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## **Peer Relationships of Students with Intellectual Disabilities in Special Needs Classrooms - A Systematic Review**

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### **Abstract**

Students with intellectual disabilities (ID) often experience difficulties in their peer relationships at school. Although a broad knowledge base on peer relationships in inclusive classrooms exists, much less is known about peer relationships in special needs classrooms. We conducted a systematic review of the literature on peer relationships in special needs classrooms for students with ID. Studies that provided information on social status, social interactions, friendships, or the classroom networks of students with ID in special needs classrooms were included. Findings from 36 studies suggest that students with ID in special needs classrooms develop and maintain differentiated peer relationships. The characteristics of these peer relationships vary depending on student (e.g., cognitive skills) and classroom factors (e.g., type of special needs classroom). Results are discussed in terms of their relevance for supporting peer relationships between students with ID. Future directions for studying peer relationships in special needs classrooms are proposed.

**Keywords:** intellectual disabilities, peer relationships, social networks, social status, special needs classrooms

Children and adolescents spend a large part of their day at school. In addition to learning from academic instruction, students gain social experience when interacting with their schoolmates. Students' involvement in peer networks at school has important implications for their social and academic development (for an overview see, e.g., Bukowski, Laursen, & Rubin, 2018). For example, students' social status among their peers is related to their future social adjustment and school achievement (Austin & Draper, 1984). Moreover, students' development of academic achievement and problem behaviors is influenced by classmate characteristics (e.g., Müller & Zurbriggen, 2016).

Given the importance of developing and maintaining peer relationships, it is crucial to note that students with intellectual disabilities (ID) face specific challenges in this regard. Difficulties can arise from impairments in intellectual functioning (i.e.,  $IQ < 70$ ) and adaptive behaviors (World Health Organization, 2016). For example, a lack of social skills can make it harder for students with ID to form friendships (Tipton, Christensen, & Blacher, 2013). However, successful peer relationships do not depend solely on personal factors but also on the school peer context (Carter, 2018). For children and adolescents with ID these peer contexts vary considerably, as they can attend various types of schools. While many students with ID currently attend inclusive classrooms together with non-disabled peers in regular schools, a large number of these students, especially those with more severe forms of ID, attend specialized classrooms for students with ID. Such special needs classrooms are attended only by students with ID and can be placed either within special needs schools for students with ID or within regular schools. Reports suggest the percentage of students with ID who attend a classroom within a special needs school varies across countries: in the US this figure is 6.1% of all students with ID and 18.9% of all students with multiple disabilities (National Center for Education Statistics, 2017), in the UK 17.3% (Department for Education, 2018; calculations by authors based on provided numbers), and in Germany 89.7%

(Kultusministerkonferenz, 2018). In the US 49.4% of students with ID attend a special needs class in a regular school for more than 60% of the day (National Center for Education Statistics, 2017).

These figures indicate the importance of having insights into the peer relationships of students with ID in special needs classrooms. As previous research syntheses have primarily focused on peer relationships in inclusive classrooms (see e.g., reviews by Lindsay, 2007, or Ruijs & Peetsma, 2009), we conducted a systematic review on the peer relationships of children and adolescents with ID in special needs classrooms.

### **Students' Social Status and Social Networks at School**

For children and adolescents, school is the primary context for forming peer relationships and interacting with others who are the same age. The complex social situation of students among their school peers can be considered across different dimensions (Rubin, Bowker, McDonald, & Menzer, 2013). One important aspect of students' social life at school is their *social status*, which relates to how members of a peer group feel about an individual member of their group (Cillessen & Bukowski, 2018). Typically, social status is assessed using peer nominations that ask students to name who they like most and who they like least. Other methods include peer ratings, and self-, parents-, or teacher reports. Different types of social status can be considered. *Social acceptance* relates to students' likeability. Higher acceptance of students is associated with positive outcomes such as more prosocial behavior and higher academic achievement (Austin & Draper, 1984; Coie, Dodge, & Coppotelli, 1982). *Socially rejected* students in contrast, are typically disliked by many peers. Rejection is often linked with higher levels of problem behaviors and lower classroom participation (Ladd, Herald-Brown, & Reiser, 2008; Miller-Johnson, Coie, Maumary-Gremaud, & Bierman, 2002). Students who are *neglected* are neither specifically liked or disliked and often have a low social impact in their classroom (Cillessen & Bukowski, 2018). Another aspect of

students' social status at school is their *perceived popularity*, which is typically assessed using peer nominations that ask students to name who they consider to be popular in class.

Popularity is associated with prestige and visibility, but popular students are not necessarily well liked by all peers and often exhibit socially dominant behaviors (Cillessen, Schwartz, & Mayeux, 2011).

Given that an individual student's social status depends on the feelings of their surrounding peers toward them, social status is thus closely connected to the *social interactions* students have with each other. Depending on the quality and quantity of interactions, students can develop *friendships*. Friendships indicate close, voluntary, and reciprocal relationships characterized by mutual affection (Rubin et al., 2013). When choosing their friends and allies, students tend to select peers that are similar to themselves in terms of behaviors and attitudes (i.e., homophily), but they also adapt their behaviors to each other (for a review see, e.g., Brechwald & Prinstein, 2011). Friendships can be thought of as being embedded in *social networks* (Gifford-Smith & Brownell, 2003). Features of social networks, such as their size, density, group cohesion (or solidarity), and the prevailing norms within the network can influence individual development and the relationships between single individuals (Borgatti, Everett, & Johnson, 2013; Stormshak, Bierman, Bruschi, Dodge, & Coie, 1999).

### **Students With Intellectual Disabilities and Their Peer Relationships in Special Needs Classrooms**

Students with ID face specific challenges in their peer relationships. Social skills deficits, such as hampered detection of emotions and intentions, adequate conflict solving abilities, as well as low conceptual skills and challenging behaviors, can hinder children and adolescents with ID from developing positive peer relationships (Carter, 2018). However, peer relationships also depend on the school peer context. Research on inclusive classrooms

suggests that individuals with ID are often less well accepted, interact less with others, and have fewer friends compared to their typically developing classmates (Avramidis, Avgeri, & Strogilos, 2018; Tipton et al., 2013). However, not all students with ID attend inclusive classrooms; a substantial number attend special needs classrooms where all peers in the classrooms exhibit difficulties in intellect and adaptive behaviors. The more pronounced the intellectual, behavioral, and communicative difficulties, the higher the probability of being taught in special needs classrooms (Kleinert et al., 2015; Kurth, Morningstar, & Kozleski, 2014). These types of classrooms typically have low student numbers and are characterized by great heterogeneity of student ability levels (i.e., mild to profound ID) and behavioral problems (National Center for Education Statistics, 2017). Students are typically instructed by special needs teachers and additional professionals (e.g., assistant teachers, therapists), following an individual educational plan.

Special needs classrooms as a social context may affect students' peer relationships in different ways. The heterogeneity of students attending these settings might result in large classroom differences regarding the quantity and quality of peer relationships and prevailing behavior norms in the classroom. These classroom differences imply that students' social status and relationships may vary significantly depending on the classroom attended. Due to the fact that most students in special needs classrooms have social skills difficulties, fewer friendships and cliques may generally be expected. It further can be assumed that in small and heterogeneously composed classes it is more difficult for students to find similar peers with whom to form friendships. Consequently, students may be more likely to rely on the entire school peer context when building peer relationships (e.g., during school breaks) than on their classroom alone.

Several methodological challenges to examining peer relationships in special needs classrooms exist. The standard procedure in regular classrooms is typically the application of

peer nominations or ratings (Cillessen, 2011). Due to the difficulties students with ID experience filling in such questionnaires, these methods can often only be used in adapted ways; other options include alternative assessments such as observations or adult ratings (for a discussion see, e.g., Coons & Watson, 2013). Some researchers may also seek to compare peer relationships in special needs classrooms with other school settings. However, valid results can be difficult to obtain as students in different school settings typically also differ in their individual characteristics (Kurth et al., 2014). Researchers may deal with this issue by controlling for student characteristics relevant for peer relationship formation (e.g., cognitive factors, social competences, levels of challenging behaviors) in their analyses (Blackford, 2006).

### **The Current Review**

To our knowledge, no systematic literature synthesis on the peer relationships in special needs classrooms exists. Previous reviews have tended to focus specifically on students with ID in inclusive settings and/or just one specific group of students (e.g., Freeman & Alkin, 2000; Lindsay, 2007; Nakken & Pijl, 2002; Nijs & Maes, 2014; Webster & Carter, 2007; Wiener, 2004). In our review we sought to address this gap by investigating two questions:

1. What is known about the *social status* of students with ID in special needs classrooms and how is status affected by individual and contextual factors?
2. What is known about the *social networks* of students with ID in special needs classrooms and how are these networks affected by individual and contextual factors?

### **Methods**

We conducted a systematic review of the literature focused on the peer relationships of children and adolescents with ID in special needs classrooms. Of interest were studies that investigated special needs classrooms for students with ID that were placed either in special

needs schools for students with ID or in regular schools. Inclusive classrooms in which single students with ID were instructed together with typically developing peers were not included in the review (but note that some studies on special needs classrooms used inclusive classrooms as comparisons). Studies were included if they had been published in English, peer-reviewed, and referred to social status and/or the social networks of students with ID at school age (including kindergarten) who were full-time attendees of special needs classrooms. Studies using quantitative or a qualitative analyses of data, as well as studies using a mixed-method approach (quantitative and qualitative approach combined) were included. The literature search was firstly carried out with the database PsycINFO using the keywords and subject headings depicted in Table 1. The ERIC database was then consulted. In addition, we checked previous reviews and references provided in published papers for relevant research.

*Please place Table 1 about here*

## **Results**

The literature search using PsycINFO identified 362 studies. We excluded 339 studies that failed to meet the criteria mentioned above, so that 23 studies were included in this review. In ERIC we found 89 additional studies, of which one study met the criteria. Six additional studies were found in previous reviews and six were identified in the reference lists of relevant papers. These 36 studies were thematically assigned to those examining social status (i.e., acceptance, rejection, neglect, popularity) and those exploring social networks (i.e., social interactions, friendships, classroom networks). Descriptions of the studies are presented in Table 2 (classified by publication year). In the following, the methodological approaches used in the studies are described, after which the results on social status and social networks are presented. In order to save space, we refer to study numbers as given in Table 2. Where articles use other terms to reference ID (e.g., mental retardation), in this review we use the term ID for ease of understanding.

*Please place Table 2 about here*

### **Research Question 1: Social Status of Students With ID in Special Needs Classrooms**

**Research approaches.** There were 14 quantitative studies (1, 2, 3, 5, 7, 8, 11, 17, 20, 21, 22, 25, 28, 29) that examined *social status*, from which two were longitudinal (2, 3). Two studies used a mixed-methods methodology (28, 29). To assess social status, most studies conducted peer nominations, peer ratings, or both. These methods were often used in modified ways, such as reading the questions and answers aloud, using smiling faces as response alternatives, or conducting student interviews. Sometimes students with ID rated their own social status, or parents and teachers provided this information. Several studies compared the social status of students with ID between different types of special needs classrooms or between special needs and inclusive classrooms. In these analyses, some studies controlled for certain individual student characteristics (e.g., IQ, adaptive behaviors, age) or contextual factors (e.g., family demographics, educational program).

**Social acceptance.** Results generally suggest that sociometric structures exist in special needs classrooms. For example, in Study 1 students differed in their received nominations when their peers could choose with whom they liked to play and work with or whom they wanted to sit near. Depending on the study and class, 0 - 43% of students with ID were rated as accepted (1, 3, 29; calculations by authors based on provided numbers). The studies suggest that certain individual factors, such as older age (11, 22), less loneliness (21), greater physical attractiveness (29, not tested using inferential statistics), better cognitive skills, and more appropriate behaviors (5, 8, 20, 29 but see 7) are associated with more social acceptance of students with ID in special needs classrooms. In contrast, there was no evidence of differences in social acceptance between students with different types of disabilities (25). Results regarding the role of gender in social acceptance were inconclusive, with some results finding more positive self-perceived acceptance in girls (22) and others finding no gender

differences when peer nominations were used (21). Generally, results on gender differences were difficult to interpret as they appeared to be strongly related to gender ratios in classrooms (11, 28, 29, but see 3).

Some studies also considered the effects of contextual factors on social acceptance. Studies 5, 7, and 8 found that teachers' perceptions of students' cognition and attending behavior predicted students' perceptions of their peers, that in turn, were associated with social acceptance. Students with ID thus seem to at least partially refer to their teacher's judgment when assessing their peers. Moreover, interventions (e.g., group activities that combine students with ID who have high and low acceptance), led to higher acceptance among low-accepted students (2). Further, Study 21 found that individuals with ID in special needs schools achieved higher peer acceptance scores than students with ID in special needs classes in regular schools, but there are also contradictory findings (22).

**Social rejection.** Results suggest that social rejection exists in special needs classrooms and differs between students. Across the classrooms investigated, 0 - 37.5% of the students were considered to be rejected (3, 11, 29; calculations by authors based on provided numbers). Certain individual factors, such as greater levels of misbehavior and lower cognitive skills seem to be linked to higher social rejection of students with ID in special needs classrooms (5, 8, 29, but see 7).

**Neglect.** We identified three studies that explicitly dealt with the question of social neglect in students with ID in special needs classrooms (1, 3, 29). Students in the considered studies were categorized as neglected if they had received only few positive and negative peer nominations. The prevalence of students considered to be neglected in special needs classrooms was between 0 and 19% (calculations by authors based on provided numbers).

**Perceived popularity.** We found no studies that investigated the perceived popularity of students with ID in special needs classrooms.

**Summary regarding social status.** Students with ID in special needs classrooms appear to vary in their social status and different status groups seem to exist. Older age and greater cognitive abilities, as well as more adaptive and less problem behavior, less loneliness, and a positive view from teachers on the student appear to be related to higher status. Regarding the role of other individual and contextual factors, evidence is still very limited or inconclusive.

## **Research Question 2: Social Networks of Students With ID in Special Needs Classrooms**

**Research approaches.** *Social interactions* between students in special needs classrooms were investigated in 13 quantitative studies (4, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 25, 31), and in two studies using a mixed-methods approach (24, 28). Four of these studies (4, 9, 10, 13) were longitudinal. To investigate social interactions, researchers conducted student observations, interviews, or used parent or teacher questionnaires. Student *friendships* were examined in 19 studies (1, 3, 6, 11, 16, 17, 18, 19, 23, 25, 26, 27, 28, 30, 32, 33, 34, 35, 36), of which three were longitudinal (3, 23, 33). Overall 14 studies used quantitative, two qualitative (23, 34) and three a mixed-methods approach (28, 33, 35). Friendships were assessed using observations, peer nominations, student self-reports, student or parent interviews, or teacher or parent questionnaires. *Classroom networks* were investigated in two quantitative studies (1, 3) using peer nomination procedures. Study 3 was longitudinal. When comparing different school settings, authors sometimes controlled for single or multiple individual factors, such as age, cognitive skills, or adaptive behavior components. When students with ID were compared with typically developing students, in some instances groups were matched by school grade, sample size, household income, or staff-to-student ratio.

**Social interactions.** Students with ID in special needs classrooms differ from each other in the amount of social interactions among peers they have. An individual factor associated with the frequency of social interactions appears to be the type and severity of

disability (15, 25, but see 17, 18). For example, Study 25 found that students with non-specific ID initiated more social interactions than students with autism and as many as students with Down syndrome. Moreover, older mental and verbal age (in line with 9) were found to be significantly correlated with higher levels of social play in students with ID. In contrast, early cognitive and language skills as well as chronological age (but see 18) did not predict the frequency of social interactions of students with ID in special needs classrooms. Study 9 showed that students' social interactions correlated positively with adaptive behavior (but see 25) and negatively with personal maladaptive behavior. No differences between boys' and girls' frequencies of social interactions were found (9) but Study 28 found that students with ID in special needs schools spent much time with students of the opposite gender.

In terms of the role of contextual factors in students' social interactions, several studies suggest that students with ID in special needs classrooms interact less often with classmates than those in inclusive classrooms (10, 13, 15, 16, 19, 24, 31, but see 14, 18, 25). These differences may partly be explained by the differing activities performed in these settings (12, 24, 31). For example, Study 12 found that higher rates of pre-academic activities and lower levels of play in preschool special needs classes for students with ID than in regular classes may have played a role in explaining lower levels of social interactions in special needs classrooms. Other explanations may relate to differing peer characteristics, as students with ID were found to show less social play when their attempts to contact their peers were rejected frequently. Compared to students without ID in regular schools, the rejection of contact attempts may be more likely among classmates with ID in special needs classrooms (25). Yet other studies examined the quality of interactions in different school settings. They found a tendency for the interactions of students with ID in special needs classrooms to be

less social in nature and more task-related than the ones of students with ID in inclusive classes (15) and to include more aggression and less positive behaviors (4).

**Friendships.** Generally, students with ID in special needs schools appear to have poorer peer relations than students without ID (36). Nevertheless, students with ID in special needs classrooms are selective in choosing their friends and many are rather precise in identifying them (i.e., as indicated by reciprocated friendship nominations; see 1, 3, 11, 28). Notable is the relatively large number of friendship elections outside the classroom (3, 11) and the naming of adults as friends (11).

Still, the friendship situation of students with ID in special needs classrooms differs across students. Study 11 found a tendency for older students with ID to be more likely to mutually nominate each other as friends than younger students with ID (but see 6). Also, students with ID appear to choose friends of similar age (17, 18) and of similar cognitive skills (17, 18, 23). Higher cognitive skills were found to be associated with more reciprocal friendship choices (11) and greater communicative skills were positively related to the mean number of friendship themes mentioned in interviews (33). Students with Down syndrome were found to be most likely to have a best friend, while students with autism were least likely. Students with non-specific ID were in between (25).

The school setting appears to contribute as a contextual factor to the friendship situation of students with ID (6, 16, 19, 26, 27, but see 17, 18, 30, 32). For example, Study 27 found that 60% of students with ID in special needs schools reported having only one friend, while only 7.7% of students with ID in special needs classes in regular schools and 6% of typically developing students reported having only one friend. Fewer students with ID in special needs schools than those in special needs classes in regular schools or students without ID had five or more friends. Part of an explanation of these findings may be different school facilities (34, 35). Although many students perceived special needs classrooms in special

needs schools to be a protective environment to make friends, certain aspects, such as a fence around the schoolyard (35), were perceived as barriers to forming friendships, especially by students who had previously attended inclusive classes.

**Classroom networks.** The characteristics of the social network structure of special needs classrooms have received scant attention. There are two early studies that examined group solidarity respectively group cohesion in special needs classrooms (1, 3). Based on a definition that used high rates of reciprocated peer nominations to characterize group solidarity, the authors of Study 1 found evidence of solidarity in all of the examined classrooms. Similarly, Study 3 reported intact group cohesion in most of the investigated classes.

**Summary regarding social networks.** Students with ID in special needs classrooms differ in the social networks they have. Certain types of disabilities, older mental age, more adaptive behaviors, and less maladaptive behaviors were found to be associated with more *social interactions*. Furthermore, fewer social interactions appear to take place in special needs classrooms than in inclusive and regular classrooms, which may partly be explained by different activities within these settings and by peer characteristics. However, studies on institutional differences remain difficult to interpret, given that the individual characteristics of students were not always controlled for.

Results also show that students with ID in special needs classrooms maintain *friendships*. Older age, greater cognitive and social skills, type of disability, and similarity between peers appear to contribute to more friendships. Keeping in mind the methodological limitations just mentioned, in general fewer friendships were reported in special needs schools than in special needs classrooms in regular schools.

Regarding *classroom network* characteristics in special needs classrooms, in our view, too little research has been conducted to allow for clear conclusions.

## Discussion

After reviewing the existing studies on the peer relationships of students with ID in special needs classrooms, one main result is that even using a relatively broad set of criteria only produced 36 studies for inclusion. These studies provide evidence that researchers are able to describe and evaluate peer relationships in special needs classrooms and each investigation allows valuable insights into the subject. It has to be noted, however, that many studies had small sample sizes, most used cross-sectional analyses, and in general comparisons across studies were difficult due to large differences in assessment methodology. While such challenges are not uncommon in special education research (see also Armstrong, 2017), a specific problem met here was that interpretation of the results on the comparisons between special needs and other types of classrooms was often hampered by the fact that relevant individual-level variables were seldomly controlled for when investigating peer relationships. Despite of these challenges for interpreting the global state of research, preliminary conclusions on the peer relationships of students with ID in special needs classrooms can be drawn.

The first important conclusion of this review is that differentiated peer relationships exist in special needs classrooms for students with ID, including sociometric structures and various forms of social interactions. Given that ID can include profound disabilities and extremely challenging behaviors, this finding is not trivial and points to the importance of taking peer relationships into account in these settings. Although students have fewer friends than typically developing individuals, students appear to join with similar others, even if this means reaching out beyond their classroom to the entire school. Second, and in line with general peer relationships research (Bukowski et al., 2018), the quantity and quality of peer relationships in special needs classrooms appear to be associated with specific individual and contextual factors. Individual characteristics found to benefit peer relationships in multiple

studies include students' higher cognitive abilities, more adaptive behaviors, and fewer maladaptive behaviors. In terms of contextual factors, certain activities and school facilities appear to have the potential to foster social interactions and positive peer relationships in special needs classrooms.

Despite of these insights from existing studies, large research gaps remain. In terms of methodology, more longitudinal studies with large sample sizes and statistical models including detailed information on student and peer relationship characteristics are needed. Such studies would improve understanding of the processes mediating and moderating the development of peer relationships in special needs classrooms. Additionally, relatively new developments in social networks analysis that use stochastic-actor-based modeling, may increase understanding of the peer selection and socialization processes taking place in these settings (e.g., Snijders, van de Bunt, & Steglich, 2010).

Other research desiderata include more knowledge on social rejection and perceived popularity, as both concepts were little studied in special needs classrooms. Given the severe consequences of social rejection (Miller-Johnson et al., 2002) and the individual risks associated with popularity (Cillessen et al., 2011), more research in this field is warranted. Our review also shows that no studies exist on the role of classroom norms in shaping peer relationships in special needs classrooms. Evidence from regular classrooms suggests that the level of behavioral problems in classrooms can moderate the relation between individual characteristics and social status (Stormshak et al., 1999). More knowledge is also needed regarding the quality of friendships in special needs classrooms and the level of heterogeneity in students' social and cognitive competences within a classroom that is most advantageous for students' opportunities to interact and form relationships. As access to peers without disabilities varies between school settings, it will also be important to further examine

differences between peer relationships of students attending special needs classrooms within special needs schools and those attending special needs classrooms within regular schools.

Given the major importance of using research data to inform practice (Armstrong, 2017; Cook & Odom, 2013), the present review suggests that peer interactions in special needs classrooms should be actively fostered and that this is specifically important for certain groups of students. While research is still limited, students with more cognitive problems and behavioral difficulties appear to be less well-accepted by their peers in special needs classrooms. One possible intervention approach may be to build up the social skills of these individuals (e.g., O'Handley, Ford, Radley, Helbig, & Wimberly, 2016). Another approach is to target low status using classroom-level interventions. For example, van den Berg and Stoltz (2018) showed that seating arrangements in the classroom can be a useful tool to increase peer liking. Also, a teacher's general classroom organization and management style can provide opportunities for positive peer relationships, an approach sometimes described as a teacher's "invisible hand" (Farmer et al., 2018). Accordingly, the reduced levels of social interactions between peers in special needs classrooms may be targeted through active observation of peer relationships, followed by systematically providing opportunities for positive peer interactions in class.

In sum, this systematic review sought to fill a gap in the literature by providing an overview of the peer relationships of students with ID in special needs classrooms. In doing so, we decided to integrate a broad set of studies that used a heterogeneous set of methodologies and assessment procedures. While this approach complicated comparisons across studies, a broad review was possible. These results can serve as a starting point for investigating more specific questions related to a basic understanding of peer relationships in special needs classrooms and the development of adequate support systems for students with ID in these settings.

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Table 1

*Keywords Used for the Online Literature Search in PsycINFO*

	Keywords
	intellectual disabilities OR intellectual development disorder OR learning disabilities OR learning disorders OR developmental disabilities OR delayed development
AND	peer relations OR social status OR popularity OR social acceptance OR social networks OR social interaction OR interpersonal interaction OR friendship OR reciprocity OR social groups OR sociograms OR sociometry
AND	special needs school OR special needs class OR special education OR special education students OR special education teachers

Table 2

*Identified Studies Included in the Review*

Study	Authors	Participants			Setting <sup>c</sup>			Examined variables			Methods	
		Age <sup>a</sup>	Disability <sup>b</sup>	N	Special needs school	Special needs class	Inclusive/Regular class	Social status	Social network	Examined associated factors	Peer relationships	Control variables/selection criteria <sup>d</sup>
1.	Laing & Chazan, 1966	9.5-15y	ID	87	*			Acceptance Neglect	Group cohesion Reciprocated nominations		Peer nomination	
2.	Chennault, 1967	10-16y	ID	282		*		Acceptance		Intervention	Peer rating	
3.	Laing, 1972	M=11;11y	ID	124	*	*		Acceptance Rejection Neglect	Group cohesion Reciprocated nominations	Gender	Peer nomination	Chronological age School grade
4.	Ziegler & Hambleton, 1976	-	ID TD	-	*	*			Social interactions	Setting	Observations	Gender Mental and social age Chronological age Etiology Language(s) spoken at home Expressive and receptive language Number of siblings, birth order Socioeconomic background
5.	MacMillan & Morrison, 1980	7-14y	ID LD	222 65		*		Acceptance Rejection		Cognitive skills Behavior	Peer rating	
6.	Kingsley, Viggiano, & Tout, 1981	10-14y	ID TD	30 30		*	*		Friendship	Setting Age	Interview	Comparing ID to TD Chronological age
7.	Morrison & Borthwick, 1983	M=11y	ID	208		*		Acceptance Rejection		Cognitive skills Behavior	Peer rating	
8.	Morrison, Forness, & MacMillan, 1983	M=11.3y (SD=1.6)	ID	133		*		Acceptance Rejection		Cognitive skills Behavior	Peer rating	
9.	Forness & Nihira, 1984	M=11.9y (SD=2.1)	ID	47	*				Social interactions	Adaptive behavior IQ	Teacher questionnaire Observation	
10.	Jenkins, Odom, & Speltz, 1989	M=4.5-4.8y (SD=0.7-1.1)	ID+ TD	16 38 16		*	*		Social interactions	Intervention Setting	Observation	Diagnostic category Intellectual functioning Chronological age Class size Staff ratio Methods and time of instruction Physical space and access to material

Study	Authors	Participants			Setting			Examined variables			Methods	
		Age <sup>a</sup>	Disability <sup>b</sup>	N	Special needs school	Special needs class	Inclusive/Regular class	Social status	Social network	Examined associated factors	Peer relationships	Control variables/selection criteria <sup>d</sup>
11.	Siperstein & Bak, 1989	M=15.7y (SD=2.0)	ID	64	*			Acceptance Rejection	Reciprocated nominations	Cognitive skills Age Gender	Peer nomination Peer ratings	
12.	Odom, Peterson, McConnell, & Ostrosky, 1990	M=5.5y M=4.7y	ID+ TD	94 33		*	*		Social interactions	Activities	Observations	Comparing ID to TD School grade School proximity to metropolitan areas Rural-urban distribution
13.	Cole & Meyer, 1991	M=13.5y (SD=3.3)	ID+	91	*		*		Social interactions	Setting	Observations	Demographic characteristics Diagnostic characteristics
14.	Martlew & Hodson, 1991	M=9;8y M=9;6y	ID, LD TD	28 10	*		*		Social interactions	Setting	Observation Teacher questionnaire	Gender Chronological age
15.	Hunt, Farron-Davis, Beckstead, Curtis, & Goetz, 1994	5-12y	ID+	32		*	*		Social interactions	Degree of disability Setting	Observations Teacher questionnaire	Chronological age Degree of disability Adaptive and maladaptive behavior Educational program Instructional and transdisciplinary teaming practice Staff ratios
16.	Fryxell & Kennedy, 1995	6-12y	ID	18		*	*		Social interactions Friendship	Setting	Observations Interviews	Chronological age Gender Level of disability Adaptive social behavior and communicative behavior Same school district Educational quality indicators Teacher education and experience
17.	Guralnick, Connor, & Hammond, 1995	M=4.9y (SD=0.6) M=4.8y (SD=0.5) M=5y (SD=0.5) M=4.9y (SD=0.6)	ID CD PD At-risk	116 84 30 32	*		*	Acceptance Rejection	Social interactions Friendship	Cognitive skills Age Gender Type of disability Setting	Interview with mothers	Chronological age IQ Disability group Adaptive behavior Family demographic Absence of sensory disability Living with caregiver more than 6 months No programs serving students with severe or multiple disabilities
18.	Guralnick, 1997	M=4.9y (SD=0.6) M=4.8y (SD=0.4) M=4.7y (SD=0.3)	ID CD TD	75 69 66	*		*		Social interactions Friendship	Age Setting Type of disability	Questionnaire for mothers Interview with mothers	Family demographics Chronological age Absence of sensory disability Living with caregiver more than 6 months English-speaking
19.	Kennedy, Shukla, & Fryxell, 1997	M=12.5y	ID	16		*	*		Social interactions Friendship	Setting	Observations Interviews	Chronological age Gender Degree of disability Adaptive communication and adaptive social behavior Educational quality indicators Teacher education and experience

Study	Authors	Participants			Setting			Examined variables			Methods	
		Age <sup>a</sup>	Disability <sup>b</sup>	N	Special needs school	Special needs class	Inclusive/Regular class	Social status	Social network	Examined associated factors	Peer relationships	Control variables/selection criteria <sup>d</sup>
20.	Santich & Kavanagh, 1997	M=11y M=10.9y	ID TD	32 32		*	*	Acceptance		Setting Behavior	Peer nomination Peer rating	Chronological age Gender Approx. same intellectual capacity and adaptive behavior School grades Schools with similar socioeconomic and ethnic mix
21.	Heiman & Margalit, 1998	M=14.0y (SD=1.6) / M=13.4y (SD=1.6) M=13.6y (SD=1.7)	ID TD	310 265	*	*	*	Acceptance		Setting Loneliness Gender	Peer rating Self-report	Chronological age Approx. same intellectual capacity
22.	Begley, 1999	8-16y	DS	64	*		*	Acceptance		Age Gender Setting	Self-report	Chronological age
23.	Day & Harry, 1999	19y 16y	ID & PD ID	1 1		*			Friendship	Cognitive skills Social skills Experiences Barriers	Interviews Observations	
24.	Dew-Hughes & Blandford, 1999	-	ID+	12	*		*		Social interactions	Setting Activities	Observations	Chronological age Educational ability
25.	Sigman et al., 1999	-	ID AU DS	25 39 56	*	*	*	Acceptance	Social interactions Friendship	Cognitive skills Type of disability Prosocial behavior Early predictors Peer characteristics	Observations Teacher questionnaire	
26.	Heiman, 2000a	M=14.0y (SD=1.6) / M=13.4y (SD=1.6) M=13.6y (SD=1.7)	ID TD	310 265	*	*	*		Friendship	Setting Setting	Self-report	Chronological age Approx. same intellectual capacity
27.	Heiman, 2000b	M=14.0y (SD=1.6) / M=13.4y (SD=1.6) M=13.6y (SD=1.7)	ID TD	310 265	*	*	*		Friendship	Setting	Self-report Teacher questionnaire	Chronological age Approx. same intellectual capacity Teacher experience
28.	Hall, L. J. & Strickett, 2002	5-18y	ID+	26 (5)	*			Acceptance Rejection	Social interactions Reciprocated nominations	Gender	Peer nominations Observations Interviews	

Study	Authors	Participants			Setting			Examined variables			Methods	
		Age <sup>a</sup>	Disability <sup>b</sup>	N	Special needs school	Special needs class	Inclusive/Regular class	Social status	Social network	Examined associated factors	Peer relationships	Control variables/selection criteria <sup>d</sup>
29.	Male, 2002	M=13;9	ID+	7	*			Acceptance Rejection Neglect		Cognitive skills Gender Physical attractiveness	Peer nominations	
30.	Sarimski, 2003	M=10;7 (SD=3;4)	ID & SS	27	*				Friendship		Parent questionnaire	Chronological age Cognitive skills
31.	Foreman, Arthur-Kelly, Pascoe, & King, 2004	M=10y (SD=2.0)	ID+	29	*							
31.	Foreman, Arthur-Kelly, Pascoe, & King, 2004	6-11y	ID	16	*				Social interactions	Setting Activities	Observations	Chronological age Gender Level of functional impairment
32.	Buckley, Bird, Sacks, & Archer, 2006	M=16.7y (SD=2.6) / M=14.7y (SD=2.8)	DS	46	*				Friendship	Setting Age	Questionnaire	Similar social and family demographics Similar abilities when they started school
33.	Matheson, Olsen, & Weisner, 2007	M=16y	ID+	27	*				Friendship	Cognitive skills Communicative skills Gender	Observations Interview	Chronological age No genetic abnormalities No known prenatal alcohol or drug usage No postnatal neglect or abuse
34.	Hall, A.-M. & Theron, 2016	12-19y	ID+	24	*				Friendship	School environment	Draw-and-talk-interviews Teacher report	
35.	Boström & Broberg, 2018	13-16y	ID+	10	*				Friendship	School environment	Interview	
36.	Boström, Johnels, & Broberg, 2018	M=14.3y (SD=1.4) / M=13.3y (SD=1.1)	ID TD	110 110	*				Friendship		Questionnaire	Comparing ID to TD School grade Sample size Household income Reception of social benefits

<sup>a</sup> Means (M) and standard deviations (SD) reported if specified in the article

<sup>b</sup> ID=intellectual disability, LD=learning disability, TD=typically developing, CD=communication disorder, PD=physical disability, DS=Down syndrome, AU=autism, SS=Sotos syndrome, ID+= students with intellectual disabilities and other disabilities

<sup>c</sup> An asterisk indicates which setting the investigated sample attended. Special needs school = special needs classroom in special needs school; Special needs class = special needs classroom in regular school; Inclusive/Regular class = classroom attended by students with and without ID (inclusive) or only by students without ID (regular) within a regular school

<sup>d</sup> Only reported for studies comparing settings.