



2006

Social Interactions of Siblings of Children with Autism: A Pilot Experiment

Sarah Janota '06
Illinois Wesleyan University

Follow this and additional works at: https://digitalcommons.iwu.edu/psych_honproj



Part of the [Psychology Commons](#)

Recommended Citation

Janota '06, Sarah, "Social Interactions of Siblings of Children with Autism: A Pilot Experiment" (2006). *Honors Projects*. 6.
https://digitalcommons.iwu.edu/psych_honproj/6

This Article is protected by copyright and/or related rights. It has been brought to you by Digital Commons @ IWU with permission from the rights-holder(s). You are free to use this material in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/ or on the work itself. This material has been accepted for inclusion by faculty at Illinois Wesleyan University. For more information, please contact digitalcommons@iwu.edu.

©Copyright is owned by the author of this document.

Running head: Children Social Interactions with Autism

Social Interactions of Siblings of
Children with Autism: A Pilot Experiment

Sarah Janota

Illinois Wesleyan University

Abstract

Despite the overwhelming amount of typical sibling relationship research available, there are few studies regarding sibling relationships involving autism. Of those, even fewer use experimental designs. The present study explored the hypothesis that siblings of children with autism-spectrum disorders develop increased compassion for others. Compassion was operationally measured through three dependent variables: participants' willingness to help, like, and interact with others. The study used an experimental design testing the social response of siblings of children with autism to potential peers who varied with respect to three independent variables: disability status (cystic fibrosis, cerebral palsy, mental retardation, autism, or typically-developing), priming condition (sibling-primed or neutrally-primed), and physical attractiveness (higher or lower attractiveness). It was specifically hypothesized that siblings of children with autism who were primed with their sibling relationship would rate potential peers with a disability or who were unattractive higher than neutrally-primed participants.

Participants completed the experiment using MediaLab software, which presented potential classmates differing on the aforementioned conditions. Participants then answered questions regarding their willingness to interact with the individual, willingness to help the individual, and how much they would like the individual. Data were analyzed using a series of t-tests and produced some marginally-significant trends that support the hypothesis, although a small sample size severely limited the statistical power. Results and limitations of this study implicate the need for further research.

Social Interactions of Siblings of Children with Autism: A Pilot Experiment

Sibling relationships can be the most important and longest interpersonal connection that a person will have throughout a lifetime. Siblings fill many roles in each others' lives, including confidant, enemy, friend, caregiver, teacher, and student. Because of this curious, yet versatile nature of sibling relationships, there has been an increased interest in sibling relationships among researchers (Weaver et al., 2003; Brody, 1998; Furman and Buhrmester, 1990; Stocker, 1994). Although there is quite an extensive amount of literature focusing on the sibling relationship, this literature is concentrated on relationships between typically-developing siblings. Another subset of the sibling relationship, however, is relationships in which one of the siblings has a mental disability, such as autism. This sibling relationship has many of the same components as a typically-developing relationship, but siblings may have added responsibilities with the introduction of a mental disorder to their family dynamic.

Autism-spectrum disorders (including Asperger's disease and Pervasive Developmental Disorder) are prevalent in society, ranging from 1 in 500 to 1 in 165 live births (Whitely et al., 1998). Autism-spectrum disorders are diagnosed based on the presence of behaviors that fall into three main categories: communication deficits, impairments in reciprocal and social interactions, and repetitive or restricted interests and behavior (American Psychiatric Association, 2000). Perhaps the most pronounced and obvious traits fall into the behavioral category and include tantrums, obsessions, and aggression (Seltzer et al., 2003). Children with autism-spectrum disorders may also display pronounced actions such as rocking back and forth and making clicking noises with their tongue. Autism is most well-known for affecting a person's social-

communication skills, especially the underdevelopment of both verbal and nonverbal communication. While its cause is unknown, there is a general agreement that autism is a pervasive, developmental disorder with at least a partial genetic component (Whitely et al., 1998).

Having a family member with a mental disorder is stressful for the entire family, but it has been suggested that of all family members, children are the most vulnerable and most affected by having a family member with a mental disability (Kinsella et al., 1996). Typically-developing siblings of children with mental disorders, including autism, may be subject to less attention from their parents as well as increased responsibilities in the family. In addition, individuals who have siblings with mental disorders are increasingly being expected to become caregivers for said siblings into adulthood (Jewell & Stein, 2002). It is difficult, however, to assess specifically how a relationship involving a mental disability affects typically-developing siblings due to the lack of research in this field.

The present study described in this report was a pilot experiment designed to broaden the scope of research on siblings of children with autism. The study was motivated by a desire to better understand how the sibling relationship affects typically-developing siblings, particularly with respect to their compassion for others. More specifically, the study explored whether increased thoughts about their sibling relationship (through priming) or other characteristics (i.e., disability status and attractiveness) influenced participants' levels of compassionate responses. The study was grounded in prior literature on typical sibling relationships, sibling relationships with a

disability (including but not limited to autism), compassion and attachment, individuals' attitudes toward disabilities and physical attractiveness, and priming.

Sibling Relationship Research

Typical sibling relationships. While children are raised with an interrelated network of relationships, the relationship between siblings may be the most important bond in a child's development and psychological adjustment. During childhood, individuals spend more time with their siblings than with any other family member, including their parents (Weaver et al., 2003). Even though the time siblings spend with one another has a tendency to decrease as children grow older, siblings remain essential, lifelong figures in each other's lives (Weaver et al., 2003).

In childhood, sibling relationships are marked by both negative and positive characteristics. For example, though aggression plays a role in virtually all sibling relationships, there is also a high prevalence of imitation, affection, and cooperation (Chess & Hertzog, 1988). Even though most typical sibling relationships contain a certain amount of conflict, this tension decreases over time and is balanced through deep support that leads to increased successful peer relationships and positive school adjustment (Brody, 1998).

Sibling relationships are important in adolescence and young adulthood as siblings serve as confidantes, teachers, role models, and friends to one another (Weaver et al., 2003). During adolescence, sibling relationships decrease in conflict and increase in companionship. Maturing siblings are much more likely to provide emotional support for one another, work together to care for their parents, and help one another in young adulthood than argue regularly (Stocker, 1994). As children grow older, their sibling

relationships typically become less influential, most likely due to decreased interactions as siblings form their own lives and families apart from their immediate family (Buhrmester & Furman, 1990). These decreases do not indicate that adolescent sibling relationships are unimportant, however, as they remain distinguished by a high level of closeness between siblings (Yeh & Lempers, 2004). In particular, strong sibling relationships appear to have a positive effect on adolescents by increasing an individual's positive friendship qualities, self-esteem, development, and academic achievement (Yeh & Lempers, 2004).

In particular, through such relationships, children often receive a feeling of acceptance and intense support that may increase confidence and sentiments in later experiences, including interaction and acceptance of others (Brody, 1998). Thus, sibling relationships are typically important in both childhood and adolescence as they are greatly associated with increased awareness of other people's emotions and points of view (Dunn et al., 1999).

Sibling relationships of disabled children. While typical sibling relationships have generally positive influences on child and adolescent development, the research on siblings of children with both physical and mental disabilities is much less conclusive. Some research suggests that such a relationship has a positive impact on individuals' lives. For example, in comparison with typically-developing sibling relationships, siblings of children with mental retardation were more likely to rate their sibling relationship positively than siblings of typically-developing children (Royers et al., 1995). Also, children with handicapped siblings were less likely to report having experienced verbal aggression with their sibling than children with non-handicapped

siblings (Royers et al., 1995). These results suggest that having a sibling with a mental disorder may result in a kinder, gentler relationship.

In contrast with this literature, other research has portrayed sibling relationships when one individual has a mental disorder in a less positive light. Although children with handicapped siblings generally rate their sibling in a positive manner, the responses varied greatly with many participants rating their sibling either very high or very low (McHale et al., 1986). Thus the overall positive nature of the responses was merely an average of very extreme scores, suggesting that disabilities either have a very positive or a very negative effect on typically-developing siblings. Also, although children rated their relationships with their disabled sibling positively, their mothers rated the same relationship negatively (McHale et al., 1986). This result suggests that the relationships are perhaps not entirely stable and that children and adults may interpret different situations in very different ways.

In comparison with siblings of typically-developing children, some researchers have found that children with disabled siblings are under significantly greater amounts of stress (Gunayer Senel & Akkok, 1996). Such stress could affect both the child's daily activities as well as his or her overall development. For example, siblings of handicapped children were lonelier, had more peer interaction problems, and viewed their sibling as a burden more than did siblings of typically-developing children (Bangenholm & Gillberg, 1991). Siblings of disabled children were found to be less affectionate toward others in general and were additionally affected by parental stress and its familial consequences (Fisman et al., 1996). For example, one of the most prominent obstacles for siblings of

disabled children is a feeling of being or actually being neglected by his or her parents due to the extra time and effort given to the disabled sibling (Schulman, 1999).

In contrast to the positive and negative patterns found in the aforementioned studies, other researchers have failed to find a significant difference between sibling relationships in which one individual has a mental disorder and typical sibling relationships (Fisman, 1991). When adolescents completed questionnaires measuring their self-worth, their interactions with peers, and their compassionate behaviors, there were no significant differences between participants with disabled siblings and participants with typically-developing siblings (O'Kane & Borkowski, 2002).

Despite these inconclusive results, a portion of the literature on siblings of children with disabilities suggests that the typically-developing sibling would be more compassionate and accepting of others. Reported by both siblings of children with Down Syndrome and their parents, siblings portrayed kinder behaviors and experienced more empathy than did typical comparison individuals (Cuskelly et al., 2003). Also, the siblings of children with Down Syndrome actively participated in more "care-giving" activities such as helping with household chores and tutoring their sibling than the typically-developing control group. Children of siblings who are diagnosed with pervasive developmental disorders have been found to be more compassionate, sensitive, competent, and positive than children with typically-developing siblings (Chess & Hertzig, 1988). While sisters with a sibling with mental retardation were significantly more compassionate, caregiving, and positive about their relationship than male siblings, brothers also had a favorable response toward their siblings with mental retardation, especially when the affected sibling was also male (Orsmon & Mailick, 2000).

Sibling relationships with autism. Due to the social and communicative symptoms of autism-spectrum disorders, relationships with persons with autism-spectrum disorders are expected to have more communication problems than typically-developing relationships and perhaps more than disabled relationships in general (Hastings, 2003). Much of the research again points toward more negative effects of having a sibling with autism, however evidence also suggests that positive characteristics exist in these relationships, and that such associations may even outweigh negative components and consequences.

Although siblings of children with autism reported experiencing feelings of neglect, worries, and anxieties regarding their sibling as well as higher levels of teasing and jealousy from peers, such problems also occurred in typically-developing relationships with the same prevalence (Howlin, 1988). Siblings of children with autism have reported less intimacy in their sibling relationships along with a decrease in prosocial behaviors and nurturance than siblings of typically-developing children (Kaminsky & Dewey, 2001). Although siblings of children with autism may be more likely to experience internalizing behaviors (such as having academic problems in school, an increased level of depression, or amplified helplessness), they did not differ from a control group of children with typically-developing sibling relationships on self-competence measured both from the participant's and his or her parents' point of view (Rodrigue et al., 1993).

Although there were lower levels of positive interactions between children and their siblings with autism, therapeutic interactions in the form of caregivers' encouragement increased the level and frequency of positive interactions between

siblings (Strain & Danko, 1995). Similarly, while siblings of children with autism had low levels of knowledge of autism, lower self-concepts, and poorer coping strategies, all three of these indicators improved with the interventions of sibling support groups, suggesting that the possibly negative aspects of such a relationship can be overcome and improved with therapeutic approaches (Smith & Perry, 1999).

Despite the negative results of many studies on sibling relationships between a child and his or her sibling with autism, there are very promising results from select research studies that suggest that siblings of children with autism are no more at risk than other siblings of children with disabilities (Pilowsky et al., 2004). In particular, siblings of children with autism have been reported as being significantly well-adjusted, more responsible, more mature, and more accepting overall of others than siblings of typically-developing children (Howlin, 1988). Also, they were also more likely to admire their sibling with autism, quarrel less, and have a reduced level of competition (Kaminsky & Dewey, 2001). Likewise, siblings of children with autism were generally more tolerant and altruistic than others of the same age, and had a greater likelihood of entering helping and caring professions when they grew older (Howlin, 1988). These results suggest that siblings of children with autism may be more compassionate and accepting of peers that are different and disabled in some fashion, as the present study investigates.

Compassionate Behavior in Children: A Sibling Perspective

Acceptance. There are, therefore, mixed results with respect to sibling relationships with children with autism. Some of these results, however, suggest that the sibling relationship with autism may lead to the siblings being more compassionate

toward others, which the present study investigated by priming participants with their sibling relationship with autism.

Priming of the sibling relationship. All children are dependent on a caregiver from birth. Children with disabilities, autism in particular, are especially dependent on others and require a secure base that is strong and wise and will lead them through their lives. While this strong base is most likely a parental figure in most children's lives, because of the extreme dependence associated with intellectual disabilities and autism, other figures in such children's lives may also adopt this role of caregiver, siblings in particular.

According to the attachment theory, caregiving behaviors are the result of an evolutionarily-developed caregiving behavioral system that leads individuals to exert a sense of protection and added support toward dependent individuals (Bowlby, 1982). Thus, when this caregiving behavioral system is activated, individuals act more compassionately as the caregiver aims to change a dependent person's situation to promote his or her safety, well-being, and security (Mikulincer & Shaver, 2005). Theoretically, in the case of siblings, children and adolescents typically relate to their siblings with a peer affiliation system, but because siblings with disabilities are so dependent, the caregiving behavioral system is likely to be activated more frequently. In other words, when the dependency of individuals increases (such as with children with autism), siblings may experience increased activation of the caregiving behavioral system, coming to the aid of the dependent individual in threatening situations.

From this perspective, it may be hypothesized that siblings of children with autism are more likely than their typically-developing counterparts to have

compassionate characteristics, and to practice those behaviors in social situations. More specifically, the participants in the present study should theoretically be more accepting of potential peers with conditions such as physical disabilities, intellectual disabilities, and low attractiveness when their schema for that sibling relationship is activated than when it is not activated. A priming manipulation—in which participants were encouraged to think about their sibling relationship or a neutral relationship—was used to activate the sibling relationship in this study.

Priming has proven to be an effective and well-validated method of eliciting responses based on previous exposure, either conscious or subconscious, to specific materials. For example, when participants were subliminally exposed to security words or instructed to imagine a situation in which they felt secure, both of these priming methods activated representations of attachment security, as shown through increases in compassionate behavior (Mikulincer & Gillah, 2002). Theoretically, the activation of the sibling relationship in this study would result in more compassionate actions toward disabled prospective peers in the child's classroom than would neutrally primed participants. The current research on priming, however, does not utilize children so this study also served to investigate whether priming is a viable experimental methodology for this population.

Attitudes toward disabilities. While society is progressing in the direction of increased integration of persons with mental disabilities, there is evidence that disabled persons are judged negatively by their peers. Children as young as four years old have been found to change their ideas of an individual's competency level when they discover that individual has a disability (Smith & Williams, 2001). Likewise, children with mental

disorders and children with physical disabilities have a low peer acceptance rate (Cook & Semmel, 1999). A low peer acceptance rate includes a lack of peers' desirability to interact with the disabled child in the classroom, such as working on a class project. Typically-developing children also treat peers with severe disabilities as if they were "babies" or somehow younger than they perceived themselves.

It has been found that children have a greater understanding of physical disabilities than of learning disabilities (Magiati et al., 2002). After being interviewed about both physical and mental disabilities, children were found to have a good understanding of prominent disabilities such as blindness or being in a wheelchair, but remained confused about other less evident disabilities such as mental disorders, even though they are more prevalent in society (Nikolarazi, 2005). For example, typically-developing children seemed confused about disabilities and how they affected individuals, such as assuming that disabilities render a person with little to no potential in life. Therefore typically-developing children were likely to underestimate their peers' aptitude and capabilities if that peer had a disability. Despite the fact that more confusion existed with mental disabilities than with physical disabilities, children in general could perceive and understand the consequences of having both physical and mental disabilities especially in social settings (Smith & Williams, 2001).

Although children are more likely to have negative attitudes toward peers who are physically or mentally disabled, these negative attitudes tend to diminish and actually improve with increased social contact with persons with disabilities (Meyer et al., 2001). In this light, since all the participants in the present study have a high level of social interaction with their siblings with autism, they should be generally accepting and have

positive attitudes toward interacting with prospective disabled individuals in the study. To the degree that siblings of children with autism are highly compassionate, they may exhibit even greater compassion and acceptance of peers with a disability than peers who are typically-developing.

Physical attractiveness. Physical attractiveness is a major factor in impression formation for persons across different societies and cultures. Adults and children alike interact more positively with attractive people than unattractive people (Byrnes, 1987; Dion, 1973). Even teachers who are supposed to treat their students as equals show different and more negative behavior toward unattractive children. Children have very similar tendencies and react practically identical to how adults react when they interact with less attractive individuals (Dion, 1973). While rating facial photographs of peers also rated by adults, children had the same judgments in the same direction of attractiveness or unattractiveness as the adults. Also, children displayed more of a preference to be friends with attractive children, disliked unattractive children more, and deemed unattractive children more likely to behave in antisocial manners than their attractive counterparts (Dion, 1973). Likewise, when children rated photographs of attractive and unattractive children on nine personality characteristics, every participant ranked the more attractive photograph as having higher levels on all dimensions including more friendly, kind, exciting, sincere, outgoing, warm, poised, sophisticated, and trustworthy (Dushenko et al., 1978).

Similarly interesting results were found while asking children to rate photographs of other children (Langlois et al., 2000). Attractiveness effects hold across cultures, as attractive children are judged and treated more positively than unattractive children.

Interestingly, in addition to being judged and treated more positively than unattractive children, some researchers have found that attractive children actually embody more positive characteristics and behaviors including mental and physical health, self-confidence, and good social skills (Langlois et al., 2000).

A less overt way to assess compassion in siblings of children with autism is to present photographs of potential peers which vary in attractiveness rather than in disability status. That is, in order to test whether any significant findings in the disability manipulation resulted from a participant's true attitude or from a socially desirable response bias, children participating in this study also rated potential peers who were higher or lower in attractiveness. Theoretically, if the children responded that they were willing to interact with a disabled individual, they should have also been likely to interact with a child of a lower physical attractiveness.

Present study. Because classrooms across the United States are gradually integrating disabled children, it is extremely important to understand how and why children react to disabilities as they do. Equally as important is how a child with autism affects his or her family, including his or her siblings.

This was a pilot, exploratory study designed to explore compassion in siblings of children with autism-spectrum disorders. Theoretically siblings of children with autism should be more compassionate toward others based on their experiences with their own disabled sibling. Siblings of children with autism who are primed with their sibling relationship will be more likely than siblings primed with their neutral relationship to show compassion and acceptance toward others, whether the differences are a physical disability, mental disability, or physical unattractiveness. Compassion and acceptance

toward an individual was operationally defined as a high willingness to help, like and interact with the individual.

The present study used an experimental approach to study sibling relationships involving autism. The participants were presented with photographs and descriptions of prospective classmates, and then responded to these potential peers under three different scales: willingness to help, like, and interact. The proposed study used a series of independent t-tests to analyze the three components of the study: priming condition, attractiveness condition, and disability condition. Priming was a between-subjects variable, with children randomly assigned to be primed with either their relationship with their sibling with autism or a relationship with a peer that is not a close friend. Disability status and attractiveness were also between-subjects variables because they were combined together so that participants either saw all attractive or unattractive disabled and typically-developing vignettes.

Method

Participants

The participants were recruited through announcements made to families in autism support groups, an autism services clinic, and as well as by word of mouth. Participants included 25 children and adolescents between the ages of 8 and 17 who have siblings diagnosed with autism-spectrum disorders. Due to technological problems with the computer software, data from 3 of the participants were lost. Data from 2 subsequent participants were excluded from analysis because it was suspected from their behavior while completing the experiment that their responses were influenced by outside forces (i.e., 1 had a severe behavioral disorder and 1 had a parent observing his responses.)

The final sample included 20 participants aged 8 to 17 ($M = 11.45$, $SD = 6.25$). Twelve of the participants were girls and 5 were boys. Seventeen participants self-identified as having a white ethnicity while 1 participant each identified as Hispanic, Arab, and as other. The participants' siblings with autism-spectrum disorders ranged in age from 2 to 19 ($M = 9.25$, $SD = 3.81$), with the majority identified by parents as boys ($n = 19$) and having a diagnosis of autism ($n = 17$; the remaining 3 were diagnosed with PDD-NOS/atypical autism).

Measures

The dependent variable, compassion and acceptance of others, was measured using three scales, each of which had three items. First, *willingness to interact* was measured by questions such as "How many days a week would you want this person to each lunch with you?" Second, *helping behaviors* were measured through questions such as "How much would you like to help this person when they need help?" Last, *overall liking* was measured by questions such as "How much would you like this person as a friend?" The questions were answered on a Likert-type scale with responses ranging from 1 (low levels of liking, helping, and interacting) to 6 (high levels of endorsement), with each of the nine questions presented randomly. The full list of dependent variable questions is included in the appendix.

Procedure

This experiment was performed either at Illinois Wesleyan University in a computer laboratory, on site at various autism support group functions, and at an autism services clinic in the Chicago area. Informed consent was received from the parents of the participants and informed assent from the participants. The entire study was by a

computer using the Medialab software program. The participants were seated approximately 24 inches from the computer screen. It was ensured that the participants knew how to utilize the computer program as well as had privacy through the use of headphones and positioning. Participants first completed one of two versions of a short questionnaire regarding relationships in order to prime a specific relationship. The participants were then asked to respond to several questions regarding the vignettes about how willing they would be to interact with the target individual, how willing they would be to help the target individual, and how much they would like the target individual.

The Medialab software then randomly presented eight photographs (four male, four female) of children/adolescents of similar age as the participant and a simultaneous audio file describing those children/adolescents. The audio file was the voice of a “teacher” explaining that the photographed child was a new student in the participant’s classroom. Immediately following the presentation of each peer, the participants responded to the nine items for the helping, liking, and interacting scales. All participants were compensated with a small token (e.g., a toy) or a gift certificate worth 5 dollars.

Independent Variables

There were three independent variables manipulated throughout the computer software: (a) a priming manipulation, (b) presence of a disability in the prospective student, and (c) attractiveness of the prospective student.

Priming. Participants were randomly assigned to one of two groups: sibling prime and neutral prime. In the sibling prime group, the participants first answered questions regarding their sibling with autism to activate the schema for their relationship

with their sibling with autism. All of the questions and scales were adapted from the Sibling Relationship Questionnaire (Buhrmester & Furman, 1990). In the neutral prime group the participants answered a parallel set of questions regarding a relationship with a schoolmate who is not a close friend (e.g., a student in a different class). The priming task required participants to answer five questions regarding the target priming individual (e.g., see full priming questionnaires in Appendix).

Disability. The audio files described two of the prospective classmates as having a physical disability (cystic fibrosis and cerebral palsy), two as having an intellectual/developmental disability (autism and mental retardation), and four as a normally developing child/adolescent (see full list of vignettes in Appendix).

Attractiveness. The facial photographs were acquired from children ages 8-16 and were manipulated using Adobe Photoshop software to be more and less attractive, respective to the original photograph by changing aspects such as skin tone, blemishes, spacing and size of eyes, nose shape/size, lip shape, apparent weight, symmetry/asymmetry, and eyebrow shape (see Appendix for example of manipulated photographs).

Results

Data Analysis

The data were originally to be analyzed using a 2 (priming) X 2 (disability status) X 2 (attractiveness) mixed analysis of variance. These analyses could not be conducted as planned for several reasons. First, there was an insufficient number of participants in each of the cells to be able to conduct the analyses (the number of participants in each analysis cell ranged from 3 to 8). Second, after data collection was complete, the

researchers discovered a confounding variable embedded in the stimuli in that pairings of level of attractiveness and disability status were not fully counterbalanced. For example, participants saw four disabled vignettes that were attractive and four typically-developing vignettes that were unattractive, or vice versa (rather than both attractive and unattractive persons with and without disabilities). Because of this confound the *interaction* between attractiveness and disability status could not be analyzed.

As a result, data were analyzed using t-tests for independent means in three stages. First, data were analyzed for priming effects by running a series of t-tests for independent means using the participants' priming condition as the independent variable. Second, the data were then analyzed for differences between attractiveness conditions. Third, the data were analyzed for differences between ratings of disabled and typically-developing vignettes (i.e., with the disability status as the independent variable). The three sets of analyses have slightly different numbers of participants due to the confound described above.

Priming Results

It was hypothesized that participants who were primed with their sibling relationship versus those primed with a neutral relationship would be more compassionate and accepting of peers with differences. In particular, sibling-primed participants should have been more willing than neutrally-primed participants to help, interact with, and like individuals who had a disability or who were lower in attractiveness. The sample size for these analyses was 16. As seen in Table 1, demographic characteristics of participants in the sibling and neutral prime groups were

similar with two exceptions: (a) there was a greater presentation of girls in the neutral priming group and (b) there was a slightly older average age of the neutral prime group.

Contrary to the hypothesis, participants primed with their sibling relationship did *not* report a greater willingness to help disabled peers ($M = 5.39$, $SD = 1.01$) than did neutrally primed participants ($M = 5.39$, $SD = .353$), $t(15) = .700$, *ns*. Likewise, participants primed with their sibling relationship did *not* report a greater liking of peers ($M = 4.58$, $SD = .719$) than did neutrally-primed participants ($M = 4.49$, $SD = .470$), $t(15) = -.033$, *ns*. Last, participants primed with their sibling relationship did *not* report a greater willingness to interact with disabled peers ($M = 3.92$, $SD = .658$) than did neutrally-primed participants ($M = 4.02$, $SD = .664$), $t(15) = .320$, *ns* (see Table 2 for priming analysis statistics).

Analyses were re-run to determine whether participants primed with their sibling relationship showed more compassion than neutrally-primed participants when rating *unattractive* peers. Similar to analyses reported above, the sibling prime did not lead to more willingness to help, $t(15) = .885$, *ns*, more liking, $t(15) = .409$, *ns*, or more willingness to interact, $t(15) = 1.01$, *ns* (see Table 2 for means and standard deviations).

Attractiveness

Independent t-tests were conducted to assess whether or not participants would rate unattractive peers higher than attractive peers. Analyses were conducted separately for ratings of unattractive versus attractive peers with disabilities and for unattractive versus attractive typically-developing peers. The sample size was 20 participants, with 10 in each condition. Groups were similar, with the exception of an increased average sibling age in the attractive disability condition (see Table 3 for demographics).

Inspection of means, shown in Table 4, shows consistent patterns of ratings in that unattractive peers with a disability were rated higher than attractive peers with a disability, although some differences were not significant. First, there was marginally-significant finding suggesting that participants were less willing to help *attractive* ($M = 4.92, SD = .747$) versus *unattractive* peers with a disability ($M = 5.49, SD = .575$), $t(19) = -1.84, p < .10$. Similarly, there was a marginally-significant result indicating lower willingness to interact with peers who had a disability when they were *attractive* ($M = 3.63, SD = .490$) versus *unattractive* ($M = 4.11, SD = .681$), $t(19) = -1.75, p < .10$. In contrast, participants did not report lower liking of *attractive* peers with a disability ($M = 4.45, SD = .670$) than *unattractive* peers ($M = 4.71, SD = .554$), $t(19) = -.993, ns$.

Inspection of means, also shown in Table 4, shows that ratings of typically-developing peers that followed a consistent pattern in the opposite direction in that attractive peers were rated higher than unattractive peers on every scale. Despite this pattern in the means, ratings for willingness to help ($t(19) = -1.12, ns$) and liking ($t(19) = -1.17, ns$) did not differ significantly for *unattractive* typically-developing peers versus *attractive* typically-developing peers. Participants did, however, report significantly lower willingness to interact with *unattractive* typically-developing peers ($M = 3.52, SD = .728$) than *attractive* typically-developing peers ($M = 4.28, SD = .812$), $t(19) = -2.18, p < .05$.

Disability Status

T-tests were used to investigate whether there were differences in participants' willingness to help, like, and interact with peers based on whether or not they had a disability. There were 18 participants in this analysis (see Table 5 for demographics). It

was hypothesized that participants would rate potential peers with a disability higher than typically-developing peers. This hypothesis was tested in two ways, one for attractive peers and one for unattractive peers.

Analyses were first conducted for attractive target potential peers. Participants were not more willing to help attractive *typically-developing* ($M = 5.36$, $SD = .688$) than attractive peers with a *disability* ($M = 4.92$, $SD = .797$), $t(17) = -.963$, *ns*. Similarly, participants did not report higher liking of attractive *typically-developing* peers ($M = 4.78$, $SD = .529$), than attractive peers with a *disability* ($M = 4.45$, $SD = .812$), $t(17) = -1.20$, *ns*. Participants did, however, report a marginally-significant higher willingness to interact with attractive *typically-developing* peers ($M = 4.28$, $SD = .812$) than attractive disabled peers ($M = 3.63$, $SD = .490$), $t(17) = -2.19$, $p < .10$ (presented in Table 6).

Analyses were repeated for unattractive potential peers. Participants did not report a lower willingness to help ($t(17) = 1.71$, *ns*), like ($t(17) = .563$, *ns*), or interact ($t(17) = 1.53$, *ns*) with unattractive *typically-developing* versus *disabled* peers (means and standard deviations presented in Table 6).

Exploratory Analyses: Overall Reactions by Target Status

Exploratory analyses were conducted to assess, first, how specific disability status (cystic fibrosis, cerebral palsy, mental retardation, autism, typically-developing) might have influenced ratings and, second, whether participants were different in the strength of their willingness to help or like peers. Data were therefore analyzed using a 2 (helping/liking) X 6 (target disability status) mixed analysis of variance to discover (1) any main effect for the different scales (helping versus liking), (2) any main effect for the different disabilities, and (3) an interaction effect between disability subtype and scales.

There was a main effect across the scales ($F 1,17 = 30.42, p < .05$), indicating that the siblings of children with autism were more likely to endorse items asking about their *willingness to help* versus items asking about their *liking* of potential peers. Figure 1 portrays a major trend across all conditions throughout this experiment: participants rated all potential peers (all disability statuses and all attractiveness conditions) relatively high on the 6-point scale. Most of the means for each condition fall between 4 and 5, which was not expected considering past research.

In contrast, there was no significant main effect for the disability status ($F 5,13 = .663, ns$), indicating that siblings of children with autism do not exhibit different levels of compassion for potential peers with cystic fibrosis, cerebral palsy, mental retardation, autism, or who are typically-developing.

Finally, there was no interaction effect between the scales and disability subtypes ($F 5,13 = 1.06, ns$), suggesting that the relative endorsement of helping and liking of peers does not vary on the specific disability status. (Note: The willingness to interact scale was omitted from these analyses as it was not directly comparable to the helping and liking scales.)

Discussion

The main hypothesis in this study was that siblings of children with autism who were primed with their sibling relationship would rate peers who were unattractive or that had a disability higher than participants who were primed with a neutral relationship. Although there were no significant priming results, further analyses suggested that siblings of children with autism may be more compassionate toward others with differences, although this cannot be concluded without further evidence. This study is

important in this field of research because it embarks on using experimental techniques to study children's social relationships, which is not a common method in past research.

The hypothesis that participants primed with their sibling relationship would respond more compassionately than those primed with a neutral relationship was not supported. One possible explanation is that priming is not a viable experimental method for children in studies of this sort. That is, perhaps using priming to elicit relationships and characteristics such as compassion is only practical in adults and is not an effective method to use with children in these experimental methods. This explanation does not seem very plausible, however, considering the extreme success and validity that priming has had previously in a wide variety of research studies and populations (Mikulincer & Shaver, 2005).

A more plausible explanation is that participants could have entered the experiment already primed for their sibling relationship. That is, all participants completed the experiment knowing that it was because they had sibling with autism and participated in autism-related contexts. If the participants were all primed with their sibling relationship, they theoretically would all be more compassionate toward peers who were unattractive or had a disability, as per the hypothesis. There were some marginally-significant and non-significant trends that suggested that the participants reacted more compassionately to such peers, but further research needs to investigate this issue more in order to draw more definitive conclusions.

Three other possible explanations may account for the lack of priming effects. First, the priming questionnaires used in the present study were not adequate to elicit such a response. The questionnaires were adapted from a larger measure, the Sibling

Relationship Questionnaire, which was not originally designed as a priming instrument, but as a measure of the quality of a sibling relationship across various scales (Buhrmester & Furman, 1990). Second, the disability descriptions (seen by all participants) could have primed for compassion in all conditions. Third, there were gender and age confounds embedded in the priming condition. Thus the increased number of female and younger participants in the neutral priming condition could have altered the results.

Participants did not show a strong preference for either attractive or unattractive faces. In general, participants were extremely positive toward both attractiveness conditions, with mean ratings for all scales falling between 4 and 6 on a six-point measure. There was a marginally-significant preference for *unattractive* faces when the peers were disabled (in the helping and interacting scales) and for *attractive* faces when the peers were typically-developing (significant for the interaction scales). These trends differ from findings in previous literature suggesting that attractive children are usually rated significantly higher than unattractive children (Langlois et al., 2000; Dion, 1973; Dushenko, 1978; Byrnes, 1987). Results of the current study, especially the increased willingness to help and interact with peers who were both unattractive and had a disability are consistent with the hypothesis that siblings of children with autism are more compassionate. This cannot be confirmed, however, without a typically-developing control group. There also needs to be a manipulation check on the photographs to confirm that what was presented as attractive and unattractive truly is perceived by children as more and less attractive.

Participants did not show a strong preference for peers with disabilities versus typically-developing peers, although there was a slight preference for disabled peers

when all peers were unattractive and a slight preference for typically-developing peers when they were all attractive. These are mixed results when compared with prior research suggesting that children tend to rate peers with disabilities significantly lower than typically-developing peers (Magiati, 2002; Nikolarazi, 2005; Smith & Williams, 2001). As previously mentioned, participants may have entered this experiment already primed with their sibling relationship and therefore could be responding with more compassion than if they would have been neutrally-primed. This would explain why there were generally positive responses across all conditions of all variables and all scales.

Experimental Shortcomings

Being a pilot study, this experiment had several unexpected issues emerge throughout the research process both with the participants and with the experimental methods. Perhaps the greatest shortcoming was the small number of participants that were recruited. This was due to the limited pool of possible participants, especially in this geographic location. With such a small sample size, experimental power was very low in this study making it unlikely that even meaningful differences would be detected. Further, the obtained small sample of participants may not be representative of the general population of siblings of children with autism-spectrum disorders. Finally in this small sample, there was also a large age range of participants, from age 8 to age 17. Since this age range spans across almost a decade of development, participants could have been in much different developmental stages which could have influenced their ratings of potential peers.

Second, this study did not include a control group consisting of children with siblings that are typically-developing. Such a control group would help support the speculation that siblings of children with autism are more compassionate. In order to investigate if there is a difference between siblings of children with autism and siblings of typically-developing children, there needs to be a matched control group of siblings of typically-developing children to directly compare results.

Third, a number of methodical issues limit conclusions that can be drawn from this study. For example, the computer software, Medialab posed several problems for the researchers. The software was, at times, finicky and even deleted some data that were collected from viable participants. These issues with the software need to be solved before continuing to explore this research with future experiments. As previously mentioned, there was also no manipulation check on the photographs' attractiveness levels used in this study, which is needed to better understand attractiveness. Finally, human error accounts for a notable shortcoming that was not realized until data had already been collected. In an attempt to control for many variables including gender and random and equal presentation of stimuli, each participant either saw all vignettes portrayed with a disability as either all attractive or unattractive (rather than as half attractive and half unattractive). This led to a confound that did not allow for the planned 2 X 2 X 2 mixed-design analysis of variance. Therefore, results could not be compared across attractiveness status and disability status in interaction with one another. The computer program needs to be reprogrammed to eliminate this confound if the study is to be continued.

Future Research

Because the data resulted in some marginally-significant trends consistent with the proposed hypotheses, future research should focus on these topics with some improvements. In particular, future research needs to be conducted on a larger sample that is more representative of the general population. Another improvement would be to collect data from a control group consisting of siblings of typically-developing children who are matched by demographics with the participants with siblings with autism. This control group will allow for direct comparison between groups as well as refining the hypotheses about siblings of children with autism being more compassionate than typical children.

Other priming methods need to be piloted to compare with the method used in this experiment or to discover a more viable method of eliciting sibling and neutral relationships in children and adolescents. Specifically, a stronger de-priming method may need to be developed in order to counteract any advanced priming of participants with regard to their sibling relationship. There also needs to be a manipulation check of the photographs to assess whether attractive and unattractive faces are sufficiently distinct. Also, future results should be analyzed according to sibling demographics in order to discover any possible moderator variables. For example, whether a participant has a brother or a sister, an older or a younger sibling, and overall sibling relationship quality can all affect how participants respond to potential peers with disabilities or that are unattractive.

This experiment can be expanded to participants of siblings with all disabilities, mental and physical. Aside from expanding the relatively limited research literature on

siblings of children with disabilities, such a study would have important implications for society. Having increased knowledge about how and why people react to others who are different could help form the basis of conquering discrimination and prejudice. Children in particular could be targeted at young ages as to shape their ideas and attitudes about others.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC.
- Bagenholm, A. & Gillberg, C. (1991). Psychosocial effects on siblings of children with autism and mental retardation: A population study. *Journal of Mental Deficiency Research*, 35, 291-307.
- Bickett, L. & Milich, R. (1990). First impressions formed of boys with learning disabilities and attention deficit disorder. *Journal of Learning Disabilities*, 23(4), 253-259.
- Bowlby, J. (1982). *Attachment and loss: Vol. 1. Attachment* (2nd ed.). New York: Basic Books.
- Brody, G. H. (1998). Sibling relationship quality: Its causes and consequences. *Annual Review of Psychology*, 49, 1-18.
- Buhrmester, D. & Furman, W. (1990). Perceptions of sibling relationships during middle childhood and adolescence. *Child Development*, 61, 1387-1398.
- Byrnes, D. A. (1987). The physically unattractive child. *Childhood Education*, 64, 80-85.
- Chess, S. & Hertzig, M. E. (1988). Examining the effects of chronic disease and disability on children's sibling relationships. *Journal of Pediatric Psychology*, 13(3), 389-407.
- Cook, B. G. & Semmel, M. I. (1999). Peer acceptance of included students with disabilities as a function of severity of disability and classroom composition. *Journal of Special Education*, 33(1), 50-61.

- Cuskelly, M. & Gunn, P. (2003). Sibling relationships of children with down syndrome: Perspectives of mothers, fathers, and siblings. *American Journal on Mental Retardation*, 4, 234-244.
- Davis, C. S & Salkin, K. A. (2005). Sisters and friends. *Journal of Contemporary Ethnography*, 34(2), 206-234.
- Dion, K. K. (1973). Young children's stereotyping of facial attractiveness. *Developmental Psychology*, 9(2), 183-188.
- Dushenko, T. W., Perry, R. P., Schilling, J., & Smolarski, S. (1978). *The Journal of Social Psychology*, 105, 303-304.
- Fiske, S. T. & Neuberg, S. L. (1990). A continuum of impression formation, from category-based to individuating processes: Influences of information and motivation on attention and interpretation. *Advances in Experimental Social Psychology*, 23, 1-74.
- Fisman, S. (1991). The handicapped child: Psychological effects of parental, martial, and sibling relationships. *Psychiatric Clinics of North America*, 14 (1), 199-217.
- Fisman, S., Wolf, L., Ellison, D., Gillis, B., Freeman, T., & Szatmari, P. (1996). Risk and protective factors affecting the adjustment of siblings of children with chronic disabilities. *Child and Adolescent Psychiatry*, 35(11), 1532-1541.
- Fox, Tara L; Barrett, Paula M; Shortt, Alison L. (2002). Sibling relationships of anxious children: A preliminary investigation. *Journal of Clinical Child and Adolescent Psychology*, 31(3), 375-383.

- Gunayer Senel, H. & Akkok, F. (1996). Stress levels and attitudes of normal siblings of children with disabilities. *International Journal for the Advancement of Counseling, 18*, 61-68.
- Harris, S. L. (1986). Families of children with autism: Issues for the behavior therapist. *The Behavior Therapist, 9*(9), 175-177.
- Hastings, R. P. (2003). Brief report: Behavioral adjustment of siblings of children with autism. *Journal of Autism and Developmental Disorders, 33*(1), 99-104.
- Howlin, P. (1988). Living with impairments: The effects on children of having an autistic sibling. *Child: Care, Health, and Development, 14*, 395-408.
- Jewel, T. C. & Stein, C. H. (2002). Parental influence on sibling caregiving for people with severe mental illness. *Mental Health Journal, 38*(1), 17-33.
- Kaminsky, L. & Dewey, D. (2001). Siblings relationships of children with autism. *Journal of Autism and Developmental Disorders, 31*(4), 399-410.
- Kinsella, K. B. & Anderson, R. A. (1996). Coping skills, strengths, and needs as perceived by adult offspring and siblings of people with mental illness: A retrospective study. *Psychiatric Rehabilitation Journal, 20*(2), 1095-2006.
- Knott, F., Lewis, C., & Williams, T. (1995). Sibling interaction of children with learning disabilities: A comparison of autism and Down's Syndrome. *Journal of Child Psychology and Psychiatry 36*(6), 965-976.
- Langlois, J. H., Kalakanis, L., Rubenstein, A. J., Larson, A., Hallam, M., & Smoot, M. Maxims or myths of beauty? A meta-analytic and theoretical review. *Psychological Bulletin, 126*(3), 390-423.

- Magiati, I., Dockrell, J. E., Logotheti, A. (2002). Young children's understanding of disabilities: The influence of development, context, and cognition. *Applied Developmental Psychology*, 23, 409-430.
- Mates, T. E. (1990). Siblings of autistic children: Their adjustment and performance at home and in school. *Journal of Autism and Developmental Disorders*, 20(4), 545-553.
- McAninch, C. B., Manolis, M., Milich, R., & Harris, M. J. (1993). Impression formation in children: Influence of gender and expectancy. *Child Development*, 64, 1492-1506.
- McHale, S. M. (1986). Sibling relationships of children with autistic, mentally retarded, and nonhandicapped brothers and sisters. *Journal of Autism and Developmental Disorders*, 16(4), 399-413.
- Meyer, L., Gouvier, W. D., Duke, M., & Advokat, C. (2001). Influence of social context on reported attitudes of nondisabled students toward students with disabilities. *Rehabilitation Counseling Bulletin*, 45(1), 50-52.
- Mikulincer, M. & Gillah, O. (2002). Activation of the attachment system in adulthood: threat-related primes increase the accessibility of mental representations of attachment figures. *Journal of Personality and Social Psychology*, 83 (4), 881-895.
- Mikulincer, M. & Shaver, P. R. (2005). Attachment security, compassion, and altruism. *Current Directions in Psychological Science*, 14(1), 34-38.
- Moser, R. P. & Jacob, T. (2002). Parental and sibling effects in adolescent outcomes. *Psychological Reports*, 92(2), 463-479.

- Nikolarazi, M. (2005). A cross-cultural examination of typically developing children's attitudes toward individuals with special needs. *International Journal of Disability, Development, and Education*, 52(2), 101-119.
- Orsmond, G. I. & Mailick Seltzer, M. (2000). Brothers and sisters of adults with mental retardation: Gendered nature of the sibling relationship. *American Journal on Mental Retardation*, 105(6), 486-508.
- Pilowsky, T., Yirmiya, N., Doppelt, O., Gross-Tsur, V. & Shalev, R. S. (2004). Social and emotional adjustment of siblings of children with autism. *Journal of Child Psychology and Psychiatry*, 45(4), 855-867.
- Rodrigue, J. R., Geffken, G. R., Morgan, S. B. (1993). Perceived competence and behavioral adjustment of siblings of children with autism. *Journal of Autism and Developmental Disorders*, 23 (4), 665-674.
- Roeyers, H. & Mycke, K. (1995), Siblings of a child with autism, with mental retardation and with a normal development. *Child: Care, Health, and Development*, 21(5), 305-319.
- Schulman, G. L. (1999). Siblings revisited: Old conflicts and new opportunities in later life. *Journal of Marital and Family*, 25(4), 517-524.
- Seltzer, M., Wyngaarden Frauss, M., Shattuck, P. T., Orsmond, G., Swe, A., & Lord, C. (2003). The symptoms of autism spectrum disorders in adolescence and adulthood. *Journal of Autism and Developmental Disorders*, 33(6), 565-581.
- Smith, L. A. & Williams, J. M. (2001). Children's understanding of the physical, cognitive and social consequences of impairments. *Child: Care, Health, and Development*, 27(6), 603-617.

- Smith, T. & Perry, A. (1999). A sibling support group for brothers and sisters of children with autism. *Journal on Developmental Disabilities, 11*(1), 77-88.
- Stocker, C. M. (1994). Children's perceptions of relationships with siblings, friends, and mothers: Compensatory processes and links with adjustment. *Journal of Child Psychology and Psychiatry, 35*(8), 1447-1459.
- Weaver, S. E, Coleman, M., & Ganong, L. H. (2003). The sibling relationship in young adulthood: Sibling functions and relationship perceptions as influenced by sibling pair composition. *Journal of Family Issues, 24*(2), 245-263.
- Whiteley, P., Rodgers, J., & Shattock, P. (1998). Clinical features associated with autism: Observations of symptoms outside the diagnostic boundaries of autistic spectrum disorders. *Autism, 2*(4), 415-422.
- Wood-Rivers, J. & Stoneman, Z. (2003). Sibling relationships when a child has autism: Marital Stress and support coping. *Journal of Autism and Developmental Disorders, 33*(4), 383-394.
- Yeh, H. & Lempers, J. D. (2004). Perceived sibling relationships and adolescent development. *Journal of Youth and Adolescence, 33*(2), 133-147.

Table 1

Participant Demographics by Priming Condition

Demographics	Priming Condition ($n = 16$)	
	Sibling ($n = 8$)	Neutral ($n = 8$)
Gender		
Male	4	2
Female	4	6
Age		
Mean	12.25	9.75
SD	3.15	1.58
Sibling Gender		
Male	8	7
Female	0	1
Sibling Age		
Mean	9.38	8.38
SD	2.82	5.37

Table 2

Priming Effects on Compassion Measures

Target Status & Scale	Priming Condition		<i>t</i>
	Sibling	Neutral	
Peers with Disability			
Helping	5.39	5.11	0.700
Liking	4.58	4.49	0.719
Interacting	3.92	4.02	-0.033
Unattractive Peer			
Helping	4.94	5.28	0.885
Liking	4.60	4.75	0.409
Interacting	3.82	4.27	0.409

Note: All comparisons not significant at $p < .05$.

Table 3

Participant Demographics by Attractiveness Condition

Demographics	Disability Attractiveness (<i>n</i> = 20)	
	Attractive (<i>n</i> = 10)	Unattractive (<i>n</i> = 10)
Gender		
Male	4	3
Female	6	7
Age		
Mean	12.89	10.27
SD	2.57	2.15
Sibling Gender		
Male	9	10
Female	1	0
Sibling Age		
Mean	10.67	8.38
SD	8.09	3.21

Table 4

Attractiveness Effects on Compassion Measures

Target Status & Scale	Attractiveness		<i>t</i>
	Attractive	Unattractive	
Peer with Disability			
Helping	4.92	5.49	-1.84 ⁺
Liking	4.45	4.71	-.993
Interacting	3.63	4.11	-1.75 ⁺
Typically-developing Peer			
Helping	5.24	4.93	-1.12
Liking	4.82	4.49	-1.17
Interacting	4.28	3.52	-2.18*

⁺p < .10

*p < .05

Table 5

Participant Demographics by Disability Condition

Demographics	Disability Condition (<i>n</i> = 18)	
	Disability (<i>n</i> = 9)	Typical (<i>n</i> = 9)
Gender		
Male	4	3
Female	5	6
Age		
Mean	12.89	10.67
SD	2.57	2.18
Sibling Gender		
Male	8	9
Female	1	0
Sibling Age		
Mean	10.67	8.56
SD	4.18	3.05

Table 6

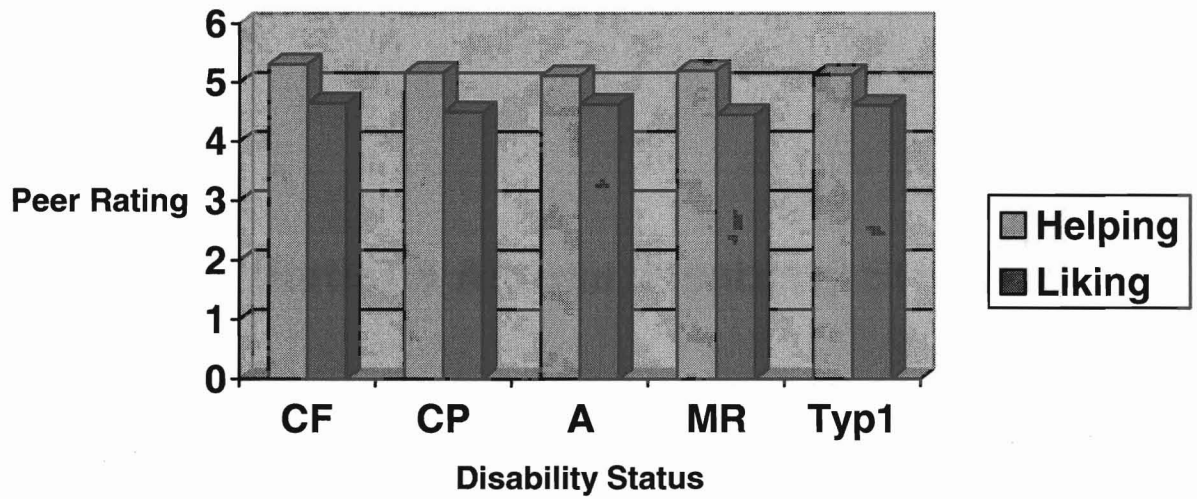
Disability Status Effects on Compassion Measures

Target Status & Scale	Disability Status		<i>t</i>
	Disability	Typical	
Attractive Peer			
Helping	4.92	5.26	-.963
Liking	4.45	4.78	-1.20
Interacting	3.63	4.28	-2.19 ⁺
Unattractive Peer			
Helping	5.48	4.93	1.71
Liking	4.66	4.49	.563
Interacting	4.05	3.52	1.53

⁺p < .10

Figure 1

Peer Ratings Across Disability Status



Appendix

Dependent Variable Questionnaire

Pre-Experimental Questionnaire (Sibling Prime)

Pre-Experimental Questionnaire (Neutral Prime)

Experimental Vignettes

Manipulated Photographs

Rating of Prospective Classmate

(Dependent Variable)

These questions were presented by the computer following the presentation of each target child. Participants responded on Likert-type scales to show the degree of their response.

Interaction Scale:

- 1) How close would you want [name] to sit next to you in class? (e.g., respond on a scale from 1 [not at all] – 6 [very much])
- 2) How many days per week would you want to eat lunch with [name]?
- 3) During a school day, how often would you want to do things with [name]?

Helping Scale

- 1) How willing would you be to stick up for [name] if he/she was being teased?
- 2) How willing would you be to help [name] when he/she needs help?
- 3) How willing would you be to help [name] with his/her schoolwork?

Liking/Affective Response Scale

- 1) How comfortable would you feel around [name]?
- 2) How do you feel about [name] joining your class?
- 3) How much do you think you would like [name]?

Pre-Experimental Questionnaire (Sibling Prime)

- 1) How much do you show this sibling how to do things he or she doesn't know how to do ?
- ☐ Hardly at all
☐ Not too much
☐ Somewhat
☐ Very much
☐ Extremely much
- 2) How much do you admire and respect this sibling ?
- ☐ Hardly at all
☐ Not too much
☐ Somewhat
☐ Very much
☐ Extremely much
- 3) Some kids spend lots of time with their siblings while others don't spend so much. How much free time do you and this sibling spend together ?
- ☐ Hardly at all
☐ Not too much
☐ Somewhat
☐ Very much
☐ Extremely much
- 4) How much do you and your sibling disagree and quarrel?
- ☐ Hardly at all
☐ Not too much
☐ Somewhat
☐ Very much
☐ Extremely much
- 5) Some siblings care about each other a lot while other siblings don't care about each other that much. How much do you and your sibling care about each other?
- ☐ Hardly at all
☐ Not too much
☐ Somewhat
☐ Very much
☐ Extremely much
- 6) Write down 3 things that describe your sibling.

Pre-experimental Questionnaire (Neutral Prime)

- 1) How much do you show this person how to do things he or she doesn't know how to do ?
- ☐ Hardly at all
☐ Not too much
☐ Somewhat
☐ Very much
☐ Extremely much
- 2) How much do you admire and respect this person ?
- ☐ Hardly at all
☐ Not too much
☐ Somewhat
☐ Very much
☐ Extremely much
- 3) Some kids spend lots of time with their classmates while others don't spend so much. How much free time do you and this person spend together ?
- ☐ Hardly at all
☐ Not too much
☐ Somewhat
☐ Very much
☐ Extremely much
- 4) How much do you and this person disagree and quarrel?
- ☐ Hardly at all
☐ Not too much
☐ Somewhat
☐ Very much
☐ Extremely much
- 5) Some classmates care about each other a lot while other classmates don't care about each other that much. How much do you and this person care about each other?
- ☐ Hardly at all
☐ Not too much
☐ Somewhat
☐ Very much
☐ Extremely much
- 6) Write down 3 things that describe this person.

Experimental Vignettes (adapted from Smith and Williams 2001)

All vignettes began with this prompt with the blanks randomly filled from the parenthetical list:

_____ will be joining your class. His/her favorite subject is _____
(math, reading, social studies, science). He/She likes _____ (drawing, playing the
piano, singing, listening to music, watching TV, going to the movies, playing board
games, playing cards) and _____ (dogs, cats, books, computers, pizza, spaghetti,
the zoo, the beach).

- Of the 8 vignettes, 4 contained only this material
- 2 vignettes also contained 1 of the following 2 physical disability descriptions:

Alex has cystic fibrosis. This means that Alex has too much mucus in his lungs and that makes him sick. To feel better he must breathe medicine through a tube to help him cough up the mucus.

Amy has cerebral palsy. This means that Amy has trouble moving, walking, and writing. Sometimes Amy cannot control her body and may move her arms and legs in strange ways or drool.

- 2 vignettes also contained 1 of the following 2 intellectual disability descriptions:

Laura has mental retardation. This means that it takes her longer to learn things and she gets to do easier work than the other kids.

David has autism. He doesn't talk much and has a hard time listening in class. He makes clicking noises with his tongue and rocks back and forth. Although he is really good at puzzles, he usually wants to do them alone.

Manipulated Photographs Example

