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Nonverbal Social Skills of Adults with Mild Intellectual Disability Diagnosed with Depression

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Abstract

Depression is one of the most common psychiatric disorders in adults with intellectual disability (ID), yet little is known about depressive behaviors in an ID population. This study examined the nonverbal social skills of 18 adults with mild ID diagnosed with depression and a matched sample of adults with mild ID without depression. Nonverbal social skills were coded from videotapes of actual social interactions. Results indicate that adults with mild ID diagnosed with depression evidence a profile of maladaptive nonverbal social skills including limited body movement, a restricted range of facial expressions, infrequent smiling, speaking in a flat and quiet voice, and taking a long time to respond to the questions or comments of a social partner. Findings from this study have implications for enhancing the early detection and diagnosis of depression and guiding theories of and treatments for depression in an ID population.

The point prevalence of depression in adults with intellectual disability (ID) is estimated to 4%, making depression one of the most common psychiatric disorders in this population (Cooper & Bailey, 2001; Cooper, Smiley, Morrison, Williamson, & Allan, 2007; Smiley & Cooper, 2003). Yet, there remains a paucity of research on the presentation of depression in adults with ID. Identifying behavioral symptoms of depression is of particular importance given that adults with ID often do not have the verbal or cognitive abilities to describe how they think or feel (e.g., Clarke & Gomez, 1999; Marston, Perry, & Roy, 1997). Studies suggest that adults with ID exhibit many of the same depressive behaviors as their typically developing peers, yet also display a unique set of depressive behaviors. For instance, depression is related to increased aggression, loss of skills, and a rise in behavior problems in adults with ID (McBrien, 2003; Marston, Perry & Roy, 1997; Matson et al., 1999). Identification of the similarities and differences in depressive behaviors between the typically developing population and adults with ID is important for enhancing early detection and diagnosis of depression. It is also essential for informing theories of and designing interventions to treat depression in an ID population. The purpose of this study is to determine whether adults with mild ID evidence the same profile of depressive nonverbal social skills as seen in the general population.

In the general population, people with depression exhibit a unique profile of depressive nonverbal social skills characterized by reduced involvement in interactions and responsiveness to social partners (e.g., Dykman, Horowitz, Abramson, & Usher, 1991; Fauber, Forehand, Long, Burke, & Faust, 1987; Lewinson, Mischel, Chaplin, & Barton, 1980). People with depression speak slower, speak with lower volume and in a more monotone voice, and

take longer to respond to social partners than people without depression (e.g., Bouhuys & van der Meulen, 1984; Darby, Simmons, & Berger, 1984; Greden & Carroll, 1980; Nilsonne, 1988; Pope, Blass, Siegman, & Rahe, 1970). People with depression also have low levels of eye contact with social partners, frown more and smile less, and demonstrate less overall body movement and gesturing than people without depression (e.g., Dow & Craighead, 1987; Fossi, Faravelli, & Paoli, 1984). In addition, people with depression exhibit less head nodding (as if indicating 'yes' or agreement) and more head shaking (as if indicating 'no' or disagreement) and display more tearfulness than people without depression (e.g., Kazdin, Sherick, Esveltd-Dawson, & Rancurello, 1985).

These depressive nonverbal social skills impede people with depression from positively connecting with their social environment. Specifically, these depressive nonverbal social skills violate the basic expectation that people will contribute to social interactions and appropriately respond to social partners by showing interest in and support for social partners (e.g., Amstutz & Kaplan, 1987; Gotlib & Beatty, 1985; Gurtman, 1986a; Segrin, 1992; Segrin & Abramson, 1994). This violation causes conversations to break down and be perceived as dull, aversive, and unrewarding to social partners (e.g., Davis, 1982; Davis & Perkowski, 1979; Davis & Holtgraves, 1984; Harper & Hughey, 1986; Wilfong, Saylor, & Elksnin, 1991). Subsequently, social partners limit their interactions with people with depression or these interactions become negative. In this way, people with depression experience less positive social support and more interpersonal stress, which contributes to further depressed affect (Lewinsohn, 1974; Libet & Lewinsohn, 1973). The large body of research on depressive nonverbal social skills has informed interpersonal theories of and interventions for depression in the general population (e.g., Barkham & Hardy, 2001; Goldstein, 1980).

Whether depression is related to a similar profile of depressive nonverbal social skills in adults with mild ID has yet to be systematically examined. Many of the depressive nonverbal social skills seen in the general population have been shown to occur across a wide developmental age range. Adults, adolescents, and children with depression evidence a profile of depressive nonverbal social skills including infrequent body movement, gesturing and eye contact, frequent head shaking (i.e., as if indicating disagreement) and tearfulness, and speaking in a quiet and monotone voice (e.g., Fauber et al., 1987; Greden, & Carroll, 1980; Kazdin, Sherick, Esveltd, Dawson, & Rancurello, 1985; Nilsonne, 1988). Adults with mild ID are developmentally similar to typical children and adolescents and therefore may also display these depressive nonverbal social skills. In addition, there is strong evidence that facial expressions, including smiling and frowning, are universal expressions of emotions that occur regardless of developmental level or culture (e.g., Ekman & Rosenberg, 1997; Fridlund, 1994). Thus, as in the general population, it is likely that depression is related to an increase in frowning and a decrease in smiling in adults with mild ID.

The few studies that have investigated social skills in an ID population have shown a relation between poor verbal and nonverbal social skills and depressive symptoms in samples of adults with borderline IQ to moderate ID (Benson, Reiss, Smith, & Laman, 1985; Heiman & Margalit, 1998; Helsel & Matson, 1988; Laman & Reiss, 1987; Payne & Jahoda, 2004; Reiss & Benson, 1985). However, conclusions from these studies are limited in that they largely included participants who did not have a diagnosis of depression, and thus results do not reflect whether adults with mild ID diagnosed with depression exhibit a unique profile of maladaptive social skills. Moreover, previous studies examined the association between depressive symptoms and social skills broadly, using the total score from self- or caregiver-rated measures. An investigation of the specific nonverbal social skills that differentiate adults with mild ID with and without depression is needed.

Caregiver-ratings and self-report measures can provide meaningful information on the nonverbal social skills related to depression in adults with mild ID. However, these measures require raters to recall subtle behaviors that they were likely not cognizant of at the time of occurrence. It may be difficult for these raters to be mindful of subtle and often fleeting nonverbal social skills (e.g., response latency, facial expressions, and intonation) during their daily interactions. Caregiver ratings and self-report measures can also be biased by systematic errors, such as leniency in ratings, halo effects, contrast errors due to comparisons with particular sets of others, recency effects stemming from recent interactions, and social desirability (e.g., Bernard, Killworth, Kronenfeld, & Sailor, 1984; Lilienfeld & Fowler, 2006; Renk, Donnelly, McKinney, & Baksh, 2007). Observations of nonverbal social skills in actual social situations can avoid these difficulties and may provide greater insight into the depressive nonverbal social skills of adults with mild ID. There has not been a published study of observed nonverbal social skills in adults with ID with and without depression.

In this study, we examined the nonverbal social skills of 18 adults with mild ID diagnosed with depression and 18 adults with mild ID without depression. The participants with and without depression were matched on IQ, age, gender, and ethnicity, in order to limit differences in nonverbal social skills between the groups due to variables other than depressive diagnosis status. Nonverbal social skills were coded from observations of an actual social interaction. Adults with mild ID diagnosed with depression were predicted to speak in a quieter and more monotone voice, take longer to respond, use fewer gestures and head nodding but greater head shaking, have less overall facial expressiveness, frown more, smile less, have more tearfulness, and make less eye contact with social partners than adults with mild ID without depression.

Method

Participants

Participants were selected from a larger subject pool of adults with mild ID (IQ 55–70 and concomitant impairments in adaptive behavior) recruited from 10 disability service providers in the Rocky Mountain region of the United States. All participants had adequate oral communication skills (i.e., orally communicate without the aid of another person). Participants with a diagnosis of autism were excluded given that impaired social functioning is a core aspect of this disorder. In order to be consistent with previous studies of depression (e.g., Esbensen & Benson, 2007; Hartley & MacLean, 2005; Lunskey, 2003; Lunskey & Benson, 2001), participants had various etiologies for ID, with the largest portion being of unknown etiology. This study is based on the 18 participants diagnosed with a current depressive disorder (8 Major Depressive Disorder, 3 Dysthymia, and 6 Depression NOS) who could be matched on age (within 6 years), gender, ethnicity (Caucasian versus Non-Caucasian), and IQ (within 5 points) to participants without a depressive disorder. The majority of participants diagnosed with depression were taking medication to manage their depression. The subject characteristics of the 18 matched pairs with and without depression are presented in Table 1. The participants with and without depression were successfully matched on gender and ethnicity. Independent samples *t*-tests indicated that there was no significant difference between the groups in age ($t(31) = -.34, p = .74$) or IQ ($t(31) = -1.02, p = .31$). Six of the 18 (33.3%) participants without depression had a diagnosis of an alternative psychiatric disorder; one of these participants had two alternative psychiatric disorder diagnoses. Five of the 18 (27.8%) participants diagnosed with depression had a diagnosis of an alternative psychiatric disorder in addition to depression. The prevalence of alternative psychiatric disorders is consistent with epidemiology research on co-occurring mental health disorders in adults with ID (Borthwick-Duffy, 1994; White, Chant, Edwards, Townsend, & Waghorn, 2005).

Caregivers from participants' disability service provider, largely case managers, who worked with the participant at least twice a week were also recruited to complete measures. Caregivers

reported working with the participant for an average of 3.4 years (range 0.5 to 8.0 years). Twenty-one of the caregivers were female and 11 were male and their average age was 28.2 years ($SD = 6.02$ years).

Measures

Subject characteristics—The Kaufman Brief Intelligence Test, 2nd Edition (K-BIT-2, Kaufman & Kaufman, 2004), an individually administered measure of verbal and nonverbal cognitive abilities, was used to assess participants' IQ. The K-BIT-2 IQ Composite score has satisfactory internal consistency (.86 to .96), test-retest reliability (.88 to .92), and concurrent validity (Kaufman & Kaufman, 2004). Staff reported on the age, gender, living status, and ethnicity of the participants. Staff also completed the Adaptive Behavior Assessment System-2nd edition (ABAS-II; Harrison & Oakland, 2006) to assess the everyday living skills of the participants. The ABAS-II General Adaptive Composite (GAC) score has adequate internal consistency (.97 to .99), test-retest reliability (.86 to .99), and concurrent validity (Harrison & Oakland, 2006).

Depression—The Glasgow Depression Scale for People with a Learning Disorder (GDS; Cuthill, Espie, & Cooper, 2003) was used to verify that participants with a diagnosis of depression were currently experiencing more depressive symptoms than the participants without depression. Both the 20-item GDS self-report and 16-item GDS caregiver supplement were used. GDS items are based on criteria for depression in the Diagnostic Criteria for Psychiatric Disorders for use with adults with Learning Disabilities/Mental Retardation (DC-LD; Royal College of Psychiatrists, 2001) and rated on a 3 point scale ("Never/No," "Sometimes," and "Always/A Lot"). The self-report GDS has satisfactory internal consistency (0.97), test-retest reliability (0.97), and criterion validity (Cuthill et al., 2003). The caregiver supplement GDS also has adequate inter-rater reliability (0.93), internal consistency (0.88), and test-retest reliability (0.98) (Cuthill et al., 2003). In this study, the self-report GDS (0.83) and caregiver supplement GDS (0.87) had adequate internal consistency. There was a significant positive correlation between the GDS self-report and GDS caregiver supplement ($r = .43, p < .01$). A paired sample t-test indicated that the participants diagnosed with depression had a significantly higher GDS self-report score ($M = 17.81, SD = 6.87$) than the participants without depression ($M = 13.31.78, SD = 5.87$), $t(17) = 3.00, p = .01, d = 0.70$). The participants diagnosed with depression ($M = 11.91, SD = 6.01$) also had a significantly higher GDS caregiver supplement score than the participants without depression ($M = 7.04, SD = 6.24$), $t(17) = 3.07, p < .01, d = 0.79$.

Social Interaction—In accordance with studies of typically developing children and adults, a semi-structured videotaped interview was used to observe the nonverbal social skills of the participants (e.g., Arkowitz, Lichtenstein, McGovern, & Hines, 1975; Jacobson & Anderson, 1982; Kazdin et al., 1985; Lewinsohn, Mischel, Chaplin, & Barton, 1980). The interview was conducted individually with each participant in a private setting. Interview questions and procedure were based on a previous study of nonverbal social skills of depressed children (aged 7 to 12 years) in the general population (Kazdin et al., 1985), however some questions were slightly altered to be appropriate for adults with mild ID (e.g., "What have you been doing in school?" was changed to "What have you been doing at your work/day program?"). Participants were asked 10 questions about their everyday experiences: "Tell me what you did today." "What shows on TV do you like?" "What have you been doing at work/your day program?" "What makes you happy?" "What makes you sad?" "What makes you angry?" "What do you like to do on the weekends?" "What kinds of chores do you have to do around the house?" "Have you gone on a vacation lately? Where did you go (where would you like to go)?" "What do you do when you get home from work/day program at night?" All interviews were conducted

by the same female researcher who was naive to group membership (i.e., depressive disorder status). The positioning of the interview chairs and camera was constant across participants.

In line with protocols used in the general population (Arkowitz et al., 1975; Jacobson & Anderson, 1982; Kazdin et al., 1985; Lewinsohn et al., 1980), the interview followed a standardized script, yet attempted to model natural conversation. Therefore, following the participant's initial response to each of the 10 questions, the interview provided 1 follow-up question and 1 comment regarding their opinion or experience. The interviewer was then instructed to be responsive to the participant's initiations to maintain the conversation by commenting or answering questions, but did not provide their own efforts to maintain the conversation. To ensure fidelity to the interview protocol, each interview was rated to determine whether the protocol was followed (i.e., yes or no) for each of the 10 questions for all participants. For 3 participants, one question was rated as not having followed the interview protocol; this question was eliminated from analyses. Therefore, ratings for each nonverbal social skill were summed across questions and then divided by the total number of questions.

Two research assistants who were naive to group membership independently coded the nonverbal social skills of the participants. Definitions and coding responses for the nonverbal social skills are shown in Table 2. The definitions and coding response categories were developed in a previous study (Kazdin et al., 1985). Prior to coding the actual videotapes, the research assistants were required to obtain at least 90% agreement in their coding with both with the leading author and other research assistant. During this training, all discrepancies in coding were discussed until consensus was reached.

Each interview question was viewed 3 times for each participant. During the first viewing, Overall Body Movement, Head Nodding and Lowering and Head Shaking were coded. During the second viewing, Facial Expressiveness, Frowning, Smiling, Intonation, and Tearfulness were coded. During the third viewing, Gesturing, Volume of Voice, Response Latency, and Eye Contact were coded. All nonverbal social skills were rated on a 3-point scale. Head shaking, Frowning, and Tearfulness were reverse scored prior to analyses so that lower ratings indicate more impairment for all nonverbal social skills. A Total Lack of Involvement/Responsiveness score was computed by taking the average of the summed scores for each nonverbal social skill.

Interrater reliability was assessed by calculating Cohen's Kappa for the two coders for each nonverbal social skill across all 10 questions. There was a moderate to substantial mean interrater agreement between coders for all nonverbal social skills (Landis & Koch, 1977): Overall Body Movement ($\kappa = .73$, range = .69 to .76), Head Nodding and Lowering ($\kappa = .68$, range = .66 to .69), Head Shaking ($\kappa = .72$, range = .69 to .76), Facial Expressiveness ($\kappa = .78$, range = .76 to .79), Frowning ($\kappa = .72$, range = .69 to .76), Smiling ($\kappa = .72$, range = .69 to .76), Intonation ($\kappa = .73$, range = .71 to .76), Tearfulness ($\kappa = .72$, range = .69 to .76), Gesturing ($\kappa = .72$, range = .69 to .76), Volume of Voice ($\kappa = .72$, range = .69 to .74), Response Latency ($\kappa = .72$, range = .69 to .76), and Eye Contact ($\kappa = .66$, range = .62 to .70).

Procedure

A researcher naive to group membership (i.e., depressive disorder status) administered assessments. Participants were informed that their participation was voluntary, responses would be confidential, and they could withdraw from the study at any time. A training procedure was used to ensure that participants could reliably use a 3-point Likert-type scale. Participants were asked to arrange 3 clear containers with varying amounts of colored water by quantity of water. Participants were then asked to match these containers to written descriptors ("No" "Sometimes" and "Extremely") and a numerical scale (0 to 2). Finally, participants were asked to use the containers, written descriptors, or numbers to indicate their

preference for their most favorite and least favorite food. Only participants who successfully passed this training procedure were included in the study. This training procedure has been shown to result in a low rate of response bias for Likert-type scales in actual testing (Hartley & MacLean, 2005). Participants were given the K-BIT-2. They were then read the GAS self-report. Clear containers with varying amounts of colored water were paired with the GAS Likert-type scale to provide a visual representation of response options. The videotaped interview was administered. The procedure took 35 to 75 minutes.

Results

Paired sample correlations were first conducted to examine the importance of matching the participants with and without depression on key subject characteristics including age, gender, ethnicity, and IQ. Paired sample correlations were positive for 10 of the 13 nonverbal social skills and significant for 2 scores ($r = .39$ to $.43$, $p < .05$), suggesting that subject characteristics do indeed impact nonverbal social skills. Given that the groups were successfully matched on age, gender, ethnicity, and IQ, paired sample t-tests were used to identify differences between the depressed and non-depressed groups. Cohen's d calculations based on the original standard deviations (or between group t-test values) were used to estimate effect size (Dunlop, Cortina, Vaslow, & Burke, 1996).

Table 3 presents the means, standard deviations, and results of the paired sample t-tests for the nonverbal social skills observed during the interview for the depressed and non-depressed groups. The depressed group had a significantly lower (i.e., more impaired) score than the non-depressed group for Overall Body Movement ($t(17) = 2.08$, $p = .05$, $d = 0.67$), Facial Expressiveness ($t(17) = 4.64$, $p < .01$, $d = 1.49$), Smiling ($t(17) = 3.59$, $p < .01$, $d = 1.39$), Intonation ($t(17) = 4.72$, $p < .01$, $d = 1.59$), Volume of Voice ($t(17) = 3.97$, $p < .01$, $d = 1.21$), Response Latency ($t(17) = 2.26$, $p = .04$, $d = 0.75$), Eye Contact ($t(17) = 2.09$, $p = .05$, $d = 0.44$), and Total Lack of Involvement/Responsiveness score ($t(17) = 4.85$, $p < .01$, $d = 1.71$). There was not a significant difference between the depressed and non-depressed groups in Head Nodding/Lowering ($t(17) = 0.99$, $p = .34$), Head Shaking ($t(17) = 1.13$, $p = .28$), Frowning ($t(17) = -1.44$, $p = .17$), Tearfulness ($t(17) = 0.67$, $p = .51$), or Gesturing ($t(17) = 1.44$, $p = .17$).

In order to determine whether depressive symptoms were associated with nonverbal social skills regardless of diagnosis of depression, correlations were conducted between the GDS caregiver supplement and GDS self-report and the nonverbal social skills. There was a significant positive correlation between the GDS caregiver supplement and Facial Expressiveness ($r = .38$, $p = .02$), Intonation ($r = .49$, $p < .01$), Smiling ($r = .31$, $p = .04$) and Total Lack of Involvement/Responsiveness ($r = .41$, $p = .01$). The GDS caregiver supplement was not significantly correlated with the remaining nonverbal social skill scores. There was a significant correlation between the GDS self-report and Response Latency ($r = .23$, $p = .45$), Intonation ($r = .23$, $p = .45$), Volume ($r = .31$, $p = .04$), and Total Lack of Involvement/Responsiveness ($r = .23$, $p = .45$). The GDS self-report was not significantly correlated with the remaining nonverbal social skills.

Discussion

Despite the high prevalence of depression in adults with ID (Cooper & Bailey, 2001; Cooper et al., 2007), little research has been devoted to identifying depressive behaviors in this population. In the general population, people with depression exhibit a profile of depressive nonverbal social skills involving a lack of involvement in interactions and responsiveness to social partners (e.g., Darby et al., 1984; Fossi et al., 1984; Kazdin et al., 1985; Nilsson, 1988). Findings from this study suggest that adults with mild ID display a similar profile of

depressive nonverbal social skills. Adults with mild ID diagnosed with depression exhibited less body movement, showed less smiling, had a more restricted range of facial expressions, spoke in a more flat and quiet voice, and took longer to respond to the questions or comments of a social partner than adults with mild ID without depression. Moreover, adults with mild ID who had more depressive symptoms, regardless of whether they were diagnosed with depression, evidenced a more overall 'depressive' profile of nonverbal social skills than adults with mild ID who had fewer depressive symptoms. Having more depressive symptoms was also positively associated with having a more restricted range of facial expressions, speaking more quietly and in a more monotone voice, having a longer response delay, and smiling less often.

Unlike findings from the general population (e.g., Dow & Craighead, 1987; Kazdin et al., 1985), there was no significant difference between the adults with mild ID with and without depression in frowning or tearfulness. This unexpected finding may be due to the limited variability in ratings for these behaviors; most participants did not exhibit frowning or tearfulness during the interview, possibly because questions largely pertained to everyday, ordinary experiences and did not evoke strong emotional responses. Although similar questions were used with typically developing children and depression was related to increased frowning and tearfulness, the difference between the depressed and non-depressed groups was rather small (Kazdin et al., 1985). Future studies should include questions intended to evoke a range of emotions to better assess the relevance of tearfulness and frowning for depression among adults with mild ID. In addition, adults with mild ID diagnosed with depression did not evidence significant differences in gesturing or head nodding and shaking as compared to adults with mild ID without depression, despite variability in ratings for these behaviors. These nonverbal social skills may not be part of a depressive presentation in adults with mild ID. Further research using a larger sample of adults with mild ID diagnosed with depression is needed to investigate this possibility.

Findings from this study are important for enhancing the diagnostic process of depression in adults with mild ID. As our understanding of the behavioral symptoms of depression in adults with ID increases, so does our ability to appropriately screen for and detect depression early on in this population. Findings from this study are also important for informing theories of and treatments for depression in adults with mild ID. The large body of research on depressive nonverbal social skills in the general population has informed interpersonal theories of depression. These theories suggest that depressive nonverbal social skills are both a consequence of and contributor to further depressed affect by evoking negative social interactions (e.g., Segrin & Abramson, 1994; Youngren & Lewinsohn, 1980). Previous research has shown that depression is also related to a heightened experience of negative social interactions in adults with mild ID (Hartley & MacLean, 2005; Lunskey & Benson, 2001). One reason for this heightened experience of negative social interactions may be that adults with mild ID diagnosed with depression also evidence a profile of nonverbal social skills characterized by a lack of involvement in interactions and responsiveness to social partners. Subsequently, these depressive nonverbal social skills may make interactions seem dull, aversive, and unrewarding to social partners, and thereby social partners may limit their interactions with adults with mild ID diagnosed with depression or these interactions may become negative. Further research is needed to investigate this possibility.

Skill training programs are often used with adults with ID, and may be helpful in teaching adults with mild ID diagnosed with depression adaptive nonverbal social skills such as making better eye contact and smiling periodically during conversations. Although these programs alone are not sufficient to treat depression, they can help adults with mild ID better access positive social interactions and support, which is important for improving depressed affect. Perhaps more importantly, findings from this study can be used to develop interventions aimed

at educating care professionals and family about the potential for depressive nonverbal social skills to make social interactions seem boring, dull, and aversive. More specifically, care professionals and family could be educated about depressive nonverbal social skills and strategies for not getting frustrated or aggravated by these interpersonal behaviors. For instance, care professionals and family could be taught to remind themselves that these behaviors are common among people who are depressed and use these behaviors as a reminder to give the adult with mild ID more positive support.

There are several strengths to this study. This is the first study of nonverbal social skills among adults with mild ID diagnosed with depression. The study employed a standardized protocol developed for typically developing children to elicit nonverbal social skills during an actual social interaction and had multiple trained coders rate these skills. Moreover, adults with mild ID with and without depression were closely matched on several key subject characteristics. There are also several limitations to this study. A priori hypotheses regarding differences between the matched depressed and non-depressed groups were tested through repeated paired sample t-tests. Our hypothesis-driven approach limits concern for chance findings, although the use of multiple t-tests can result in alpha inflation. This study also had a relatively small sample size and a larger study is needed to increase confidence in the generalizability of results. In addition, diagnosis of depression was made by participants' disability service provider, and included an evaluation by a licensed mental health provider. In support of the accuracy of diagnoses, participants with a diagnosis of depression had significantly more depressive symptoms on the GDS than participants without a depressive diagnosis. However, an in-depth evaluation of depressive diagnoses was not conducted by the present research team. Given the paucity of information on depression in adults with mild ID, and likely problems with the dissemination of this information to mental health providers and physicians, there is a potential for unreliable diagnoses. It is also important to note that several participants diagnosed with depression were being treated with medication and therapy services and this may have limited their presentation of depressive social skills.

Adults with mild ID in the non-depressed group often had an alternative psychiatric disorder. Differences between the depressed and non-depressed groups may have been stronger if a more "healthy" sample of adults with mild ID without depression was used. Moreover, using adults with mild ID as their own comparison group in a longitudinal design, by assessing nonverbal social skills prior to and during a depressive episode, would provide an even stronger methodology. However, the inclusion of adults with mild ID with alternative psychiatric disorders in the non-depressed group increases confidence that the nonverbal social skill problems identified in this study unique related to a depressive social skill profile.

This study only examined the limited set of depressive nonverbal social skills found to be important in the general population. However, additional nonverbal social skills may also be seen in depression in adults with mild ID. For instance, previous research suggests that depression is related to increased anger and/or aggression in adults with ID (e.g., Davis, Judd, & Herman, 1997; Laman & Reiss, 1987). Nonverbal social skill problems related to anger management (e.g., scowling or aggressive posturing) may thus also be part of the depressive social skill profile in an ID population. We encourage future researchers to use discussion groups made up of experts in the field of ID and people with ID to compile a list of additional nonverbal social skills that may be unique to an ID population. This study is also limited in that it included a cross-sectional examination of the association between depression and nonverbal social skills. This methodology cannot inform understanding of the direction of the relation between these variables. In the general population, depressive nonverbal social skills both precede and follow the occurrence of a depressive episode (Segrin, 2000). Furthermore, an interpersonal model of depression was used to discuss the impact of depressive nonverbal social skills for maintaining and exacerbating depressed affect. However, alternative

explanations are also relevant for explaining a relation between depressive nonverbal social skills and negative social interactions. For instance, repeated exposure to negative social interactions may cause adults with mild ID to provide slower and less reactive nonverbal social responses. Thus, a longitudinal study is needed to determine the time-order relation between depressive episodes, nonverbal social skill problems, and negative social interactions in an ID population.

In summary, this study suggests that adults with mild ID diagnosed with depression evidence a profile of nonverbal social skills characterized by a lack of involvement in interactions and responsiveness to social partners. Findings from this study have important implications for enhancing the early detection and diagnosis of depression in adults with mild ID. Findings are also important for guiding interpersonal theories of and interventions for depression in an ID population. Research studies are now needed to determine whether these depressive nonverbal social skills contribute to the heightened experience of negative social interactions in adults with mild ID. Efforts to improve nonverbal social skills of adults with mild ID and to educate caregivers about depressive nonverbal social skills may help adults with mild ID diagnosed with depression better access positive social interactions and support.

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Table 1**Subject Characteristics of Participants**

	Depressed n = 18	Non-Depressed n = 18
Gender (n)		
Female	12	12
Male	6	6
Age in years (M, SD)	36.38 (8.87)	37.88 (11.45)
Ethnicity (n)		
Caucasian	16	29
Hispanic	1	1
African-American	0	1
Native American	0	0
Asian	1	0
Other	0	0
Living status (n)		
Alone or with 1 roommate	3	3
Group home	13	13
Family/host family	2	2
Composite IQ (M, SD)	65.07 (6.99)	64.77 (6.85)
Adaptive GAC (M, SD)	63.63 (12.99)	63.49 (11.50)
Psychiatric Disorder (n)*		
None	0	12
Depressive Disorder	18	0
Other	5	6
Bipolar Disorder	0	0
Anxiety Disorder	2	2
Conduct Disorder	2	1
Personality Disorder	1	2
ADHD	0	1
Adjustment	0	1

Note. One participant in the Non-Depressed group had 2 diagnosed psychiatric disorders.

Table 2**Definition of Nonverbal Behaviors, Viewing Order, and Coding Responses**

First Viewing			
Overall Body Movement- the degree to which the torso and head of the participant changed positions while seated	Little movement 1	Moderate 2	Active, lots movement 3
Head Nodding and Lowering- movement of the head up and down as if gesturing yes	None/Little 1	Moderate 2	Lots 3
Head Shaking- movement of the head from side to side while the head is in an upright position as if gesturing no *	None/Little 1	Moderate 2	Lots 3
Second Viewing			
Facial Expressiveness- the diversity or range of different facial expressions of the participant (smiling, laughing, frowning, etc)	Little/No diversity 1	Moderate 2	Wide range 3
Frowning- the extent to which the participant evinced a sad look (the corners of the mouth turned downward or the brow furrowed) *	None/Little frowning 1	Some 2	Lots 3
Smiling- the extent to which the participant smiled (the corners of the mouth turned upward, or lips extended as in showing pleasure)	None/Little smiling 1	Some 2	Lots of smiling 3
Intonation- the amount of inflection and emotion the participant used in his or her speech, ranging from flat or unemotional to lively intonation	Flat, unemotional 1	Moderate, average 2	Very lively 3
Tearfulness- the extent to which the participant was on the verge of crying or showed tears *	None/Positive demeanor 1	Some 2	Crying/Verge of crying 3
Third Viewing			
Gesturing- the number of hand, arm, or shoulder gestures the participant used to illustrate his or her speech such as pointing to the interviewer to emphasize an answer or a shoulder shrug to illustrate indecision	None/Little 1	Moderate 2	Lots 3
Volume of Voice- loudness of the voice during the response	Quiet 1	Moderate 2	Loud 3
Response Latency- the amount of time in seconds the participant took to respond to each question	Slow to respond 1	Moderate 2	Responds quickly 3
Eye Contact- the amount of time in seconds the participant spent looking or listening during the time of a question or answer	Little, not sustained 1	Moderate 2	Lots of eye contact 3

Note.

* Item reverse scored for analyses so that for all items, lower scores denote more 'depressed' behavior.

Table 3

Mean, Standard Deviation and results of the paired sample t-tests for Observed Depressive Social Skills

	Depressed	Non-Depressed	T-test	P Value	Cohen's d
	M (SD)	M (SD)			
Overall Body Movement	1.70 (0.36)	2.40 (1.44)	2.08	.05	0.67
Head Nodding/Lowering	1.63 (0.46)	1.82 (0.53)	0.99	.34	0.36
Head Shaking	1.23 (0.35)	1.35 (0.27)	1.13	.28	0.30
Facial Expressiveness	1.52 (0.37)	1.99 (0.25)	4.64	<.01	1.49
Frowning	1.45 (0.44)	1.28 (0.22)	-1.44	.17	0.49
Smiling	1.48 (0.33)	1.96 (0.36)	3.59	<.01	1.39
Intonation	1.62 (0.37)	2.11 (0.23)	4.72	<.01	1.59
Tearfulness	1.09 (0.12)	1.06 (0.86)	0.67	.51	0.51
Gesturing	1.42 (0.40)	1.60 (0.35)	1.44	.17	0.48
Volume of Voice	1.52 (0.43)	1.93 (0.21)	3.97	<.01	1.21
Response Latency	1.87 (0.29)	2.08 (0.27)	2.26	.04	0.75
Eye Contact	1.79 (0.41)	2.08 (0.27)	2.09	.05	0.44
Total Lack of Involvement/Responsiveness	1.90 (0.16)	2.15 (0.13)	4.85	<.01	1.71

Note. Items rated on a 3 point scale (1 to 3), with lower items indicating more problems with the social skill