Increasing Social Interaction Among Adolescents with Intellectual Disabilities and Their General Education Peers: Effective Interventions

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Research indicates that peer interaction can have a substantial impact on the lives of adolescents with disabilities. However, social interaction among adolescents with intellectual disabilities and their general education peers typically occurs infrequently in secondary schools. This paper provides a critical analysis of twenty-six empirical interventions aimed at promoting social interaction among adolescents with intellectual disabilities and their general education peers in middle and high school settings. Findings are analyzed with regard to intervention components; student characteristics; interaction settings; measures of interaction; observation procedures; experimental designs; intervention components; and measures of generalization, social validity, and treatment integrity. Based upon findings from this literature, we present recommendations to guide future research and the development of effective social interaction interventions for adolescents with intellectual disabilities in middle and high schools.

DESCRIPTORS: social interaction, peer relationships, severe disabilities, social skills, peer supports, inclusion, secondary education, literature review

The impact of peer interaction on the lives of adolescents is substantial. Within the context of peer relationships, adolescents practice and refine social skills; access support systems, shared activities, and companionship; and learn peer norms and values (e.g., Hartup, 1999; Rubin, Bukowski, & Parker, 1998). Moreover, adolescents spend proportionately more of their time with their peers as they get older, intensifying the influence of peer interaction on adolescent development (Hartup & Stevens, 1997). A growing body of research has documented similar benefits for adolescents with intellectual disabilities (e.g., Goldstein, Kaczmaerk, & English, 2002; Hunt & Goetz, 1997; Ryndak & Fisher, 2001). Specifically, interaction with general education peers may play a role in academic, functional, and social skill development, as well as contribute to increased social competence, attainment of educational goals, friendship development, and enhanced quality of life. Despite these potential benefits, interaction among middle and high school students with intellectual disabilities and their general education peers occurs infrequently. Descriptive studies examining peer interaction at the secondary level confirm that few interactions between students with disabilities and their general education peers typically occur apart from intentional intervention efforts (Carter, Hughes, Guth, & Copeland, 2005; Cutts & Sigafoos, 2001; Mu, Siegel, & Allinder, 2000). In light of these findings, it is important to consider factors that may contribute to this paucity of social interaction.

The extent to which adolescents interact with their peers may be influenced by (a) the social and related skills students possess, and (b) the environmental contexts within which students spend their school day (Brown & Klute, 2003). For students with intellectual disabilities, these two factors may be particularly salient, contributing to limited social interaction with their peers without disabilities. First, although considerable diversity exists among individuals sharing the label of intellectual disabilities, substantial limitations in social interaction skills are widely prevalent (e.g., Leffert & Siperstein, 2002; McLean, Brady, & McLean, 1996). Specifically, students with intellectual disabilities may experience difficulty adequately performing an array of important social skills, including engaging in reciprocal interactions, elaborating social exchanges, adapting to novel social circumstances, and discerning and interpreting relevant social cues. As students enter adolescence, the complexity of peer interaction further intensifies, requiring adolescents to perform skills related to establishing and sustaining close dyadic relationships, adjusting to the communication needs of others, using inferential and figurative language, and monitoring their own social behavior (e.g., Bierman & Montminy, 1993).
Further, youth whose disabilities are more severe also may exhibit concomitant speech and communication impairments, lack adequate training in augmentative or alternative communication system use, or engage in challenging or stereotyped behavior (Emerson et al., 2001; Lancioni, O’Reilly, & Basili, 2001)—each of which has the potential to impact students socially. These skill limitations highlight the importance of delivering skill-related instruction to adolescents with disabilities as a means to promote peer interaction.

Second, typical secondary school environments often do not support social interaction between individuals with disabilities and their general education peers. In general, students with intellectual disabilities—particularly those with more severe disabilities—infrequently attend classes with their general education peers (U.S. Department of Education, 2003) and participate in typical school activities at diminished rates (Simeonsson, Carlson, Huntington, McMillen, & Brent, 2001). As students transition from primary to secondary schools, their isolation from relationships with their general education peers can become even more pronounced. Significant changes in the school context take place during the secondary school years. Unlike in primary schools, where students spend most or all of their school day in a single classroom accompanied by the same cohort of peers, classmates in secondary schools typically fluctuate from one period to the next as students rotate among classrooms, making it difficult for students to have sustained access to the same group of peers. Moreover, lecture-dominated instructional arrangements and the heightened emphasis on academics also may hinder opportunities for social interaction in classroom settings. In addition to physical and instructional parameters, the social parameters of secondary school environments may influence the occurrence of social interaction. General education peers may feel they lack the skills and knowledge to interact with their classmates who have intellectual disabilities (e.g., Copeland et al., 2004). Each of these barriers suggests the need for incorporating support-based interventions in which aspects of school environments are arranged to promote peer interaction. In fact, adolescents with disabilities’ lack of well-developed skills for initiating and sustaining frequent, quality interaction may reflect limited learning and interaction opportunities, as much as they reflect intellectual disabilities.

In light of these findings and potential barriers, it is not surprising that increasing social interaction among adolescents with and without disabilities remains a consistent and prominent focus of legislative, policy, and research initiatives (e.g., Individuals with Disabilities Education Improvement Act of 2004; Ryndak & Fisher, 2001). Improving the social outcomes of youth with disabilities requires intentional efforts on the part of educators, who play a prominent role in equipping students with the skills they need to interact meaningfully with their peers and ensuring that environments are optimally arranged to foster peer interaction. As such, promoting social interaction among students has been identified as an essential competency for general educators, special educators, and paraprofessionals (Council for Exceptional Children, 2003; Educational Testing Services, 2005). To undertake this task effectively, educators must have an empirically-validated base of interventions from which to draw (Odom et al., 2005; Pavri, 2004). Over the past 30 years, numerous interventions have been directed toward increasing social interaction among students with disabilities and their general education peers. The purpose of this review is to synthesize these research efforts and offer recommendations for future research and practice. This study extends the literature by providing the first comprehensive review of empirical investigations examining the efficacy of interventions directed at increasing social interaction among adolescents with intellectual disabilities and their general education peers in secondary schools.

Method

A comprehensive review of the literature was conducted using the following procedures. First, an electronic search was conducted for studies published between 1975 and 2004 using the following online databases: ERIC, Education Abstracts, PsycINFO, and Social Sciences Abstracts. Keywords used to describe the participant population (e.g., cognitive disability, developmental disability, intellectual disability, mental retardation, severe disability) were used in combination with the following descriptors: conversation, friendship, general education, inclusion, initiation, integration, mainstreaming, peer relations, peer support, response, social contacts, social interaction, social networks, and social relationships. Second, a hand search of refereed journals (n = 18) that regularly publish educational research involving participants with intellectual disabilities was conducted to identify articles not included in electronic databases. Third, bibliographies of related research reviews were examined. Fourth, an electronic search of the Social Sciences Citation Index was conducted to locate studies citing already identified articles. These studies subsequently were examined for potential inclusion in this synthesis.

Studies were selected for review based on the following criteria. First, at least half of the study participants were identified by the study authors as having an intellectual disability. Recognizing that disability definitions have evolved over time, we relied on diagnoses and categorical descriptions provided by study authors to determine whether participants met this criterion. The majority of participants in the identified studies had secondary disabilities or other substantial and ongoing support needs. However, studies in which the majority of participants were identified as having autism, deaf-blindness, significant health impairments, or other disabilities not accompanied by an intellectual disability were
excluding from this review. Second, study participants were students receiving special education services in secondary school settings (i.e., junior high and high school, 7th to 12th grade). Studies conducted exclusively in elementary schools, community-based settings, employment settings, separate schools, or other settings that were not clearly described were not included. Third, the primary dependent variable for at least half of the participants in each study was a measure of social interaction (e.g., initiations, responses, social interactions, social contacts) between a student with an intellectual disability and a general education peer, and the measure of social interaction was obtained using direct observation procedures. Studies were excluded if interactions occurred only with school staff, other special education students, or undesignated social partners. Fourth, the study comprised an empirical, intervention-based investigation and was published in a peer-refereed journal between 1975 and 2004.

A total of 26 articles meeting these criteria were included for review and analysis. Our intention was to produce a systematic and detailed methodological review of this literature. Therefore, each of the articles was coded and analyzed with respect to the following variables: (a) intervention components and primary results, (b) participant characteristics, (c) school settings and contextual variables, (d) measures of social interaction, (e) observation procedures and measurement reliability, (f) experimental design, and (g) additional measures (i.e., generalization, social validity, treatment integrity).

**Review and Discussion of Intervention Studies**

In this section, we review the intervention components and outcomes of these studies. To facilitate discussion about intervention components and outcomes, the studies are grouped into two categories based upon whether the primary focus of the intervention was skill-based ($n = 12$) or support-based ($n = 14$; see Tables 1 and 2). *Skill-based interventions* involved teaching participants with disabilities skills to increase their social interaction with peers, while *support-based interventions* focused on arranging aspects of the school environment to promote or support peer interaction. Within these two categories studies are arranged by similarity of intervention components. Following the discussion of intervention components and outcomes we discuss other salient features of this literature (i.e., participants; settings; measures of interactions; observations of interactions; research design; generalization; social validity; treatment integrity). In addition, we present limitations of this literature, suggestions for future research, and recommendations to guide practitioners in selecting appropriate interventions for increasing interactions among adolescents with disabilities and their general education peers.

**Intervention Components and Outcomes**

**Skill-based Interventions**

The effects of skill-based interventions on students’ social interactions were examined in 12 studies. These studies are grouped into four types of intervention: (a) self-management and social interaction instruction, (b) collateral skill instruction, (c) communication book and social interaction instruction, and (d) social interaction skill instruction alone.

**Self-management and social interaction instruction (n = 5)**. In 5 studies, researchers examined the effects of self-management skill instruction delivered by peers. Hughes, Harmer, Killian, and Niarhos (1995) and Hughes, Killian, and Fischer (1996) evaluated the efficacy of a peer-delivered self-instruction training package on the social interactions of students with moderate intellectual disabilities and speech/language impairments. Multiple peers (i.e., 4 to 9 per participant) volunteered to teach socially-validated conversational initiations and self-instructional strategies to participants using modeling, practice, prompting, and corrective feedback. Training was associated with substantial increases in participant initiations with familiar and unfamiliar peers, peer responses, and participant eye gaze. Hughes et al. (2000) taught multiple peers to use modeling, prompting, practice, and corrective feedback to teach participants with intellectual disabilities and either autism or speech impairments to prompt themselves to use a picture prompt booklet (i.e., 10 to 20 sequenced line drawings representing peer-validated conversational initiations) to initiate interaction. Participants were taught to (a) look at a peer, (b) ask a question while pointing at the corresponding picture, (c) wait for a response, (d) expand on the response, and (e) repeat the process with the next picture. Training resulted in increases in participant initiations and peer responses, as well as a greater variety of conversational topics discussed by dyads.

In 2 studies, researchers examined the effects of having adults teach self-management procedures to students. Hughes, Copeland, Agran, et al. (2002) taught 2 students with moderate intellectual disabilities and either autism or hearing impairments to use self-monitoring to prompt their social behavior with general education peers, resulting in increases both in participant initiations and peer responses. Hughes et al. (2004) taught 5 students with moderate intellectual disabilities and speech impairments to set recreational activity goals, self-prompt initiation of recreation activities with peers through the use of a picture booklet (i.e., photographs showing a person selecting an activity and two people interacting), and self-evaluate their participation in recreation activities. All 5 participants increased their engagement in recreational activities with peers, and dyadic interactions were rated by observers as being of higher quality.
<table>
<thead>
<tr>
<th>Authors</th>
<th>School/observation settings</th>
<th>Intervention component(s)/training time/experimental design</th>
<th>Primary results</th>
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<tbody>
<tr>
<td>Breen and Haring (1991)</td>
<td>Junior high school, Special education classroom</td>
<td>Computer game-playing instruction 26–39 sessions, 20 min each MBL across participants, alternating treatment</td>
<td>Increased social initiations(^{a,b}) and decreased teaching initiations(^{a,b}) during trained games for participants (3/3) and peers (2/3) over untrained games</td>
</tr>
<tr>
<td>Donder and Nietupski (1981)</td>
<td>Junior high school, Playground</td>
<td>Peer training 5 sessions, 30 min each Recreation skill training # of sessions/duration not stated MBL across participants</td>
<td>Overall interactions(^{a,b}) and appropriate interactions(^{a}) increased (3/3) and inappropriate interactions decreased (3/3)</td>
</tr>
<tr>
<td>Gaylord-Ross et al. (1984)</td>
<td>High school, Courtyard</td>
<td>Leisure skill training # of sessions/duration not stated Peer training # of sessions/duration not stated Social skill training for participants # of sessions unclear, 5 min each MBL across stimuli with multiple probe</td>
<td>Initiations(^{a,b}) by participants (3/3) and peers increased following social skill training, but not leisure skill training only</td>
</tr>
<tr>
<td>Hughes, Copeland, Agran, et al. (2002)</td>
<td>High school, Cafeteria, gymnasium, hallway</td>
<td>Self-monitoring instruction 2–3 sessions, duration not stated MBL across participants</td>
<td>Increase in participant initiations(^{a}) (1/1), partner responses(^{b}) (1/1), and correct social responses(^{a}) (1/1)</td>
</tr>
<tr>
<td>Hughes et al. (2004)</td>
<td>High school, Gymnasium</td>
<td>Self-management intervention package 3–8 sessions, (M = 13) min each MBL across participants</td>
<td>Increase in activity engagement(^{c}) (5/5) and ratings of interaction quality(^{a}) (5/5)</td>
</tr>
<tr>
<td>Hughes et al. (1995)</td>
<td>High school, Cafeteria, multi-purpose room, special education classroom</td>
<td>Peer training: # of sessions/duration not stated Self-instruction training package 8–12 sessions, (M = 15) min each MBL across participants with multiple probe</td>
<td>Increase in participant initiations(^{a,b}) with familiar and unfamiliar peers (4/4), peer responses(^{a,b}) (overall), and participant eye gaze(^{a,b}) (4/4)</td>
</tr>
<tr>
<td>Hughes et al. (1996)</td>
<td>High school, Cafeteria, classrooms (unspecified), gymnasium, hallways</td>
<td>Peer training # of sessions/duration not stated Self-instruction training package 11–14 sessions, (M = 15) min each MBL across participants with multiple probe</td>
<td>Increase in participant initiations(^{a}) with familiar and unfamiliar peers (4/4), peer responses(^{b}) (overall), and participant eye gaze(^{a,b}) (4/4)</td>
</tr>
<tr>
<td>Hughes et al. (2000)</td>
<td>High school, Cafeteria, classrooms (unspecified), gymnasium</td>
<td>Peer training # of sessions/duration not stated Communication book training for participants 5–19 sessions, (M = 13) min each MBL across participants with multiple probe Communication book training package</td>
<td>Increase in participant appropriate initiations(^{a,b}) (5/5), partner responses(^{a,b}) (overall), and variety of conversational topics(^{c}) (overall)</td>
</tr>
<tr>
<td>Hunt et al. (1988)</td>
<td>High school, Cafeteria, community, special education classroom</td>
<td>Communication book training package 30–37 sessions, 5 min each MBL across participants</td>
<td>Increase in conversational turn taking(^{a}) (3/3) and percentage of sessions initiating(^{a}) (3/3)</td>
</tr>
<tr>
<td>Hunt et al. (1991)</td>
<td>High school, Cafeteria, community, general education class (unspecified), gymnasium, special education classroom, community</td>
<td>Communication book training package 20–31 sessions, 5 min each MBL across participants with multiple probe component</td>
<td>Increase in conversational turn taking(^{a}) (3/3) and percentage of sessions initiating(^{a}) (3/3)</td>
</tr>
<tr>
<td>Hunt et al. (1990)</td>
<td>High school, Classrooms (unspecified), community, school settings (unspecified)</td>
<td>Communication book training package 17–34 sessions, 4 min each MBL across participants with multiple probe</td>
<td>Increase in conversational turn taking(^{a}) (3/3), conversational initiations(^{a}) (3/3), and communicative behaviors(^{a}) (3/3); decrease in inappropriate social interaction behaviors(^{a}) (3/3)</td>
</tr>
<tr>
<td>Nientimp and Cole (1992)</td>
<td>Junior high school, Special education classroom</td>
<td>Social response training 15–19 sessions, 10 min each ABA, ABA, AB with multiple probes</td>
<td>Increase in independent responses(^{a}) (3/3)</td>
</tr>
</tbody>
</table>

\(^{a}\) Behavior of participant with a disability.

\(^{b}\) Behavior of general education peer.

\(^{c}\) No distinction between behavior of students.

Note: Under primary results, XX indicates the number of participants with disabilities (unless otherwise specified) for whom the effects were observed, out of the total number of participants.
### Support-Based Interventions

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Cushing et al. (1997)</td>
<td>Junior high school English class</td>
<td>1. Social grouping + revised curriculum 2. Curricular adaptations for participants ABABAB</td>
<td>No differences in social interaction&lt;sup&gt;c&lt;/sup&gt; between conditions; participants received slightly higher levels of social support&lt;sup&gt;a,b&lt;/sup&gt; (1/2) in combined condition</td>
</tr>
<tr>
<td>Haring and Kennedy (1992)</td>
<td>Junior high school Cafeteria, courtyard, hallways, locker area, school field</td>
<td>1. Peer social network MBL across participants</td>
<td>Increase in single- and multiple-turn interactions&lt;sup&gt;a&lt;/sup&gt; (2/2) and appropriate responding&lt;sup&gt;a&lt;/sup&gt; (2/2)</td>
</tr>
<tr>
<td>Hughes, Carter, et al. (2002)</td>
<td>High school Special education classroom</td>
<td>1. Instructional role 2. Non-instructional role Alternating treatments</td>
<td>Increase in social-related initiations&lt;sup&gt;a,b&lt;/sup&gt; and responses&lt;sup&gt;a,b&lt;/sup&gt;; interaction quality&lt;sup&gt;c&lt;/sup&gt;; and variety of conversational topics&lt;sup&gt;c&lt;/sup&gt; during non-instructional role (3/3)</td>
</tr>
<tr>
<td>Hughes, Copeland, Wehmeyer, et al. (2002)</td>
<td>High school Cafeteria, gymnasium, special education classroom</td>
<td>1. Verbal directive to interact MBL across participants</td>
<td>Increase in social interaction&lt;sup&gt;d&lt;/sup&gt; (5/5) and communication behaviors&lt;sup&gt;a&lt;/sup&gt; (overall); improvement in interaction quality&lt;sup&gt;c&lt;/sup&gt; (5/5) and reciprocity&lt;sup&gt;c&lt;/sup&gt; (5/5); and greater variety in conversational topics&lt;sup&gt;c&lt;/sup&gt; (overall)</td>
</tr>
<tr>
<td>Johnson and Johnson (1982)</td>
<td>High school Math class</td>
<td>1. Cooperative instruction 2. Individualistic instruction Posttest-only control-group design</td>
<td>Significantly more verbal comments&lt;sup&gt;b&lt;/sup&gt; directed from peers to participants in cooperative than individualistic condition</td>
</tr>
<tr>
<td>Johnson et al. (1983)</td>
<td>Junior high school Science class</td>
<td>1. Cooperative instruction 2. Individualistic instruction Posttest-only control-group design</td>
<td>Task, management, and social statements&lt;sup&gt;a,b&lt;/sup&gt; and from participants were more frequent in cooperative than individualistic condition</td>
</tr>
<tr>
<td>Kennedy, Cushing, and Itkonen (1997)</td>
<td>Junior/High school Hawaiian, health, art, and science classes; special education classroom, gym</td>
<td>1. General education class participation MBL across classes</td>
<td>Increase in social contacts&lt;sup&gt;c&lt;/sup&gt; (6/6 classes), increase in number of peers contacted&lt;sup&gt;c&lt;/sup&gt; (6/6 classes), and slight increase in interaction quality&lt;sup&gt;c&lt;/sup&gt; (2/2)</td>
</tr>
<tr>
<td>Kennedy and Itkonen (1994)</td>
<td>High school English, art, health, and science classes; special education classrooms; community</td>
<td>1. General education class participation Nonconcurrent MBL across classes with embedded ABAB for one participant</td>
<td>Increase in social contacts&lt;sup&gt;c&lt;/sup&gt; (3/3), increase in number of peers contacted&lt;sup&gt;c&lt;/sup&gt; (3/3), and no difference in interaction quality&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Kennedy, Shukla, and Fryxell (1997)</td>
<td>Junior high school General (unspecified) and special education classrooms</td>
<td>1. General education class participation 2. Special education class participation Post-test only, control group design</td>
<td>More frequent interactions&lt;sup&gt;c&lt;/sup&gt;, social contacts&lt;sup&gt;c&lt;/sup&gt;, social support behaviors&lt;sup&gt;a,b&lt;/sup&gt; for general education class condition; no differences in peers contacted&lt;sup&gt;c&lt;/sup&gt; or social contact quality&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Martella et al. (1995)</td>
<td>High school Special education classroom</td>
<td>Social interaction training for peers MBL across behaviors</td>
<td>Increases in specific praise statements&lt;sup&gt;b&lt;/sup&gt; and appropriate commands&lt;sup&gt;b&lt;/sup&gt; (2/2 peers); decreases in percentage of negative statements&lt;sup&gt;b&lt;/sup&gt; (2/2 peers)</td>
</tr>
<tr>
<td>Santomier and Kopczuk (1981)</td>
<td>Junior high school Gymnasium</td>
<td>1. Pairing + reinforcement of motor skills 2. Pairing + reinforcement of interactions Pretest-posttest control group design</td>
<td>Highest rates of social interaction&lt;sup&gt;c&lt;/sup&gt; when participants were paired and reinforcement was provided for social interaction</td>
</tr>
<tr>
<td>Shukla et al. (1998)</td>
<td>Junior high school English, math, and piano classes</td>
<td>1. Peer-delivered support 2. Adult-delivered support ABACABAC, ACABACAB</td>
<td>Social interactions&lt;sup&gt;c&lt;/sup&gt; occurred more often in the peer support condition (3/3)</td>
</tr>
<tr>
<td>Shukla et al. (1999)</td>
<td>Junior high school Math, art, social studies, and industrial arts classes</td>
<td>1. Peer-delivered support 2. Adult-delivered support ABAB, ABABAB, BABAB</td>
<td>Higher occurrence of social interactions&lt;sup&gt;c&lt;/sup&gt; (3/3) and greater variety of social support behaviors&lt;sup&gt;c&lt;/sup&gt; (3/3) in the peer support condition</td>
</tr>
<tr>
<td>Staub and Hunt (1993)</td>
<td>Junior high school Special education classroom, community</td>
<td>1. Social interaction and disability awareness training for peers MBL across participants</td>
<td>Increases in peer initiations&lt;sup&gt;b&lt;/sup&gt; and expansions&lt;sup&gt;b&lt;/sup&gt; (2/4) and increases in targeted participant behaviors&lt;sup&gt;d&lt;/sup&gt; during training (2/4)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Behavior of participant with a disability.
<sup>b</sup>Behavior of general education peer.
<sup>c</sup>No distinction between behavior of students.

*Note.* Under primary results, X/X indicates the number of participants with disabilities (unless otherwise specified) for whom the effects were observed, out of the total number of participants.
Collateral skill instruction (n = 3). Breen and Haring (1991) taught 3 students with moderate intellectual disabilities to play four computer games by following a six-step task analysis. Instruction in game play was provided sequentially using modeling, prompting, practice, and praise until criterion performance was met for each game. Explicit instruction in social interaction skills was not provided to the students. Participants’ social initiations with peers during trained computer game-play increased to levels substantially higher than levels exhibited during untrained game-play. Peers’ teaching initiations also occurred with increased frequency during untrained game-play for 2 of 3 peers. Gaylord-Ross, Haring, Breen, and Pitts-Conway (1984) used prompting, praise, and contingent feedback to teach 3 students with moderate to severe intellectual disabilities and autism to engage in three leisure activities. Researchers later taught 6 peers to teach participants with disabilities to follow task analyses that involved approaching and greeting peers, extending an offer to play with a leisure object, and terminating the interaction. Instruction involved prompting, practice, praise, and corrective feedback delivered by multiple peers. Leisure skill training, when provided alone, resulted in only slight increases in social interaction for 1 participant and his peers. When later combined with social skill training, however, substantial increases in social interaction were observed for all participants. Donder and Nietupski (1981) taught 14 peers to provide instruction in leisure skills to 3 participants with mild to moderate intellectual disabilities. Peers were: (a) taught to use modeling, shaping, chaining, and contingent praise; (b) provided opportunities to role-play these techniques; and (c) provided opportunities to participate in weekly feedback sessions with their teacher throughout the intervention. Following leisure skill instruction, the percentage of dyadic interactions and percentage of interactions coded as appropriate increased.

Communication book and social interaction instruction (n = 3). Hunt, Alwell, and Goetz (1988, 1991) and Hunt, Alwell, Goetz, and Sailor (1990) developed communication books for participants with severe intellectual disabilities. Communication books were comprised of pictures depicting socially-validated conversational topics with associated written labels. Participants were taught to point to pictures and follow a specified conversational turn-taking structure. Training was provided to participants by the researchers using prompts, praise, and practice with multiple peer exemplars. Participants in all 3 studies demonstrated increases in conversational turn-taking and conversational initiations. Hunt et al. (1990) also reported increases in communicative behaviors (e.g., greetings, social comments) and decreases in inappropriate social interaction behaviors (e.g., perseverative statements, interrupting).

Social interaction skills instruction alone (n = 1). In a study by Nientimp and Cole (1992), a special education teacher used constant time delay to teach 3 students with severe intellectual disabilities and autism to respond appropriately to five commonly used social greetings. Greetings and responses were identified by surveying almost 150 general education peers. All participants acquired appropriate responses to social greetings with an adult trainer and demonstrated increased generalized responding with general education peers.

Support-based Interventions

The effects of support-based interventions on students’ social interactions were examined in 14 studies. These studies are arranged into five types of intervention: (a) general education class participation support, (b) peer support arrangements, (c) assigning roles to general education peers, (d) instructional groupings, and (e) peer training.

General education class participation support (n = 3). Kennedy, Cushing, and Itkonen (1997) and Kennedy and Itkonen (1994) examined the effects of general education class placement support on the social interaction of participants with mild to severe intellectual disabilities who previously had attended special education classes. Intervention components included: enrollment in general education classes using cooperative instruction, active collaboration between educational staff, recruitment and training of peer supports, adult feedback and monitoring of peer supports, and ongoing curricular adaptations for participants. General education class participation was associated with increases in social contacts and the number of peers that participants contacted, but substantial improvements in interaction quality were not found. Kennedy, Shukla, and Fryxell (1997) examined the effects of class placement on the peer interactions of two groups of students with severe to profound intellectual disabilities receiving educational services full-time in either general or special education classes. Special education classrooms had active peer tutoring programs. Students in the general education class group engaged in significantly more interactions and social contacts with peers, as well as received and provided significantly higher proportions of social support. No differences in the number of peers contacted or interaction quality were found between groups.

Peer support arrangements (n = 3). Santomier and Kopczuk (1981) examined the effects of pairing students with moderate to severe intellectual disabilities and general education peers on measures of social interaction during free play in a physical education class. Students were randomly assigned to one of three groups: (1) students with disabilities and their general education peers were not paired in dyads, but were given verbal praise contingent on motor skill perfor-
mance; (2) students were paired in dyads and a teacher provided verbal praise contingent on motor skill performance only; or (3) students were paired in dyads and a teacher provided verbal praise contingent on social interaction only. Social interactions occurred significantly more often when students were paired together, but only when teachers also reinforced social interaction. When students were paired together and teachers reinforced only motor skills, students did not interact more often than when students were not paired together. Shukla, Kennedy, and Cushing (1998, 1999) compared the effects of peer-delivered versus adult-delivered support on the social interaction of participants with moderate to profound intellectual disabilities and their general education peers. In the peer-delivered support condition, general education peers adapted assignments, provided systematic instruction related to Individualized Education Program (IEP) goals, facilitated socialization with classmates, implemented behavior support plans, and sat next to the participant, all under the supervision of the special educator. In the adult-delivered support condition, the special educator, rather than a general education peer, engaged in these activities. The peer-delivered support condition was associated with more frequent and longer durations of social interaction than the adult-delivered support condition. Moreover, Shukla et al. (1999) showed that a greater variety of social support behaviors were exhibited during the peer-delivered support condition.

Assigning roles to general education peers (n = 2). Hughes, Carter, Hughes, Bradford, and Copeland (2002) compared dyadic peer interactions across three alternating conditions: baseline condition (i.e., no verbal directives to interact provided to any student), instructional role condition (i.e., students were directed to jointly engage in an activity in which the participant with moderate to severe intellectual disabilities and language impairments required assistance), or non-instructional role condition (i.e., students were directed to jointly engage in an activity in which a participant did not require assistance). Assigning a non-instructional role was associated with higher levels of social-related initiations and responses, greater variety of conversational topics, and higher observer ratings of interaction quality than assigning an instructional role. Hughes, Copeland, Wehmeyer, et al. (2002) assessed the effects of delivering a verbal directive to general education peers to interact with a participant with moderate to severe intellectual disabilities or autism "as a friend" while engaged in various leisure activities. Adults approached peers who were in proximity to the participants, stated that the participants had few opportunities to interact with classmates, and delivered the verbal directive. Directing general education peers to interact as friends was associated with increases in social interaction and participants’ communication behaviors, improvements in observer ratings of overall interaction quality, and greater variety of conversational topics discussed.

Instructional groupings (n = 3). Cushing, Kennedy, Shukla, Davis, and Meyer (1997) examined the impact of social grouping by comparing peer interactions in a combined social group (i.e., cooperative groups composed of 4 general education students and 1 participant with moderate to severe intellectual disabilities) plus revised curriculum (SGRC) condition with a revised curriculum only (RCO) condition. Students in the combined social groups were taught to assume one of four alternating group roles (i.e., materials manager, recorder, checker, organizer) and class instruction followed a consistent sequence of activities. The RCO condition was similar to the SGRC condition except that the cooperative groups were eliminated and students completed all activities individually. No differences were found between conditions on measures of social interaction, although 1 student did receive slightly higher levels of social support in the combined condition. Johnson and Johnson (1982) and Johnson, Johnson, DeWerdt, Lyons, and Zaidman (1983) examined the effects of cooperative instruction (i.e., participants with mild intellectual disabilities sat with 2 to 3 general education peers, and teacher praise and reward were contingent on group performance) and individualistic instruction (i.e., students worked alone, and teacher praise and reward were contingent on individual performance). Participants received significantly more verbal comments from peers in the cooperative condition than in the individualistic condition. However, students were specifically instructed to avoid peer interaction during individualistic conditions. Johnson et al. (1983) also found that social, task, and management interactions to and from participants occurred significantly more often in the cooperative instruction condition.

Peer training (n = 3). Haring and Breen (1992) implemented a peer-mediated social network intervention package consisting of recruitment of general education peers, weekly feedback and planning meetings with adult facilitation, scheduling of interactions, peer data collection of social interaction, adult feedback on peer performance, peer reinforcement of participant social behavior, and social skill training for participants. Following introduction of the intervention package, frequency of social interaction increased substantially for both participants with moderate intellectual disabilities or autism. Staub and Hunt (1993) evaluated the effects of a five-day social interaction training program for 4 general education peer tutors. The training program addressed disability awareness; using people first language; understanding the communicative function of certain behaviors; and brainstorming, discussing, and practicing techniques for increasing social interaction.
During training, initiations and expansions also increased for 2 peers with mild to severe intellectual and physical disabilities. Similar increases also were found for the targeted social behaviors of 2 participants. However, effects were not maintained following training. In Martella, Marchand-Martella, Young, and Macfarlane (1995), 2 peer tutors were taught to provide effective instructional procedures when working with a student with severe intellectual disabilities and challenging behaviors on math problems. Both peer tutors increased their use of specific praise statements and appropriate instructions, and decreased their use of negative statements. In addition, corresponding decreases in the challenging behavior of the participant with disabilities were observed.

In general, these 26 studies suggest that both skill-based interventions and support-based interventions are effective at facilitating peer interaction. However, the focus and degree of behavior change varied across interventions, prompting need for discussion regarding for whom and under what conditions these interventions may be effective (Odom et al., 2005).

**Participants: Effective for Whom and with Whom?**

**Students with Disabilities**

Taken together, the reviewed interventions were found to be effective with a wide range of students. Of the 109 participants with disabilities in the studies, 47% were female, 40% were male, and gender was not provided for the remaining youth. Students ranged in age from 11 to 22 years (M = 15). Ethnicity was reported for 28 of the 108 students, of whom 54% were African American, 36% were European American, and 11% were Asian American. Participant descriptions indicated that 58% of students had a sole label of intellectual disability, 28% had an additional label of at least one other disability (i.e., autism, visual impairments, hearing impairments, physical disabilities, speech/language impairments), 8% had other disability labels (e.g., autism, learning disabilities, speech/language impairments), and 6% had broad labels of severe, profound, or multiple disabilities.

Conclusions about the appropriateness of an intervention for particular students are complicated by variations in the level of detail and content of participant descriptions across studies. Youth with severe disabilities are a heterogeneous group whose description is not captured simply by the level of intellectual disability. However, limited information was provided regarding participants’ speech mode, communication skills, and challenging behaviors across the majority of studies. For example, some indicator of communication ability (e.g., length of utterance, primary communication mode, vocabulary) was reported for only 69% of participants, of whom 66 were verbal and 9 were nonverbal. In addition, more than one-quarter of participants were reported to engage in some form of challenging behavior (e.g., aggression, self-injurious behavior, destruction). Similarly, wide variations were apparent in the level of detail provided about cognitive ability and adaptive behavior. For example, 13 studies reported information from 1 of 6 different intelligence tests, 10 reported information from 1 of 2 different behavior rating scales, and 10 reported information from 1 or more of 13 different formal speech/language assessments. Clear and consistent participant descriptions are critical to assessing intervention outcomes, ensuring appropriate generalization of findings, making comparisons within and across studies, and enabling study replication (e.g., Horner et al., 2005). The interpretability of this literature would increase if shared conventions for reporting participation information were implemented, such as clear selection criteria (i.e., inclusion and exclusion criteria), functional assessments of limited social interaction, and descriptions of speech mode and communication skills.

Although both skill-based and support-based interventions were effective at increasing peer interaction with participants with a range of level of intellectual disabilities (i.e., mild to profound), differential effects were documented for several types of interventions. Although collateral skill instruction and peer training interventions increased social interaction across a range of participants, communication book instruction, social interaction skill instruction, and peer support arrangements were demonstrated to be effective primarily among participants with severe intellectual disabilities. The effectiveness of general education participation and assigning roles to general education peers primarily was demonstrated with participants with severe to profound intellectual disabilities. Self-management interventions were found to be effective predominantly with participants with moderate intellectual disabilities, although these students also were reported to have secondary disabilities and engage in significant challenging behaviors. Although instructional groupings were primarily evaluated with youth with mild intellectual disabilities, Cushing et al. (1997) demonstrated the impact of such groupings with students with moderate to severe intellectual disabilities. In considering whether to employ a given type of intervention, educators should consider its appropriateness in light of relevant student needs and characteristics (e.g., communication book interventions for students with concomitant communication deficits, assigning social rather than tutoring roles for students who have few friendships), as well as the intervention’s appropriateness for the school setting (e.g., collateral skill instruction delivered in nonacademic settings, instructional groupings established in academic classrooms). Further research with a broader range of participants is needed to determine the parameters within which each
type of intervention is effective. Given the relatively small number of studies investigating a given type of intervention, generalizations regarding the appropriateness of an intervention for students with certain characteristics should be treated as tentative pending systematic replication.

It is important to note that participants in the reviewed studies overwhelmingly were individuals who never or very rarely engaged in any peer interaction prior to intervention, with baseline rates of interaction approaching zero despite physical proximity to peers. That almost all of the reviewed interventions were highly successful at effecting substantial increases in participants’ social interaction behaviors suggests that these interventions constitute powerful tools for dramatically improving social outcomes. Additional research is needed, however, to determine whether these interventions would demonstrate similar effects with individuals with disabilities who display higher, but still atypical, interaction levels. That is, effecting increases from zero to moderate rates of interaction may require different intervention efforts than those required to move students from moderate to normative rates.

**General Education Peers**

The influence of conversational partners on the social behaviors of the students with whom they are interacting is important to consider. General education peers were involved in one or more of the following capacities: peer trainer, interaction partner, or student present in the observation setting. In 6 studies, general education peers (n = 61) served as peer trainers by providing skill instruction to students with disabilities. In 21 studies, general education peers (n ≥ 400) were directed specifically to interact with the participants with disabilities. In 10 studies, multiple general education students (exact number not reported) were present in the observation setting, but were not specifically directed by adults to interact with participants.

Despite limited available demographic and descriptive information, several tentative conclusions about the role of general education peers in these interventions can be drawn. First, interventions generally were found to increase interaction between participants and peers with a range of familiarity. Second, most of the general education participants were students who, when asked by adults, agreed to interact with the participants. As a result, these students may have differed in important ways from students who were not asked or chose not to participate in interactions (e.g., Carter, Hughes, Copeland, & Breen, 2001). It remains unclear whether these interventions would demonstrate similar impact among peers who did not receive such a directive from adults. Third, general education peers were as effective as adults in delivering skill-based interventions to increase social interaction, a finding corroborated by interventions directly comparing peer-delivered versus adult-delivered support (Shukla et al., 1998, 1999). Fourth, few indications were provided about the nature of the relationships among peers and participants, challenging future researchers to examine the degree to which interventions are indeed increasing interactions with peers whom participants regard as socially important. This issue is of primary importance if the ultimate goal is not simply to increase casual interactions, but also to set the foundation for meaningful friendship development.

**Settings: Influence of Contexts on Peer Interactions**

Researchers documented increases in peer interaction across a wide range of secondary school environments, reflecting the variety of settings encountered by students throughout a typical school day (U.S. Department of Education, 2003). Direct observations of social interactions were conducted in one or more of the following school settings (see Tables 1 and 2): special education classrooms (12 studies), physical education classes (9 studies), cafeterias (8 studies), nonclassroom school settings (e.g., hallways, courtyards, locker areas; 7 studies), core academic general education classrooms (e.g., math, English, science, social studies; 7 studies), other general education classrooms (e.g., art, industrial crafts, piano; 4 studies), and unspecified classrooms (5 studies). Researchers in 6 studies also conducted observations of peer interaction in off-campus settings (i.e., community businesses, student’s home, job training sites).

Although trends across time provide evidence of a general shift toward implementing interventions in more inclusive settings, the majority of observations of peer interaction in the reviewed studies—particularly skill-based interventions—were conducted outside of academic general education classrooms (e.g., cafeterias, gymnasiums, hallways, non-core academic classrooms) and sometimes in special education classrooms which required the added presence of general education peers. Although these settings may be more conducive to peer interaction than many core academic classrooms, additional research is needed to evaluate the degree to which (a) skill-based interventions can be implemented effectively and demonstrate similar effects within academically-oriented classrooms and (b) skill instruction provided in other school settings generalizes to these classrooms. This is critically important as increasing emphasis is placed on ensuring that youth with disabilities are accessing the general curriculum. Peer support arrangements emerged as especially promising interventions for ensuring that general education access is accompanied by improved social outcomes.

Because contextual variables present in the reviewed studies may have promoted the effectiveness of interventions, close consideration should be given to the potential impact of these factors. First, peer support programs were in effect in the environment in which
most \(n = 14\) of the reviewed studies were conducted. Such programs may have involved an orientation to disability issues, training in social interaction and behavior management strategies, and frequent opportunities to interact with multiple peers with disabilities. While students participating in these programs represent a logical choice for interaction partners, they may constitute a population of peers who are more willing to respond to participants’ initiations or who may interact in a different manner than would students who are not involved in peer support programs. Some researchers, however, documented similar increases in peer interaction across both general education students who were trained as peer supports and those who were not (e.g., Gaylord-Ross et al., 1984; Hughes et al., 2000). Second, participants’ social behavior was reinforced in many of the studies by arranging for general education peers to sit next to and interact with participants with disabilities (\(n = 11\) studies), and/or providing peers with instructions regarding the manner in which they were to interact (\(n = 5\) studies; e.g., following a conversational script, responding without initiating). Future research should examine whether skill-based or support-based interventions maintain their effectiveness when such directives are not provided.

Additional contextual variables also may have been present in the reviewed studies, but not readily apparent in the published reports. For example, qualitative studies (e.g., Schnorr, 1997; Staub, Spaulding, Peck, Gallucci, & Schwartz, 1996; Williams & Downing, 1998) have highlighted a number of variables that might influence students’ interactions in school settings, including administrative leadership, school climate and structure, teacher characteristics, classroom arrangements, ongoing instructional activities, and existing peer group structures. Researchers should specify clearly the contextual variables associated with implementation of an intervention and discuss the potential impact of these variables on outcomes. Such information would be especially important for practitioners who may implement the reviewed interventions and expect similar results in the absence of these variables.

Measures of Interaction: Identifying Behaviors for Change

The findings of this synthesis indicate that a wide array of social behaviors is responsive to intervention (see Tables 1 and 2). Measures of social interaction varied from discrete behaviors (e.g., initiations, responses, expansions) to broader interaction measures (e.g., social contacts, interaction quality). Although initiations, social interactions, responses, and interaction quality were most often targeted for intervention, improvements also were documented for measures as varied as eye gaze, reciprocity, expansions, and conversational topics. Overall differences were noted, however, between the types of measures that were addressed in skill- and support-based interventions. Skill-based interventions were found mainly to be successful at effecting changes in more discrete social behaviors, such as initiations, responses, and conversational turnoaking. Moreover, behavior change most often was evaluated with the participant and/or peer, rather than the dyad, as the unit of analysis, likely reflecting researchers’ interests in evaluating the specific effects of skill training. By contrast, support-based interventions generally were found to be effective at increasing broader measures of behavior, such as social contacts, interaction quality, and social support behaviors. These changes also were evaluated primarily at the level of the dyad, in which distinctions were not made between the social behaviors of the participant and those of the general education peer, suggesting that changes in environmental supports are expected to impact all students, rather than just participants with disabilities.

Researchers’ use of multiple measures in assessing changes in peer interaction in most studies may reflect the complexity of peer interaction, varying opinions regarding how interaction should be operationalized, and/or differing experimental questions. Despite the diversity of measures apparent across the reviewed studies, researchers should consider expanding the array of social interaction measures used in interventions with secondary-age students. First, a number of social behaviors examined in intervention or qualitative research with younger children were rarely or never assessed in the reviewed studies (e.g., affect, reciprocity, nonverbal behaviors, shared activities, attending, topic maintenance). Second, global increases in the frequency of initiations, responses, and social interactions are important, but provide relatively little information about potential changes in the content of peers’ interactions. By incorporating more detailed categories of behavior, such as conversational topics (e.g., Hughes et al., 2002) or social support behaviors (e.g., Cushing et al., 1997), precise conclusions about the specific effects of an intervention on student behavior can be drawn, such as whether students’ interactions have become more sophisticated, typical, or appropriate. Third, and perhaps most important, research is needed that examines increases in students’ social interactions in relation to broader outcomes, such as the extent to which changes in discrete social behaviors relate to improvements in peer acceptance and durable friendships.

Observing Peer Interactions

Across the 24 studies that reported the length of observation sessions, sessions lasted between 3 min and the entire school day \((M = 67\) min). Observation length for skill-based interventions \((M = 10\) min) tended to be substantially shorter than for support-based interventions \((M = 113\) min). Although skill-based interventions were effective at increasing interactions over a short
period of time (i.e., less than 15 min), it remains unclear whether skill instruction alone is sufficient to promote interactions of a longer duration. Additional arrangements of the environment (i.e., support-based interventions) may be required to set the occasion for longer duration interactions.

As in most studies utilizing direct observation of peer interactions, the potential for the presence of observers to alter the social context and possibly influence the nature of ongoing interactions should be considered. Interventions that involved general education peers, classroom teachers, or paraprofessionals in data collection suggest possible strategies for minimizing the potential influence of an outside observer (e.g., Haring & Breen, 1992; Kennedy & Itkonen, 1994). Additional strategies used in the reviewed studies that may minimize participant reactivity included conducting extended pre-baseline observations to acquaint participants to the presence of the observers (e.g., Hughes et al., 1995; Hughes et al., 1996) and use of broader dependent measures that did not necessitate discrimination of conversational content (e.g., engagement in activity with peers, Hughes et al., 2004; social contacts, Kennedy & Itkonen, 1994). Across studies, researchers reported high rates of interobserver agreement using a variety of direct observation methods.

**Research Designs: Expanding Experimental Questions**

Single-case designs were used to evaluate intervention effects in 22 studies and group designs were used in 4 studies. Although support-based interventions employed a variety of experimental designs to evaluate intervention efficacy, multiple baseline designs were utilized in almost all of the skill-based interventions. Selection of this design was likely influenced by the nonreversibility of many of the skills taught to participants and the nature of the investigators’ experimental questions (i.e., demonstrating whether or not a particular skill-based intervention was effective). Although such designs are well-suited to demonstration analyses, certain limitations exist with regard to their flexibility in answering other types of experimental questions (Kennedy, 2005). First, knowing which intervention component (or combination of components) is responsible for the observed effects can assist in determining why an intervention works. Because most interventions consisted of multi-component treatment packages, it remains unclear which of the intervention components are essential, superfluous, or incidental to intervention outcomes. Second, comparison of different interventions can enable researchers to determine which intervention is most effective for which students. For example, while this literature reports positive effects for both collateral skill instruction and social interaction skill instruction, it still remains unclear if one approach is more effective than the other. Compounding this limitation is the presence of near zero baseline rates of interaction for participants in most studies. Because most social interaction interventions are likely to boost social interaction above floor levels, comparative analysis can assist researchers in identifying which intervention accomplishes this goal most effectively. Third, parametric and component analyses of intervention packages would assist researchers and practitioners in maximizing intervention efficiency by eliminating unnecessary or improving less potent intervention components.

**Generalization: Seeking Widespread Intervention Effects**

The degree to which intervention effects generalized to conditions that differed across one or more dimensions (e.g., setting, time, persons) from the intervention condition was assessed in 16 studies (see Table 3). Generalization across time (i.e., response maintenance) was assessed in all of these studies, with levels of behavior observed during generalization sessions approximating or exceeding levels of behavior observed during intervention sessions in 13 of these studies. Generalization of the intervention effects across persons and across settings also was observed in 8 and 6 studies, respectively. Generalization was reported to be promoted through the use of multiple exemplars (i.e., peers, settings, conversational topics) in 7 studies and/or programming of common stimuli in 2 studies. Type of generalization procedure used was not reported in the remaining 9 studies.

The effects of all of the skill-based interventions—particularly self-management and communication book intervention packages—were found to generalize across one or more dimensions, such as settings and partners. The portability of self-management and communication book skills may have contributed to their generalized use and effects. In addition, generalization was actively promoted in these studies through the use of multiple exemplars. Although the effects of skill-based interventions maintained in every study, time of follow-up never exceeded 11 months and most typically concluded within 2 to 8 weeks. The short- to moderate-length effects of skill-based interventions are clear. Long-term effects were not evaluated, however, highlighting the need for longitudinal evaluations extending over multiple semesters or school years. Less is known about the durability and robustness of effects in support-based interventions. Although some of these interventions were never intended to be withdrawn, additional research should be conducted to determine whether interactions would extend to times, settings, and persons when similar supports are not available. For example, do relationships established as part of peer support arrangements spill over to other times throughout or beyond the school day?
Social Validity and Treatment Integrity: Tractability for Practitioners

Measures of social validation were reported in 11 studies (see Table 3). Subjective evaluation methods were employed to assess the value of behavior change as perceived by others in 10 studies. The social validity of intervention goals was assessed in 6 studies, of intervention procedures in 4 studies, and of intervention outcomes in 8 studies. Assessments of social validity involved interviewing or providing questionnaires to one or more of the following persons: general education peers (8 studies), students with disabilities (7 studies), teachers (6 studies), family members (3 studies), or other individuals (2 studies). Social comparison was used to evaluate participants’ social behavior relative to that of a comparison group in 4 studies.

Although almost half of the studies provided evidence for the social importance of intervention goals and outcomes, they offered less insight into the tractability of skill-based and support-based interventions for practitioners. Understanding all of the components that comprise an intervention along with the time, effort, and other expenditures required for implementation can influence intervention effectiveness and use by practitioners. Survey research indicates that teachers generally perceive social interaction interventions to be moderately feasible and effective, however, their reported implementation of these interventions lags somewhat behind (Odom, McConnell, & Chandler, 1994). Researchers should query practitioners regarding their perceptions of and satisfaction with skill- and support-based interventions. Unless practitioners find a given intervention to be acceptable, it is not likely to be fully implemented or maintained.

Fewer than half of the studies assessed the extent to which intervention conditions were implemented as intended (see Table 3). Few studies reported numerical data on treatment integrity. Treatment integrity was assessed for training only in 5 studies, for the intervention condition only in 1 study, and for all experimental conditions in 1 study. Researchers in 4 studies reported that treatment integrity was monitored, but provided no numerical data. In studies in which treatment integrity was assessed, interventions were implemented with a high degree of fidelity. However, most studies did not include assessments of treatment integrity and, when it was assessed, it most often was assessed during only one of the study conditions—typically the intervention condition. This finding represents a substantial limitation of this literature, restricting the conclusions that can be drawn about whether effects can be attributed to the intervention. Because most of the reviewed interventions were implemented by researchers, either directly or through their training of peers, additional research is needed to determine whether interventions can be implemented with high integrity by teachers. Otherwise, the generality of these interventions for use in actual secondary school settings remains uncertain.

Implications for Practice

This review described a variety of interventions that have been developed and evaluated to promote peer interaction among adolescents with intellectual disabilities and their general education peers, with a compa-

### Table 3

<table>
<thead>
<tr>
<th>Measures</th>
<th>Number of studies</th>
<th>Studies</th>
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<tbody>
<tr>
<td>Generalization Across time</td>
<td>16</td>
<td>Breen and Haring (1991); Donder and Nietupski (1981); Gaylord-Ross et al. (1984); Haring and Breen (1992); Hughes, Carter, et al. (2002); Hughes et al. (2004); Hughes et al. (1995); Hughes et al. (1996); Hughes et al. (2000); Hunt et al. (1988, 1991); Hunt et al. (1990); Martella et al. (1995); Nientimp and Cole (1992); Shukla et al. (1998, 1999)</td>
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<tr>
<td>Across persons</td>
<td>8</td>
<td>Gaylord-Ross et al. (1984); Hughes et al. (2004); Hughes et al. (1995); Hughes et al. (1996); Hughes et al. (2000); Hunt et al. (1988, 1991); Hunt et al. (1990)</td>
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<tr>
<td>Across settings</td>
<td>6</td>
<td>Gaylord-Ross et al. (1984); Hughes et al. (1995); Hughes et al. (1996); Hughes et al. (2000); Hunt et al. (1991); Hunt et al. (1990)</td>
</tr>
<tr>
<td>Social Validity Goals</td>
<td>7</td>
<td>Hughes, Carter, et al. (2002); Hughes et al. (2004); Hughes et al. (1995); Hughes et al. (1996); Hughes et al. (2000); Hunt et al. (1990); Nientimp and Cole (1992)</td>
</tr>
<tr>
<td>Procedures</td>
<td>4</td>
<td>Breen and Haring (1991); Cushing et al. (1997); Haring and Breen (1992); Hughes et al. (2000)</td>
</tr>
<tr>
<td>Outcomes</td>
<td>8</td>
<td>Breen and Haring (1991); Cushing et al. (1997); Hughes, Carter, et al. (2002); Hughes, Copeland, Agran, et al. (2002); Hughes et al. (2004); Hughes et al. (1995); Hughes et al. (1996); Hughes et al. (2000)</td>
</tr>
<tr>
<td>Treatment Integrity Assessed</td>
<td>7</td>
<td>Gaylord-Ross et al. (1984); Hughes, Carter, et al. (2002); Hughes, Copeland, Wehmeyer, et al. (2002); Hughes et al. (2004); Hughes et al. (2000); Hunt et al. (1991); Hunt et al. (1990)</td>
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<tr>
<td>Monitored</td>
<td>4</td>
<td>Hughes et al. (1995); Hughes et al. (1996); Johnson et al. (1982, 1983)</td>
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</table>
rable emphasis placed on both skill- and support-based interventions and an increasing emphasis on inclusive settings. Although almost all of the interventions were found to be effective at increasing peer interaction, it is clear that the focus, impact, and implementation requirements of these interventions differ. In deciding how to increase social interaction among students in secondary schools, practitioners should consider the following recommendations.

First, different interventions may be used to focus on different dimensions of social interaction. In light of the paucity of interaction in which adolescents with intellectual disabilities typically engage with their general education peers, determining which aspects of social interaction are most important to increase requires thoughtful consideration. Is the goal to increase brief initiations or sustained social contacts among students, conversational turn-taking or transient greetings? Individualized student goals should be used to guide selection of the most appropriate intervention approach. For example, self-management interventions may be likely to increase initiation rates, while cooperative instructional groups may increase the reciprocal exchange of social support behaviors.

Second, a balanced intervention approach involves combining support- and skill-based components into comprehensive intervention packages. Although skill instruction has the potential to increase students’ independence, probability of successful interaction, and social competence, no amount of instruction will increase interaction if peers are not in proximity or if interaction is actively discouraged within certain settings. Similarly, even when educational environments are arranged to maximize opportunities for peer interaction, interaction will remain less than optimal if students are not provided with skill instruction related to communicating with their peers. An exclusive focus on one component versus the other overlooks the important role that both social competence and environment factors have on peer relationships.

Third, interventions should be selected with thought to their varying implementation requirements. That is, differing time and resource commitments may be associated with each intervention procedure. In general, skill-based interventions involved minimal training time and consisted of fairly straightforward instructional procedures. However, delivering this initial training may be difficult in some academically-oriented general education classrooms. Although some support-based interventions (e.g., assigning roles, peer support arrangements) also may be appealing to practitioners because of the relative ease with which they can be implemented, other interventions (e.g., cooperative groupings, peer training) may require more effort or changes in existing programming.

Fourth, general and special educators should be called on to work collaboratively to improve the educational outcomes of adolescents with disabilities in inclusive settings. The journal outlets in which these studies appeared suggest that increasing social interaction among students with and without disabilities continues to be regarded primarily as a special education issue. Given the important benefits associated with peer interaction for general education peers and the increased responsibility general education teachers have for educating students with disabilities, dissemination efforts should be expanded to include general education audiences so that all educators are equipped to improve the social outcomes of every youth in their classrooms.

Without efforts to promote it, limited social interaction among adolescents with intellectual disabilities and their general education peers typically occurs in most secondary school settings (Carter et al., 2005). The interventions reviewed in this paper offer promise for practitioners wanting to increase peer interaction at the secondary level. Additional research should be conducted to evaluate further the conditions under and parameters within which these interventions are effective (e.g., Carter, Cushing, Clark, & Kennedy, 2005; Sasso, Mundschenk, Melloy, & Casey, 1998). Such findings will make important additional contributions to this rapidly developing research literature and enable greater numbers of adolescents with disabilities to access the benefits associated with peer interaction.

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*Asterisks denote articles that were included in the synthesis.


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