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Assessment of Social Competence of Boys with Attention-Deficit/Hyperactivity Disorder: Problematic Peer Entry, Host Responses, and Evaluations

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Abstract Anecdotally and empirically, there is clear evidence that children with the Combined subtype of Attention-deficit/Hyperactivity Disorder (ADHD) experience disturbed peer relations, yet the field has not clearly established the origin of these difficulties. This is the first known investigation to examine the role of peer entry as a means to determine the social competence of boys with ADHD as they joined lab-based games played by age-mates who were good friends but unfamiliar with entry boys. Observational data of entry boys and their hosts, plus coders' ratings, indicate that 7- to 12-year-old boys with and without ADHD did not differ in the use of competent entry strategies known to lead to acceptance by peers. However, boys with ADHD relied more heavily on incompetent entry strategies (e.g., disruptive attention-getting) known to exacerbate negative peer reputation. In addition, they failed to apply a frame-of-reference that was relevant to host boys' ongoing activity. As such, host boys considered boys with ADHD less likeable as they spent more time with them. This pattern of findings has theoretical implications and informs the foci of social skills interventions for children with ADHD.

Keywords ADHD · Peer entry · Social competence

Having friends, especially those with prosocial attributes, is developmentally advantageous throughout the lifespan (Hartup and Stevens 1997). Quality friendships are indicative of children's developmental mastery and serve as a protective factor for those at risk for concurrent and future difficulties. Unfortunately, not all children have friends. Indeed, some are considered objectionable playmates, and are actively disliked or rejected by peers.

This is especially the case for children with Attention-deficit/Hyperactivity Disorder (ADHD) (Hoza et al. 2005). Many of these children have few friends, tend to play with others much younger than themselves, and are frequently nominated by classmates as least-liked. In fact, Pelham and Bender (1982) provided early evidence that children with ADHD can turn-off unfamiliar peers within minutes of first contact. These peer problems are often so pervasive, escalating, and durable that some have suggested the presence of disturbed peer relations of children with ADHD should be among the diagnostic criteria for the disorder (Erhardt and Hinshaw 1994). In response, experts now assert that evidence-based assessment of ADHD must include focus on the referred child's functioning in the peer group (Pelham et al. 2005).

Interestingly, controversy exists regarding whether children with ADHD demonstrate a veritable skill deficit in their social functioning or a performance deficit (King et al. 2009; Huang-Pollock et al. 2009). The question is: "Are the social problems of children with ADHD due to limited knowledge of age-appropriate social skills (i.e., they do not know how to make and keep friends) or the inability to effectively and efficiently implement extant skills in the moment (i.e., they have a performance deficit)?" Barkley's Unifying Theory (Barkley 1997) suggests the latter. However, since it is difficult to imagine appropriate performance in the absence of adequate skill development (i.e., knowledge is necessary but not sufficient), the skill- versus performance debate may represent a false choice that constrains our understanding of children's disturbed peer relations. Instead, the complexity of social problems may

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be clarified if one invokes the multidimensional view represented by the *social competence* construct.

Social competence has been operationalized in numerous ways involving a variety of measures. In the present study, social competence was considered from the theoretical perspective suggested by Dirks et al. (2007). Specifically, the construct of social competence goes well beyond "social skillfulness." It is an evaluative term representing the confluence of child characteristics (e.g., reputation or social status), the child's social behavior, the context, plus an appropriate *match* between the child's behavior and the situation. To be considered competent, the child's interpersonal behavior must *fit* ongoing circumstances as judged by others. As such, assessment of children's social competence must invoke an external standard (e.g., perceptions of peers) regarding the child's ability to behave in ways that are consistent with what others are doing (Dirks et al. 2007). In the current study, the social competence of boys with ADHD was assessed by virtue of their observed behavior, observed peer responses to that behavior, performance ratings by coders, as well as perceived likeability ratings from peers. In addition, boys' behavioral match with ongoing peer behavior was evaluated in a manner consistent with Putallaz's (1983) notion of frame-of-reference (i.e., the ability to converse and behave consistent with the norms of others' on-going activity).

What is known about the social competence of children with ADHD? In spite of considerable evidence that their social behavior is immature and annoying, the field has yet to identify the causal processes underlying these peer problems (Hoza 2007). To better understand how a child's rejected peer status may develop, there is a need for research that examines *initial* peer interactions, or peer entry, of children with ADHD prior to the onset of negative reputation. In this way, the child's social behavior can be disentangled from social history and social status. Peer entry involves the necessary first ingredient, or gateway, to the development of positive peer relationships. It includes the verbal and nonverbal behaviors that children use to approach and gain access to ongoing social activities (Dodge et al. 1983; Putallaz and Wasserman 1990). Children who demonstrate successful peer entry not only join the peer group, but are also afforded subsequent opportunity for continued peer interaction. Children who fail to evince successful peer entry are often denied access to the peer group, experience reduced opportunity for peer interactions, and are at-risk for unfavorable peer reputation (Putallaz and Wasserman 1990; Zarbatany et al. 1996). This is the first known investigation to examine the peer entry behavior of children with ADHD.

The work of Dodge et al. (1983) provides a model of competent peer entry. Specifically, when entering a peer group, the competent child will use a sequence of entry behaviors that progresses from "low-risk" to "high-risk." Low-risk behaviors are those that tend to elicit a neutral, as opposed to a decisively positive (i.e., accepting) or negative (i.e., rejecting) response from host peers. For example, waiting and hovering (i.e., the entry child approaches the physical proximity of hosts and observes their activity, but does not speak) is a low-risk entry behavior. High-risk entry behaviors, such as asking questions (e.g., "What's your name?") or engaging in attention-getting behavior (e.g., making annoying noises), are those that elicit decisive positive or negative peer responses. The competent entry child may begin by using the low-risk behavior of waiting and hovering to gain a sense of the group's norms and expectations. While gradually moving physically closer to other children, that child then mimics the hosts' activity and makes a statement relevant to that activity. For example, if hosts are sitting at a table choosing pawns for a board game, the entry child will move toward the table, sit down, and then make a general statement such as "…looks like a fun game." Throughout the entry process, the competent child attempts to match ongoing activity by maintaining the group's frame-of-reference, and attends to hosts' responses. This is similar to the Dirks et al. (2007) goodness-of-fit component in their social competence model.

According to Dodge et al. (1983), maintaining this frame-of-reference involves conversation and behavior that is relevant, as opposed to irrelevant or tangential, to ongoing group activities. Attending to hosts' responses requires the entry child to focus on, and accurately interpret, how other children are responding to his/her entry attempts, and then respond accordingly. Additionally, the competent entry child will demonstrate agreeableness and refrain from engaging in attention-getting or other behaviors disruptive to the group's activity. The incompetent child, in contrast, does not follow the Dodge et al. (1983) model of competent peer entry. S/he abruptly engages in high-risk behaviors, fails to maintain the group's frame-of-reference (e.g., engaging in off-topic conversation), does not attend to hosts' responses, and is socially inappropriate.

Successful peer entry can be a daunting challenge for some children. Research has firmly established that children with negative social status (e.g., unpopular, rejected, or aggressive) are more likely to display incompetent entry behavior than those with more favorable status (i.e., popular) (Dodge 1983; Dodge et al. 1983; 1986; Putallaz 1983; Putallaz and Gottman 1981; Tryon and Keane 1991). Due to their hypothesized problems with behavioral disinhibition (Barkley 1997), children with ADHD may experience difficulty when entering a playgroup. Thus, the specific purpose of this investigation was to examine the strategies used by boys with ADHD when attempting to join an ongoing game being played by unfamiliar host boys. Going beyond the skill-deficit/performance-deficit dichotomy, this was accomplished using the multicompo-

nent assessment model of social competence proposed by Dirks et al. (2007). Specifically, the child's behavior, the circumstances of the situation, the fit of child behavior with that situation, and the evaluative view of judges were considered when assessing the peer entry competence of boys with and without ADHD. It is well known that peer problems may progress over time (Pelham and Bender 1982). With that in mind, it was decided to examine boys' entry strategies during two consecutive entry sessions with the same hosts. It was predicted that, across multiple measures and multiple informants, boys with ADHD, compared to those without, would emit more incompetent strategies when joining a game played by peers and would evince more incompetent entry strategies during their second attempt. Specifically, it was anticipated that observed entry behaviors, observed host responses, host ratings of entry boys' likeability, and coder-rated frame-of-reference would reveal that boys with ADHD experience problematic peer entry.

Method

Participants

Participants were 147 boys from general education ranging in age from 7 to 12 years. Based on parental reports of categorical and dimensional criteria, 49 participants served as entry boys, including 26 who met criteria for ADHD (Age M=9.81, SD=1.52) and 23 without ADHD (Age M=9.65, SD=1.19), $t(47)$=.39, p=0.70. The remaining 98 boys (Age M=9.63, SD=1.65), who were determined to be free of known behavior problems, functioned as hosts during peer entry. Boys alone were selected because ADHD is a male-dominated disorder (APA, 2000), and research suggests there is a qualitative difference in the peer entry behavior of boys and girls (Borja-Alvarez et al. 1991; see also, Levy et al. 2005). Given that psychostimulant medications can attenuate symptoms of ADHD (Fabiano et al. 2007), parents of boys receiving medication for ADHD (n=17) refrained from administering this treatment on the day of their son's research participation. Four of these 17 were prescribed a non-psychostimulant medication (i.e., Strattera).

Following approval from the university Institutional Review Board (IRB), participants were recruited from a small Midwestern community using a variety of sources, including school districts, a non-profit organization serving individuals with ADHD (i.e., CHADD), community summer programs (e.g., summer school and summer camp), advertisement in a local newspaper, and flyers posted on community information boards. To be selected for the ADHD group, a parent confirmed that his or her son had been diagnosed with the disorder, and provided ratings on Hyperactivity-Impulsivity and/or Total scales of the *ADHD Rating Scale-IV-Home Version* (DuPaul et al. 1998) that exceed the 85th percentile. This cut-off score has demonstrable clinical utility in the efficient discrimination of clinical vs. non-clinical children due to its high positive predictive power (PPP) and high negative predictive power (NPP) (Power et al. 2001). Boys whose ratings exceeded the 85th percentile on the Inattention scale only were excluded based on the theoretical premise that behavioral disinhibition, not inattention, is the primary impairment among children with ADHD (Barkley 1997). *ADHD Rating Scale-IV* descriptive statistics for boys with ADHD involved a mean Inattention score of 20.19 (SD=4.35), mean Hyperactive-Impulsive score of 16.92 (SD=4.32), and a mean Total (combined) score of 37.15 (SD=8.26). Because teacher data were not available for this investigation, the extent of each participant's school-based problems with ADHD symptoms and impaired peer relations could not be determined.

Boys who served as non-ADHD participants (either entry-controls or hosts) were rated by a parent on all three scales of the *ADHD Rating Scale-IV* (DuPaul et al. 1998) below the 60th percentile. Non-ADHD boys received parent ratings within normal limits. Specifically, their mean Inattention score was 6.70 (SD=4.23), mean Hyperactive-Impulsive score was 4.22 SD=3.59), and mean Total (combined) score was 11.26 (SD=6.48). For logistical reasons, ADHD boys with comorbid Oppositional-defiant Disorder (ODD) were not systematically excluded from study. However, a measure of ODD symptom severity (i.e., *Conners' Parent Rating Scale-Long Version-Oppositional-Defiant Items* (Conners 1997) was administered to parents to serve as a potential covariate in analyses. As expected, entry boys with ADHD were significantly more symptomatic of ODD (M=13.69, SD=7.20) than entry boys without ADHD (M=4.43, SD=5.32), $t(47)$=5.06, $p<0.001$. However, preliminary analyses revealed that ODD symptom severity was not significantly associated with observed entry behaviors, observed hosts' responses, or coder ratings. Thus, ODD symptom severity was not considered a covariate in subsequent analyses.

Procedure

Forty-nine triads of boys were seen in a university-based laboratory for a 1-hour session that involved two entry attempts. Each triad consisted of one entry boy (with or without ADHD) and two familiar non-ADHD host boys who knew one another but not the entry boy. To ensure familiarity between hosts, parents were asked if their son had a good friend who would like to participate with him in the study. Friends who met the non-ADHD selection

criteria were paired together to participate as familiar hosts. Regarding instances in which a good friend was not identified, host boys were paired with familiar peers who were from the same classroom, or at least the same grade in the same school.

Entry boys were unfamiliar with host boys. This was done to ensure that observed entry behaviors and hosts' responses were not attributable to entry boys' reputation or social status, and because of evidence that hosts respond differently to entering friends than non-friends (Zarbatany et al. 1996). To accomplish unfamiliarity, entry boys were paired with host boys from different schools. It is important to note that no host boy recognized the entry boy at their initial meeting (or vice versa).

Upon arrival, each boy for whom parent permission had been obtained was taken to an interview room where an investigator briefly described the study, obtained child verbal assent and, when applicable, confirmed with the parent that medication had not been administered that day. Then, a pair of host boys was escorted to the playroom, while the entry boy remained in the interview room for pre-entry questions and to learn the game.

In the playroom, two investigators taught host boys how to play one of two board games (with game order counter balanced), either a Word-Naming Game or a Question-Answering Game. At the same time, a third investigator taught the entry boy, who remained in the interview room, how to play the same game. The Word-Naming Game was first described by Putallaz and Gottman (1981), and has been successfully used by several peer entry researchers (e.g., Borja-Alvarez et al. 1991). To prevent possible participant boredom from playing the same game twice, the Question-Answering Game was developed for this study. Both games used a similar format: Players advance across a game board and attempt to reach the finish line first. To advance, the Word-Naming Game required boys to think of a word that started with a certain letter and fit a certain category, whereas the Question-Answering Game required them to correctly answer a question.

Once host boys understood how to play the game, they were instructed to begin playing, and to continue playing until told to stop. After approximately 5 min, the entry boy entered the playroom. Immediately upon his entry, all interactions were videotaped by a camera discretely located in the ceiling for subsequent coding of entry behaviors and hosts' responses.

Observed Peer Entry Behavior The coding scheme used in this study was derived from Dodge et al. (1983) to capture entry behavior/hosts' responses and discriminate between competent and incompetent entry. Specifically, eight entry behaviors were coded: wait-and-hover (i.e., approaching hosts and observing their activity without speaking), synchronous behavior (i.e., approaching hosts and mimicking what they are doing without speaking or actually playing with them), group-oriented statement (i.e., a verbal statement directed towards the hosts or the play activity), question (i.e., a question directed to the hosts), self-statement (i.e., a statement referring to or describing oneself), attention-getting (i.e., verbal or nonverbal means to gain the attention of the hosts), and disruption (i.e., verbal or nonverbal behavior that is aversive). Because this investigation focused on boys with ADHD, it was decided to include a code for self-aggrandizing statements (i.e., a boasting statement referring to or describing one's competencies) (see Hoza et al. 2002; 2005). In addition, four observed host response behaviors were coded: initiation (i.e., unsolicited behavior directed by hosts to invite entry boy to play), positive (i.e., response that is favorable or neutral), negative (i.e., response that is unfavorable), and ignoring (i.e., no response). Undergraduate research assistants, blind to participants' group status, were trained to code entry behaviors and hosts' responses. Five-second momentary time sampling began as soon as the entry boy entered the playroom and continued for 10 min. Each time an entry behavior was coded, the hosts' corresponding response was also coded. To establish reliability, a second coder blind to participant group status examined 14 of 49 (28.6%) sessions. Kappa coefficients for observed entry behaviors ranged from 0.67 (self-aggrandizing statements) to 1.00 (synchronous behavior), and 0.67 (initiation) to 0.90 (negative) for hosts' responses. These values are consistent with acceptable values for basic observational research (Nunnally and Bornstein 1994).

Coder Ratings In addition to observations of discrete entry behaviors, coders completed global ratings of entry performance. These included three aggregated *task performance* items (e.g., "How well did the entry boy appear to do playing the game with the other two boys?" alpha=0.74 at Entry 1 and 2) and three *social performance* items (e.g., "How well did the entry boy appear to get along with the other two boys?" alpha=0.72 at Entry 1 and 0.76 at Entry 2). Coders' ratings were based on a 5-point Likert scale, anchored by 1 (extremely poor/not at all) and 5 (extremely well/very much). All aggregated coder rating variables showed acceptable inter-rater agreement, as Pearson correlations ranged from 0.73 to 0.87 for task- and social performance ratings across each entry session.

Additionally, coders rated the entry boy's ability to maintain the group's *frame-of-reference* on three items using operational definitions developed by Putallaz (1983). Specifically, percent of time during which the entry boy's conversation and behavior was relevant (i.e., directly related), irrelevant (i.e., unrelated), and tangential (i.e.,

indirectly related, but not pertinent) to the group's ongoing activities were noted. To establish reliability of coders' frame-of-reference ratings, Spearman correlations were calculated for the same 14 of 49 sessions (28.6%) examined by two coders. With the exception of tangential frame-of-reference at Entry 1 (r=0.51, p=0.06), correlations were significant (rs=0.78 to 0.94), indicating adequate reliability.

Host Likeability Ratings After 10 min of game playing, each entry boy was escorted back to the interview room for a short break. At the same time, host boys were separated into different interview rooms, and each was asked three social preference questions regarding the entry boy (e.g., "How much did you like [entry boy's name] who joined the game with you?"). These likeability questions, based on a 5-point Likert scale anchored by 1 (not at all) and 5 (very much), were consolidated into an internally consistent variable (alpha=0.86). All procedures and assessments were repeated for the second entry attempt, after which participants were debriefed and given a small prize.

Results

To facilitate interpretation of results, a series of Pearson correlations was conducted to examine the association between observed entry behaviors and host responses and coders' ratings at Entry 1 and 2 (see Table 1). Consistent with the Dodge et al. (1983) model of competent peer entry, boys who emitted higher frequencies of observed competent entry behaviors received more positive host responses and more favorable social performance ratings from coders. In contrast, boys who emitted higher frequencies of observed incompetent entry behaviors received more negative host responses, less favorable social performance ratings from coders, and were viewed as less likely to maintain the group's frame-of-reference. Pearson correlations also were conducted to determine whether it would be appropriate to combine entry behaviors; however, correlations were not significant, and thus, each entry behavior represented a distinct variable in our univariate approach.

Observed Entry Behaviors of Boys with and Without ADHD

To examine entry strategies among boys with and without ADHD, group (ADHD vs. Non-ADHD) X time (Entry 1 vs. Entry 2) mixed model Analyses of Variance (ANOVAs) were first applied to observed behaviors indicative of competent peer entry (see Dodge et al. 1983). These behaviors included wait-and-hover, synchronous behavior, group-oriented statements, and questioning. The ANOVAs failed to reveal significant between-group differences in competent entry behaviors (see Table 2). Thus, boys with and without ADHD were found to be equally competent in their peer entry strategies. With regard to time, entry boys evinced significantly more waiting-and-hovering during their first entry attempt (M=3.67, SE=0.98) than their second attempt (M=1.52, SE=0.44), F (1, 47)=8.46, p<.01, η_p^2=0.15, representing a large effect (Cohen 1988) (see Table 3). In addition, entry boys engaged in significantly more synchronous behavior during Entry 1 (M=1.02, SE=0.20) than Entry 2 (M=0.41, SE=0.11), F (1, 47)=8.15, p<.01, η_p^2=0.15, representing a large effect. The remaining time effects and the interactions did not reach traditional levels of significance.

Second, group (ADHD vs. Non-ADHD) X time (Entry 1 vs. Entry 2) mixed model ANOVAs were applied to entry strategies considered incompetent and evocative of peer rejection (Dodge et al. 1983). These behaviors included disruption, self-aggrandizing, self-statements, and attention getting. As expected, boys with ADHD (M=7.94, SE=1.03) displayed significantly more attention-getting behavior than boys without ADHD (M=3.87, SE=1.09), F (1, 47)=7.37, p<.01, η_p^2=0.14, representing a large effect (see Table 2). Moreover, boys emitted significantly more attention-getting during their second entry attempt (M=8.05, SE=1.07) versus their first (M=3.76, SE=0.63), F (1, 47)=21.49, p<.01, η_p^2=0.31, representing a large effect (see Table 3). Results also revealed a significant Group X Time interaction regarding (incompetent) self-statements, F (1, 47)=6.04, p=0.02, η_p^2=0.11, representing a moderate effect. Specifically, at Entry 1, boys with ADHD (M=1.31, SE=0.29) made significantly more self-statements than boys without ADHD (M=0.30, SE=0.31), t (47)=2.40, p=0.02. This greater reliance on self-statements among boys with ADHD did not emerge during their second entry attempt (ADHD: M=0.92, SE=0.29; Non-ADHD: M=1.22, SE=0.31), t (47)=−0.70, p=0.49. The remaining main effects and interactions did not reach traditional levels of significance.

Coders' Ratings of Performance

In addition to the discrete observation variables described above, coders rated task performance and social performance. These ratings were subjected to group (ADHD vs. Non-ADHD) X time (Entry 1 vs. Entry 2) mixed model ANOVAs, which revealed a significant main effect of diagnostic group status on task performance, F (1, 47)=4.62, p<.05, η_p^2=0.09, representing a moderate effect (see Table 4). This difference suggests that as predicted, entry boys with ADHD were rated as performing significantly less well while playing the game, following the rules, and trying to win, than entry boys without ADHD. These

Table 1 Pearson correlations between observed entry behaviors and host boys' responses and coders' ratings (N=49)

		Host boys' response					Coder ratings		Frame of reference		
		Positive	Negative	Ignore	Initiate	Liked Boy	Task Perform	Social Perform	Relevant	Irrelevant	Tangential
Entry session 1											
Competent entry	Wait & Hover	-0.16	-0.06	0.88**	-0.10	-0.02	-0.06	-0.40**	0.15	-0.06	-0.23
	Synchronous	0.09	-0.22	0.11	0.07	-0.04	0.04	-0.01	0.02	-0.16	0.31*
	Group-oriented	0.82**	0.52**	0.08	-0.18	-0.11	0.25	0.47**	0.10	-0.19	0.18
	Question	0.56**	0.45**	-0.03	0.29*	-0.03	0.22	0.31*	0.00	-0.10	0.23
Incompetent entry	Disruptive	0.18	0.41**	-0.01	0.03	-0.05	-0.18	0.03	-0.07	0.03	0.11
	Self Statements	0.19	-0.05	0.05	-0.12	-0.08	-0.07	-0.04	-0.21	0.07	0.33*
	Attention-getting	0.42**	0.49**	0.15	-0.10	-0.10	-0.22	0.00	-0.39**	0.28	0.30*
	Self-aggrandizing	0.10	0.32*	0.15	0.15	-0.06	-0.23	-0.26	-0.32*	0.25	-0.15
Entry session 2											
Competent entry	Wait & Hover	-0.19	0.22	0.48**	-0.18	0.10	-0.22	-0.14	0.09	-0.12	0.01
	Synchronous	-0.25	-0.25	-0.11	0.14	0.01	0.18	0.04	0.19	-0.09	-0.21
	Group-oriented	0.73**	0.47	0.03	-0.26	-0.09	0.21	0.45**	0.06	-0.14	0.08
	Question	0.30	0.09	0.05	-0.05	-0.07	0.05	-0.18	-0.31*	0.24	0.23
Incompetent entry	Disruptive	0.19	0.55	0.06	-0.13	-0.49	-0.34	-0.33	-0.44	0.27	0.42
	Self Statements	0.21	-0.11	-0.06	-0.14	0.11	-0.13	-0.15	-0.08	-0.10	0.29*
	Attention-getting	0.17	0.49**	0.68**	-0.04	-0.11	-0.52**	-0.53**	-0.75**	0.65**	0.46**
	Self-aggrandizing	-0.05	0.04	0.04	0.01	0.02	-0.13	-0.25	-0.19	0.16	0.13

*$p \leq 0.05$; **$p \leq 0.01$

Table 2 Descriptive statistics of group status effects on entry behavior

Observed entry behavior	ADHD	Non-ADHD
Competent peer entry		
Wait-and-hover	2.52 (0.91)	2.67 (0.97)
Group-oriented statement	15.23 (1.80)	16.48 (1.92)
Question	2.92 (0.34)	3.24 (0.36)
Synchronous behavior	0.56 (0.17)	0.87 (0.18)
Incompetent peer entry		
Attention-getting	7.94 (1.03)	3.87 (1.09)**
Disruption	1.31 (0.43)	0.33 (0.45)
Self-statement	1.12 (0.22)	0.76 (0.24)
Self-aggrandizing statement	0.27 (0.11)	0.26 (0.11)

*SE*s in parentheses

*$p \leq 0.05$; **$p \leq 0.01$

analyses also revealed a significant main effect of time on coders' ratings of social performance, F (1, 47)=5.04, $p<.05$, $\eta_p^2=0.10$, representing a moderate effect (see Table 4). This effect revealed improvements in boys' social performance during entry. No other main effects or interactions reached traditional levels of significance.

Coder ratings of entry boys' ability to maintain the group's frame-of-reference were analyzed using group (ADHD vs. Non-ADHD) X time (Entry 1 vs. Entry 2) mixed model ANOVAs. As expected, group-focused conversation/behaviors emitted by entry boys with ADHD were rated less relevant, F (1, 47)=12.01, $p<.001$, $\eta_p^2=0.20$ (large effect), more irrelevant, F (1, 47)=7.46, $p<.01$, $\eta_p^2=0.14$ (large effect), and more tangentially related to the hosts' ongoing activities, F (1, 47)=4.93, $p<0.05$, $\eta_p^2=0.10$ (moderate effect), than those of entry boys without ADHD. Thus, coders viewed entry boys with ADHD as

Table 3 Descriptive statistics of time effects on entry behavior

Observed entry behavior	Entry 1	Entry 2
Competent peer entry		
Wait-and-hover	3.67 (0.98)	1.52 (0.44)**
Group-oriented statement	15.75 (1.51)	15.96 (1.29)
Question	2.95 (0.41)	3.21 (0.42)
Synchronous behavior	1.02 (0.20)	0.41 (0.11)**
Incompetent peer entry		
Attention-getting	3.76 (0.63)	8.05 (1.07)**
Disruption	0.43 (0.16)	1.20 (0.59)
Self-statement	0.81 (0.21)	1.07 (0.21)
Self-aggrandizing statement	0.35 (0.11)	0.18 (0.08)

*SE*s in parentheses

*$p \leq 0.05$; **$p \leq 0.01$

significantly less able to maintain the group's frame-of-reference (see Table 4). These findings further revealed a significant main effect of time for tangential frame-of-reference, F (1, 47)=19.08, $p<0.001$, $\eta_p^2=0.29$, representing a large effect (see Table 4). All entry boys' were less able to maintain the group's frame-of-reference in the second entry session. In addition, the main effects of group and time on tangential conversation/behavior were qualified by a significant Group X Time interaction, F (1, 47)=5.59, $p<0.05$, $\eta_p^2=0.11$, representing a moderate effect. Specifically, at Entry 1, boys with ADHD (M=0.89, SE=0.15) and without ADHD (M=0.61, SE=0.16) did not differ in their use of tangential conversation/behavior. In contrast, boys with ADHD (M=1.62, SE=0.21) emitted significantly more tangential conversation/behavior than those without ADHD (M=0.83, SE=0.22), t (47)=2.64, p=0.01, during their second entry attempt. No other main effects or interactions reached traditional levels of significance.

Host Boys' Responses to Entry Attempts

The effects of group status and time on host boys' observed positive responses to peer entry behaviors (i.e., initiation, positive) were analyzed with group (ADHD vs. Non-ADHD) X time (Entry 1 vs. Entry 2) mixed model ANOVAs. There were no significant between-group differences in positive host responses; however, boys with ADHD (M=0.37, SE=0.14) received significantly fewer host initiation responses than did boys without ADHD (M=0.76, SE=0.15), F (1, 47)=3.95, p=0.05, $\eta_p^2=0.08$, representing a moderate effect (see Table 5). Regarding main effects of time, there was no significant difference in frequency of hosts' positive responses across time; however, all hosts emitted significantly more initiation responses at Entry 1 (M=0.69, SE=0.12) than at Entry 2 (M=0.44, SE=0.12), F (1, 47)=4.05, p=0.05, $\eta_p^2=0.08$, representing a moderate effect (see Table 5). No other main effects or interactions reached traditional levels of significance.

The effects of group status and time on host boys' observed negative responses to peer entry behaviors (i.e., negative, ignoring) were analyzed with group (ADHD vs. Non-ADHD) X time (Entry 1 vs. Entry 2) mixed model ANOVAs, yielding a significant Group X Time interaction for negative host responses, F (1, 47)=5.96, p=0.02, $\eta_p^2=0.11$, representing a moderate effect. Specifically, at Entry 1, boys with (M=1.58, SE=0.52) and without ADHD (M=2.00, SE=0.56) did not differ in the number of negative host responses they received, t (47)=−0.55, p=0.58. In contrast, there was a trend indicating boys with ADHD (M=2.85, SE=0.50) received more negative host responses than boys without ADHD (M=1.48, SE=0.53), t (47)=1.87, p=0.07, during the second entry attempt. No other effects reached traditional levels of significance.

Table 4 Descriptive statistics of group status and time effects on coder ratings

Coder rating	Group status		Entry time	
	ADHD	Non-ADHD	Entry 1	Entry 2
Task Performance	2.65 (0.12)	3.01 (0.12)*	2.78 (0.10)	2.88 (0.10)
Social Performance	2.83 (0.12)	3.01 (0.12)	2.83 (0.09)	3.01 (0.09)*
Relevant Frame-of-Reference	7.42 (0.32)	9.02 (0.34)**	8.45 (0.26)	8.00 (0.26)
Irrelevant Frame-of-Reference	1.33 (0.27)	0.26 (0.28)**	0.81 (0.25)	0.78 (0.21)
Tangential Frame-of-Reference	1.25 (0.16)	0.72 (0.18)*	0.75 (0.11)	1.22 (0.15)**

*SE*s in parentheses

*$p \leq 0.05$; **$p \leq 0.01$

To examine hosts' responses to the peer entry strategies of boys with and without ADHD, the effect of diagnostic group status and time on hosts' rating of entry boys' likeability was analyzed with a group (ADHD vs. Non-ADHD) X time (Entry 1 vs. Entry 2) mixed model ANOVA. This analysis yielded a significant Group X Time interaction, representing a moderate effect, F (1, 47)=4.00, p=0.05, η_p^2=0.08. Following Entry 1, entry boys with (M=4.22, SE=0.12) and without ADHD (M=4.42, SE=0.12) were equally well liked by their hosts, t (46)=−1.18, p=0.25; however, following their second entry attempt, boys with ADHD (M=4.07, SE=0.13) were less well liked than were boys without ADHD (M=4.54, SE=0.13), t (47)=−2.77, p<0.01. Overall, boys with ADHD (M=4.15, SE=0.11) were rated by hosts as significantly less likeable than boys without ADHD (M=4.48, SE=0.12), F (1, 47)=4.18, p<0.05, η_p^2=0.08, representing a moderate effect.

Discussion

One important skill area that may provide insight into the social problems experienced by children with ADHD involves their peer entry behavior. Peer entry, defined as the verbal and nonverbal behaviors used to join other children's ongoing activity (Putallaz and Wasserman 1990), represents a gateway to the development of positive peer relationships. Central to successful entry, competent tactics avoid drawing attention to one's self and, instead, focus on group play activity. If peer entry can be studied among unfamiliar children, it is possible to disentangle a child's on-going behavior from the confounding bi-directional effects of social reputation. In this investigation, multiple measures were used to assess boys' social competence (Dirks et al. 2007). These included observed entry behaviors, observed host responses, host boys' ratings of entry boys' likeability, and coders' ratings of entry boys' performance and ability to maintain frame-of-reference.

Results of this investigation revealed an interesting pattern that may clarify the association between the social behavior of boys with ADHD and their apparent propensity to "turn-off" others when meeting for the first time. Specifically, boys with and without ADHD made equal use of all competent entry behaviors described by Dodge et al. (1983), including waiting-and-hovering, synchronous behavior, group-oriented statements, and questions. In other words, boys with ADHD were observed to display the requisite skills necessary to evince successful entry into a game. Even so, across both sessions, boys with ADHD also emitted twice the amount of attention getting than their

Table 5 Descriptive statistics of group status and time effects on host responses

	Group status		Entry time	
	ADHD	Non-ADHD	Entry 1	Entry 2
Host responses				
Initiation	0.37 (0.14)	0.76 (0.15)*	0.69 (0.12)	0.44 (0.12)*
Positive	19.52 (1.83)	20.83 (1.94)	19.70 (1.64)	20.64 (1.29)
Ignoring	9.15 (1.49)	5.48 (1.58)	6.60 (1.27)	8.03 (1.24)
Negative	2.21 (0.45)	1.74 (0.48)	1.79 (0.38)	2.16 (0.37)
Host rating of likeability	4.15 (0.11)	4.48 (0.12)*	4.32 (0.09)	4.31 (0.09)

*SE*s in parentheses

*$p \leq 0.05$; **$p \leq 0.01$

non-ADHD counterparts. As revealed by simple correlations in Table 1, attention-getting behavior was associated with significantly more negative responding from hosts, less proficient task- and social performance ratings from coders, and a clear indication of inattention to the on-going activity (i.e., a disconnected frame-of-reference). In addition, boys with ADHD talked significantly more about themselves during their first entry attempt than boys without ADHD, an apparent strategy (albeit, incompetent) to increase the chance of being accepted (either socially or into the game) by the hosts whom they were just beginning to meet. This self-centered pattern seems similar to recent results reported by Normand et al. (2010) who observed children with ADHD playing games with their nominated best friend. In these games, children with ADHD were significantly more self-centered, leading Normand et al. to question if those with ADHD value service-to-self over the principle of equity in friendship.

Regarding the effect of time on entry behaviors, results suggest that the second entry session may have been less daunting. Specifically, all boys emitted more synchronous behavior and less waiting and hovering when returning to the playroom a second time. This represents apparent increased connection with hosts who were becoming more familiar. This main effect of time on entry behavior must have impressed the coders, as they rated all boys as showing better social performance during the second entry. In sum, both groups of boys were comparable in the use of tactics that *should* lead to acceptance, but boys with ADHD were also excessive in their use of high-risk entry strategies (e.g., disruptive attention-getting). Thus, regarding one of the social competence criteria (i.e., behavior) posited by Dirks and colleagues (2007), as well as the peer entry criteria described by Dodge et al. (1983), boys with ADHD presented themselves as less socially competent.

Even so, assessment of social competence should not be based exclusively on social behavior *per se*. Dirks et al. (2007) make it clear that children who are considered socially competent behave in a manner that is consistent with the situation or context of what others are doing. This goodness-of-fit consideration was assessed by coders' ratings of entry boys' ability to maintain frame-of-reference (Putallaz 1983) or group-focused conversation/behavior. Maintaining the playgroup's frame-of-reference was clearly more difficult for boys with ADHD. Although marginal reliability on one of these variables may lead to cautious interpretation, coders' ratings also revealed that, during Entry 1, boys with and without ADHD were comparable in their use of tangential conversation/behavior; however, boys with ADHD were significantly more tangential in their frame-of-reference than non-ADHD boys in the second entry session.

Thus, coders' ratings of frame-of-reference revealed a pattern of entry incompetence that was consistent with obtained observation data. One explanation for this pattern involves attention processes. Whether in academic or social settings, children with ADHD have difficulty attending to the task at hand and often display off-task conversation and behavior (de Boo and Prins 2007). Thus, it is not surprising that entry boys with ADHD, compared to those without, may have been less attentive to the group's frame-of-reference. A second explanation for this failure to behave in a relevant way comes from Marton et al. (2009) who demonstrated that children with ADHD evince a deficit in their social perspective taking (i.e., the ability to understand a social situation from the perspective of someone else). Normand et al. (2010) found similar results, as children with ADHD were observed to behave in self-serving ways. Whatever the explanation, current data indicate that a boy's failure to attend to, process, or understand the on-going activity of others places that boy at risk for appearing inappropriate (Huang-Pollock et al. 2009).

The third social competence assessment strategy used in this study involved the evaluative component suggested by Dirks et al. (2007). According to their model, appraisal of judges or application of an external standard must be considered. Thus, assessment of host behavioral responses to entry boys, as well as hosts' ratings of entry boy likeability, were used to determine *impact* of entry boy behavior on hosts as well as the social validity of the Dodge et al. (1983) model of competent entry. Results again revealed peer problems among boys with ADHD. Although no between-group difference emerged regarding hosts' positive responses to entry boys, those with ADHD received significantly fewer host initiation responses than their non-ADHD counterparts. In terms of negative host responses, boys with and without ADHD did not differ in the number they elicited during the first entry session, but a trend ($p=0.07$) revealed that boys with ADHD subsequently evoked more negative responses than non-ADHD boys. This pattern provides further evidence that these boys with ADHD "turned-off" their hosts as hosts got to know them better.

Few studies have examined repeated entry attempts over time, as was done in the current investigation. However, the Dodge et al. (1983) study allowed for an examination of several entry attempts, and found that negative host responses were relatively infrequent on the first day of free play, but much more frequent by the last day. These findings support the contention that, initially, hosts may have more likely responded to entry boys politely, using mainly positive or ignoring responses. Yet, as hosts got to know entry boys and their aversive behaviors, they may have been more inclined to respond negatively. In this study, only entry boys with ADHD, not entry boys without ADHD, received increasingly more negative host responses over time.

Results stemming from measures of observed entry behavior, coder ratings of frame-of-reference, and hosts' observed responses suggest that boys with ADHD were less socially competent in peer entry. Nonetheless, it could be argued that peer likeability represents the preeminent assessment of social competence. Did their behavior and its poor fit with the on-going activity of the group (i.e., context) influence evaluation as proposed by Dirks et al. (2007)? Results indicate this was clearly the case. Even though boys with and without ADHD were equally well liked following the first 10-min interaction, following the second entry attempt, entry boys with ADHD became significantly less liked by hosts. This pattern is consistent with a wealth of anecdotal and empirical evidence indicating that children with ADHD are at risk for peer rejection even after brief contact (see de Boo and Prins 2007; King et al. 2009).

This outcome is consistent with established research suggesting that children who use less competent strategies to join group play will have less favorable social status and evoke more negative impressions from hosts (Dodge et al. 1983; 1986; Putallaz 1983; Tryon and Keane 1991). Thus, the current study adds to the peer entry literature by providing a measure of entry boys' likeability, as well as the demonstration that host boys seem to become more turned-off to entry boys with ADHD as they spent more time with them. This diminished likeability seems tied to disruptive entry performance and a diminishing ability to accomplish a good fit with on-going game activity.

Several limitations to the current study deserve mention. First, although the contrived social situation in the lab permitted an opportunity to disentangle entry behavior and hosts' responses from social history and its effect on peer reputation, this analog may prevent generalizability of obtained findings to free play situations involving familiar children. Second, the behavior observation codes were selected based on successful use in previous studies. As a consequence, other behaviors, such as facial expressions, tone of voice, fidgeting, sharing, disagreeing with hosts, gloating, and emotional outbursts were not coded. Both theoretically (Barkley 1997; Martel 2009; Nigg 2001) and empirically (Walcott and Landau 2004), boys with ADHD seem less able to inhibit their negative emotional responses and, as a consequence, appear to behave as if they are insensitive to the feelings of others (Marton et al. 2009). As noted by de Boo and Prins (2007), emotional factors play a large role in social interactions. Third, although best-practice assessment of ADHD (see Pelham et al. 2005) should include information regarding the child's impaired peer relations, these data were not available. Thus, obtained findings may not pertain to clinic-referred children with ADHD. Finally, the current investigation was limited to 7- to 12-year old boys. In the interpersonal domain, boys and girls pursue different objectives in their peer and friendship relationships, and they differ in their social values and social behavior (Rose and Rudolph 2006). The same can be said for boys versus girls with ADHD (de Boo and Prins 2007). Research indicates that the peer problems of boys with ADHD are evident at least by seven years of age (Hoza et al. 2005), but these problems, especially those involving peer entry, may emerge well before age seven. Determining the earliest age at which time peer problems first develop will inform the timing of efforts at prevention and intervention.

Even though no single investigation can identify all culpable factors responsible for the disturbed peer relations of children with ADHD, it is widely recognized that these problems are relatively intractable. Social skills training (SST) designed to reduce inappropriate behaviors and increase prosocial behaviors have consistently failed to impress classmates (Pelham and Fabiano 2008). Being least-liked or rejected by members of the peer group is highly resistant to change (Parker and Asher 1987). Indeed, de Boo and Prins (2007) suggest it can take a year or longer to undo a negative reputation, and that same amount of time may be needed to elicit positive responses from peers once behavioral change has occurred.

Unfortunately, therapeutic effects of pharmacological interventions are mixed. There is strong evidence that methylphenidate (MPH) can have a short-term salutary effect on the boisterous, annoying, excessive behaviors of children with ADHD, but will not facilitate increased expression of appropriate prosocial behavior. In addition, medication does not seem to mediate the intervention effectiveness of psychosocial skills training (i.e., those receiving a combination do not fare better than those receiving MPH alone) (de Boo and Prins 2007). In addition, recent unsettling evidence suggests that MPH may actually exacerbate the hostile attribution bias of a child with ADHD because that child may be more selectively attentive to hostile cues while on medication (King et al. 2009).

Results of this investigation and the theoretical conception of social competence posited by Dirks et al. (2007) offer several potential foci for prevention and intervention. Clearly, peer entry behavior can affect first impressions among the unacquainted, and it is clear that first impressions play a vital role in the development and trajectory of social relationships (Sunnafrank and Ramirez 2004). Unfortunately, most social psychology research regarding impression formation focuses on adults, providing little insight into how first impressions develop among children. Even so, results of the current study suggest that boys with ADHD may fail to create a desirable first impression. Initial impressions are formed quickly. For example, Miers et al. (2010) recently demonstrated that unfamiliar peers who viewed a video-recorded speech by socially anxious

children developed a first impression *within two minutes* that these children lacked social skills. Since the seminal work of Asch (1946), person-perception studies on this *primacy effect* have consistently revealed that first impressions remain salient and durable. To make matters worse, negative information that follows a first impression (e.g., continued annoying or disruptive behavior) will be weighted more heavily than positive information (Mellers et al. 1992). Under these circumstances, it is more likely an unsavory first impression will endure. Clinicians who are involved in social skills interventions should consider the power and stability of first impressions, coaching children to provide positive first impressions.

In addition, results of this investigation and the model described by Dirks et al. (2007) emphasize the importance of goodness-of-fit between the entering child's behavior and peers' on-going activity. Success in accomplishing this match requires that a child attempting to join others avoids drawing attention to him or herself, takes time to *read the situation*, and present a frame-of-reference that is relevant to peers. Unfortunately, this may require age-appropriate social perspective taking, a challenging cognitive process for children with ADHD (Marton et al. 2009). Clinicians must recognize there are individual differences in children's sensitivity to the thoughts, feelings, and needs of others; that some children (especially those with ADHD) may give preference to needs-of-self when engaged in play (Normand et al. 2010). These assertive behaviors, as well as problems with a positive illusory bias (Hoza 2007), may contribute to the longevity of a negative reputation.

The present results make it clear that the skill- versus performance-deficit debate regarding the peer problems of children with ADHD may reflect a false choice, and is limiting because of its within-child focus. Indeed, the child who successfully gains acceptance into a peer group may have concurrently engaged social knowledge as well as adequate performance of that social skill. Interventions for peer problems should be guided by theory, recognizing multiple, interacting interpersonal-contextual factors (de Boo and Prins 2007). As such, clinicians should consider characteristics of the child, the specifics of the context (e.g., peer entry), the match between child behavior and context, as well as the social validity of intervention targets (i.e., peer evaluations). In these ways, we hope to promote successful peer entry as a gateway to positive peer relationships.

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