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A Randomized Trial of a Classroom Intervention to Increase Peers' Social Inclusion of Children with Attention-Deficit/ Hyperactivity Disorder

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Abstract

Objective—Interventions for peer problems among children with Attention-Deficit/Hyperactivity Disorder (ADHD) typically focus on improving these children's behaviors. This study tested the proposition that an adjunctive component encouraging the peer group to be socially inclusive of children with ADHD would augment the efficacy of traditional interventions.

Method—Two interventions were compared: Contingency Management Training (COMET), a traditional behavioral management treatment to improve socially competent behavior in children with ADHD, and Making Socially Accepting Inclusive Classrooms (MOSAIC), a novel treatment that supplemented behavioral management for children with ADHD with procedures training peers to be socially inclusive. Children ages 6.8 – 9.8 (24 with ADHD; 113 typically developing [TD]) attended a summer day program grouped into same-age, same-sex classrooms with previously unacquainted peers. Children with ADHD received both COMET and MOSAIC using a repeated measures crossover design. TD children provided sociometric information about the children with ADHD.

Results—Whereas the level of behavior problems displayed by children with ADHD did not differ across treatment conditions, children with ADHD displayed improved sociometric preference and more reciprocated friendships, and received more positive messages from peers, when they were in MOSAIC relative to in COMET. However, the beneficial effects of MOSAIC over COMET predominantly occurred for boys relative to girls.

Conclusions—Data support the concept that adjunctive procedures to increase the inclusiveness of the peer group may ameliorate peer problems among children with ADHD, and suggest the potential utility of modifying MOSAIC to be delivered in regular classroom settings.

Keywords

ADHD; peer relationships; peer rejection; friendship; treatment

Impairments in peer relationships are common among children with Attention-Deficit/ Hyperactivity Disorder (ADHD), with a meta-analysis reporting the typical effect size of peer problems relative to typically developing (TD) youth as $d = .72$ (for children with ADHD and no comorbidities) to $d = 1.25$ (for children with ADHD and comorbid conduct

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problems; Waschbusch, 2002). These meta-analytic results are consistent with other studies finding that 56–82% of children with ADHD score at least 1 standard deviation (SD) above their classroom mean in peers' rejection (Hoza, Mrug, et al., 2005; Pelham & Bender, 1982). Further, children with ADHD are twice as likely as TD youth to have no reciprocated friendships (Blachman & Hinshaw, 2002; Hoza, Mrug, et al., 2005).

Such peer difficulties are concerning because they incrementally predict maladjustment in prospective longitudinal studies. Boys with ADHD and childhood peer problems showed more criminality, depression, and substance use in adolescence than did boys with ADHD but without peer problems (Greene, Biederman, Faraone, Sienna, & Garcia-Jetton, 1997). In a sample of girls, childhood peer rejection and ADHD status made independent contributions to adolescent school failure, disruptive behaviors, and internalizing symptoms (Mikami & Hinshaw, 2006).

Resistance of Peer Difficulties to Existing Treatments

Stimulant medication and behavioral management ameliorate the core symptoms of ADHD and may result in parents and teachers rating children's social skills as improved (MTA Cooperative Group, 1999). Yet, a corresponding increase in peers' actual liking of the child, such as is assessed with sociometric measures where peers nominate classmates whom they like and dislike, does not consistently follow (Mrug, Hoza, & Gerdes, 2001). In the Multimodal Treatment Study of Children with ADHD (MTA), both intensive medication and behavioral management failed to increase sociometrically assessed acceptance or friendship at the end of the 14-month active treatment period (Hoza, Gerdes, et al., 2005). Thus, despite receiving state-of-the-art treatments empirically supported for ADHD symptoms under ideal circumstances in the MTA trial, children with ADHD remained profoundly impaired in peer functioning. Social skills training for children with ADHD has received inconsistent empirical support, particularly when assessed with sociometric measures (Abikoff et al., 2004). Based on these findings, ADHD investigators have suggested that peer problems are a prevalent, yet treatment-refractory domain of impairment for this population (Hoza, Mrug, et al., 2005).

Peers' Biases as Contributors to Social Problems among Children with ADHD

Existing interventions for peer problems attempt to increase socially competent behaviors in children with ADHD, under the assumption that behavior change will result in peers' liking. However, the peer group may possess biases that discourage social inclusion of children with ADHD and also contribute to rejection and lack of friendship in this population.

Social devaluation of ADHD

Peer problems experienced by children with ADHD may be influenced, in part, by peers' stigma attached to ADHD symptoms or to the label of ADHD. Relative to peers' reactions towards children with physical health conditions or mental health problems such as depression or anxiety, peers possess increased negative judgments about children displaying hyperactive/impulsive behaviors and are more likely to view these children as responsible for their actions (Hinshaw, 2005); perceptions that children can control their ADHD symptoms (as opposed to beliefs that problem behaviors are out of a child's control) have been found to mediate the relationship between ADHD symptoms and peer rejection (Juvonen, 1991). The label of ADHD may also evoke social devaluation beyond the specific behaviors associated with this disorder, as even when targets' behaviors are held constant, peers make more negative social judgments about targets whose behaviors have been

labeled as “due to ADHD” as opposed to when such a label has not been provided (Canu, Newman, Morrow, & Pope, 2008; Whalen, Henker, Dotemoto, & Hinshaw, 1983).

Exclusionary peer behavior

Peers' exclusionary behaviors may also intensify the peer rejection and friendship problems seen among children with ADHD. Peers behaviorally enact their negative affective judgments by being unfriendly toward, excluding, or (at extreme levels) victimizing children whom they dislike (Perry, Kusel, & Perry, 1988). Being the recipient of exclusionary peer behavior can then exacerbate the disliked child's original levels of peer rejection, because such peer behavior broadcasts that the child is low status and discourages other children who might have been friendly toward the child from doing so (Perry, et al., 1988). The mere expectation that a child has ADHD may be sufficient to induce exclusionary peer behavior. In studies where child participants were either told or not told that a partner with whom they were about to interact had ADHD (when in actuality, all partners were TD children), naïve observers rated the participants as less friendly when participants expected the partner to have ADHD (Harris, Milich, Corbitt, Hoover, & Brady, 1992; Harris, Milich, & McAninch, 1998).

Reputational bias

Once the peer group becomes inclined to view a child with ADHD negatively, peers may have a biased way of interpreting that child's actions that prevents them from ever revising their impressions. Literature on the persistence of negative reputations suggests that peers interpret the ambiguous behaviors of children they dislike as hostile in intent, selectively remember their unskilled behavior, and make internal, global, and stable attributions for their poor behaviors (Hymel, Wagner, & Butler, 1990). By contrast, identical actions performed by well-liked children are perceived benignly (Peets, Hodges, & Salmivalli, 2008). Peers' cognitive biases may serve to perpetuate their dislike of children with ADHD, even in the presence of positive behavior on the part of the child with ADHD.

The literatures on social devaluation of ADHD, exclusionary peer behavior, and reputational bias provide potential explanations as to why medication and behavioral management can yield improvements in adult ratings of children's behavior, yet not peer acceptance and friendship. Increasing socially competent behavior in the child with ADHD may be a necessary but not sufficient condition to improve peer liking. Without addressing peers' biases against children with ADHD, existing treatments that solely focus on improving the behavior of children with ADHD may not be maximally efficacious. The current study tests the incremental value of supplementing behavioral management of children with ADHD with procedures to encourage peers' inclusiveness, relative to behavioral management alone.

Interventions to Address Peers' Biases

There are no existing empirically-supported interventions that aim to increase the inclusiveness of the peer group as a treatment for peer problems of children with ADHD. However, various literatures suggest the promise of reducing peers' social devaluation of ADHD, exclusionary peer behavior, and reputational bias as an intervention approach.

Social devaluation of ADHD

A teacher's warm versus frustrated response to a child with ADHD symptoms may provide peers with cues about whether these behaviors should be socially devalued and whether, therefore, children with ADHD symptoms should be peer-rejected. A teacher's personal liking and acceptance of children with behavioral problems has been found to attenuate the typically strong correlation between a child's off-task/disruptive behavior and sociometric

peer rejection (Chang, 2003; Mikami, Griggs, Reuland, & Gregory, 2012). Conversely, the extent to which a teacher is observed to display frustration with or publicly criticize children's off-task/disruptive behavior has mediated the relationship between these child behaviors and sociometric peer rejection (McAuliffe, Hubbard, & Romano, 2009).

Exclusionary peer behavior

It may be possible to train the peer group to refrain from excluding and instead interact inclusively with children who display different behavior. Encouraging TD peers to include children with Autism Spectrum Disorders (ASD) has been suggested to augment the effectiveness of social skills training for the children with ASD on parent and teacher ratings of child social competence (Barry et al., 2003; Bauminger, 2002). Kasari, Rotheram-Fuller, Locke, and Gulsrud (2012) found that training TD peers to positively engage with children with ASD was more effective than social skills training of children with ASD in improving sociometrically assessed peer-reported (though not reciprocated) friendships and observations of prosocial peer interactions.

Reputational bias

Adults may be able to dismantle peers' negative impressions of children with ADHD by drawing attention to a child's behavior in a way that influences that child's reputation with peers. In a series of studies, child participants watched a teacher deliver experimentally manipulated feedback to a target child with a negative reputation (whose behavior was held constant). Participants altered their perceptions accordingly, increasing their positive sociometric ratings when the target was praised and providing more negative ratings when the target was criticized (White & Jones, 2000; White, Jones, & Sherman, 1998).

Girls with ADHD

Although girls remain underrepresented in the ADHD literature relative to their male counterparts, all evidence suggests that girls with ADHD have highly impaired peer relationships (Blachman & Hinshaw, 2002). Crucially, peers' biases and perceptions may play a substantial role in the social impairment of girls with this disorder. As the male:female ratio in ADHD is 3:1, girls with this disorder are more statistically unusual for their peer group, and likely to stand out more for being deviant. Further, ADHD symptoms may violate the social norms of girls' peer groups more than they do for boys' groups, given the emphasis on turn-taking and sustained attention in the social interactions of females (Maccoby, 1990). Consistent with findings that peers' rejection of children with disruptive behavior increases when these symptoms become more deviant from the peer group norm (Chang, 2004), some work suggests stronger associations between symptom severity and peer impairment among girls relative to boys with ADHD (Carlson, Tamm, & Gaub, 1997; Mikami & Lorenzi, 2011). A peer relationship intervention designed specifically to address peers' biases against children with ADHD would therefore be well-served to directly assess differences in effects by sex.

Study Aims

We conducted a randomized clinical trial with a repeated measures crossover design in a summer program setting to examine the incremental efficacy of supplementing behavioral management for children with ADHD with procedures encouraging the peer group to be inclusive (Making Socially Accepting Inclusive Classrooms; MOSAIC), relative to behavioral management for children with ADHD alone (Contingency Management Training; COMET). COMET was selected as the comparison condition because behavioral management is an empirically-supported treatment that focuses on improving socially competent behavior in youth with ADHD (Pelham & Hoza, 1996) without addressing peers'

biases. MOSAIC included the behavioral management techniques of COMET, supplemented by procedures to: (1) reduce peers' tendency to stigmatize and socially devalue ADHD symptoms; (2) encourage peers to interact inclusively with children who have ADHD symptoms; and (3) draw attention to positive characteristics of children with ADHD to improve these children's reputations. We hypothesized that whereas behavior problems would be equally controlled in both conditions, children with ADHD would show better sociometric outcomes when receiving MOSAIC relative to COMET. Our secondary aim was to assess sex by treatment interactions in an exploratory fashion, as no studies have examined the malleability of peers' impressions about female versus male children with ADHD. We expected peers' biases to make a greater contribution to the peer impairment of girls relative to boys with ADHD. One possibility was that MOSAIC might address these factors, leading to greater efficacy for girls with ADHD. Alternatively, it might prove more challenging to convince peers that girls with ADHD are not deviant, making MOSAIC less effective for girls.

Method

Participants

Participants were 24 children with ADHD (13 boys, 11 girls) who were the focus of the treatment and 113 TD children (53 boys, 60 girls) who provided sociometric information about the children with ADHD. All were 6.8 – 9.8 years old and had completed the 1st, 2nd, or 3rd grade. Children were 81% White, 6% Asian American, 3% African American, 2% Latino, and 8% were more than one ethnicity. ADHD and TD samples did not differ in most demographic measures, with the exception of IQ scores (Table 1). ADHD and TD children were recruited through advertisements and community centers. Children with ADHD were also recruited through pediatricians and schools. Thirty-two teacher education students served as summer program teachers. All were enrolled in a credentialing program in the school of education at a public university in the southeastern United States: twenty were pursuing a credential in elementary education, six in special education, five in secondary education, and one in speech pathology. Summer program teachers had a mean age of 22.4 (*SD* = 1.4) and all but one were female. They were 70% White, 12% Asian American, 12% Latina, and 6% African American.

Procedure

Figure 1 displays the CONSORT diagram. Parents and teachers provided consent and children assented to study procedures, which were approved by the institutional review board.

Determination of study eligibility—Parents were administered a screener where they rated children on the 18 ADHD symptoms from the Child Symptom Inventory (CSI; Gadow & Sprafkin, 1994) and reported on peer impairment using seven questions (sample item: Is disliked or actively avoided by peers) on a 4-point scale (0 = *never*, 1 = *sometimes*, 2 = *often*, 3 = *very often*). Children's regular school teachers answered the same questions and also estimated the proportion of peers who like, dislike, and ignore the target child (Dishion & Kavanagh, 2003).

Children with ADHD needed to have at least six of nine symptoms of inattention or six of nine symptoms of hyperactivity/impulsivity rated by both parent and teacher as “often” or “very often.” Children with four or five symptoms endorsed by one informant remained candidates if, using the “or” algorithm in the DSM-IV field trials (Lahey et al., 1994) where a symptom is present if endorsed by either parent or teacher, they met or exceeded six symptoms. Children with ADHD also needed to have at least three of seven items of peer

impairment endorsed as “often” or “very often” by parents and teachers, and fewer than 50% of peers rated as liking them. As peer problems are highly prevalent among children with ADHD, though not universal, an inclusion criterion of sufficient peer problems was important to ensure that the intervention reached the target population. TD children needed to have no more than three symptoms of inattention or hyperactivity/impulsivity and no more than four total ADHD symptoms endorsed by parent or teacher using the “or” algorithm, no more than one symptom of peer impairment endorsed by parent or teacher, and at least 50% of peers rated as liking them.

Candidates meeting these criteria in the screener attended an intake where diagnoses were assessed using the Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS; Kaufman et al., 1997), a clinical interview administered to parents. Reliability of KSADS diagnoses was assessed by independent observers who scored all videos of the disruptive behavior disorders module. Agreement was 100% for ADHD, 99% for Oppositional Defiant Disorder (ODD), and 100% for Conduct Disorder (CD) diagnoses. To be eligible for study enrollment, children in the ADHD group needed to have an ADHD diagnosis validated in the KSADS. Comorbid disorders were diagnosed if the parent endorsed disorder criteria on the KSADS and the regular school teacher reported a *T*-score > 60 on the Teacher Report Form for that disorder (Achenbach, 1991). Because comorbidities are common among children with ADHD, they were not exclusionary, with the exception of ASD diagnoses. TD children could not meet diagnostic criteria for any disorder. Both ADHD and TD children needed to have a Full Scale IQ of at least 80 on the Wechsler Abbreviated Scale of Intelligence (Wechsler, 1999). Psychotropic medication use was not an exclusionary criterion for children with ADHD, but medicated children stayed on a consistent regimen during the summer program.

Summer program—Eligible children were enrolled in the summer program and grouped into classrooms. Classrooms had an average of 3.0 children with ADHD (*SD* = 0.52) mixed with 7.1 TD children (*SD* = 1.00), to yield 10.1 total children (*SD* = 0.93). Within each classroom, all children were the same sex, within a 12 month age span, and attended different regular schools so as to minimize previous interactions. Single-sex classrooms were created to maximize the number of classrooms, given research suggesting children this age typically form friendships with same-sex peers (Maccoby, 1990). Each classroom was led by two summer program teachers who were informed that some children had ADHD, but were not told which children had this diagnosis or the specific number of children with ADHD. Children remained with their classroom peers during all program activities and engaged in class, art, music/drama, and physical education periods with their teachers, and recess and lunch breaks without teachers.

The summer program was conducted on weekdays from 9 a.m. to 3 p.m. for four weeks, divided into a Session 1 and Session 2 of two weeks each. Children with ADHD attended both sessions and were randomly assigned using a computer generated sequence either to a classroom in the MOSAIC treatment condition in Session 1 and a different classroom (with new, previously unacquainted peers and teachers) in the COMET treatment condition in Session 2, or vice versa. Assignment was stratified by child age and sex, and there were no significant differences in ADHD subtype, χ^2 (1, N = 24) = 0.89; p = .35, ODD comorbidity, χ^2 (1, N = 24) = 0.00; p = 1.00, internalizing comorbidity, χ^2 (1, N = 24) = 1.51; p = .22, or medication use, χ^2 (1, N = 24) = 0.00; p = 1.00, between children who received COMET first relative to MOSAIC first. TD children attended either Session 1 or Session 2 (stratified by age and sex and randomly assigned to one classroom receiving either COMET or MOSAIC). Teachers were randomly assigned to either carry out the COMET or MOSAIC treatment, stratified on the basis of their credentialing program (e.g., elementary education, special education) and program year.

It was important to have COMET as an active treatment comparator to MOSAIC in order to reduce expectancy effects. Thus, parents, summer program teachers, and all research assistants (who collected the data) were told that both treatments were anticipated to aid children's social competence, but the study aimed to determine if they might do so in different ways.

Contingency Management Training (COMET) Treatment Condition

COMET employed the principles of existing behavior management interventions for children with ADHD (Pelham & Hoza, 1996), such as those used in behavioral condition in the MTA study (MTA Cooperative Group, 1999). COMET is based on the theory that clear, consistent application of contingencies will shape children's socially-appropriate behavior. Teachers provided children with specific expectations for desired behavior during each activity and were trained to consistently implement a system whereby children gained and lost points based on their compliance with these behaviors, which teachers tracked. For children needing extra assistance, teachers created specialized behavior plans whereby additional target behaviors could be identified. In order to ensure that children understood the contingency system, teachers told children what specific behavior they had enacted and which rule the behavior followed/violated to result in the consequence of point gain/point loss. There were “point checks” at the end of each activity where teachers publically announced the point totals of all the children.

In order to make points a salient incentive that motivated children to behave better, teachers gave daily, public awards to children who had achieved high point totals and allowed children with the most points to have privileges such as lining up first and getting their choice of snack. Children with the highest point totals were designated as team captains for activities and allowed to select the peers they wanted on their team. Additionally, children visited a summer program store where more points bought more desirable toys.

Making Socially-Accepting Inclusive Classrooms (MOSAIC) Treatment Condition

Based on our hypothesis that socially competent behavior among children with ADHD is a necessary but not sufficient condition to achieve peer acceptance and friendship, MOSAIC relied upon the same behavioral management techniques as COMET did, supplemented by procedures to increase peers' inclusiveness of children with ADHD.

Social devaluation of ADHD—To model for peers that children with ADHD were worthy of liking, teachers were instructed to develop positive relationships with children through having warm, one-on-one interactions to discuss the child's personal interests. These interactions could be brief (e.g., *Teacher*: “How did your swim meet go?” *Child*: “Great!” *Teacher*: “You sure are a super swimmer.”) so long as they communicated to the child and to peers that the teacher valued and enjoyed interacting with the child. Teachers were told to foster warm interchanges with all children, but to especially try to connect with youth who were struggling with behavioral compliance because these children were most at risk for social marginalization.

Although MOSAIC teachers also implemented the behavioral contingency management system whereby children received and lost points for their behavior and redeemed these points for prizes, a key component of COMET was having the teacher place social value on points by providing praise and privileges to children for high point totals in front of the class. By contrast, the theory behind MOSAIC was that emphasizing differences between children in point totals may also encourage the peer group to create a status hierarchy where they devalue children who earn few points. Unfortunately, we thought that even when children with ADHD are maximally motivated to do so, they remain unlikely to behave as

appropriately as TD youth. If teachers place high social value on points, improvements in the behavior of a child with ADHD may not result in increased peer acceptance because of the peer group's accentuated tendency to notice and devalue the child with ADHD for still earning fewer points than most TD classmates.

Therefore, in order to minimize social comparisons between children based on points, MOSAIC teachers provided corrections about behavior (e.g., “You lost a point for not following directions”) privately by calling the child aside when feasible. Teachers conducted point checks where they informed children of their personal point totals in one-on-one private discussions. Although MOSAIC teachers praised children for personal improvements in point totals from the day before during the one-on-one meetings, they did not publically compare children's point totals in front of the class or praise (or reward) children for earning more points than their peers.

Exclusionary peer behavior—In order to reduce exclusionary and increase positive peer behavior, MOSAIC teachers set explicit classroom rules for social inclusion, and all children (ADHD and TD) lost points in the behavioral contingency management system for ostracizing others. In addition, teachers explicitly identified commonalities between children (e.g., “both of you are on soccer teams, maybe you should talk about that during recess”) to encourage social bonds. Teachers assigned children to work in teams for collaborative activities where children had to work together in order to succeed, while explicitly explaining to children that they should treat each other with kindness and patience (and reinforcing this behavior with points).

Reputational bias—To draw peers' attention to positive (reputation-disconfirming) characteristics of children with ADHD, teachers used daily awards to publicly identify children's genuine strengths that were unrelated to their behavioral compliance and point totals, and would be valued by their peer group (e.g., great artist, awesome rapper). Although teachers were instructed to do this for all children, they made special efforts to do this for children with behavioral difficulties who were most at risk for developing a negative reputation.

Intervention Training

Teachers received 8 hours of training in their intervention condition prior to the summer program. Additionally, five doctoral students in clinical or developmental psychology served as consultants to coach teachers in the intervention to which they were assigned. Each consultant worked with an equivalent number of MOSAIC and COMET teachers so as to equate consultant nonspecific factors across conditions. Every day during the summer program, consultants observed teachers for a minimum of 2 hours and met with teachers to discuss the intervention. Consultants selected video clips of their teachers to play during meetings in order to illustrate times in which the teacher implemented the treatment well or to brainstorm how the teacher might carry out the treatment better. Consultation sessions in COMET averaged 47 minutes with 1.3 video clips per day and sessions in MOSAIC averaged 48 minutes with 1.2 video clips per day, with no differences in these metrics, $t(14) = 0.10$; $p = .92$ and $t(14) = 0.79$; $p = .44$.

Each teacher completed a survey to assess buy-in and alliance at the end of the first week and again at the end of the second week, and their answers were not viewed until after the summer program ended. The survey contained four questions (sample items: “I personally buy into the techniques my consultant is training me in”, “My consultant gives me feedback in a way that is supportive and non-critical”) answered on a 4-point scale (0 = *Not at all*; 3 = *Very much*). There was no significant difference between the mean of teachers' responses,

collapsed across survey time points, in COMET (2.67) relative to in MOSAIC (2.69), $t(62) = 0.13$; $p = .90$.

Implementation Fidelity

All teachers attended 100% of summer program days and consultation sessions. Out of 10 possible days, children with ADHD attended an average of 9.2 days in COMET and 9.7 days in MOSAIC. TD children attended an average of 9.7 days in COMET and 9.8 days in MOSAIC.

Trained research assistants, unaware of treatment condition, observed each classroom for an average of 651 8-minute intervals and recorded key teacher behaviors (a) intended to relate to the point system and therefore expected be equal in both conditions; as well as (b) intended to reduce peers' social devaluation of ADHD, exclusionary behavior, and reputational bias, and expected to distinguish MOSAIC from COMET. To assess inter-rater reliability, 47% of intervals were double coded and ICC (1,1) was calculated for continuous variables and κ for dichotomous variables (Shrout & Fleiss, 1979).

As hypothesized, observations indicated that COMET and MOSAIC teachers both used the behavioral management point system. Coders globally rated the consistency with which teachers used the point system (ICC = .61) on a 3-point scale (1 = *unclear what behaviors lead to point gain/loss*, 3 = completely clear what behaviors lead to point gain/loss); this was not different between COMET ($M = 2.97$, $SD = 0.06$) and MOSAIC ($M = 2.93$, $SD = 0.06$), $t(14) = 1.32$; $p = .21$. Similarly, end of period point checks (1 = *absent*; 2 = *present*; $\kappa = 1.0$) occurred equally often among COMET ($M = 1.94$, $SD = 0.16$) and MOSAIC teachers ($M = 1.72$, $SD = 0.44$), $t(14) = 1.22$; $p = .25$. Coders rated teacher preparedness to implement the point system (1 = *absent*; 2 = *present*; κ not calculated as all double-coded sessions indicated presence) as not different between COMET ($M = 2.00$, $SD = 0.01$) and MOSAIC ($M = 1.96$, $SD = 0.07$), $t(14) = 1.45$; $p = .17$. However, it may have been more apparent to children that points were being tracked (ICC = .74; 1 = *unclear that points are being tracked*, 3 = *completely obvious that points are being tracked*) in COMET ($M = 2.56$, $SD = 0.24$) relative to MOSAIC ($M = 1.84$, $SD = .41$), $t(14) = 4.25$; $p < .01$. Because MOSAIC teachers were told to downplay public social comparisons between children in points, this may have resulted in fewer overt references to the point system.

Social devaluation of ADHD—Coders tallied the raw number of times that the teacher had warm, one-on-one personal interactions with each child (ICC = .64) per 8-minute observation period. Teachers' personal interactions were more frequent in MOSAIC ($M = 0.13$, $SD = 0.08$) relative to in COMET ($M = 0.04$, $SD = 0.02$), $t(14) = 3.02$; $p < .01$, with MOSAIC teachers having this type of interaction three times more often with children, or 0.13 times per child in each 8-minute observation period. Coders also tallied the number of times per child, within each 8-minute period, that teacher provided behavioral corrections privately (ICC = .87) and publicly (ICC = .81). The mean number of private behavioral corrections per child provided in MOSAIC ($M = 0.11$, $SD = 0.08$) was greater than in COMET ($M = 0.02$, $SD = 0.02$), $t(14) = 3.01$; $p < .01$. The mean number of public behavioral corrections provided in COMET ($M = 0.25$, $SD = 0.19$) tended to be greater than in MOSAIC ($M = 0.12$, $SD = 0.06$), $t(14) = 1.93$; $p = .075$. In addition, 100% of point checks were observed to be done publically in COMET classrooms and 100% were done privately in MOSAIC classrooms ($\kappa = 1.0$).

Exclusionary peer behavior—Coders globally rated the degree to which teachers encouraged peers to interact inclusively during the observation period (e.g., explicitly stating classroom rules to this end, arranging collaborative activities) using a 3-point scale (1 = *no*

examples, 3 = *repeatedly built connections, multiple instances*; ICC = .66). As expected, these teacher practices were rated as occurring more often in MOSAIC (M = 1.71, SD = 0.40) relative to COMET (M = 1.35, SD = 0.28), $t(14) = 2.10$; $p = .05$.

Reputational bias—Coders tallied the raw number of times that teachers praised each child for personal strengths that were not about behavioral compliance (ICC = .64), such as being a good artist or athlete. As expected, this behavior occurred more often in MOSAIC (M = 0.25, SD = 0.08) relative to COMET (M = 0.08, SD = 0.06), $t(14) = 4.55$; $p < .01$, with MOSAIC teachers, on average, providing this type of praise to children three times more often, or 0.25 times per child in each 8-minute observation period.

Measures

Measures were assessed on an identical schedule in Session 1 and in Session 2. Thus, on each measure, children with ADHD had a value to represent their functioning when in the COMET condition and a value to represent their functioning when in the MOSAIC condition.

Peer sociometric nominations—Children were administered a sociometric procedure (Coie, Dodge, & Coppotelli, 1982) in individual interviews at the end of the session with research assistants unaware of treatment group. Children nominated an unlimited number of classroom peers whom they liked (positive nominations), disliked (negative nominations), and considered to be friends (friendship nominations). Children also rated each peer on a 5-point scale (1 = *really do not like*; 5 = *really like*). To aid recall, children were provided with the pictures and names of classmates. Proportion scores were calculated for each child with ADHD by dividing the number of positive and negative nominations that the child received by the number of classroom peers. Peers whom the child nominated as a friend were investigated to determine if they nominated that child as a friend in return. A proportion score for each child was calculated by dividing the number of reciprocated friendships by the number of classroom peers. The average rating that each child received from peers on the 1–5 scale was also calculated.

Peer interactions—During recess and lunch times when teachers were not present, research assistants unaware of treatment group videotaped each classroom for a total of 6 hours distributed over the session. These research assistants noted when children were involved in negative peer interactions. Independent raters viewed videos of 40 interactions initially coded as negative and 40 interactions randomly selected from the same classrooms at different times not originally coded as negative. The agreement between the independent raters and the original classifications of interactions into negative versus not negative was acceptable ($\kappa = .63$). The number of negative interactions in which each child with ADHD was involved was calculated.

Messages from peers—Children were instructed to write a message to each classmate in a memory book. Teachers left the classroom while research assistants unaware of treatment group administered this measure. Research assistants helped children with writing if needed, but did not provide suggestions about message content. All memory books were double coded by independent raters to establish reliability. Raters judged messages for the presence of (a) sincere compliments (e.g., “You are a good artist”; $\kappa = .91$); (b) indicators that the dyad shared a close, positive relationship (e.g., “You are a great friend”; $\kappa = .93$); and (c) plans to see each other outside of the summer program (e.g., “Come to my birthday party later”; $\kappa = .96$). A total score for each child with ADHD was calculated to represent the proportion of messages the child received containing each of these positive indicators, summed together.

Problem behaviors—Children were rated every day by summer program teachers using the Teacher-Child Rating Scale (TCRS; Hightower et al., 1986) subscales to assess inattention (four items; α = .88), hyperactivity (four items; α = .90), oppositional behavior (three items; α = .86), and internalizing problems (three items; α = .67). Ratings were made on a 5-point metric (1= *not a problem*, 3 = *moderate problem*, 5 = *very serious problem*). The average rating across the session was calculated for each child. In addition, research assistants unaware of treatment condition observed each child for an average of 197 20-second intervals and rated off-task and aggressive/noncompliant behavior as 0 = *not present* and 1 = *present*. To assess inter-rater reliability, two coders simultaneously observed the same child during 50% of intervals. Off-task behavior was indicated when the child engaged in an activity that was not permitted or not relevant to the task (κ = .68). Aggression/noncompliance was indicated for verbal or physical aggression to adults or peers, or where the child heard adult instructions but defied them (κ = .84). Proportion scores were calculated representing the number of times the child engaged in the behavior divided by the total number of observations conducted on that child.

Data Analytic Plan

Hypotheses were tested using repeated measures ANCOVA procedures, with treatment condition as the within-subject factor. Thus, for each dependent variable, the functioning of children with ADHD when in COMET was compared to the same children's functioning when in MOSAIC. We did not expect the order in which the treatment conditions were administered, or the interaction between order and treatment, to affect the peer relationship dependent variables, and none of these effects was significant. This is because the teachers and classroom peers changed between treatment conditions, so there would be no reason for sustained effects of the previous treatment on the perceptions of the new peer group to occur. Intent-to-treat analyses were employed to provide the most unbiased estimate of efficacy, unaffected by teachers' implementation of or children's actual receipt of the treatments (Lachin, 2000).

Effect sizes were computed using partial eta squared (η_p^2) and interpreted using the following conventions: small = .01 – .06; medium = .06 – .14; large = .14 and above (Cohen, 1988). Statistical power to detect a medium effect size of η_p^2 = .10 (with 95% CI) for the primary outcomes was acceptable at .88 (Faul & Erdfelder, 1992), assuming that the correlation between sociometrics in the two treatment conditions was .5 (estimated from Frederickson & Furnham, 2002). To test the exploratory hypothesis that treatments might have differential effects based on child sex, this variable was included as a between-subject factor, and sex by treatment condition interaction effects were tested. We included ODD and internalizing comorbidity (dichotomous) as covariates because of evidence that these conditions may influence treatment response (MTA Cooperative Group, 1999); however, there were no interactions between treatment condition and these comorbidities. Of note, when ADHD subtype, age, medication status, and Full Scale IQ were included as covariates, results remained highly similar, and there were no interactions with treatment condition for any of these factors, so we excluded them from final models.

Results

Descriptive Statistics

Tables 2 and 3 present the descriptive statistics for children with ADHD on the outcome variables in the COMET and MOSAIC treatment conditions. All 24 children with ADHD had complete data on all study measures. Skewness for most variables was acceptable, in the range of +/− 1.1, with the exception of reciprocated friendships in the COMET condition,

which was positively skewed (skew = 2.1; most children had no friendships). We chose to leave this variable untransformed because we thought it accurately reflected functioning.

Peer Relationship Outcomes

Positive nominations—As displayed in Table 2, the main effect for treatment condition on positive nominations was not significant, nor was the interaction between treatment and sex.

Negative nominations—Children with ADHD received fewer negative nominations when in MOSAIC relative to when in COMET. The effect size for this comparison was large, $\eta_p^2 = .23$ (CI = .00 − .48). The interaction between treatment and sex was not significant (Table 2).

Reciprocated friendships—As displayed in Table 2, children with ADHD in MOSAIC received more reciprocated friendship nominations relative to when in COMET. The effect size for this comparison was large at $\eta_p^2 = .34$ (CI = .04 − .57). The interaction with sex was also significant and large, $\eta_p^2 = .33$ (CI = .04 − .56). Probing revealed that boys with ADHD had more reciprocated friendships when in MOSAIC relative to COMET, $t(12) = 3.62$; $p < .01$, but there was no difference for girls with ADHD between treatment conditions, $t(10) = 0.15$; $p = .88$.

Peer sociometric ratings—Children with ADHD received significantly more favorable ratings from peers on the 5-point scale when in MOSAIC relative to when in COMET. The effect size for this comparison was $\eta_p^2 = .22$ (CI = .00 − .47), which is large. There was no interaction between treatment condition and sex for this outcome measure. See Table 2.

Research suggests that peers nominated in sociometric procedures by children with ADHD and TD children tend to be similar (Blachman & Hinshaw, 2002). However, in order to ensure that results on sociometric variables were not driven by the nominations from other children with ADHD, we reconducted all analyses with sociometric variables based on nominations from TD children only. Results were nearly identical, and no new findings emerged.

Peer interactions—There was no main effect for treatment condition on observed negative peer interactions. However, the interaction effect with sex was significant and large, $\eta_p^2 = .20$ (CI = .00 − .45). Probing suggested a trend for boys with ADHD to engage in fewer negative interactions when in MOSAIC relative to COMET, $t(12) = -1.55$; $p = .15$, but that the opposite trend may have occurred for girls with ADHD, $t(10) = 1.89$; $p = .09$. See Table 2.

Messages from peers—As displayed in Table 2, children with ADHD in MOSAIC received a significantly greater proportion of positive messages from peers in memory books relative to when they were in COMET. This comparison had an effect size of $\eta_p^2 = .19$ (CI = .00 − .45), which is large. The treatment by sex interaction was not significant.

Problem Behavior Outcomes

As is displayed in Table 3, there were no main effects for treatment condition on summer program teacher reports of internalizing behavior, hyperactivity, inattention, or oppositional behavior, nor on observations of off-task behavior or aggressive/noncompliant behavior. Further, no treatment by sex interaction was present for any of these variables.

Normalization

We compared the functioning of children with ADHD to the functioning of the TD children on the primary peer sociometric outcomes (see Table 2). Based on Jacobson and Truax (1991), we considered children with ADHD whose functioning was at least 2 SDs poorer than the mean of the TD sample to be outside the normative range. The number of children (out of the 24 children with ADHD in the study) who had positive nomination scores at least 2 SDs below the TD mean was five when in COMET but two when in MOSAIC. Regarding negative nomination proportion scores, 15 children with ADHD when in COMET and 10 children with ADHD when in MOSAIC were at least 2 SDs above the TD mean. On the sociometric rating variable (1 = *really do not like*; 5 = *really like*), 14 children with ADHD when in COMET and five children with ADHD when in MOSAIC scored at least 2 SDs below the TD mean. The SD for the TD sample was large for the variable of reciprocated friendships, so it was not possible to conduct the normalization analyses in the same manner. However, we calculated friendships in a similar way as was done in the MTA study (Hoza, Mrug, et al., 2005). Among TD children, 13% had no reciprocated friends, 26% had one friend, and 61% had more than one friend. For the 24 children with ADHD, when in COMET, 50% (n = 12) had no reciprocated friends, 38% (n = 9) had one friend, and 13% (n = 3) had more than one friend. When in MOSAIC, 21% (n = 5) had no reciprocated friends, 29% (n = 7) had one friend, and 50% (n = 12) had more than one friend.

Discussion

These findings provide initial evidence that increasing socially competent behavior on the part of children with ADHD may be a necessary, but not sufficient, condition to improve peer acceptance and friendship. As expected, COMET and MOSAIC appeared to equally control problem behaviors among children with ADHD, because both employed behavioral management principles validated to increase appropriate conduct in this population (Pelham & Hoza, 1996). However, MOSAIC resulted in improved peer relationships relative to COMET, suggesting that adjunctive procedures to help peers reduce peers' social devaluation of ADHD symptoms, exclusionary behaviors, and reputational biases may be needed to maximize sociometric improvement.

Sociometric measures have historically proved resistant to treatment among children with ADHD, yet it is important for interventions to demonstrate changes in these measures. In prospective longitudinal studies, peer sociometrics are suggested to be better predictors of subsequent criminality, depression, and school failure than are adult informant ratings of social competence (Parker & Asher, 1987). However, the significant effects on sociometric outcomes in the current study are qualified by the observation that few children with ADHD achieved normalization in MOSAIC. With the exception of the variable of reciprocated friendships (for which boys with ADHD matched the TD mean when in MOSAIC but not COMET), children with ADHD remained, on average, 1 SD below the functioning of the TD children in peer functioning. This result highlights the continued need for novel treatment strategies to reduce peer impairment among children with ADHD. Nonetheless, we are unaware of any existing intervention, psychopharmacological or psychosocial, that demonstrates reliable improvement on peer sociometrics, much less normalizes sociometric preference in this population, so we consider any movement in a positive direction to be promising.

Statistical interactions were found between treatment condition and sex, whereby boys with ADHD, but not girls, received benefit from MOSAIC relative to COMET in reciprocated friendships and observed peer interactions. Visual inspection of the means further suggested that for every peer relationship outcome measure (even for variables in which no significant treatment by sex interaction was obtained) boys with ADHD appeared to reap more benefit

from MOSAIC than did their female counterparts. Because the current study grouped children into same-sex classrooms, it is unknown whether male peers would have gained a more positive impression of girls with ADHD in MOSAIC. If so, this could be beneficial despite the tendency for same-sex friendships among children this age.

We offer speculations for why MOSAIC might have been less effective for girls relative to boys with ADHD. First, because ADHD has a strong male predominance, girls with this disorder may be perceived as more deviant from social norms than are boys (Mikami & Lorenzi, 2011). It may have proven difficult for MOSAIC teachers to convince peers to adopt an inclusive attitude towards girls with ADHD (or to believe this themselves), because these girls were objectively more norm-violating. Another speculation is informed by findings that TD girls are more likely than boys to respond with anger and aggressive strategies when they perceive transgressions to social rules (MacEvoy & Asher, 2012). MOSAIC teachers may have had difficulty stopping female peers from responding with censure when they perceived girls with ADHD as behaving in atypical ways.

Although there was never a significant iatrogenic effect for girls receiving MOSAIC relative to COMET, differences between means were found in that direction for some measures (positive nominations, participation in negative peer interactions), although not others (negative nominations, reciprocated friendships, sociometric rating, messages from peers in memory books). If there was an iatrogenic effect of MOSAIC, one process through which this may have occurred is if female peers, given their advanced social language, were sensitive to teachers paying positive attention to children if praise was not fully genuine and therefore assumed that teachers felt sorry for girls with ADHD. By contrast, male peers might have been more likely to take teachers' positive attention at face value. Future research should consider what changes to MOSAIC are needed to maximize efficacy for girls with ADHD. If altering the biases of the entire female peer group is challenging, a MOSAIC teacher might initially foster a friendship between a girl with ADHD and a specific female (or male) peer known by the teacher as amenable to viewing the girl with ADHD in a positive light.

Strengths of this study include the use of a rigorous experimental design with high internal validity, whereby children with ADHD received both MOSAIC and COMET counterbalanced for order in classrooms with previously unacquainted peers and teachers. The use of an active comparison treatment to MOSAIC, in which teacher buy-in and time was matched, reduced the likelihood of expectancy effects or attention as contributors to outcomes. Finally, children with ADHD were clinically diagnosed and treatment efficacy was evaluated using multi-informant batteries including the gold standard of peer sociometrics.

A major limitation of this study is the restricted external validity of MOSAIC in its current form. This study was conducted as a proof-of-concept, testing MOSAIC under ideal circumstances. Summer program teachers were teacher education students (increasing their potential amenability to learning new procedures), the teacher:child ratio was high at 2:10, class sizes were small, teachers faced no demands to increase children's academic test scores, and teachers received daily coaching from the research team. These factors likely increased the implementation fidelity in this study, but are not present in regular school classrooms. The promising findings of MOSAIC under well-controlled conditions suggest the necessity of next examining the feasibility of implementing this treatment in regular classroom settings.

Further, in the current study all children within a classroom attended different regular schools in order to minimize previous interaction. Although this procedure was important to

equate reputational effects between COMET and MOSAIC conditions (which might not have been completely eliminated by randomization), children in regular school classrooms have a rich interaction history. Thus, the positive effects of MOSAIC may also be attenuated when a teacher must counteract the pre-existing negative reputations that children with ADHD have with their peers. However, MOSAIC includes teacher practices specifically theorized to dismantle children's negative reputations, so it is possible that MOSAIC will continue to be efficacious in regular classrooms if sufficient time is allotted for change to occur. In addition, the current study tested peers' impressions after a relatively brief (2-week) period, so it is unknown whether MOSAIC will be able to alter peers' lasting sociometric judgments. Nonetheless, the stability of peer rejection from the beginning to the end of a school year tends to be high (e.g., r = .6–.8; Mayeux, Bellmore, & Cillessen, 2007), so peers' initial impressions may have meaningful staying power in classrooms where teachers implement consistent practices over time.

Although children's problem behavior was suggested to be equally controlled in COMET and MOSAIC, it is important to note that we are making the untested assumption that the behavioral contingency management present in both conditions would have led to improved behaviors relative to a no-treatment condition. Given that behavioral management procedures are empirically supported to reduce ADHD symptoms (Pelham & Hoza, 1996), it seemed unnecessary and unethical to include a condition with no behavioral management. We also note that although behavioral management was implemented similarly overall in COMET relative to MOSAIC, teachers in MOSAIC downplayed social comparisons between children in point totals to prevent peers from devaluing those with few points. Yet, the social value that teachers place on points can motivate children with ADHD to behave better, so while this study found that the point system led to equivalent behavior in MOSAIC relative to COMET, it is possible that this would not occur in regular classrooms where children with ADHD have increased academic demands and may need larger motivational incentives to behave appropriately.

Other limitations of this study pertain to the sample. The small size of the ADHD sample limits confidence in our moderation results in particular. Additionally, it was not practical to use classroom sociometrics to ensure that children met inclusion criteria for peer problems, so we relied on parent and teacher report of this information with the recognition that these informants may not be fully aware of the extent to which children are disliked by peers. This may have resulted in more children with ADHD failing to qualify for the study than warranted because they were reported to have insufficient peer problems (see Figure 1). Finally, the sample was relatively ethnically homogeneous (81% white) and upper-middle class, and most children had Full Scale IQ scores in the High Average range. Although these demographics are representative of the university community in the southeastern United States where the data was collected, it remains important to investigate the utility of MOSAIC among children with more diverse demographics. However, there were no suggestions in the current sample that MOSAIC worked differently based on these demographic factors, nor is there evidence in the literature that children with these demographics are more amenable to being socially inclusive of diverse peers.

In conclusion, these findings suggest that adjunctive procedures to increase the inclusiveness of the peer group may be a promising approach to ameliorate peer problems among children with ADHD. Improving socially competent behavior among children with ADHD may be a necessary, but not sufficient, condition to result in sociometric acceptance and friendship. Further, training regular classroom teachers to increase the inclusiveness of the peer group may have the potential for ripple effects extending beyond the few children with ADHD in that teacher's classroom when the treatment is provided. After active treatment ceases, a lasting increase in peers' inclusiveness may discourage rejection of new children with

ADHD to enter that group in subsequent years. A durable change in teacher practices may additionally prevent rejection of children with ADHD who enroll in that teacher's class in the future. MOSAIC may also be applicable to increasing peers' inclusiveness toward children who are different for a variety of reasons beyond ADHD, such as children who are in the demographic minority, or who have other mental or physical health conditions, or special learning needs.

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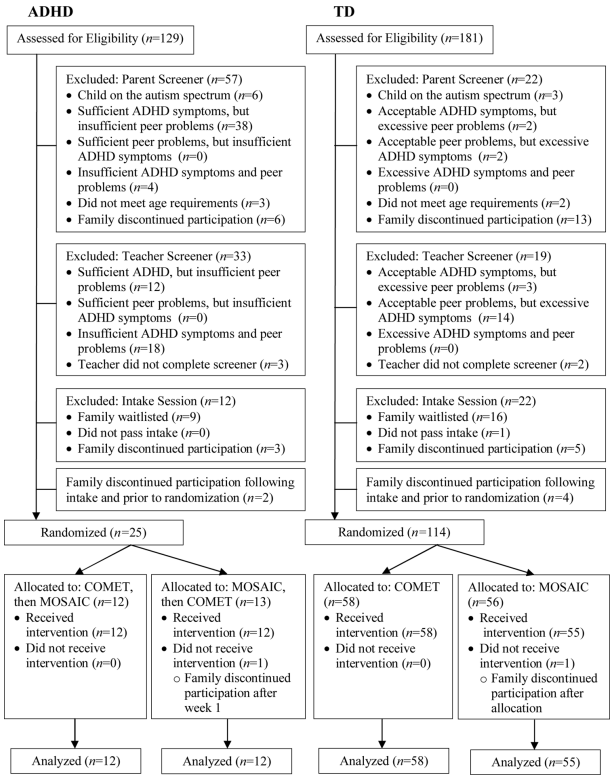

Figure 1.
CONSORT flow diagrams for ADHD and TD samples.

Table 1

Demographic Characteristics of Children with ADHD and TD Children

Variable	ADHD (*n* = 24) Mean (SD)	TD (*n* = 113) Mean (SD)	*p*
Child age (years)	8.15 (.79)	8.19 (.83)	0.83
Grade	2.00 (.89)	1.94 (.79)	0.73
Adults in household	1.92 (.41)	2.07 (.50)	0.16
Family income	$76,789 (31,251)	$106,597 (67,864)	0.06
Full Scale IQ	109.96 (15.65)	120.89 (13.31)	<0.01
Male (%)	54	47	0.52
White (%)	75	83	0.35
ADHD Combined Type (*n*)	18	0	--
ADHD Inattentive Type (*n*)	6	0	--
ADHD Hyperactive/Impulsive Type (*n*)	0	0	--
Comorbid ODD (*n*)	5	0	--
Comorbid internalizing (*n*)	4	0	--
Comorbid ODD and internalizing (*n*)	7	0	--
Comorbid CD	0	0	--
Psychotropic medication (*n*)	10	0	--

Note. Comorbid internalizing represents depressive and/or anxiety diagnoses. All 10 medicated children were receiving stimulant preparations for ADHD and some were taking additional medications for comorbid conditions. Significance testing was conducted using independent samples *t*-tests for continuous variables and χ^2 for dichotomous variables. There were no differences between boys and girls with ADHD in subtype, comorbidities, or medication use.

Table 2

Peer Relationship Outcomes in COMET and MOSAIC

Variable	ADHD-Comet		ADHD-Mosaic		TD	Treatment		Treatment x Sex	
	Girls	*Boys*	*Girls*	*Boys*	*Overall*	*F*(1,20)	*p*	*F*(1,20)	*p*
Positive Nominations	0.34(.24)	0.26(.15)	0.29(.14)	0.36(.18)	0.55(.21)	0.05	.83	3.90	.06
Negative Nominations	0.24(.19)	0.35(.16)	0.23(.25)	0.21(.20)	0.07(.08)	5.85	.03	2.73	.11
Reciprocated Friendships	0.12(.18)	0.07(.07)	0.12(.14)	0.23(.16)	0.23(.17)	10.19	.01	9.67	.01
Sociometric Ratings	2.67(0.64)	2.30(0.41)	2.89(0.48)	2.63(0.52)	3.26(0.40)	5.49	.03	0.50	.49
Peer Interactions	3.82(3.55)	11.23(6.98)	6.18(6.48)	7.92(5.17)	3.36(2.77)	0.26	.62	4.95	.04
Messages from Peers	0.96(0.20)	0.43(0.26)	0.98(0.28)	0.65(0.19)	0.83(0.34)	4.70	.04	2.94	.10

Note. Data in table represent raw group means, with SDs in parentheses. “Positive Nominations”, “Negative Nominations”, and “Reciprocated Friendships” are proportion scores (received nominations divided by number of peers). “Sociometric Ratings” represents the child's received rating on the 1–5 scale (higher numbers indicate better acceptance). “Peer Interactions” represents the total of observed negative peer interactions during lunch/recess for the child with ADHD across the session. “Messages from Peers” indicates the average number of positive indications observed per peer message for the children with ADHD (possible to have a maximum of three positive indicators per message, and a minimum of zero). Sex had a significant main effect for the dependent variables of Peer Interactions and Messages from Peers, such that girls were observed to have more positive interactions than were boys. All main effects and interactions involving comorbid ODD, and comorbid internalizing problems were non-significant.

Table 3

Problem Behavior Outcomes in COMET and MOSAIC

	ADHD-Comet		ADHD-Mosaic		TD	Treatment		Treatment X Sex	
Variable	***Girls***	***Boys***	***Girls***	***Boys***	***Overall***	***F*(1,20)**	***p***	***F*(1,20)**	***p***
Internalizing Problems	1.34(.26)	1.61(.46)	1.46(.46)	1.54(.52)	1.17(.30)	0.01	.93	1.19	.29
Hyperactivity	1.48(.43)	2.54(.82)	1.64(.72)	2.32(.83)	1.20(.30)	0.02	.89	2.71	.12
Inattention	1.66(.57)	2.50(.78)	1.62(.54)	2.15(.54)	1.17(.31)	0.10	.76	1.84	.19
Oppositional Behavior	1.29(.28)	1.90(.96)	1.43(.49)	1.96(.80)	1.10(.24)	0.01	.92	0.03	.86
Off-task Behavior	0.04(.04)	0.08(.07)	0.03(.04)	0.13(.08)	0.02(.02)	1.99	.17	2.79	.11
Aggression/Noncompliance	0.00(.00)	0.01(.03)	0.00(.00)	0.02(.03)	.00(.00)	1.42	.25	0.09	.77

Note. Data in table represent raw group means, with SDs in parentheses. “Internalizing Problems”, “Hyperactivity”, “Inattention”, and “Oppositional Behavior” were session averages of daily ratings from the summer program teachers on the CBQ (1= *not a problem*, 3 = *moderate problem*, 5 = *very serious problem*). “Off-task Behavior” and ”Aggression/Noncompliance“ represent the proportion of instances that this behavior was observed to occur relative to the total number of observations conducted. Sex had a significant main effect for the dependent variables of Hyperactivity, Inattention, Oppositional Behavior, and Off-task Behavior, such that boys displayed more of these behaviors than did girls. All main effects and interactions involving comorbid ODD and comorbid internalizing problems were non-significant.