be more susceptible to victimization when they are initiating interactions with peers. Thus boys' victimization may occur in response to behaviors which may annoy peers and lead to aggressive responses. In response to victimization,

boys were more likely to seek entry and engage with peers, and were more actively accepted following victimization. Boys seem to respond actively to victimization and are able to either repair relations with the bully or find new peers to interact with. However, boys were also more likely than girls to be victimized before and after exclusion, thus while some boys were able to repair relations with peers, others may experience ongoing maltreatment in the form of alternating exclusion and victimization.

Girls may be the victims of aggression that is initiated by peers, which occurs within the course of an interaction, or girls may be more likely to exhibit behavior within an interaction that makes them susceptible to victimization. Girls were also more likely to be continuously passively engaged with peers throughout the victimization, thus they may initiate less conversation and appear more submissive to peers in the context of an interaction (Schwartz et al., 1993). This passive acceptance of victimization could contribute to the higher rates of internalizing symptoms in girls (Albano & Krain, 2005). Girls were also more likely than boys to experience continuous intervals of victimization. Perhaps since their victimization occurs within the context of an interaction, it occurs for longer durations than that of boys.

Boys and girls also experienced different sequences of entry seeking which suggest that boys are more likely to receive negative responses to an attempt to enter interactions. Boys were more likely than girls to be excluded in response to and concurrent to entry seeking, and more likely to be alone directed after entry seeking. Boys may have more difficulty joining in to a group of their peers, and therefore often return to solitary directed play rather than continue facing negative treatment. In

contrast, girls were more likely to be actively accepted and actively and passively engaged following entry seeking, thus were more likely than boys to obtain interaction after seeking entry. Girls may have better social skills that enable them to more successfully enter a group, or they may be better at assessing which peers may be most welcoming. Alternatively, boys may often enter a group by seamlessly joining in to a larger group, thus may have less success when they have to make an explicit entry attempt. Although previous evidence does suggest that boys are more likely to engage in group activities, whereas girls interact in dyads (Maccoby, 1990), the effect of group size was not tested in this investigation. Boys may have a harder time entering groups and experience longer durations of multiple maltreatments, whereas girls are better able to enter interactions but also experience victimization within these interactions.

Contributions and Limitations

This study provides useful information about the processes of peer treatment and how they differ for AS and control children. By observing children's free play behavior at recess with familiar peers, it provides useful insight with high external validity. Previous studies that have used observations to investigate solitary play have focused on preschool aged children, so this investigation provides important evidence about the peer relations of AS children in middle childhood. Previous work has often neglected peer behavior, whereas this study adds to the literature by investigating sequences and contingencies between AS children and their peers. Although observational evidence has addressed the frequency and duration of AS children's behavior, there has been little work on sequential processes, thus this study offers new insight in the processes of

interaction between children and their peers. Clearly this methodology provides new evidence about how AS children in middle childhood engage in different play behavior than their non-AS peers, and the contingencies under which this behavior functions.

The live observations did impose restrictions on the coding system that provide some limitations for the interpretation of the results. By using an interval scale, observers were limited to coding one behavior per 30 seconds. All behaviors that occurred within the interval were not necessarily coded, thus many of the more minute sequences within the interval may have been lost. However, interval data allowed for tracking of behavioral sequences across intervals, therefore captured processes over longer durations of time. The interval data also made the interpretation of concurrent relations between behaviors somewhat difficult, because it is impossible to determine the sequence in which the child and peer behavior occurred within the interval. One can only hypothesize about which behavior occurred first within the 30 seconds. Additionally, the live coding restricted the amount of information that could be gathered about the peers. Therefore, it was impossible to determine whether the target child was interacting with the same or different peers within and across intervals. In future studies, recording the onset and offset time for each behavior and allowing multiple behaviors to co-occur would allow for a more detailed assessment of these processes. Although this type of detailed breakdown of behavior is difficult in live observations, videotaping a play session could allow researchers to code all behavior for both the target child and the peers and identify the specific peers with whom the child interacts. However, videotaped play sessions often take place in contrived contexts, thus lose the external validity that live

observations offer. Therefore, this study provides valuable information about how children interact with their familiar peers on a day to day basis.

Conclusions

These results demonstrate that AS and control children exhibit and experience similar behaviors, but at different frequencies, durations, and sequences, and functioning in the context of different contingencies. Sequential relations between child and peer behavior demonstrated that although AS children and their peers received maltreatment in response to similar behavior, AS children were often treated poorly concurrent to a behavior, whereas control children were given time before they were actually maltreated. However, there were also specific child behaviors that led to maltreatment for control, but not AS, children. Evidence from children's interactive behavior demonstrated that AS children tended to move away from, rather than toward interaction with peers. They also had a more difficult time obtaining group entry, as they needed to make overt entry attempt before being accepted, in comparison to control children who enter interaction more seamlessly. Thus the interaction between child and peer contingencies led AS children to be more maltreated and this may over time contribute to anxiety and internalizing symptoms, as well as further peer difficulties.

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APPENDIX. TABLES AND FIGURES

Table 1

Intercorrelations Among All Variables

	Child sex	Peer sociometrics				Observed child behavior							Observed peer treatment			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
M	-0.18	0.74	0.37	0.27	-0.15	0.12	0.05	0.05	0.51	0.12	0.09	0.01	0.22	0.02	0.51	0.19
SD	0.99	1.32	1.23	1.01	0.89	0.15	0.07	0.09	0.20	0.11	0.07	0.03	0.19	0.03	0.21	0.14
1 Child sex (male =1, female = -1)	1.00															
Peer sociometrics																
2 Anxious solitude	0.01	1.00														
3 Exclusion	0.18 *	0.66 ***	1.00													
4 Victimization	0.19 *	0.55 ***	0.86 ***	1.00												
5 Acceptance	-0.16 *	-0.48 ***	-0.67 ***	-0.57 ***	1.00											
Observed child behavior																
6 Alone directed	-0.03	0.16 *	0.18 *	0.14 †	-0.20 *	1.00										
7 Alone onlooking	-0.04	0.27 ***	0.23 **	0.12	-0.31 ***	0.03	1.00									
8 Alone unoccupied	0.08	0.28 ***	0.31 ***	0.28 ***	-0.22 **	0.17 *	0.16 *	1.00								
9 Active engagement	-0.07	-0.27 ***	-0.28 ***	-0.22 **	0.32 ***	-0.67 ***	-0.38 ***	-0.50 ***	1.00							
10 Passive engagement	0.03	0.11	-0.07	-0.07	0.05	-0.19 *	0.03	-0.09	-0.20 *	1.00						
11 Entry seeking	0.02	-0.19 *	-0.07	-0.04	0.07	0.09	0.01	-0.07	-0.21 **	-0.29 ***	1.00					
12 Aggression	0.01	-0.05	0.06	0.04	-0.08	-0.14 †	-0.16 *	-0.07	0.02	0.00	-0.07	1.00				
Observed peer treatment																
13 Exclusion	0.04	0.34 ***	**0.36 *** **	0.29 ***	-0.38 ***	0.77 ***	0.43 ***	0.60 ***	-0.82 ***	-0.17 *	0.08	-0.14 †	1.00			
14 Victimization	0.23 **	0.02	0.31 ***	**0.27 *** **	-0.25 **	0.02	0.00	-0.02	-0.13 †	-0.01	0.00	0.25 ***	0.00	1.00		
15 Active acceptance	-0.12	-0.31 ***	-0.34 ***	-0.25 **	**0.39 *** **	-0.48 ***	-0.36 ***	-0.50 ***	0.78 ***	-0.29 ***	0.06	0.01	-0.71 ***	-0.22 ***	1.00	
16 Passive acceptance	0.02	-0.02	-0.03	-0.03	0.01	-0.34 ***	0.01	-0.08	-0.01	0.74 ***	-0.24 **	0.09	-0.27 ***	0.09	-0.39 ***	1.00

Note. $N = 163$. ***$p < .001$. **$p < .01$. *$p < .05$. †$p < .10$. Correlations for sociometric nominations and corresponding observed peer treatments are in bold.

Table 2

Peer Interaction Observation System: Child and Peer Behavior

Actor	Behavior	Operational definition	*M* (%)	κ
Child	Alone directed	Engaged in a solitary activity	12	0.87
	Alone onlooking	Solitary but within 10 feet of peers, focusing on them without joining in	5	0.90
	Alone unoccupied	Solitary and not engaged in purposeful activity	5	0.86
	Active with others	Engaging with peers in active give and take of verbal or gestural communication	51	0.92
	Passive with others	Engaging in the same activity as peers without actively interacting	12	0.87
	Entry seeking	Joining in to an activity with peers or initiating or changing an ongoing activity	9	0.95
	Aggression	Physical or verbal behavior intented to hurt another child	1	1.00
Peers	Exclusion	Ignoring, not acknowledging, or explicitly leaving out the target	22	0.88
	Victimization	Verbally teasing, physically aggressing, rejecting, or negatively approaching the target	2	0.98
	Active acceptance	Actively interacting with give and take of verbal or gestural communication, or positively approaching the target	51	0.80
	Passive acceptance	Allowing the target to participate in an activity without actively engaging with him or her	19	0.86

Note. N = 163, all children observed for a total of 25 minutes. Only codes relevant to current analyses are presented. M = mean percent of intervals in which behavior was observed. κ = Cohen's kappa.

Table 3

Direction of Significant Adjusted Residuals for Each Child Behavior Preceding and Following Every Other Child Behavior

	Target child behavior													
	Directed		Onlooking		Unoccupied		Active Others		Passive Others		Entry Seeking		Aggression	
Lag	-1	1	-1	1	-1	1	-1	1	-1	1	-1	1	-1	1
Given child behavior														
Alone directed	+	+												
Alone onlooking			+	+										
Alone unoccupied			+	+	+	+								
Active with others	-	-	-	-	-	-	+	+						
Passive with others	-	-			-		-	-	+	+				
Entry seeking			+		+		-	-	-		+	+		
Aggression							-						+	+

Note. $N = 163$. All p s $< .05$. A + indicates that the child behavior was more likely that expected by chance given the occurrence of the other child behavior. A - indicates that the child behavior was signficantly less likely than expected by chance given the other behavior. Lag 0 was not tested because identical given and target behaviors always co-occur concurrently. The top right and bottom left triagles are mirror images, thus the directions are only reported for the relations in the bottom left half of the table. Adjusted residuals are useful for establishing direction of effect, however because they are strongly affected by cell size they are not useful for establishing the magnitude of the effect size. Therefore they are not presented in this table.

Table 4

Between Group Comparison for Each Observed Child Behavior Preceding and Following Every Other Given Child Be

	Control			Anxious solitary			Between groups
Lag	*Observed*	*Expected*	*Yule's Q*	*Observed*	*Expected*	*Yule's Q*	*F*
Alone directed							
Alone Directed							
1/-1	131	25.14	**0.92**	88	25.64	0.84	4.02 *
Alone onlooking							
-1	10	8.23	**0.12**	13	13.55	-0.03	10.59 **
1	7	7.23	-0.02	15	13.81	**0.05**	4.64 *
Alone unoccupied							
-1	13	9.49	0.19	15	13.55	0.07	3.42 †
1	7	8.49	-0.11	22	15.02	0.25	2.80 †
Active engagement							
-1	41	132.69	-0.76	32	76.20	-0.62	1.82
1	29	121.00	-0.82	21	76.32	-0.75	3.72 †
Passive engagement							
-1	15	27.66	-0.35	10	22.00	-0.45	2.76 †
1	7	26.09	-0.64	12	22.46	-0.37	2.16
Entry seeking							
-1	26	25.60	0.01	9	12.24	-0.19	0.15
1	34	21.48	0.29	13	15.78	-0.12	0.01
Aggression							
-1	0	1.71	-1.00	0	1.02	-1.00	0.06
1	2	1.89	0.03	0	1.37	-1.00	0.41
Alone onlooking							
Alone onlooking							
1/-1	17	2.37	**0.84**	24	7.30	0.68	7.61 **
Alone unoccupied							
-1	8	2.73	0.55	11	7.30	0.25	0.82
1	8	2.78	0.54	11	7.94	0.20	3.16 †
Active engagement							
-1	17	38.15	-0.60	18	41.03	**-0.57**	4.61 *
1	20	39.60	**-0.54**	14	40.33	-0.65	10.59 **
Passive engagement							
-1	8	7.95	0.00	12	11.85	0.01	3.11 †
1	6	8.54	-0.20	12	11.87	**0.01**	8.74 **
Entry seeking							
-1	10	7.36	0.18	10	6.59	0.25	2.20
1	9	7.03	0.14	16	8.34	**0.40**	4.32 *
Aggression							
-1	0	0.49	-1.00	0	0.55	-1.00	1.60
1	1	0.62	0.25	0	0.72	-1.00	1.18
Alone unoccupied							
Alone unoccupied							
1/-1	29	3.20	0.91	40	7.94	0.86	3.13 †
Active engagement							
-1	17	44.78	-0.66	16	44.64	-0.65	1.94
1	13	45.65	-0.75	7	40.33	-0.83	1.52
Passive engagement							
-1	9	9.33	-0.02	5	12.89	-0.50	0.07
1	4	9.84	-0.46	5	11.87	-0.46	0.02
Entry seeking							
-1	9	8.64	0.02	2	7.17	-0.60	0.13
1	14	8.10	0.32	13	8.34	0.27	0.10
Aggression							
-1	0	0.58	-1.00	0	0.60	-1.00	2.10
1	0	0.71	-1.00	0	0.72	-1.00	0.54
Active engagement							
Active engagement							
1/-1	835	638.55	0.66	347	226.78	0.72	1.72
Passive engagement							
-1	102	133.10	-0.28	69	65.48	0.05	0.08
1	120	137.66	-0.16	59	66.73	-0.12	0.77
Entry seeking							
-1	108	123.20	-0.15	32	36.42	-0.12	1.51
1	89	113.34	-0.26	39	46.89	-0.17	1.52
Aggression							
-1	8	8.25	-0.03	4	3.04	0.27	0.50
1	7	9.96	-0.32	1	4.06	-0.74	1.45
Passive engagement							
Passive engagement							
1/-1	86	28.69	0.70	45	19.27	0.58	0.00
Entry seeking							
-1	21	26.56	-0.14	13	10.72	0.12	1.79
1	13	23.62	-0.34	6	13.54	-0.44	0.21
Aggression							
-1	2	1.78	0.07	0	0.89	-1.00	0.28
1	1	2.07	-0.38	3	1.17	0.54	0.75
Entry seeking							
Entry seeking							
1/-1	40	21.87	0.39	16	7.53	0.45	1.81
Aggression							
-1	0	1.46	-1.00	0	0.63	-1.00	2.20
1	4	1.92	0.41	0	0.65	-1.00	2.00
Aggression							
Aggression							
1/-1	3	0.13	0.94	3	0.05	0.99	0.49

Note. *N* (Control) = 105, *N* (AS) = 58. Lag = number of intervals prior to (-) or following (+) peer treatment, which occurred at lag 0. Observed = observed frequency. Expected = expected frequency. ***p < .001. **p < .01. *p < .05. †p < .10. Bolded Yule's *Q*s are the value for the group that was significantly more likely to exhibit the sequence.

Table 5

Direction of Significant Adjusted Residuals for Each Peer Treatment Preceding and Following Every Other Peer Treatment

	Target peer behavior							
	Exclusion		Victimization		Act. Accept		Pass. Accept	
Lag	-1	1	-1	1	-1	1	-1	1
Given peer behavior								
Exclusion	+	+						
Victimization			+	+				
Active acceptance	-	-	-		+	+		
Passive acceptance	-	-			-	-	+	+

Note. $N = 163$. All ps $< .05$. A + indicates that the peer behavior was more likely that expected by chance given the occurrence of the other peer behavior. A - indicates that the peer behavior was signficantly less likely than expected by chance given the other behavior. Lag 0 was not tested because identical given and target behaviors always co-occur concurrently. The top right and bottom left triagles are mirror images, thus the directions are only reported for the relations in the bottom left half of the table. Adjusted residuals are useful for establishing direction of effect, however because they are strongly affected by cell size they are not useful for establishing the magnitude of the effect size. Therefore they are not presented in this table.

Table 6

Between Groups Comparison for Each Observed Peer Treatment Preceding and Following Every Other Given Peer Treatment

	Control			Anxious solitary			Between groups
Lag	*Observed*	*Expected*	*Yule's Q*	*Observed*	*Expected*	*Yule's Q*	*F*
Exclusion							
Exclusion							
1/-1	204	66.76	**0.83**	225	108.03	0.80	8.15 **
Victimization							
-1	6	6.55	-0.05	4	7.63	-0.40	2.96 †
1	8	6.64	**0.12**	7	8.54	-0.14	5.27 *
Active acceptance							
-1	112	214.65	**-0.60**	71	152.28	-0.64	6.14 *
1	96	204.12	**-0.64**	66	151.67	-0.67	6.37 *
Passive acceptance							
-1	42	74.04	-0.37	37	65.31	-0.41	0.91
1	33	67.98	-0.45	38	64.39	-0.39	0.35
Victimization							
Victimization							
1/-1	5	0.65	0.82	4	0.60	0.80	1.47
Active acceptance							
-1	18	21.35	-0.18	12	12.04	0.00	2.44
1	16	20.02	-0.22	7	10.71	-0.32	1.50
Passive acceptance							
-1	5	7.36	-0.23	3	5.17	-0.31	1.43
1	8	6.67	0.12	6	4.55	0.18	1.41
Active acceptance							
Active acceptance							
1/-1	827	656.30	0.60	319	213.80	0.66	0.35
Passive acceptance							
-1	169	226.37	-0.34	73	91.69	-0.22	3.00 †
1	157	218.58	-0.37	68	90.77	-0.27	2.49
Passive acceptance							
Passive acceptance							
1/-1	176	75.39	0.68	91	38.93	0.67	1.90

Note. *N* (Control) = 105, *N* (AS) = 58. Lag = number of intervals prior to (-) or following (+) peer treatment, which occurred at lag 0. Observed = observed frequency. Expected = expected frequency. ***p < .001. **p < .01. *p < .05. †p < .10. Bolded Yule's *Q*s are the value for the group that was significantly more likely to exhibit the sequence.

Table 7

Direction of Significant Adjusted Residuals for Each Child Behavior Given Each Peer Treatment

	Target child behavior																							
	Directed			Onlooking			Unoccupied			Active Others			Passive Others			Entry Seeking			Aggression		
Lag	-1	0	1	-1	0	1	-1	0	1	-1	0	1	-1	0	1	-1	0	1	-1	0	1
Given peer behavior																					
Exclusion	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-			+	-		
Victimization											+	+					+		+	+	+
Active acceptance	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-		+	-		-	
Passive acceptance	-	-	-		-		-	-	-		-		+	+	+		-	-			

Note. $N = 163$. All p s < .05. A + indicates that the child behavior is more likely that expected by chance given the occurrence of the peer behavior. A - indicates that the child behavior is signficantly less likely than expected by chance given the peer behavior. Adjusted residuals are useful for establishing direction of effect, however because they are strongly affected by cell size they are not useful for establishing the magnitude of the effect size. Therefore they are not presented in this table.

Table 8

Between Groups Comparison of Each Observed Child Behavior Preceding, Concurrent To, and Following Each Given Peer Treatment

	Control			Anxious solitary			Between groups
Lag	*Observed*	*Expected*	*Yule's Q*	*Observed*	*Expected*	*Yule's Q*	*F*
Exclusion							
Alone directed							
-1	129	40.02	**0.80**	113	53.71	0.69	5.10 *
0	231	50.55	**0.95**	189	66.60	0.93	4.79 *
1	139	41.94	**0.82**	112	51.57	0.72	4.97 *
Alone onlooking							
-1	33	13.10	**0.61**	49	28.38	0.47	15.09 ***
0	79	15.73	0.96	112	35.29	**0.98**	11.66 **
1	33	12.06	**0.65**	53	27.77	0.56	7.46 **
Alone unoccupied							
-1	48	15.10	0.75	64	28.38	0.71	2.25
0	88	17.50	0.96	111	36.52	0.95	1.72
1	41	14.16	0.68	67	30.21	0.70	1.23
Active engagement							
-1	81	211.19	-0.73	69	159.61	-0.68	3.10 †
0	5	256.13	-0.99	3	196.72	-0.99	3.54 †
1	62	201.85	**-0.79**	40	153.50	-0.83	6.29 *
Passive engagement							
-1	31	44.02	-0.23	27	46.08	-0.38	1.90
0	4	54.80	-0.90	3	57.70	-0.94	0.68
1	20	43.52	-0.45	29	45.17	-0.32	1.55
Entry seeking							
-1	51	40.75	0.16	26	25.63	0.01	0.20
0	48	47.20	0.01	26	35.91	-0.23	0.35
1	61	35.83	0.37	41	31.74	0.21	0.10
Aggression							
-1	0	2.73	-1.00	0	2.14	-1.00	0.49
0	6	3.71	0.30	1	2.76	-0.56	0.71
1	3	3.15	-0.03	1	2.75	-0.56	0.72
Victimization							
Alone directed							
-1	7	3.98	**0.32**	4	4.25	-0.04	4.80 *
0	4	5.01	**-0.13**	1	4.64	-0.69	4.11 *
1	6	4.11	0.22	1	3.64	-0.61	1.97
Alone onlooking							
-1	1	1.30	-0.14	2	2.24	**-0.06**	6.74 *
0	2	1.56	**0.13**	0	2.46	-1.00	10.12 **
1	0	1.18	-1.00	0	1.96	-1.00	1.94
Alone unoccupied							
-1	2	1.50	0.15	0	2.24	-1.00	0.84
0	1	1.73	-0.28	1	2.54	-0.46	1.08
1	1	1.39	-0.17	2	2.13	-0.04	0.25
Active engagement							
-1	16	21.01	-0.26	12	12.62	-0.05	1.89
0	14	25.39	-0.48	8	13.70	-0.40	2.47
1	16	19.80	-0.21	7	10.84	-0.33	1.83
Passive engagement							
-1	3	4.38	-0.21	2	3.64	-0.33	2.44
0	3	5.43	-0.32	3	4.02	-0.17	3.71 †
1	4	4.27	-0.04	6	3.19	0.38	2.94 †
Entry seeking							
-1	5	4.05	**0.12**	1	2.03	-0.36	5.19 *
0	6	4.68	0.14	9	2.50	**0.66**	4.17 *
1	4	3.51	0.07	5	2.24	0.45	1.34
Aggression							
-1	1	0.27	0.60	2	0.17	0.89	0.23
0	7	0.37	0.94	3	0.19	0.92	0.92
1	2	0.31	0.77	2	0.19	0.87	0.03

Note. *N* (Control) = 105, *N* (AS) = 58. Lag = number of intervals prior to (-) or following (+) peer treatment, which occurred at lag 0. Observed = observed frequency. Expected = expected frequency. ***p < .001. **p < .01. *p < .05. †p < .10. Bolded Yule's *Q* s are the value for the group that was significantly more likely to exhibit the sequence.

Table 8 (cont.)

Between Groups Comparison of Each Observed Child Behavior Preceding, Concurrent To, and Following Each Given Peer Treatment

	Control			Anxious solitary			Between groups
Lag	*Observed*	*Expected*	*Yule's Q*	*Observed*	*Expected*	*Yule's Q*	*F*
Active acceptance							
Alone directed							
-1	58	122.36	-0.60	39	75.41	-0.51	3.72 †
0	16	159.94	-0.93	12	92.49	-0.89	3.80 †
1	70	134.86	-0.56	35	72.7	-0.54	3.45 †
Alone onlooking							
-1	22	40.05	-0.49	22	39.85	**-0.44**	12.38 **
0	4	49.77	**-0.93**	1	49.01	-0.98	10.16 **
1	20	38.77	**-0.53**	18	39.15	-0.54	5.76 *
Alone unoccupied							
-1	22	46.16	-0.57	16	39.85	-0.60	1.92
0	2	55.36	-0.97	3	50.72	-0.94	1.73
1	22	45.51	-0.57	16	42.59	-0.63	1.32
Active engagement							
-1	792	645.74	0.53	309	224.08	**0.55**	5.51 *
0	1212	810.34	0.90	501	273.2	0.91	2.65
1	807	649.00	0.56	324	216.38	0.67	0.09
Passive engagement							
-1	90	134.60	-0.40	61	64.7	-0.06	0.01
0	20	173.36	-0.92	23	80.13	-0.73	0.34
1	100	139.91	-0.35	50	63.67	-0.22	0.04
Entry seeking							
-1	124	124.59	-0.01	33	35.99	-0.08	1.64
0	169	149.32	0.17	57	49.87	0.13	0.16
1	97	115.19	-0.20	41	44.74	-0.08	1.42
Aggression							
-1	8	8.34	-0.05	5	3.00	0.54	0.50
0	0	11.74	-1.00	2	3.84	-0.45	1.46
1	10	10.11	-0.01	1	3.87	-0.72	1.42
Passive acceptance							
Alone directed							
-1	12	40.75	-0.63	12	32.01	-0.55	0.60
0	6	54.37	-0.85	2	40.26	-0.93	1.05
1	12	46.51	-0.67	12	31.18	-0.54	0.93
Alone onlooking							
-1	10	13.34	**-0.18**	12	16.92	-0.21	7.63 **
0	2	16.92	**-0.83**	1	21.33	-0.93	5.37 *
1	13	13.37	**-0.02**	14	16.79	-0.12	4.18 *
Alone unoccupied							
-1	5	15.37	-0.57	9	16.92	-0.37	0.22
0	2	18.82	-0.84	0	22.08	-1.00	0.50
1	14	15.70	-0.07	8	18.26	-0.47	0.66
Active engagement							
-1	204	215.06	-0.07	104	95.13	**0.10**	5.61 *
0	155	275.45	-0.55	87	118.92	**-0.30**	4.29 *
1	209	223.85	-0.09	104	92.79	0.13	1.97
Passive engagement							
-1	111	44.83	0.66	51	27.47	0.46	0.23
0	272	58.93	0.97	149	34.88	0.95	1.02
1	117	48.26	0.65	54	27.3	0.51	0.38
Entry seeking							
-1	32	41.49	-0.17	18	15.28	0.11	3.06 †
0	37	50.76	-0.20	21	21.71	-0.02	1.62
1	30	39.73	-0.18	12	19.19	-0.29	1.12
Aggression							
-1	5	2.78	0.38	0	1.27	-1.00	0.47
0	6	3.99	0.26	1	1.67	-0.29	1.42
1	2	3.49	-0.32	4	1.66	0.56	1.15

Note. *N* (Control) = 105, *N* (AS) = 58. Lag = number of intervals prior to (-) or following (+) peer treatment, which occurred at lag 0. Observed = observed frequency. Expected = expected frequency. ***p < .001. **p < .01. *p < .05. †p < .10. Bolded Yule's *Q* s are the value for the group that was significantly more likely to exhibit the sequence.

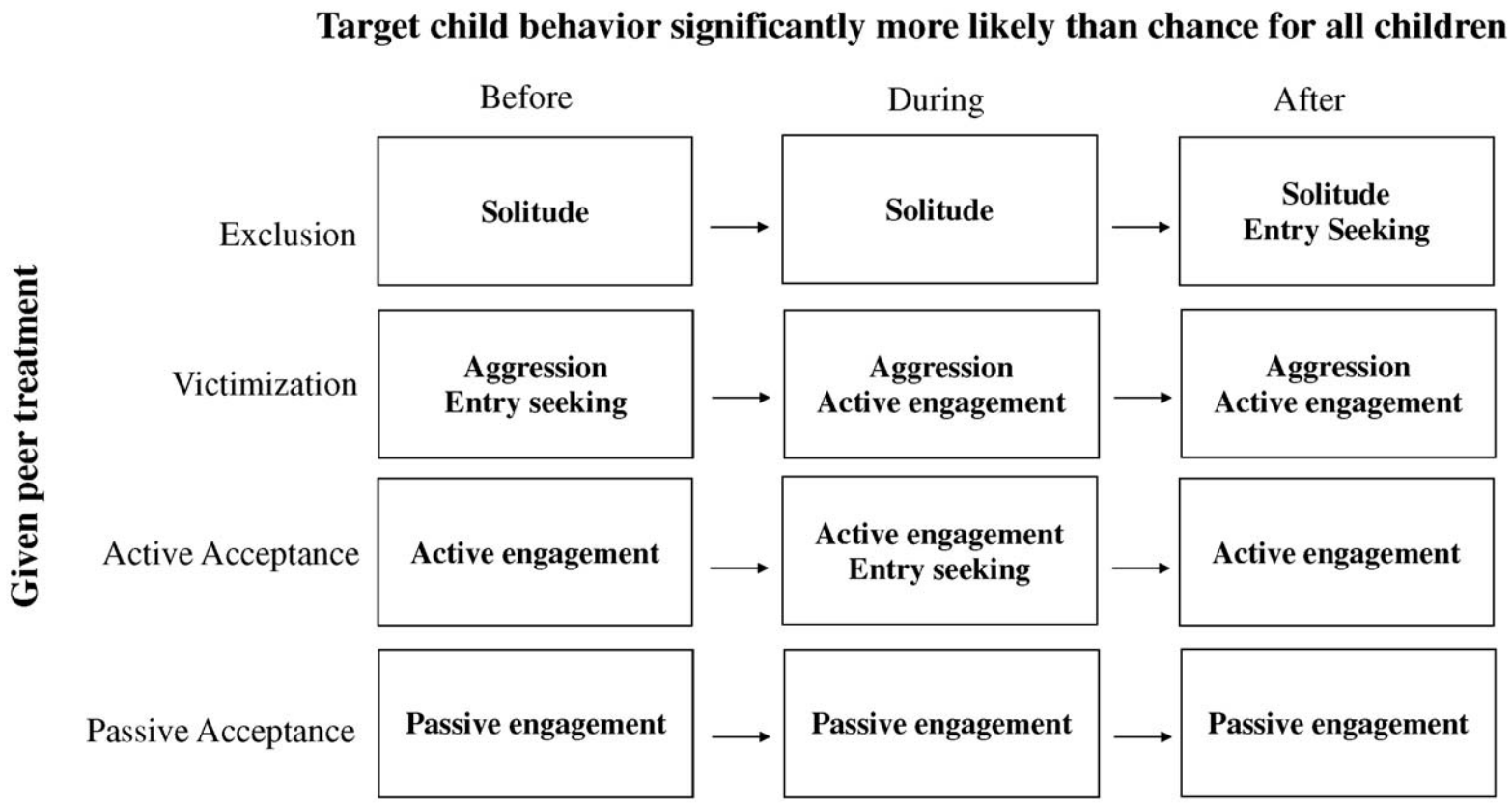

Figure 1. Child Behavior that was Significantly More Likely Than Chance to Occur Before, During, and After Each Given Peer Treatment for All Children. Behaviors that were significantly less likely than chance are not presented in this figure.

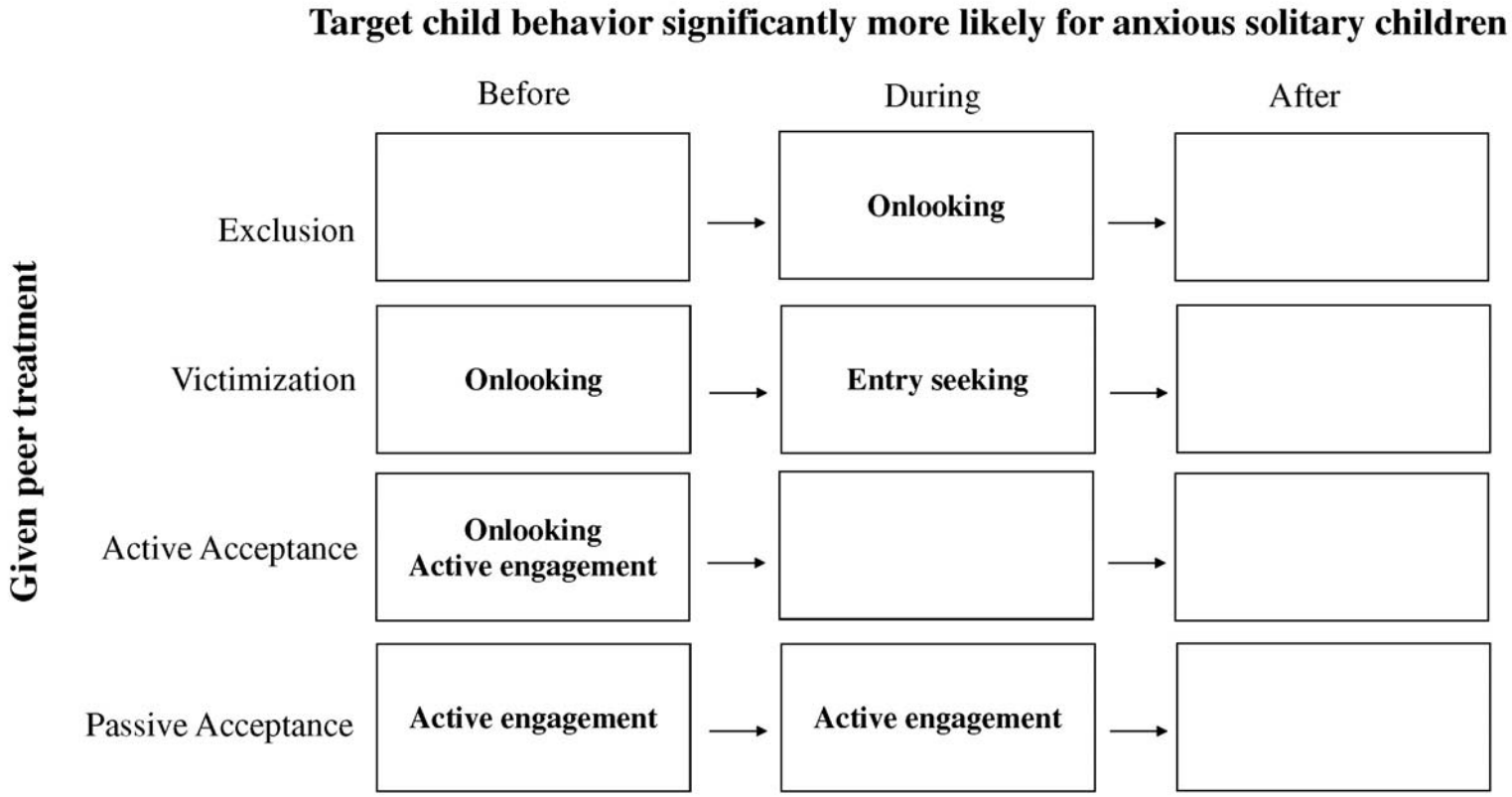

Figure 2. Child Behavior that was Significantly More Likely for Anxious Solitary versus Control Children to Occur Before, During, and After Each Given Peer Treatment. Empty boxes demonstrate that anxious solitary children were not significantly more likely than control children to exhibit a specific behavior in relation to the peer treatment.

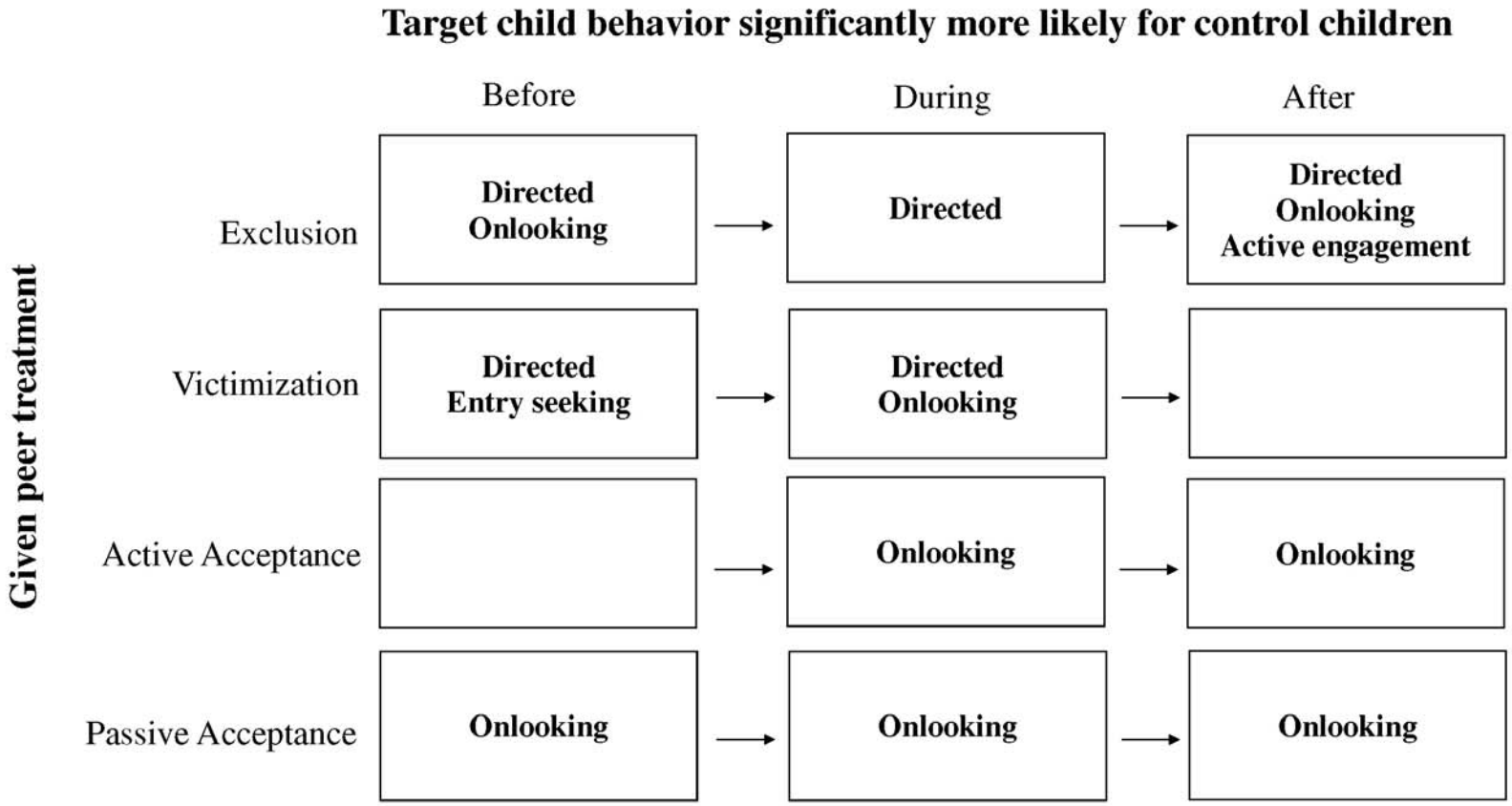

Figure 3. Child Behavior that was Significantly More Likely for Control versus Anxious Solitary Children to Occur Before, During, and After Each Given Peer Treatment. Empty boxes demonstrate that control children were not significantly more likely than anxious solitary children to exhibit a specific behavior in relation to the peer treatment.