

COLLEGE STUDENTS' ATTITUDES TOWARD INDIVIDUALS WITH AUTISM

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ABSTRACT

DAVID MAHONEY: College Students' Attitudes Toward Individuals With Autism
(Under the direction of Gary Mesibov)

This study examined several predictors of college students' attitudes toward individuals with autism. Three hundred thirty college students completed measures of general and behavioral knowledge of autism, quantity and quality of past contact with individuals who have autism, anxiety, attributions about behavioral and causal controllability of autism, respondent gender and socially desirable response tendency as well as the attitude dimensions of desired social distance, views of academic integration, the rights of business owners not to serve people with autism and behavioral intention to do volunteer work with people who have autism. Results suggested that students had relatively positive attitudes toward individuals with autism. General and behavioral knowledge, quantity and quality of contact, anxiety, attributions about behavioral control and respondent gender were significant predictors of one or more attitude dimensions. However, several mediational models of potential interrelationships among these predictors failed to fit the data. The need for further assessment of these attitudes and predictor variables, such as in relation to actual behaviors directed toward individuals with autism, is discussed.

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CHAPTER 1

INTRODUCTION

In the years since the beginning of deinstitutionalization there has been increased interest in perceptions of individuals with mental disorders as they have been integrated into the community (Caruso & Hodapp, 1988). As Caruso and Hodapp (1988) observe, study of these perceptions contributes to the understanding of how people may react to individuals with mental disorders. An important focus of such studies has been attitudes toward individuals with mental disorders. An attitude is “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (Eagly & Chaiken, 1993, p.1). Attitudes can be observed in three general classes of evaluative response-cognitive, behavioral and affective-reflecting the extent to which the attitude object is associated with attributes, behaviors/intended behaviors and emotional states of an overall positive or negative quality (Eagly & Chaiken, 1993).

In the case of individuals with mental illnesses such as schizophrenia and mental retardation, attitudes, which have been assessed mostly via cognitive and behavioral responses, are generally negative. Children and adolescents express less willingness to interact with peers who have mental/intellectual disabilities compared to physical handicaps (Karnilowicz, Sparrow & Shinkfield, 1994; Nowicki, 2006) and adults desire greater social distance from (i.e., are less willing to befriend, live near or work with) people who have mental retardation or mental illnesses than from individuals with physical handicaps such as blindness or deafness (Gordon, Feldman, Tantillo & Perrone, 2004; Thomas, 2000; Tringo,

1970). On account of these negative patterns, a mental disorder can be a form of stigma or “an attribute that conveys a devalued social identity in particular contexts” (Crocker, Major & Steele, 1998, p.506). Negative consequences that may follow from such stigmatizing attitudes are discriminatory behavior and decreased self-esteem in the stigmatized due to awareness of having a devalued social identity and experiencing negative social interactions (Crocker, Major & Steele, 1998). Consistent with these hypotheses, several studies have found that people identified as mentally ill are less likely to be hired for jobs or rented apartments and may experience lower self-esteem due to their devalued social status (Corrigan & Penn, 1999).

Given the significance of attitudes toward people with mental disorders, considerable research has focused on variables that predict attitudes to understand better how these attitudes develop and how they may be modified. As attitudes may consist of cognitive, behavioral and affective evaluative responses, so factors in each of these domains can also potentially influence attitudes (Eagly & Chaiken, 1993). These factors, discussed in greater detail below, include the cognitive factor of knowledge about the particular disorder, the behavioral factor of having contact with individuals who have the disorder and the affective factor of feeling anxious about people with the disorder. The additional respondent characteristics of gender as well as socially desirable response tendencies have also been examined in relation to attitudes.

One disorder affected by deinstitutionalization and increased community integration that has been relatively neglected in studies of attitudes toward mental disorders is autism. The prevalence of this disorder has been increasing in recent years (Klinger, Dawson & Renner, 2003), and coverage in the media has also increased (e.g., recent cover stories about autism

in both *TIME* Wallis, 2006 and *Newsweek* Kantrowitz & Scelfo, 2006). This suggests that public exposure to people with autism is likely to be increasing in various settings (e.g., neighborhoods, schools, the workplace) and that the importance of understanding attitudes toward individuals with autism and behaviors directed toward them is increasing accordingly. To date, several studies suggest that children are less socially accepting of a child with autistic symptoms than of a normally developing peer (e.g., Campbell et al., 2004; Harnum, Duffy & Ferguson, 2006; Swaim & Morgan, 2001). The nature of adult attitudes is less clear since they have been assessed in only one sample of 30, but in that case adults were equally accepting of target children described as having autistic symptoms and normal development (Harnum, Duffy & Ferguson, 2006). Also, the examination of attitudes toward individuals with autism in relation to the aforementioned predictor variables has been limited and those investigations did not include adults. Young adults (i.e., college students) are of interest in this regard since they will have the potential to influence the experience of people with autism in various community settings (e.g., as coworkers, neighbors or service providers) for years to come. However, this population has not been the specific focus of any previous studies and so their attitudes toward individuals with autism are largely unknown. Consequently, the present study was designed to increase understanding of young adult attitudes toward autism by building on previous studies and assessing a more complete set of attitude predictors drawn from the literature on attitudes toward other mental disorders. An overview of that literature as well as discussion of the few studies that specifically examine attitudes toward autism is provided in the following sections.

Knowledge and Attitudes Toward Mental Disorders

One attitude predictor that has been the focus of considerable research attention is the cognitive variable of knowledge about mental disorders. Studies have examined whether having accurate information about the condition will make people less likely to endorse prejudicial stereotypes and desire significant social distance (Corrigan & Penn, 1999). In the case of attitudes toward mental illness, Corrigan and Penn (1999) reviewed studies of the association between knowledge and attitudes, finding that individuals who better understand the nature of mental illnesses tend to endorse fewer negative or discriminatory attitudes. They noted that numerous studies over a 30 year period have found that presentation of vignettes, fact sheets or participation in brief classes about mental illness tends to promote more positive attitudes in a variety of populations (e.g., adolescents, college students, community residents, and pre-service professional students) at least in the short-term (Corrigan & Penn, 1999). For example, Holmes and colleagues (1999) found that college students believed people with mental illnesses are less dangerous and deserving of greater community integration after completing a course on severe mental illnesses.

Corrigan and Penn (1999) also note that providing brief educational interventions when coupled with media accounts of persons with mental illness has not had an effect on attitudes in several studies. In a similar vein, Penn and Link (2002) found that presentation of an educational fact sheet did not have a significant effect on perceived dangerousness, overall quality of affective response or desired social distance from a target individual with mental illness shown on a video having a short conversation with a confederate. It was suggested that more extensive information possibly also presented in a video format could influence attitudes towards targets in media presentations of this type (Penn & Link, 2002). These

findings suggest that knowledge may need to be relatively extensive to have a significant influence on attitudes in some cases.

As with attitudes toward mental illness, a number of studies have examined the effect of knowledge on attitudes toward mental retardation and reported a similar pattern of results. After viewing video taped interviews of peers with mental retardation discussing their abilities and interests, children endorsed more positive adjectives describing the peer with mental retardation, although the information did not influence their willingness to interact with the target child (Bak & Siperstein, 1987). Participation in a 10-week course about mental retardation and other mental disorders led to endorsement of desire for less social distance and more positive opinions of individuals with mental disorders among high school students (Fiedler & Simpson, 1987) at least in the short-term. In contrast, another study of high school students found that prior knowledge did not have an effect on desired social distance or views of academic mainstreaming of individuals with mental retardation, although information about the source or extent of this knowledge was not assessed making it difficult to determine why knowledge did not affect attitudes in this case (Krajewski & Flaherty, 2000). Also, college students have endorsed more positive attitudes after reading vignettes that describe the abilities and interests of individuals with mental retardation (MacDonald & MacIntyre, 1999). Overall, the majority of these studies suggest that knowledge may have a generally positive impact on attitudes toward individuals with a mental disorder, although there effects may diminish when paired with media presentations about people with mental disorders.

Contact and Attitudes Toward Mental Disorders

Besides knowledge, the effect of the behavioral variable of contact with individuals who have mental disorders on attitudes has also been a focus of considerable research. The major theoretical statement regarding the effects of contact on attitudes has been the so-called “contact hypothesis” formulated most notably by Allport in the 1950’s, which predicts that contact should lead to improved attitudes toward a particular group if contact is cooperative, participants in the contact are of equal status, participants share common goals and the contact has support from social customs or laws (Dovidio, Gaertner & Kawakami, 2003). Allport also noted the importance of relatively more intimate contact for improving attitudes, and it has been suggested that such contact in the form of intergroup friendships may promote more positive attitudes (Pettigrew, 1998). In addition, it has been proposed that a perception of contact as qualitatively positive or pleasant may be associated with the positive impact of contact on attitudes (Dovidio, Gaertner & Kawakami, 2003).

The importance of contact for reducing negative attitudes toward numerous groups has been well documented. Pettigrew and Tropp (2000) conducted a meta-analytic review of 203 studies from the past 50 years that have assessed the effect of exposure to direct (i.e., face to face) contact on attitudes toward a variety of minority groups (e.g., racial and ethnic minorities, homosexuals, individuals with physical disabilities and individuals with mental illness). They found that increased interpersonal contact in unstructured or structured settings led to significant decreases in prejudicial attitudes (i.e., endorsement of fewer negative or stereotypical beliefs about and decreased desire for social distance from the outgroup). Significantly, the largest effects were reported for a subset of 38 studies that structured contact to satisfy all or most of the four conditions specified by the contact

hypothesis. These findings reinforce the importance of qualitative aspects of intergroup contact experiences for influencing attitudes in addition to having the experience of contact itself (Pettigrew & Tropp, 2000).

With respect to investigations of contact and attitudes toward mental illness, a meta-analysis examined 35 studies from the 1960's through early 1990's that provided direct contact with individuals who have a mental illness in the context of professional training (e.g., medical students or employees in psychiatric institutions) or undergraduate student training (i.e., contact for course credit or as a volunteer activity) (Kolodziej & Johnson, 1996). The analysis found that having contact significantly improved attitudes (i.e., endorsement of fewer negative or stereotypical beliefs about and less social rejection of people with mental illnesses). Interestingly, greater attitude change was found for undergraduate students than professionals. Kolodziej and Johnson suggested that qualitative aspects of the contact (e.g., being voluntary in nature or relatively more equal status existing between patients and college students in junior institutional positions compared to professional staff) might have influenced this difference.

Furthermore, in a review of more recent studies on contact and attitudes toward mental illness, Couture and Penn (2003) report that a number of studies found that people reporting more prior contact with individuals who have mental illnesses endorse more positive attitudes toward them. For example, Alexander and Link (2003) found that those who had more prior direct contact tended to believe that individuals with mental illness are not generally dangerous and desired less social distance from a hypothetical individual with mental illness. Consistent with Kolodziej and Johnson's (1996) findings, Couture and Penn (2003) also note that several recent studies found that the attitudes of professional students

when assessed before and after contact in a psychiatric institution did not change significantly. It was again suggested that differences in qualitative aspects of the situation (e.g., extent to which it was on an equal or voluntary basis) likely account for the lack of significant effects for contact reported in these cases (Couture & Penn, 2003). This proposal, consistent with the contact hypothesis, highlights the likely impact of quality of contact on attitudes in addition to the impact of merely having the experience of contact.

In addition to the impact of contact on attitudes toward mental illness, the effect of contact on attitudes toward individuals with mental retardation has also been examined. Many of the early studies from the 1950's through the 1970's examined attitudes toward elementary school children with mental retardation who were mainstreamed into regular education classrooms. In a review of this literature, Horne (1985) reported that studies generally found a negative effect of contact, as children rejected and did not wish to interact with their peers who had mental retardation. Horne (1985) noted that in several studies rejection was associated with reactions to disruptive behavior by children with mental retardation. Hence, qualitatively unpleasant aspects of contact may have contributed to more negative attitudes.

When the effect of contact on attitudes in populations other than elementary school students is assessed, results have been more positive. Adolescents who report more prior direct contact with individuals who have mental retardation tend to desire less social distance and be more favorable toward mainstreaming students with mental retardation into regular classes (Krajewski & Flaherty, 2000). Also, college and pre-service professional students have reported more positive adjective ratings of and feelings about individuals with mental retardation following interactions in classroom and social settings (Nosse & Gavin, 1991). The importance of qualitative aspects of contact on attitudes has also been directly addressed

in one study of college students' attitudes toward individuals with Down's Syndrome (Hall & Minnes, 1999). Hall and Minnes (1999) found that quality (i.e., perceived pleasantness) but not quantity of prior direct contact was a significant predictor of attitudes toward individuals with Down's Syndrome as more positive beliefs about the abilities and competencies of such individuals were associated with more positive quality of previous contact. They also found that indication of behavioral intent to volunteer at an agency that provided services to people with mental retardation were associated with more positive quality of previous contact (Hall & Minnes, 1999).

In addition to a direct effect of contact on attitudes, it has been hypothesized that this relationship may be mediated by other variables. In this context the role of affective influences on attitudes is considered as one proposed mediator, specifically feelings of anxiety about members of a particular group (Dovidio, Gaertner & Kawakami, 2003; Pettigrew, 1998). If there is minimal contact with a particular group or repeated contact is perceived as qualitatively negative, anxiety about members of that group may be higher and promote more negative attitudes toward the group (Pettigrew, 1998). In contrast, increased quantity as well as qualitatively positive contact should decrease anxiety and lead to more positive attitudes toward the group (Pettigrew, 1998). This mediational model was initially supported by a study of contact, anxiety and attitudes among several ethnic groups (Islam & Hewstone, 1993). Furthermore, it is possible that anxiety may also mediate the association between knowledge and attitudes. Having greater knowledge about a particular group may also lessen anxiety generated by unfamiliarity with the group to some extent thereby leading to more positive attitudes toward that group.

However, this may not be the only potential mediational model that could account for relationships among these variables. A plausible alternative would be that contact is a mediator such that anxiety toward as well as knowledge about a particular group may influence the amount of contact that occurs with that group as well as the perceived quality of that contact, which in turn influences attitudes. Thus, a low level of anxiety and high level of knowledge could lead to seeking relatively more contact that is also perceived as qualitatively more positive, which could lead to more positive attitudes. Both of these models merit evaluation to determine whether one can provide a better account for the relationships among these variables and attitudes.

Regarding tests of mediators of predictors for attitudes toward mental disorders, several studies have provided support for the model in which the effect of contact on attitudes is mediated by anxiety. In a large German community survey, Angermeyer and Matschinger (1997) found that more previous contact with individuals who have mental illnesses was associated with decreased anxiety toward and also increased pity for targets described in a vignette as having one of several mental illnesses. Decreased anxiety in turn was associated with the desire for less social distance from the target. Corrigan and colleagues (2001) subsequently obtained similar results with an American sample. Also, in a study of imagined contact, Graves and colleagues (2005) examined physiological response as well as subjective distress ratings in students who were shown a picture of someone either labeled as having schizophrenia or else not labeled and asked to imagine having contact with that individual. Participants were likely to experience facial muscle activity consistent with a threat response and to report more subjective distress when imagining interacting with the individual labeled as having schizophrenia. Participants also rated desired social distance from the target and

more pronounced physiological anxiety response predicted a desire for greater social distance, suggesting that the imagined contact generated anxiety that influenced attitudes (Graves, Cassisi & Penn, 2005). The alternative that the effect of anxiety on attitudes may be mediated by contact has not been examined. Overall, these studies suggest that quantitative as well as qualitative dimensions of contact and anxiety may have an impact on attitudes toward individuals with mental disorders.

Attributions and Attitudes Toward Mental Disorders

Another potential predictor of the cognitive type that has recently begun to receive attention independently as well as in relation to knowledge and contact is attributions about individuals with mental disorders. The type of attribution examined in most studies is controllability or beliefs about the extent to which the individual is responsible for causing their condition as well as managing their behavior (Corrigan, 2000). Both the onset and behavior management aspects of controllability have been examined and found to be associated with attitudes. The initial focus of such studies was on stigmatized groups other than people with mental illnesses. With respect to control over the cause of one's condition, people express greater willingness to assist individuals with conditions believed to have a less controllable onset (e.g., AIDS due to a blood transfusion) than those perceived as having a more controllable onset (e.g., AIDS due to sexual promiscuity) (Weiner, Perry & Magnusson, 1988). Similarly, regarding control over behavior management, studies of racial prejudice have found that attributions about the extent to which people can control their circumstances influence endorsement of the need for government assistance programs with attributions of greater personal control corresponding to less support for such assistance (e.g., Kluegel, 1990; Tuch & Hughes, 1996).

With respect to attributions and attitudes toward mental disorders, people attribute varying levels of controllability over illness onset to different disorders with cocaine addiction and psychotic disorders perceived as most under the individual's control while mental retardation is perceived as relatively uncontrollable by the individual (Corrigan et al., 2000). An association between these personal controllability attributions and attitudes has also been reported. Martin and colleagues (2000) found that those who attributed the cause of a hypothetical individual's mental illness to aspects of the individual's bad character, which implies a degree of personal control, desired greater social distance than those who attributed the disorder to less personally controllable causes such as a genetic or inherited problem. Similarly, when the degree of personal control over the onset of a hypothetical individual's mental illness is manipulated, attributions of more personal responsibility are associated with greater social rejection (Corrigan et al., 2003). Finally, Penn and colleagues (2003) found that viewing a documentary film about individuals with schizophrenia was associated with decreased attributions of controllability over the disorder's cause as well as behavior management, but these attributional changes were not accompanied by significant changes in perceived dangerousness, desired social distance, quality of affective response or expressed behavioral intent to attend a meeting with a person who had a mental illness. Nevertheless, Penn and colleagues (2003) note that a trend in the direction of positive change was observed and speculate that the information presented in the documentary may not have been presented in a sufficiently systematic manner to have a significant impact on attitudes.

Several studies have also examined the association of knowledge and contact to controllability attributions and attitudes toward mental illness. Corrigan and colleagues (2002) found that educational presentations and, to a greater extent, brief contact with

individuals who have a mental illness that included discussion of personal controllability over mental illness decreased the extent to which individuals with mental illness were perceived as responsible for their condition and decreased desired level of social distance. Corrigan and colleagues (2003) also found that history of prior contact with individuals who have mental illnesses was not associated with controllability attributions. In this case, attributions concerned a particular hypothetical individual for whom specific information about the degree of personal responsibility for illness onset was provided. This outcome suggests that there may be some instances when knowledge is the most important predictor of attributions (i.e., when focusing on an individual about whom specific information is known).

Taken together, these two studies provide tentative support for the hypothesis that knowledge, contact, controllability attributions and attitudes may be associated. Knowledge and contact may influence the extent to which people perceive mental illnesses as controllable, which may then influence their attitudes. Alternatively, knowledge as well as perceptions of controllability may influence the extent to which people seek contact with an individual who has a mental illness, which then influence attitudes. Overall, it appears that attributions likely have some impact on attitudes toward individuals with mental disorders and that this impact may relate to other factors such as knowledge and contact.

Respondent Characteristics and Attitudes Toward Mental Disorders

While the impact of knowledge, contact and attributions on attitudes toward mental disorders have been the primary focus of most studies, the possibility that respondent characteristics such as gender and a socially desirable response tendency may contribute to how these attitudes are reported has also been examined. Regarding gender, it has been

suggested that females may report more positive attitudes due to a tendency to be more nurturant, kind or sensitive than males (Farina, 1981; MacDonald & MacIntyre, 1999). However, results have been mixed with gender differences reported in only some studies. In the case of attitudes toward mental illness, reviewing early studies from the 1960's and 1970's, Farina (1981) found that in five studies involving behavioral interactions with someone identified as having a mental illness, women were always more accepting than men (e.g., willing to hire and work with a job applicant identified as a former mental patient). In contrast, in early studies that relied only on written attitude measures, no gender differences were reported in 11 cases while females were more accepting in three and males more accepting in four cases (Farina, 1981). This mixed pattern has continued more recently with several studies that relied on written measures finding that females were more accepting and desired less social distance (Penn & Link, 2002; Corrigan et al., 2003), while another study of this type using a large national sample of adults did not find a significant gender difference in perceived dangerousness or desired social distance from vignette descriptions of individuals with mental illnesses (Schnittker, 2000).

Mixed results have also been obtained in the case of attitudes toward mental retardation. Females have endorsed significantly more positive attitudes toward individuals with mental retardation among elementary school children (Bak & Siperstein, 1987) adolescents (Fiedler & Simpson, 1987; Krajewski & Flaherty, 2000) and one sample of college students (MacDonald & MacIntyre, 1999). However, in a second sample of college students, Hall and Minnes (1999) did not obtain a significant gender difference in extent of negative attitudes. It is unclear why gender differences have often been obtained, but these results suggest that there may be some effect of gender on attitudes toward individuals with mental disorders.

Future studies might evaluate whether gender differences in attitudes may be mediated by knowledge about or contact with people who have mental illnesses.

Regarding socially desirable response tendencies, it has been noted that concerns about political correctness and a desire not to appear prejudiced may lead to reporting more socially desirable attitudes toward individuals with mental disorders (Hall & Minnes, 1999). Several studies have found that high social desirability may relate to more positive reported attitudes. In their study of attitudes toward mental illness, Alexander and Link (2003) found that a higher socially desirable response tendency corresponded to perceptions that individuals with mental illness are not dangerous as well as endorsement of less social distance from a hypothetical individual with mental illness. Similarly, in the case of attitudes toward mental retardation, Hall and Minnes (1999) found that higher social desirability scores corresponded to more positive beliefs, but not expressed intent to volunteer at an agency that provided services to individuals with mental retardation. This suggests that a socially desirable response tendency may be more important in relation to reports of hypothetical as opposed to actual behavior. In a similar vein, Penn and colleagues (2003) found that social desirability did not affect attitudes, which included assessment of beliefs as well as behavioral intentions, toward hypothetical individuals with schizophrenia after viewing a film about the disorder. Significantly, Penn and colleagues included other measures (e.g., evaluating film quality, current mood, and self-esteem) to disguise the salience of their attitude assessment thereby possibly limiting the associated socially desirable response tendency. Overall, these studies suggest that assessing social desirability will be useful to determine the extent to which it influences attitudes in addition to other variables such as knowledge or contact.

Summary of Attitudes Toward Mental Disorders

The literature suggests that attitudes toward individuals with mental disorders such as mental illness and mental retardation are generally negative as significant social distance from such individuals is typically endorsed. This literature also suggests that knowledge about and contact with individuals who have mental disorders are generally associated with endorsement of more positive attitudes. Regarding contact, quantitative as well as qualitative dimensions likely contribute to attitudes toward individuals who have mental disorders. It also seems that lower anxiety as well as attributions of less controllability over the disorder may be associated with more positive attitudes. Several models accounting for the interrelationships among these predictors are also suggested. Finally, it seems that gender and social desirability may also have some impact on reported attitudes toward individuals with mental disorders.

Knowledge and Attitudes Toward Autism

There have been relatively few investigations of factors related to attitudes toward autism. Because there have been substantial changes in the definition of autism as well as understanding of its etiology and treatment since the condition was first identified 60 years ago, knowledge about autism has been the focus of a number of studies, although most did not examine the association of knowledge to attitudes. With respect to changes in the conceptualization of autism, in terms of etiology, there has been a shift from the belief that autism is an emotional disorder caused by cold and inadequate parents to the belief that it is a neurological disorder likely caused by interaction among a number of biological factors (Schopler & Mesibov, 1984). In terms of cognitive aspects of autism, it was initially thought that the intelligence of individuals with autism was untestable, but most likely average, with

most of these individuals having particular peak skills such as impressive rote memorization abilities (Schopler & Mesibov, 1984). Over time, numerous studies demonstrated that the intelligence of these children could be reliably assessed and that the majority of individuals with autism also have some degree of mental retardation (Schopler & Mesibov, 1984; Klinger et al., 2003). Finally, since most of the small group of children first diagnosed with autism came from families of high socioeconomic status (SES), it was believed for many years that autism occurred more frequently in this group (Schopler & Mesibov, 1984). However, subsequent studies have demonstrated that autism is commonly diagnosed in families at all levels of SES (Schopler & Mesibov, 1984; Klinger et al., 2003).

Several studies have assessed knowledge about autism among various professional groups and found a pattern of inaccurate knowledge in several domains. Stone (1987) developed a survey that assesses knowledge about cognitive and social/emotional features of autism as well as general descriptive features such as course and prognosis and compared responses for a group of university-based autism specialists to a sample of community clinical psychologists, school psychologists, speech language pathologists and pediatricians. The community-based professionals were more likely than the specialists to believe that autism is an emotional disorder and that individuals with autism do not show social attachments or affectionate behaviors. Similarly, they were more likely to believe that children with autism cannot be accurately assessed for intelligence, and, three of the four community groups believed that children with autism are more likely to have certain special talents. All four community groups were also less likely to believe that most individuals with autism also have mental retardation. In terms of course and prognosis, all community groups were more likely to believe that autism exists only in childhood and that it can be outgrown with proper

treatment. Finally, all four groups were more likely than the specialists to believe that autism occurs more frequently in individuals of higher SES.

Two more recent studies have found that some inaccurate beliefs about autism persist among health and mental health professionals. In a replication of Stone's (1987) study, Heidgerken and colleagues (2005) administered Stone's measure to primary providers such as pediatricians or family physicians, mental health professionals such as psychologists, and autism specialists. While non-specialists agreed with autism specialists that autism and mental retardation can be comorbid and that people with autism do not necessarily have special talents, both non-specialist groups were still more likely to believe that children with autism do not show social attachments or affectionate behaviors and that autism is more prevalent in people of higher SES. The primary providers were also more likely than autism specialists to believe that autism can be outgrown with treatment and that autism is due to cold rejecting parents. Using a different method, Cucarro and colleagues (1996) also demonstrated the persistence of the belief that autism is more common in higher SES individuals. They presented school psychologists, speech language pathologists and physicians with an ambiguous vignette that was either weighted toward diagnostic criteria for autism or attention deficit hyperactivity disorder (ADHD). They alternated descriptions of the SES of the target child in the vignette and found that the autism vignette was significantly more likely to be diagnosed with autism when described as coming from a high SES family than from a low SES family. Interestingly, SES had no effect on whether the ADHD-weighted vignette was assigned that diagnosis.

Knowledge about autism has also been investigated among special education teachers and parents of children who have autism with results that are generally consistent with those for

helping professionals. Using their autism survey, Stone and Rosenbaum (1988) compared teacher and parent responses to those of university based autism specialists. Both parents and teachers were less likely than autism specialists to believe that children with autism can also have mental retardation and more likely to believe that such children have special talents and are more intelligent than tests indicate. Parents and teachers were also more likely to believe that autism is an emotional disorder and that emotional factors play a major role in the development of autism. Parents were also more likely than teachers or specialists to believe that autism exists only in childhood and can be outgrown with proper treatment. In one notable departure from the professionals in Stone's (1987) and Heidgerken et al's (2005) samples, the teachers and parents were likely to agree with the autism specialists that individuals with autism can show affectionate behavior. Also, in a recent study of special and regular education teachers in the United Kingdom using Stone's (1987) measure, Helps and colleagues (1999) reported a similar pattern of results.

In addition to investigations of knowledge about autism among professional groups, three studies have examined aspects of knowledge about autism among the general public and found varying degrees of accurate knowledge. In the first investigation, Roth and Smith (1983) surveyed Arkansas homeowners' knowledge about mental retardation, cerebral palsy, epilepsy, and autism. Respondents were to indicate agreement, disagreement or uncertainty about the veracity of a series of statements for each disability with four items related to autism. Respondents displayed generally accurate knowledge about cerebral palsy, epilepsy, and mental retardation, though in the latter case nearly one third of respondents were uncertain about causes and prevention. Respondents displayed limited knowledge about autism as one third were uncertain about whether autism was a mental illness, a

communication disorder, or an inability to relate to others and nearly one half were uncertain about whether children with autism are highly intelligent. Roth and Smith also included an attitude measure as part of their survey and the majority of respondents agreed with statements suggesting that individuals with disabilities should attend public schools as well as have the right to live and work in the community. However, many of the statements in this survey used “mentally retarded people,” as the referent with “people with mental disabilities” or “handicapped people” also used for several items. Only one item assessing the right for individuals with problems to attend public school specifically included autism and the majority of respondents supported it. Hence, these results did not clearly indicate what attitudes adults have toward individuals with autism and the relationship between knowledge and attitudes was not assessed.

More recently, the National Alliance for Autism Research (NAAR) (2003) conducted a survey in a nationwide sample of adults. Twenty percent of respondents reported having a close friend or family member with autism, but their responses were not analyzed separately. Consistent with the findings among teachers and parents, respondents were either unsure about or overestimated the cognitive abilities of individuals with autism (e.g., one third believed most children with autism have peak skills in math and are typically smarter than the average child). With respect to mental retardation, the majority of respondents knew that autism and mental retardation are distinct diagnoses, but they were not asked to estimate the rate of comorbidity for the two conditions. Also consistent with previous findings, most of these respondents believed that individuals with autism benefit from treatment. In contrast to the various professional groups, NAAR survey respondents did not generally believe that autism is more common among individuals from higher SES or that individuals with autism

cannot show affection. Respondents were also uncertain about other aspects of autism such as prevalence and gender ratio. Overall, this survey suggests that members of the general public do not believe that autism is an emotional disorder, but are uncertain about other aspects of the disorder such as the cognitive abilities associated with having autism.

A third study also assessed general awareness of the challenges associated with parenting children with autism or other disabilities. Geddie and Range (1992) compared college student ratings of stress and functioning for a hypothetical family with a child labeled as either having no handicap, a physical handicap, mental retardation or autism. The family having a child with autism was believed to experience the most stress of the four groups, followed by the family having a child with one of the other disabilities assessed. Also, the students believed that families having a child with autism or one of the other disabilities would be more likely to require professional assistance to cope with the child. These college students did not believe that parents of children with autism would be more likely to have mental illnesses than parents of children in other types of families. While Geddie and Range did not directly assess knowledge of autism, these findings suggest some level of awareness among the public of the difficulties associated with having a child who has autism.

In addition to studies of knowledge about autism, two recent investigations have examined the impact of providing information about autism on attitudes among elementary school children and reported somewhat conflicting results. Swaim and Morgan (2001) showed third and sixth grade students a video of a same age peer with or without autistic behaviors. Some participants who viewed the target child displaying autistic behaviors were also provided with a brief description of the nature of autism. Participants then completed adjective ratings and a measure of their own willingness for social contact with the target

child as well as estimates of their classmates' willingness to have social contact with the target child. Swaim and Morgan found that participants rated the target child who did not display autistic behaviors more positively than the target with autistic behaviors regardless of whether information about autism was provided. Provision of information about autism also did not have an effect on desire for social contact and children reported equal willingness for social contact with both target children, but girls and sixth graders believed that their peers would be less likely to want to interact with the target displaying autistic behaviors. Swaim and Morgan observe that this difference in terms of self versus other desire for social contact may suggest that participants were more concerned with social desirability in their own responses and that their own desire for social contact may not be as strong as indicated by actual responses. This possibility suggests the utility of assessing directly the role of social desirability in future studies of attitudes toward individuals with autism.

Subsequently, Campbell and colleagues (2004) partially replicated Swaim and Morgan's (2001) procedure with third, fourth and fifth grade students. They also found that respondents rated the typical child more favorably than the child with autism. Their respondents were also less likely to indicate willingness to have contact with the child who had autism, although those who received information about autism and girls were more likely to express willingness to interact with peers who have autism than those who did not receive information about the condition. Campbell and colleagues suggest that this difference between their results and those of Swaim and Morgan in terms of effect of information was due to methodological differences such as use of a shorter version of the social activity scale, use of younger children, and also use of a larger sample size to detect the small effect of information on behavioral intentions. Taken together these two studies suggest that having

some knowledge about autism may produce a modest positive effect on attitudes among elementary school children. Also, since the information was limited and presented very briefly, more extensive presentation may have a stronger positive impact on children's attitudes. In addition, these studies provide a mixed picture regarding gender differences in attitudes as one study found no differences while the other found that females displayed more positive attitudes.

Overall, studies to date provide limited information about the impact of knowledge on attitudes toward autism. The level of knowledge about autism is variable among the non-disabled and is in some ways still consistent with early conceptualizations of the disorder (e.g., parents and teachers of children with autism are likely to overestimate the cognitive abilities of individuals with autism and many healthcare professionals believe that individuals with autism cannot display affectionate behaviors and are more likely to be of high SES). Interestingly, the general public may not endorse some of these inaccurate statements (e.g., awareness that individuals with autism can show affection and social attachments), although they continue to endorse other inaccurate information (e.g., uncertainty about the prevalence of autism, overestimation of or uncertainty about the cognitive abilities of individuals with autism). With respect to the impact of knowledge on attitudes, providing information about autism had a positive effect on attitudes among children in one case and no effect in a second case. Since these studies provided limited information about the disorder, a more extensive presentation may have a stronger positive effect on attitudes. While no studies have addressed the relationship of knowledge to attitudes among adults, the generally positive findings for the impact of knowledge on adult's attitudes toward other mental disorders (e.g., Corrigan & Penn, 1999; MacDonald &

MacIntyre, 1999) suggest that knowledge may have a positive effect on adult's attitudes toward individuals with autism. Examination of the relationship between knowledge of autism and adult attitudes is needed.

Contact and Attitudes Toward Autism

As was the case with knowledge and attitudes, two studies have assessed the relationship between contact and attitudes toward autism. These studies evaluated children's beliefs before and after periods of interaction with peers who had autism and reported conflicting results. In the first study, McHale and Simeonsson (1980) assessed the attitudes of second and third grade students before and after a series of brief free-play interactions with same age peers with autism. Participants' responses toward the child with autism were positive in terms of adjective ratings and desire for social contact both before and after the series of free-play interactions, suggesting that contact did not have a significant effect on attitudes. Because attitudes were positive pre-contact and the sample size small, it is possible that small positive effects of contact could not be detected.

In a second study, Prather and Chovan (1984) assessed second and third grade students before and after a series of brief tutoring sessions in which the non-disabled children taught the children with autism how to complete several matching tasks. Although adjective ratings were generally positive both before and after tutoring, after the sessions, non-disabled children were more likely to report a desire to exclude the child with autism from social interactions. They typically cited disruptive behaviors as the reason for exclusion. This suggests that direct contact can lead to somewhat more negative attitudes in terms of desire for less future social contact.

Prather and Chovan note the inconsistency between their results and those of McHale and Simeonsson (1980) and speculate that the reason for this may relate to qualitative differences between the two contact situations. Specifically, they suggest that the free play interactions may have been more enjoyable than their academically oriented tutoring session and this qualitatively positive experience may have prevented negative responses following contact. In a similar vein, McHale and Simeonsson suggested that in a free play situation children with autism might appear less deviant or disruptive than in a more task oriented academic situation, thereby reducing the likelihood that their peers would view them negatively or perceive the interaction as unpleasant. This hypothesis is consistent with the proposal that the positive or pleasant quality of an interaction may relate to attitudes following contact (Dovidio, Gaertner & Kawakami, 2003). Furthermore, the contact hypothesis emphasizes the importance of cooperation in an interaction for promoting positive attitudes (Dovidio, Gaertner & Kawakami, 2003). Hence, a lack of consistent cooperation from the children with autism in the academic task may have made it more qualitatively difficult or unpleasant than a lack of cooperation in the less restricted free play situation. Qualitatively unpleasant aspects of the situation likely also produced increased anxiety about interacting with an individual who has autism, which may have had a more negative impact on attitudes following the tutoring experience. Overall, these hypotheses suggest the need for future studies to assess the quality of contact with individuals who have autism as well as emotional responses to that contact to determine the extent to which these variables may affect attitudes.

Although there have not been direct assessments of the effect of contact on adult attitudes, several studies assessing the perspective of parents of children with autism provide indirect

evidence for the existence of negative attitudes among adults following contact. In both interviews (Gray 1993, 2002) and a mailing survey (Mahoney, 2003) some parents endorsed the belief that others made negative remarks, avoided them or excluded them from social activities because they had a child with autism. Parents reported that negative or critical remarks made to them frequently followed events in which the child with autism behaved in a disruptive manner (Gray 1993, 2002; Mahoney, 2003). Reports of avoidance or exclusion were accompanied by concerns that the behavior of the child with autism would disrupt an event (Mahoney, 2003). These findings suggest that people who had qualitatively unpleasant experiences were likely to express somewhat negative attitudes toward individuals with autism. They also suggest the possible influence of anxiety as past unpleasant contact may have increased anxiety about future encounters with individuals who have autism and increased negative attitudes.

These studies generally provide limited information about the effect of contact on attitudes toward autism. The available studies with elementary school children report alternatively no effect of direct contact and a negative effect of direct contact. In the case of adults, there have been no assessments of the relationship of direct contact to attitudes, although reports from parents of children with autism suggest that adults may sometimes react negatively following contact with individuals who have autism. Consistent with the explanations offered for the somewhat mixed results regarding the relationship between contact and attitudes toward individuals with other mental disorders, these results also suggest that qualitative aspects of contact that promote more positive attitudes (i.e., equality of status, cooperative and positive nature of contact, support from social custom and a level of intimacy that may promote friendship) may be important predictors of the impact of

contact on attitudes. It is also possible that emotional responses to the contact situation (i.e., level of anxiety) may be involved either by mediating the impact of contact on attitudes or by having the impact of anxiety mediated by contact. There is a need for further evaluation of attitudes toward autism among the adult population and of the extent to which various characteristics of contact may influence attitudes.

Attributions and Attitudes Toward Autism

As is the case with knowledge and contact, attributions related to autism have been the focus of limited investigation. Two studies have examined attributions of perceived controllability over the cause and behavior management of autism. In the first study, Grindstaff (2001) examined attributions made by several types of professionals (e.g., special education teachers, speech language pathologists, psychologists) before and after attending a one-week course on teaching individuals who have autism about the extent to which such individuals can control their behavior. Grindstaff found that participants' attributions regarding the behavior of individuals with autism shifted in the direction of greater uncontrollability following the training. Also, these attributions of greater uncontrollability were associated with reported intent to make greater use of the teaching techniques introduced in the training sessions. Because the training sessions involved providing information about autism as well as contact with children who have autism, this result suggests that attributions may be influenced by level of knowledge and contact. The impact of these attributions on attitudes was not assessed, but it is possible that attributions of less control over behavior could positively impact attitudes. This may be of particular importance in terms of behavior that is in some way disruptive. An attribution that the behavior is not

completely controllable and so not deliberately disruptive may lead to relatively greater tolerance of the individual than if the disruptive behavior is perceived as intentional.

In addition to attributions concerning behavior management, attributions about control over the cause of the disorder were assessed in the NAAR (2003) survey of the general public. Respondents were asked about possible causes of autism and genes were the most commonly suggested cause with environmental stressors such as toxins or vaccines also often identified. This result suggests that members of the general public attribute the cause of autism to factors outside of the individual's control. As was the case with Grindstaff's (2001) study, the NAAR survey did not assess the relation of this aspect of controllability attributions to attitudes.

This limited evidence does not provide an indication of how controllability attributions about autism may relate to attitudes. Based on findings regarding controllability attributions and attitudes toward individuals with mental illnesses (Corrigan et al., 2003; Martin et al., 2000), it seems likely that attributions of less controllability over illness onset as well as over behavior may be associated with more positive attitudes. Results from studies involving individuals with mental illness (e.g., Corrigan et al., 2002) as well as one study examining attributions related to autism (Grindstaff, 2001) suggest that knowledge and contact may also be associated with attributions and attitudes. Specifically, the levels of knowledge and contact may lead to attributions of less control over behavior and illness onset which in turn may lead to more positive attitudes toward individuals with autism. Alternatively, the effect of attributions on attitudes may be mediated by the extent to which people have contact with individuals who have autism. Future studies should evaluate both possibilities.

Summary of Attitudes Toward Autism

The available information on attitudes toward autism is limited. Several studies suggest that attitudes toward people with autism may be relatively negative among children and perhaps less so among adults. For the attitude predictors examined to date, results are generally consistent with the findings for attitudes toward other mental disorders. No gender differences as well as more positive attitudes for females have been reported in the case of autism as with other mental disorders. Similarly a small positive effect of knowledge on attitudes has been reported in one case, which is consistent with findings for other mental disorders, although no effect was found in a second study. Regarding contact, findings of no effect on already positive attitudes in one study and a somewhat negative effect of direct contact in a second study with qualitatively important differences between the two studied interactions appears generally consistent with the findings for other mental disorders suggesting the potential importance of contact quality. However, none of these studies of attitude predictors assessed adult attitudes toward autism, as participants in each case were elementary school children. Furthermore, there have been no examinations of the effect of anxiety or control attributions on attitudes toward autism. Consequently, significant gaps remain in the understanding of attitudes toward autism.

Overview of the Present Study

The purpose of the present study was to fill some of these gaps by providing a more comprehensive examination of predictors of attitudes toward autism. The influence of several cognitive, behavioral and affective predictor variables suggested by previous studies of attitudes toward autism as well as other mental disorders was assessed. The primary predictors of interest were: knowledge about autism, quantity and quality of prior direct (face

to face) contact, level of anxiety and attributions of controllability. Because the literature suggests that gender as well as the tendency to give socially desirable responses may have some impact on attitudes toward individuals with autism these variables were also included.

With respect to attitude assessment, several dimensions were evaluated that have been examined in studies of attitudes toward other mental disorders. A multidimensional attitude inventory was the primary assessment measure. One dimension tapped the cognitive class of attitudes with evaluations of the character of individuals who have autism. The other three dimensions of the measure tapped the behavioral class of attitudes. One dimension focused on evaluations of social distance or the degree of personal willingness to interact with people who have autism in a variety of social situations (e.g., encounter in public places, have as a friend or neighbor). Two other dimensions focused on evaluations of others' behaviors including the appropriateness of mainstreaming students with autism into regular education classes, an increasing trend for such students in recent years (Swaim & Morgan, 2001), as well as whether business owners should be required to serve people with autism. In addition to the attitude inventory, a behavioral intention item was included. This measure, which has been used in several studies of attitudes toward other mental disorders (e.g., Hall & Minnes, 1999), asks respondents to provide contact information for subsequent arrangement of an opportunity to interact with people who have a mental disorder. Such an assessment is recommended as a somewhat more realistic measure of behavioral intent to interact than may be obtained from only hypothetical attitude inventory items (Hall & Minnes, 1999). All of these predictor and attitude variables were evaluated in a young adult (i.e., college student) population thereby assessing an age group whose attitudes toward this population have not been extensively studied.

Regarding hypotheses about the predictors of primary interest, consistent with some findings for the impact of knowledge on attitudes toward autism (Campbell et al., 2004) as well as other mental disorders (e.g., Corrigan & Penn, 1999; MacDonald & MacIntyre, 1999), it was predicted that more accurate knowledge of autism would be associated with more positive attitudes toward individuals with autism. Regarding the impact of prior direct contact, consistent with previous studies assessing the effect of contact on attitudes toward people with autism (McHale & Simeonsson, 1980; Prather & Chovan, 1984) as well as individuals with other mental disorders (e.g., Couture & Penn, 2003), it was predicted that more as well as qualitatively more positive contact experiences would be associated with more positive attitudes. For anxiety, consistent with previous findings (e.g., Angermeyer & Matschinger, 1997), it was predicted that lower levels of anxiety would correspond to more positive attitudes. In the case of attributions, based on findings regarding controllability attributions and attitudes toward individuals with mental illnesses (Corrigan et al., 2003; Martin et al., 2000), it was predicted that attributions of less personal controllability would be associated with more positive attitudes.

For predictors of secondary interest, based on findings from one study of attitudes toward autism (Campbell et al., 2004) as well as numerous studies of attitudes toward individuals with other mental disorders (e.g., Corrigan et al., 2003; Krajewski & Flanagan, 2000), it was predicted that females would endorse more positive attitudes than males. With respect to social desirability, as Hall and Minnes (1999) as well as Swaim and Morgan (2001) observe, the desire to give socially acceptable responses may have a significant influence on self-reported attitudes toward various disability groups. Hence, it was predicted that social desirability would be a significant predictor of attitudes toward individuals with autism, as

expressions of more socially desirable responding would correspond to more positive attitudes toward individuals with autism. An exception to this prediction may relate to behavioral intentions to interact with an individual who has autism since several previous studies have not reported an impact of social desirability on behavioral intentions (Hall & Minnes, 1999; Penn et al., 2003), suggesting that there may not be a significant association between these variables.

Finally, as an exploratory follow-up analysis, several mediational models that may account for relationships among these predictor variables were evaluated. On account of the hypothesized significance of gender differences in attitudes, this variable was included to examine whether gender differences in attitudes may be mediated by differences in knowledge, contact, anxiety or attributions with the relationships among the latter set of constructs varying in each model. Social desirability was not included in these models, as self-presentational concerns were believed to focus directly on attitudes and not operate through other variables. Regarding those variables, one model suggested by previous findings related to attitudes toward mental illness (Angermeyer & Matschinger, 1997; Corrigan et al., 2001), as well as attributions about individuals with mental illness (e.g., Corrigan et al., 2002) and autism (Grindstaff, 2001) predicts that the effect of knowledge and contact will be mediated by anxiety and controllability attributions (see Model A in Figure 1). Greater knowledge and more prior contact may lead to decreased feelings of anxiety as well as attributions of decreased control and, in turn, relatively more positive attitudes. In addition, the alternative model predicting that greater knowledge, decreased anxiety and attributions of less personal control will lead to increased contact that is perceived as qualitatively more positive, which in turn leads to more positive attitudes was also evaluated

(see Model B in Figure 1) to determine which model may better account for associations among the variables.

CHAPTER 2

METHOD

Participants

A preliminary power analysis using the equations provided by Cohen (1988) indicated that with seven predictors (gender, social desirability, knowledge, contact quantity as well as quality, anxiety, and controllability attributions) to achieve power of .80 at an alpha level of .05 and detect a small to medium effect size of .10 would require approximately 300 participants. Three hundred thirty college students enrolled in a general psychology course participated in this study for course credit. Participants were 68% female, 81.5% Caucasian, 7% African-American, 7% Asian American, 3% Latino and 1.5% of other racial backgrounds with an average age of 19.

Measures

Attitude Inventory

The Mental Retardation Attitude Inventory-Revised (MRAI-R) (Antonak & Harth, 1994) was adapted for use in this study. This measure was selected because it provides comprehensive multidimensional assessment of attitudes toward a population with a developmental disability that frequently co-occurs with autism (Schopler & Mesibov, 1984). The MRAI-R consists of 29 statements for which the respondent rates level of agreement from 1 = strongly disagree to 4 = strongly agree. Negatively worded items are reverse scored so higher scores indicate a more favorable attitude. The measure has four subscales: Social Distance, which assesses willingness to associate with individuals who have mental

retardation, Inclusion-Segregation, which assesses views about integration of children with mental retardation in regular education classrooms, Private Rights, which assesses beliefs about whether landlords or business owners have the right to exclude individuals with mental retardation, and Subtle Derogatory Beliefs, which assesses negative views of the character and social behavior of individuals with mental retardation. Antonak and Harth (1994) reported acceptable reliability for the four subscales (α 's ranging from .73 to .82) and found that scores on the MRAI-R were not significantly influenced by a socially desirable response bias since MRAI-R scores for those who earned high scores on a measure of social desirability were not significantly different from those who earned low scores on the measure of social desirability. Adaptation of the MRAI-R required changing the referent in each item from "child/person with mental retardation" to "child/person with autism."

To determine whether the four-factor structure of the attitude inventory remained when the referent changed to "person with autism," a confirmatory factor analysis using maximum likelihood estimation was conducted. The following fit indices from that analysis are reported: χ^2 test, incremental fit index (IFI), comparative fit index (CFI), and the root mean square error of approximation (RMSEA) with associated 90% confidence interval. The χ^2 test evaluates whether the observed data fit the hypothesized model with non-significant χ^2 values close to 0 indicative of good model fit, although sensitivity of this statistic to sample size makes such an outcome more difficult to obtain with large samples (Byrne, 2001). IFI and CFI are incremental fit indices that range from 0 to 1 evaluating the extent to which the hypothesized model differs from an independence model in which none of the variables are correlated with values above .95 indicative of a good fit (Byrne, 2001). RMSEA evaluates how well the hypothesized model would fit in the population with a value less than .05

indicative of good fit although levels as high as .08 are considered indicative of adequate fit (Byrne, 2001).

Results across fit indices for the four factor solution were indicative of a relatively poor fit to the data, $\chi^2 (371, N = 330) = 705.51, p < .001$, IFI = .84, CFI = .83, RMSEA = .05 (.04-.06). Similarly, a one factor solution also indicated a relatively poor fit to the data, $\chi^2 (377, N = 330) = 909.49, p < .001$, IFI = .73, CFI = .73, RMSEA = .07 (.06-.07). These results indicate that the attitude scale is likely not characterized by either a four factor or single factor structure. Because no theoretical guidance was available to suggest how to re-specify the model for further confirmatory analyses, an exploratory factor analytic approach was then used to determine the appropriate factor structure for this measure.

A principal components analysis with varimax rotation was conducted on the attitude items and examination of the eigenvalues as well as the scree plot suggested a three- factor solution. A principal axis factor analysis with direct oblimin rotation specifying a three-factor solution was then conducted. The pattern coefficients for items on each factor are presented in Table 1. Results indicated that the first factor had an eigenvalue of 6.71 and accounted for 23.12 % of the variance in item scores. This factor consisted of 14 items including all but one of the items from the Social Distance subscale as well as one item from the Integration-Segregation subscale related to integrating neighborhoods, several items from the Private Rights subscale (e.g., if the respondent were a landlord, would he/she want to rent only to people without autism) and several items from the Subtle Derogatory Beliefs subscale (e.g., regarding the impracticality of social mixing between people with and without autism) relating to social interaction. Since all of the items appeared to assess desired social distance from people with autism, Social Distance was retained as the name for this subscale.

The second factor had an eigenvalue of 1.97 and accounted for 6.8% of the variance in item scores. This factor consisted of six items with five from the Integration-Segregation subscale, all of which concerned academic mainstreaming, and one item from the Subtle Derogatory Beliefs subscale concerning beliefs about the ability of people with autism to be the equals of people without autism in social situations. Given the content of these items, the name of the new subscale was changed to Academic Integration.

The third factor had an eigenvalue of 1.65 and accounted for 5.67% of the variance in item scores. This factor consisted of three items from the Private Rights subscale relating to the rights of businesses vis-à-vis children with autism and their families (i.e., whether daycare centers or private nursery schools should be required to accept them or real estate agents should be required to show homes to families having children with autism regardless of the neighbors opinions). Since these items were from the original Private Rights subscale, that name was retained. Three items from the Subtle Derogatory Beliefs subscale and one each from the Social Distance, Integration-Segregation, and Private Rights subscales did not load on any factor and were dropped from the final attitude inventory.

The new Social Distance and Academic Integration subscales displayed good internal consistency ($\alpha = .82$ for social distance and $\alpha = .74$ for academic integration), while the new Private Rights subscale displayed only moderate internal consistency ($\alpha = .55$). Scores on the three-factors of this 23-item autism attitude inventory were used in all analyses.

Behavioral Intentions

In addition to the attitude inventory, following the example of several previous studies (e.g., Hall & Minnes, 1999; Penn et al., 2003) a behavioral intentions item was included that appeared to offer an opportunity to interact with people who have autism. This item was

partially adapted from a study of attitudes toward individuals with Down's Syndrome (Hall & Minnes, 1999). A statement indicated the availability of unspecified volunteer opportunities to work with people who have autism at the local TEACCH autism treatment center. Respondents were asked if they would be interested in such an opportunity and, if so, to provide an email address or phone number where they could be reached to discuss this opportunity and their participation in greater detail. Provision of contact information constituted the measure of behavioral intention. After completing the study, all participants were provided with information about available volunteer opportunities at the local TEACCH center.

Knowledge of Autism

Participant's knowledge about autism was assessed with a revised version of Part I of Stone's (1987) Autism Survey, which has been used in several previous studies of knowledge about autism. Part II was not used because it consists of questions about specific DSM diagnostic criteria for autism, with which participants in this study were unlikely to be familiar. The original version of Part I of this instrument consisted of 21 statements about social and emotional, cognitive and general descriptive features such as course and prognosis of autism. Participants rate their level of agreement with each statement on a scale from 1 = fully agree to 6 = fully disagree, with higher scores indicating greater knowledge about autism. Campbell, Reichle and Van Bourgondien (1996) examined the psychometric properties of the 21-item version of the Autism Survey and found that it displayed only moderate reliability ($\alpha = .66$) and was best characterized by a single factor. When three items were deleted that did not load on that single factor, the reliability of the scale improved considerably ($\alpha = .74$), leading Campbell and colleagues (1996) to recommend using this

more psychometrically sound version of the measure, which was done in this study. In this sample, however, the measure displayed only moderate internal consistency ($\alpha = .62$). Since the measure had not previously been used with a college student population, an exploratory factor analysis was conducted to determine whether a multidimensional structure would better characterize the measure for such a sample.

A principal components analysis with varimax rotation was conducted and examination of eigenvalues and the scree plot suggested a two-factor solution. A principal axis factor analysis with direct oblimin rotation specifying a two-factor solution was then conducted. The pattern coefficients for items on each factor are presented in Table 2. The first factor had an eigenvalue of 3.36 and accounted for 18.68% of the variance in item scores. This factor was comprised of nine items that assessed a range of general descriptive features of autism (e.g., distinctness from childhood schizophrenia, prevalence in high SES groups, role of emotion and parental rejection in causing autism). Consequently, this subscale was named the General Knowledge subscale. The second factor had an eigenvalue of 1.57 and accounted for 8.7% of the variance in item scores. This factor was comprised of three items related to behavioral aspects of autism (e.g., whether children with autism show social attachments, affection and are deliberately noncompliant) and so it was named the Behavioral Knowledge subscale. Six items (e.g., regarding comorbidity with mental retardation, presence of special talents or skills, developmental nature of autism and accuracy of intelligence testing in this population) did not load on either factor and were dropped from the scale. The General Knowledge subscale displayed improved internal consistency ($\alpha = .67$), as did the Behavioral Knowledge subscale ($\alpha = .69$). This two-factor 12-item knowledge measure was used in all analyses.

Quantity of Contact

The Level of Contact Report (Holmes et al., 1999), which has been used to assess contact with individuals who have mental illness, was adapted for use in this study. This measure was selected for its extensive assessment of potential contact situations. The Level of Contact Report consists of 12 statements describing various levels of contact with individuals who have mental illnesses ranging from no contact to indirect contact (i.e., viewing documentaries, movies or television shows about people with mental illness) to direct contact (e.g., working with or living with someone who has a mental illness, having a friend or family member with mental illness or having a mental illness oneself). The statements were rated by several experts in psychiatric rehabilitation to determine their level of intimacy (rank order correlations between raters = .83) and each item was assigned a rank from 1-12. Respondents are asked to indicate all of the contact situations they have experienced and their score on the measure is the highest ranked item they endorse. In the present study the two items related to indirect contact (i.e., media exposure) were not used since the focus was on the influence of prior direct contact on attitudes. This procedure reduced the possible score range to 1-10, but the relative rank order of the remaining items was unchanged. Adaptation of the Level of Contact Report required changing the referent from “person with severe mental illness” to “person with autism.”

Quality of Contact

The quality of contact subscale from the contact measure employed by Islam and Hewstone (1993) in their study of attitudes toward different religious groups was adapted for use in this study. This five-item subscale was derived by factor analysis from a measure of interpersonal contact, but internal consistency of the subscale was not reported. These items,

which assess several hypothetically important qualitative aspects of contact discussed in the literature (Dovidio, Gaertner & Kawakami, 2003; Pettigrew, 1998), require respondents to rate the extent to which they typically experienced prior contact as equal, cooperative, pleasant, voluntary, and intimate on a scale from one to seven with higher scores indicating qualitatively better contact. The referent for these items was changed from the religious groups used in the original study to “individual with autism.” Participants could also indicate if they had never had direct contact with someone who has autism, which resulted in assignment of a score of 0 on this measure. This measure displayed moderate internal consistency in this sample ($\alpha = .68$).

Anxiety

The anxiety subscale from the measure of emotional reactions to mental illness used by Angermeyer and Matschinger (1997) was adapted for use in this study. This four-item subscale was derived by factor analysis from a measure of various emotional reactions to individuals with mental illness, but internal consistency of the subscale was not reported. These items require respondents to rate their feelings of uneasiness, fear, insecurity, and embarrassment regarding people with mental illness on a scale from one to five with higher scores indicating greater anxiety. Adaptation of the scale required changing the referent from the target individuals with mental illness described in the original study’s vignettes to “people with autism.” The adjective “uncomfortable” was also substituted for “embarrassment” to emphasize clearly that the anxiety dimension was being assessed. Several filler items assessing other emotional states were also included. This measure displayed good internal consistency in this sample ($\alpha = .81$).

Controllability Attributions

The attribution measure consisted of two items adapted from Corrigan and colleagues' (2002) Attribution Questionnaire. This two-item subscale was derived by factor analysis from a measure of attributions as well as emotional and behavioral reactions to individuals with mental illness, but internal consistency of the subscale was not reported. These items require ratings of the degree of control the individual with autism is believed to have over the cause of their condition as well as their autistic behaviors on a scale from 1 = not at all under personal control to 9 = completely under personal control. These items were presented with several filler items assessing participants' beliefs about the likelihood that individuals with autism will commit or be victims of crime. This measure displayed poor internal consistency ($\alpha = .31$) and so the only strategy permitting the use of these items was to enter them in all analyses as single item measures of two different dimensions of control attributions, one for control over causing autism and one for control over behavior management.

Social Desirability

The Crowne-Marlowe Scale (Crowne & Marlowe, 1960), one of the most widely used measures of social desirability (Barger, 2002), was used to assess social desirability. This measure consists of 33 statements answered in a true/false format with higher scores indicating more socially desirable responses. Crowne and Marlowe (1960) reported that the scale displayed acceptable internal consistency ($\alpha = .88$) and subsequent studies reported lower but still adequate internal consistency (e.g., Barger, 2002 obtained α 's of .73 and .74 in two large samples). The measure displayed adequate internal consistency in this sample ($\alpha = .76$).

Procedure

Participants completed all measures in groups of 8 to 16. The behavioral intention item was always presented last with the attitude inventory alternated between three different positions. The other measures were counterbalanced in most possible permutations around each placement of the attitude inventory.

CHAPTER 3

RESULTS

Analysis of the effects of the set of predictors (i.e., general and behavioral knowledge, contact quantity and quality, anxiety, behavioral and causal control attributions, gender, and social desirability) on attitude dimensions proceeded in three steps. First, the impact of the set of predictors on the subscales of the attitude inventory (i.e., social distance, academic integration and private rights) was examined using a multivariate multiple regression. From the total of 330 participants, cases with missing data (i.e., a measure that was not completed) were dropped so 322 participants were included in the analysis. Second, the impact of the set of predictors on the categorical behavioral intentions item was examined using logistic regression. Cases with missing data were again dropped so 316 participants were included in the analysis with the increase in missing data due to participants whose only non-response was for the behavioral intention item. Third, the proposed mediational analyses examining relationships among significant predictors and attitude dimensions were evaluated using path analyses. Data from all 330 participants were initially included in these analyses. As described below, missing data were subsequently dropped in a second set of analyses with 322 participants to obtain modification indices. Screening of the data indicated that there were no potential outliers likely to influence regression analyses, as all Cook's distance values were less than 1.0.

Effects of Individual Predictors on Attitude Inventory Dimensions

Respondents mean scores on each of the variables entered into the regression equations are found in Table 3. Participant responses covered nearly the full range of possible scores for each measure. On average, respondents were relatively knowledgeable about autism with somewhat weaker general than behavioral knowledge. They had moderate amounts of contact consisting of frequent observation of people with autism or working with such an individual and this contact was rated as being of low positive quality. Respondents also reported relatively low anxiety. Respondents believed that people with autism have a moderate degree of control over their behavior and very little control over the cause of their condition. On average, attitudes toward autism were also positive with relatively low desired social distance, limited support for business owners refusing to serve people with autism, and moderate support for academic integration.

Correlations between the predictor variables and the attitude inventory dimensions of social distance, academic integration and private rights as well as behavioral intentions item are found in Table 4. The size of significant correlations was generally small to moderate with most in the range from $-.30$ to $.30$. With the exception of social desirability, all predictors were significantly correlated with at least one attitude dimension. As expected, the attitude dimensions were also significantly intercorrelated indicating that they are measuring related constructs. This pattern of significant correlations suggests the suitability of this data for multivariate regression analysis.

The multivariate multiple regression indicated that overall the set of predictors (i.e., general and behavioral knowledge, contact quantity and quality, anxiety, behavioral as well as causal control attributions, gender, and social desirability) accounted for a significant 16%

of the variance in the set of attitude inventory dimensions (i.e., social distance, academic integration and private rights), $F(27, 906) = 6.60, p < .001$, Wilks' $\Lambda = .59$, partial $\eta^2 = .160$. With respect to the effects of individual predictors on the set of attitude inventory dimensions (see Table 5), general knowledge of autism accounted for a significant 4.8% of the variance in the set of attitude inventory dimensions, $F(3, 310) = 5.16, p < .002$; Wilks' $\Lambda = .95$, partial $\eta^2 = .048$, and behavioral knowledge accounted for 4.1% of the variance, which was also significant, $F(3, 310) = 4.38, p < .005$; Wilks' $\Lambda = .96$, partial $\eta^2 = .041$. For contact, quantity accounted for a significant 2.9% of the variance, $F(3, 310) = 3.13, p < .02$; Wilks' $\Lambda = .97$, partial $\eta^2 = .029$, and quality accounted for 2.5% of the variance, which was also significant, $F(3, 310) = 2.68, p < .05$; Wilks' $\Lambda = .98$, partial $\eta^2 = .025$. Anxiety accounted for a significant 11.5% of the variance, $F(3, 310) = 13.47, p < .001$; Wilks' $\Lambda = .885$, partial $\eta^2 = .115$. Behavioral control attributions accounted for a significant 3.6% of the variance in attitude inventory dimensions, $F(3, 310) = 3.82, p < .01$; Wilks' $\Lambda = .96$, partial $\eta^2 = .036$. Also, respondent gender accounted for a significant 4.8% of the variance, $F(3, 310) = 5.18, p < .002$; Wilks' $\Lambda = .95$, partial $\eta^2 = .048$, with females reporting more positive attitudes. Causal control attributions and social desirability were not significant predictors of the set of attitude inventory dimensions.

For the attitude dimension of desired social distance, the follow-up univariate regression indicated that general knowledge of autism, contact quality, anxiety and respondent gender were significant predictors (see Table 6). General knowledge accounted for 3.5% of the variance in social distance with greater general knowledge of autism associated with desire for less social distance ($b = .18, t = 3.39, p < .001$, partial $\eta^2 = .035$). Contact quality accounted for 1.7% of the variance in social distance such that increased quality of contact

was associated with desire for less social distance ($b = .08, t = 2.34, p < .02, \text{partial } \eta^2 = .017$). Anxiety accounted for 10.2% of the variance in social distance as decreased anxiety was associated with desire for less social distance ($b = -.59, t = -5.96, p < .001, \text{partial } \eta^2 = .102$). Respondent gender accounted for 1.8% of the variance in social distance with men desiring greater social distance than women (lower scores indicate desire for more social distance) ($b = -1.32, t = 14.68, p < .001, \text{partial } \eta^2 = .018$). It should be noted that causal control attributions were also a significant predictor ($b = -.36, t = -2.22, p < .03, \text{partial } \eta^2 = .016$), but cannot be interpreted meaningfully since causal control attributions did not have a significant overall effect on attitudes in the multivariate test reported previously. Behavioral knowledge, contact quantity, behavioral attributions and social desirability were not significant predictors of social distance.

For the attitude dimension of academic integration, the follow-up univariate regression indicated that behavioral knowledge, contact quantity, anxiety, behavioral control attributions and respondent gender were significant predictors (see Table 7). Behavioral knowledge accounted for 3.9% of the variance in attitudes toward academic integration as greater behavioral knowledge corresponded to increased support for academic integration ($b = .21, t = 3.56, p < .001, \text{partial } \eta^2 = .039$). Contact quantity accounted for 2.3% of the variance in attitudes toward academic integration and, contrary to expectations, decreased quantity of contact corresponded to increased support for academic integration ($b = -.22, t = -2.72, p < .007, \text{partial } \eta^2 = .023$). Anxiety accounted for 5.1% of the variance in attitudes toward academic integration as decreased anxiety corresponded to increased support for academic integration ($b = -.24, t = -4.11, p < .001, \text{partial } \eta^2 = .051$). Behavioral control attributions accounted for 3.5% of the variance and, contrary to expectations, attributions of greater

behavioral control were associated with more support for academic integration ($b = .37, t = .3.38, p < .001, \text{partial } \eta^2 = .035$). Gender accounted for 2.6% of the variance in academic integration as men were less supportive of academic integration than women ($b = -.934, t = -2.87, p < .004, \text{partial } \eta^2 = .026$). General knowledge of autism, contact quality, causal control attributions and social desirability were not significant predictors of attitudes toward academic integration.

For the attitude dimension of private rights, the follow-up univariate regression indicated that anxiety was the only significant predictor (see Table 8). Anxiety accounted for 2.5% of the variance in attitudes toward private rights as decreased anxiety corresponded to increased support for requiring business owners to serve people with autism ($b = -.11, t = -2.85, p < .005, \text{partial } \eta^2 = .025$). No other variables were significant predictors of attitudes toward private rights.

Effects of Predictor Variables on Behavioral Intention

The logistic regression model examining the set of predictor variables in relation to the behavioral intention item (see Table 9) was reliable ($\chi^2 (9, N = 330) = 49.69, p < .001$) and the set of predictors accounted for approximately 19.6% of the variance in behavioral intention to perform volunteer work with people who have autism (Nagelkerke $R^2 = .196$). This model was able to predict accurately 74.3% of those who did not indicate behavioral intent and 55.6% of those who did indicate behavioral intent with an overall predictive accuracy rate of 66.5%. In terms of individual predictors, behavioral control attributions, anxiety and respondent gender significantly predicted behavioral intention. As anxiety increased, the odds of indicating intent decreased by 81% ($b = -.21, \text{Wald} = 15.93, p < .001, \text{odds ratio} = .81$), and, as attributions of control over behavior increased, the odds of indicating intent

decreased by 73% ($b = -.31$, Wald = 10.80, $p < .001$, odds ratio = .73). Also, men were 36% less likely to indicate intent to volunteer than women ($b = -1.03$, Wald = 12.82, $p < .001$, odds ratio = .36). Finally, a trend approaching significance was noted for behavioral knowledge such that increased behavioral knowledge predicted increased odds of indicating intent ($b = .10$, Wald = 3.42, $p = .06$, odds ratio = 1.10). General knowledge of autism, contact quantity and quality, causal control attributions and social desirability did not significantly predict behavioral intention.

Mediational Analyses

Two mediational models examining relationships among the predictors of each attitude dimension were initially hypothesized. In Model A gender, levels of knowledge and contact were hypothesized to influence attributions as well as anxiety which in turn influences attitudes. In Model B gender, knowledge, attributions and anxiety were hypothesized to influence contact, which in turn influences attitudes (see Figure 1). Since results of the multivariate multiple regression indicated that different variables predicted social distance and academic integration, the two models were examined for each attitude dimension separately with one set of analyses (Models A-1 and B-1) using significant predictors of social distance (i.e., gender, general knowledge, anxiety, and contact quality) and another set (Models A-2 and B-2) using significant predictors of academic integration (i.e., gender, behavioral knowledge, behavioral attributions, anxiety and contact quantity). Private rights were not included in these mediational analyses since there was only one significant predictor of that attitude dimension. All mediational models were evaluated using path analysis with maximum likelihood estimation. The χ^2 test, incremental fit index (IFI), comparative fit index (CFI), and the root mean square error of approximation (RMSEA) with

associated 90% confidence interval were the fit indices used for evaluating these path analyses. Values indicative of good fit for index were as follows: non-significant χ^2 , IFI and CFI greater than .95, and RMSEA less than .08 with less than .05 indicating the closest fit.

For social distance, neither model provided an adequate fit to the data. Model A-1 in which gender predicted general knowledge and contact quality which in turn predicted anxiety and then desired social distance was a poor fit to the data, $\chi^2 (1, N = 330) = 27.50$, $p < .000$, IFI = .85, CFI = .84, RMSEA = .28 (.19-.38). The alternative Model B-1 in which gender predicted anxiety, and general knowledge which in turn predicted contact quality and then desired social distance also provided results indicative of a less than adequate fit to the data, $\chi^2 (1, N = 330) = 7.75$, $p < .01$, IFI = .96, CFI = .95, RMSEA = .14 (.06-.24), although a relatively better fit than Model A-1. Both models were then re-estimated with cases that had missing data deleted in order to obtain modification indices, which indicate potential decreases in χ^2 value (i.e., better fit) associated with each parameter that could be added to the model (Byrne, 2001). The new models with 322 cases provided fit indices that were similar to the full sample model, but examination of modification indices indicated that adding paths from general knowledge to contact quality in Model A-1 and from general knowledge to anxiety in Model B-1 improved fit by making both models fully saturated (i.e., with a direct path between every variable in the model), so they both fit the data perfectly (i.e., $\chi^2 = 0$, IFI/CFI = 1.00). This outcome made it impossible to compare the relative fit of the models suggesting that no beneficial adjustment to these models was possible. These final models are presented in Figure 2.

For academic integration, neither initial model provided an adequate fit to the data. Model A-2 in which gender predicted behavioral knowledge and contact quantity which in

turn predicted behavioral attributions and anxiety and then predicted academic integration provided a poor fit, $\chi^2 (2, N = 330) = 24.88, p < .000, IFI = .87, CFI = .85, RMSEA = .19 (.13-.26)$ as did the alternative Model B-2 in which gender predicted anxiety, behavioral attributions, and behavioral knowledge which in turn predicted contact quantity and then predicted academic integration, $\chi^2 (3, N = 330) = 35.62, p < .000, IFI = .81, CFI = .78, RMSEA = .18 (.13-.24)$. As was the case with the models for social distance, these models were re-estimated with cases having missing data deleted to provide modification indices that would suggest changes to improve model fit. For Model A-2, examination of modification indices suggested that adding a path from behavioral knowledge to contact quantity would improve model fit. While this addition did improve fit, $\chi^2 (1, N = 322) = 5.63, p < .02, IFI = .97, CFI = .97, RMSEA = .12 (.04-.22)$, all indices still did not consistently meet criteria for a good fit. For Model B-2, modification indices suggested that adding a path between behavioral knowledge and anxiety would improve fit. Again, this improved fit, $\chi^2 (1, N = 322) = 10.22, p < .01, IFI = .95, CFI = .95, RMSEA = .11 (.05-.19)$, although to a lesser degree than for Model A-2, but all indices still did not meet criteria for a good fit. These final models are presented in Figure 3. Taken together these results suggest that the hypothesized models did not provide adequate descriptions of the relationships among this set of predictors and the attitude dimensions of social distance and academic integration.

While neither the hypothesized nor the modified models were a good fit, examination of these models suggested another possibility. The final versions of the mediational models for social distance and academic integration indicated that general and behavioral knowledge could be mediated by contact as well as anxiety (see Figures 2 & 3). The hypothesized models did not include the possibility of contact and anxiety serving as simultaneous

mediators. Consequently, an exploratory follow-up analysis was conducted with such models. In the case of social distance, this involved adjusting the model so that gender predicted general knowledge, which then predicted contact quality and anxiety, which in turn, predicted desired social distance (see Model A in Figure 4). This model did not provide a good fit to the data, $\chi^2 (1, N = 330) = 11.68, p < .001, IFI = .94, CFI = .94, RMSEA = .18 (.10-.28)$. In the case of academic integration, this involved alternating the places of contact quantity and behavioral control attributions so that the latter variable could be assessed in relation to both contact quantity and anxiety. In the resulting model, gender predicted behavioral knowledge and behavioral control attributions, which then predicted contact quantity and anxiety, which in turn, predicted views toward academic integration (see Model B in Figure 4). This model also did not provide a good fit to the data, $\chi^2 (2, N = 330) = 11.42, p < .003, IFI = .94, CFI = .94, RMSEA = .12 (.06-.19)$. Nevertheless, the fit indices for these models were similar to those of the better fitting of the hypothesized models.

CHAPTER 4

DISCUSSION

This study was conducted to fill some of the gaps in the understanding of attitudes toward autism. Cognitive, behavioral and affective variables including general and behavioral knowledge of autism, quantity and quality of past contact with people who have autism, anxiety, attributions about behavioral and causal control, as well as respondent characteristics of gender and socially desirable response tendency were examined in relation to desired social distance, views of academic integration as well as the rights of business owners not to serve people with autism and behavioral intent to do volunteer work with people who have autism, which are behavioral attitude dimensions. These variables were assessed in college students whose attitudes toward this population have not been extensively examined.

At the descriptive level, results suggested that college students were relatively knowledgeable about autism displaying somewhat less general than behavioral knowledge of the disorder. They had moderate amounts of contact involving frequent observation of people with autism and sometimes working with individuals who have the disorder. This contact was perceived to be of somewhat positive quality. They also reported relatively low anxiety about interacting with people who have autism. These college students believed that people with autism have a moderate degree of control over their behavior and very little control over the cause of their condition. Attitudes toward autism were also generally positive with relatively low desired social distance, limited support for business owners refusing to serve people with autism, and moderate support for academic integration. These

generally positive attitudes suggest that the degree of stigmatization associated with autism may be limited.

These results appear generally consistent with previous findings for adults, which were limited to separate assessments of attitudes, knowledge of autism and causal attributions. In the case of attitudes, the current finding of relatively positive attitudes appears generally consistent with a previous report that a small sample of adults were equally socially accepting of a target child described as having autistic symptoms and a normally developing child (Harnum, Duffy & Ferguson, 2006). Regarding knowledge, behavioral knowledge in the current study included awareness that people with autism can form social attachments and show affectionate behaviors. Consequently the finding of relatively greater behavioral than general knowledge about other aspects of autism appears consistent with the NAAR (2003) survey in which members of the general public knew that people with autism can show affection and form social attachments but were less knowledgeable about other aspects of the disorder. Similarly, the current finding of limited attributions of personal responsibility for causing autism appears consistent with the NAAR (2003) survey in which members of the general public suggested mostly personally uncontrollable causes for autism such as genes and environmental stressors like toxins or vaccines.

With respect to relationships between the predictors and attitudes, results suggested a variable pattern of significant predictors across attitude dimensions (see Table 10). Greater general knowledge predicted desire for less social distance and greater behavioral knowledge predicted more support for academic integration. Better contact quality predicted desire for less social distance and lower contact quantity predicted more support for academic integration. Lower anxiety predicted desire for less social distance, more support for

academic integration, less support for the rights of business owners to refuse to serve people with autism, and greater likelihood of intending to volunteer. Attributions of greater behavioral control predicted more support for academic integration and attributions of less behavioral control predicted greater likelihood of intent to do volunteer work with people who have autism. Females were also likely to desire less social distance, indicate more support for academic integration, and were more likely to indicate intent to volunteer. Causal control attributions and social desirability did not predict any attitude dimension. Finally, the mediational models did not provide a good description of the relationships among predictors of the attitude dimensions of social distance or academic integration.

In the case of knowledge of autism and attitudes, the predicted pattern of greater knowledge predicting more positive attitudes was obtained with general and behavioral knowledge predicting different types of attitudes. Greater general but not behavioral knowledge predicted desire for less social distance. This finding that greater knowledge of some aspects of the disorder was associated with desire for less social distance is consistent with the findings of one previous study of attitudes toward autism (Campbell et al., 2004) as well as studies of attitudes toward other mental disorders (e.g., MacDonald & MacIntyre, 1999). It is unclear why behavioral knowledge did not have an impact in this case, but it may relate to the nature of the situations assessed. The social distance scale assessed a broad range of situations including a number of recreational activities (e.g., swimming or attending a birthday party) that may have somewhat more relaxed social/behavioral expectations. Consequently, participants may have been unconcerned about the degree to which limitations in social skills might affect these types of situations, while knowledge about more general

factors such as whether autism exists only in children or can be outgrown had some degree of relevance across the entire range of situations assessed.

Regarding behavioral knowledge of autism, greater knowledge predicted more support for academic integration. This finding suggests that knowledge about behavior is likely to be more salient in influencing attitudes toward academic placement than knowledge about more general or causal aspects of the disorder, which may not relate as greatly to academic functioning. Knowing to what extent a child with autism can display appropriate behavior and form social connections in a regular classroom may be viewed as more relevant to evaluating suitability for placement in that setting than knowing whether the child may outgrow autism at some future time. In addition, there was a trend toward greater behavioral knowledge corresponding to greater likelihood of indicating intent to do volunteer work with people who have autism. This trend suggests that awareness of behavioral limitations associated with autism may lead to perceptions of a clear need for assistance in this population and somewhat greater willingness to volunteer to work with them.

When considering these findings for knowledge of autism and attitudes, it is unfortunate that the items relating to cognitive aspects of autism did not load on the general knowledge subscale or constitute a separate unified subscale. It seems likely that the degree of accurate knowledge about cognitive aspects of the disorder (e.g., likelihood that individuals with autism have special talents/savant skills or may have comorbid mental retardation) may influence attitudes, particularly in relation to academic integration. The extent to which people believe that individuals with autism have savant skills in certain academic subjects may relate to how strongly they support academic integration. To test this hypothesis, future studies should consider modifications to the current items as well as developing new items

that address knowledge of cognitive aspects of autism. For example, the current item about whether people with autism have special talents or abilities could specify special mathematical or memory abilities that suggest clearly cognitive skills. Also, the current item about likelihood of comorbid autism and mental retardation could be supplemented by an item regarding whether most people with autism have average intelligence.

In contrast to the relationship of knowledge to attitudes, for contact and attitudes toward autism, significant results were not all in the predicted direction. The hypothesized relationship was observed between contact quality and social distance but not between contact quantity and academic integration. For contact quality, better quality predicted desire for less social distance, which was consistent with suggestions that qualitative aspects of contact may have a significant influence on attitudes toward people with autism (Prather & Chovan, 1984). That contact quality may have a greater impact than contact quantity, at least in terms of desired social distance, is also generally consistent with the findings of the only other study of attitudes toward a mental disorder to assess both quantitative and qualitative aspects of contact (Hall & Minnes, 1999). That study also found that contact quality but not quantity was a significant predictor of attitudes toward people with Down's Syndrome. Because the single factor attitude measure used in that study included items assessing aspects of attitudes besides social distance (e.g., beliefs about the abilities of people with mental retardation) the two outcomes are not totally comparable. Nevertheless, the present findings lend further support to the hypothesis that contact quality can have a significant impact on some attitude dimensions and that this variable merits inclusion in future investigations of contact and attitudes toward mental illnesses.

In the case of contact quantity, increased quantity was associated with less rather than more support for academic integration. This may suggest that more contact leads to more negative attitudes toward academic integration, but it is also possible that this finding could be interpreted in a more positive manner. Interestingly, this result appears consistent with the views of some autism experts and parents of children with autism. While agreeing that academic integration is an important civil right of all students and some amount of academic integration is appropriate, some autism experts argue that full integration or full inclusion may not be beneficial for many students with autism because a number of their unique educational needs may be better met in more specialized environments (Mesibov & Shea, 1996). Parents of children with autism have endorsed a similar view reporting that their children's needs cannot often be adequately met in a regular classroom and require additional specialized services provided in an alternative setting (Kasari et al., 1999). Hence, the views expressed by the current college student sample with more extensive contact could reflect similar reasoning based on their experiences. It should be noted that the finding that increased behavioral knowledge relates to a more favorable view of academic integration does not address this issue since those items were limited to knowledge of ability to form social attachments and tendency to engage in deliberately disruptive behavior and did not assess more specific aspects of educational performance. To assess this possibility further future studies should request explanations for why respondents believe that children with autism should or should not be fully mainstreamed.

Furthermore, it is noteworthy that neither contact dimension predicted behavioral intentions. It is possible that lack of specificity in the behavioral intention item's wording may have influenced this result. Items assessing other attitude dimensions evaluated beliefs

about specific situations (e.g., community or school activities), which would permit respondents to use quantitative and qualitative aspects of their prior contact experiences to inform their views of such situations. In contrast, the behavioral intention item required respondents to consider unspecified volunteer opportunities, which may not have permitted a sufficient basis for comparison with prior experience that could influence intent to volunteer. In support of this possibility, in one prior study where contact did significantly influence response to a behavioral intention item, that item described a specific type of volunteer opportunity for working with individuals who had mental retardation (Hall & Minnes, 1999). Hence, it may be informative for a future study to evaluate whether quantity and quality of prior contact would predict behavioral intention describing a more specific volunteer opportunity with individuals who have autism. In addition, it would be particularly useful to provide an actual volunteer opportunity and measure participation in that activity to assess the extent to which these predictors influence actual behavior as well as reported intentions.

Unlike the results for contact and attitudes, the findings for anxiety were all in the predicted direction. Less anxiety predicted desire for less social distance, which is consistent with findings for attitudes toward other mental disorders (e.g., Angermeyer & Matschinger, 1997). In addition, less anxiety predicted more support for academic integration, less support for business owners refusing to serve people with autism, and greater likelihood of indicating behavioral intention to do volunteer work with people who have autism. The consistent influence of this variable illustrates the importance of specific emotional reactions in predicting attitudes toward autism. Consequently, it may also be of interest to examine whether other emotional reactions (e.g., anger/frustration related to the

disruptive or unusual behavior of people with autism) also predict attitudes toward this population.

Regarding the consistency of influence for anxiety on all attitude dimensions, it is also interesting to note that none of the other predictors were related to views about the private rights of business owners not to serve people with autism. It may be that the behaviors described in this subscale were such obvious examples of potentially illegal discriminatory behavior (e.g., whether daycare centers or private nursery schools can refuse to accept children with autism) that respondents were unlikely to support such actions regardless of their knowledge of autism or history of contact with people who have autism. Instead only a negative emotional reaction to people with autism had any impact, presumably due to a desire to avoid interaction even at the risk of engaging in discriminatory behavior. However, given the low to moderate internal consistency of the private rights subscale, these results must be viewed cautiously and it will be necessary to develop a more reliable assessment prior to concluding that other predictors do not influence this attitude dimension. Toward that end, it may be useful to include items that assess rights of a wider variety of businesses to refuse to serve people with autism (e.g., travel or service industry firms).

In the case of attributions, the findings were not all as predicted. Only behavioral control attributions significantly predicted attitudes, with one result in the expected direction and another in the opposite direction. In the expected case, attributions of less behavioral control predicted behavioral intent to do volunteer work with people who have autism. It may be that by attributing less behavioral control to people with autism participants identified a clear need for assistance in this population and so were more willing to volunteer to work with them. In the unexpected case, attributions of increased rather than the predicted decreased

behavioral control were a significant predictor of greater support for academic integration. This direction of influence suggests that greater tolerance of challenging or disruptive behavior potentially associated with lower control attributions may not translate into more support for academic integration. Instead greater value may be placed on abilities to exert behavioral control in that setting.

With respect to non-significant results for attributions, the finding that behavioral control attributions did not predict desired level of social distance could be for the same reason offered for the non-significant finding for behavioral knowledge and social distance. Since the social distance scale assessed a broad range of situations including recreational activities (e.g., swimming or attending a birthday party) that may have somewhat more relaxed behavioral expectations, participants may have been unconcerned about the degree to which autistic behavior might affect these types of situations. Also, causal control attributions did not predict any attitude dimensions. Because participants generally attributed very limited control to people with autism for causing their disorder, it may be that the limited range of this variable resulted in non-significant findings.

Regarding respondent characteristics, in the case of gender, all significant findings were in the predicted direction. College-aged females desire for less social distance from those with autism is consistent with Campbell and colleagues' (2004) results for elementary school children. Females were also more supportive of academic integration and expressed greater behavioral intention to do volunteer work with people who have autism. These results appear consistent with the trend for more positive attitudes among females reported for attitudes toward other mental disorders (e.g., Farina, 1981). However, in a second sample of elementary school children gender differences in attitudes toward autism were not reported

(Swaim & Morgan, 2001), so it will be necessary to replicate the present finding before concluding more definitively that females at varying ages demonstrate more favorable attitudes toward people with autism. Regarding possible reasons for these gender differences, correlations among predictors suggest that females report more and more positive contact as well as attributions of less behavioral control. It could be that a combination of differences in these areas contributed to the more positive attitudes of females.

In contrast, social desirability was not a significant predictor of any attitude dimension. The absence of an association between social desirability and behavioral intent to volunteer was consistent with hypotheses and the results of previous research examining attitudes toward people with other mental illnesses (Hall & Minnes, 1999; Penn et al., 2003). This suggests that when considering having a behavioral interaction with someone who has autism, concerns about self-presentation are unimportant relative to other factors such as gender or anxiety. Also, although contrary to predictions, social desirability did not influence other attitude dimensions, this was a positive result suggesting that respondents were being honest in their reported attitudes and not providing what they believed to be expected or desired responses.

Finally, while many significant relationships between individual predictors and attitude dimensions were observed, the mediational models describing potential interrelationships among predictors and attitude dimensions did not provide an adequate fit to the data. Nevertheless one model for each attitude dimension did provide a relatively closer approximation to a good fit. While no conclusions can be drawn from the present results given the poor model fit, it is interesting to note that different models provided a relatively

better fit for each attitude dimension. In the case of desired social distance, it was the hypothesized alternative Model B-1 in which general knowledge and anxiety influenced contact quality. In the case of attitudes toward academic integration, the hypothesized Model A-2 in which behavioral knowledge and contact quantity influenced anxiety provided the relatively better fit. This model is similar to the model obtained in previous studies of attitudes toward other mental illnesses (e.g., Angermeyer & Matschinger, 1997).

Results of mediational analyses also suggested an additional alternative model in which contact dimensions and anxiety both mediate the effects of other predictors (i.e., gender, knowledge and control attributions) on social distance as well as academic integration. Because previous theoretical discussions (e.g., Pettigrew, 1998) and tests of mediational models (e.g., Angermeyer & Matschinger, 1997) focused on the mediating role of anxiety in the effect of contact on attitudes, only variations on this path were incorporated into the initial models. However, that respondent gender and knowledge of autism could influence contact quantity as well as quality *and* level of anxiety, which in turn, would predict attitudes, was proposed across the hypothesized models. It was also proposed that attributions could influence contact dimensions, although the possibility of influencing anxiety was not addressed. Nevertheless perceptions about the degree of control a person with autism has over their behavior could potentially relate to level of anxiety about interacting with such an individual. Exploratory follow-up analyses were conducted on models including contact and anxiety as mediators. A model in which the effects of gender and general knowledge were mediated by anxiety and contact quality in predicting desired social distance obtained fit indices similar to those of the better fitting of the hypothesized models, but still not a good fit. Likewise a model in which the effects of gender, behavioral

knowledge, and behavioral attributions were mediated by contact quantity and anxiety in predicting views toward academic integration obtained fit indices similar to those of the better fitting of the hypothesized models, but still not a good fit. The question remains which models best account for relationships among predictors. Since several different models approached a good fit, it may be useful to consider ways to improve these models for further evaluation of how to explain most accurately relationships among these attitude predictors.

In terms of model improvement, it may be useful to incorporate another predictor that could be contributing to these attitude dimensions and thereby improve model fit. Specifically, the emotional variable of empathy or feelings of sympathy and compassion for the plight of others (Batson et al., 1997) may have some degree of influence. While anxiety is the emotion that has generally been the focus in studies of attitudes toward mental disorders and hence the emotion examined in the present study, empathy has also received some attention. Feelings of pity toward people with mental illnesses have been associated with greater desire to help them (Corrigan et al., 2003). Manipulations designed to increase empathy have led to a greater desire to help other stigmatized groups such as people with AIDS and the homeless (Batson et al., 1997). It has also been suggested that, like anxiety, empathy could serve as a mediator of the effect of contact on attitudes with more contact leading to greater empathy for the situation of members of a particular group and thereby lead to more positive attitudes toward that group (e.g., Pettigrew, 1998).

With respect to placement of empathy in mediational models, in the case of the hypothesized models, for social distance it seems likely that greater empathy as well as more general knowledge and less anxiety could potentially contribute to better perceived quality of contact and then to desire for less social distance. In the case of academic integration, the

situation may be more complex. Gender, greater behavioral knowledge and more contact may lead to less anxiety, greater empathy, and attributions of greater behavioral control. This in turn may influence both greater support for some degree of academic integration, and, assuming the previously discussed interpretation for the inverse relationship between contact and support for academic integration, recognition of the continued need for some supplemental special education services. For the new alternative models, the effects of gender, knowledge and attributions on attitudes could be mediated by empathy, anxiety and contact. In the case of social distance, female gender and greater general knowledge of autism could lead to greater empathy, less anxiety, and better perceived quality of contact which in turn leads to desire for less social distance. In the case of academic integration, female gender, greater behavioral knowledge and attributions of greater behavioral control could predict more contact, less anxiety, and greater empathy which in turn predict greater support for academic integration as well as awareness of the need for continued special education services. Future tests of these competing models are warranted.

Besides exploring the avenues for further study suggested by these results (e.g., development of better items assessing knowledge of cognitive aspects of autism, assessment of empathy for people with autism), several general limitations of the present study should be noted and addressed as part of future investigations. First, the attitude inventory items assessing cognitive evaluations of the character of people with autism did not constitute a separate scale in the final version of the measure. Consequently, it is difficult to determine whether the present pattern of results for the various predictors and behavioral attitudes generalizes to such cognitive evaluations. Second, none of the measures used in this study have been employed previously to assess these autism-related variables among college

students. Hence, the evidence for the reliability of these measures as well as the factor structure of the attitude and knowledge measures reported in this study must be viewed as preliminary. Third, because no other college student samples have been assessed it is unclear how representative the responses of this sample across predictor variables as well as attitude dimensions may be relative to the larger college student population. It is equally unclear whether these results provide a representative indication of the attitudes or related influence of predictor variables among the non-college student adult population. As a result, replications using these measures as well as a separate measure of cognitive attitudes such as an adjective checklist in other samples of college students and subsequently of other adult community samples will be necessary to demonstrate further the psychometric properties of these measures as well as the generalizability of the present findings.

Overall, allowing for the noted limitations, the results of the present study suggest that knowledge, contact quantity and quality, anxiety, behavioral control attributions and respondent gender may influence college students' attitudes toward people with autism. These results provide the first support to date for the likely relation of this set of variables to attitudes toward autism in a young adult population. In general, these findings appear consistent with the pattern of relationships among predictors and attitudes reported with other mental disorders as female gender, greater knowledge, more positive contact quality and less anxiety were associated with more positive attitudes. In the case of contact quantity, to the extent that the association of greater contact with desire for less academic mainstreaming reflects understanding that at times students with autism may require assistance that is not readily available in a regular classroom, a pattern of greater contact associated with more positive attitudes emerges that is also generally consistent with findings for other mental

disorders. It is also important to note that while several variables (i.e., gender, anxiety and behavioral control attributions) predicted multiple attitude dimensions the types of knowledge and contact that were significant predictors varied across attitudes. This suggests some degree of specificity regarding which aspects of knowledge and contact relate to attitudes toward people with autism in different contexts (i.e., personal social distance versus views of academic mainstreaming). Consequently, continued multidimensional assessment of knowledge, contact and attitudes will be necessary to develop a more complete picture of relationships among these variables.

In conclusion, it should be recalled that the study of attitudes toward mental disorders contributes to the understanding of how people perceive and may react to individuals with mental disorders. Replications as well as the proposed extensions of this study should continue to inform that understanding in the specific case of individuals with autism. However, examination of how these attitudes relate to actual behavioral reactions to individuals with autism also needs to be explored. Of particular interest is how much the attitudes and related predictor variables examined in the present study contribute to discriminatory behaviors such as those sometimes directed toward people with other mental disorders (e.g., refusal to hire or work with people who have a mental disorder; for discussion see Corrigan & Penn, 1999). Hence, obtaining behavioral samples will be necessary to evaluate the link between expressed attitudes, which were generally positive rather than stigmatizing in the current study, and the behavior of the non-disabled toward people with autism, which has been described as negative at times toward parents of children with autism (e.g., Gray, 1993, 2002). To the extent that negative or discriminatory behavior is identified as problematic, it will then be necessary to investigate whether targeted interventions

directed toward specific attitude predictors (e.g., increasing knowledge of autism and related unusual/inappropriate behavior or structuring positive contact experiences) may lead to more positive behavioral responses. Clearly, much work remains to be done to provide a more complete understanding of attitudes toward people with autism as well as the degree of similarity with attitudes toward other mental disorders. Given that public exposure to people with autism is likely to continue increasing, further study of attitudes toward this population may play an important role in promoting more positive interactions between the non-disabled and individuals with autism.

Table 1

Pattern Matrix Coefficients for Autism Attitudes Inventory Following Principal Axis Factor Analysis

Item	Factor		
	1	2	3
Social Distance			
Rather not have PWA live in same apartment building	.62	.09	.08
Would allow my child to accept birthday party invitation of CWA	.60	.08	-.07
Willing for my child to have CWA as close friend	.59	-.05	.03
If barber, would not resent being told to serve PWA	.52	.18	.17
Willing to introduce PWA to hometown friends or neighbors	.51	.02	.12
Rather not have PWA as dinner guests with my friends	.47	-.23	-.05
Rather not have PWA swim in same pool	.47	-.14	.01
CWA waste time playing in class instead of trying to do well	.45	-.09	-.08
If landlord, want to pick tenants even if meant only renting to non-PWA	.43	-.06	.13
Laws requiring employers not to discriminate violate rights of those who do not want to associate with PWA	.40	-.13	.01
Even though PWA have cause for complaint, would get what they want if more patient	.38	-.01	-.12
Social mixing may be right, but impractical until PWA learn to accept limits in relations with opposite sex	.36	-.14	.01
No objection to attending movies or play in company of PWA	.36	-.28	-.14
<u>Should integrate PWA and non-PWA in same neighborhoods</u>	<u>.33</u>	<u>-.13</u>	<u>.07</u>

Note: CWA=child/children with autism, PWA=people with autism. Item wording shortened from actual measure.

Table 1 cont'd

<u>Item</u>	<u>Factor</u>		
	1	2	3
Academic Integration			
CWA should be integrated into regular school classes	-.12	-.80	.17
Schools should not put CWA in same class with other children	-.16	-.71	.02
Integrating CWA into high school classes of other students more trouble than it is worth	.15	-.62	.06
Integrating CWA into preschool classes of other children should not happen due to resulting turmoil	.17	-.52	.13
Good idea to have separate after-school programs for CWA	.03	-.37	.11
Even with equal social opportunity, PWA could not show themselves equal in social situations	.13	-.35	-.06
Private Rights			
Regardless of personal views, private nursery school director required to admit CWA	-.02	-.08	.56
Real estate agents required to show homes to families of CWA regardless of desires of other homeowners	-.03	-.18	.54
<u>Person not permitted to run day care center if will not serve CWA</u>	<u>.30</u>	<u>.10</u>	<u>.40</u>
<i>Note: CWA=child with autism, PWA=person with autism. Item wording shortened from actual measure.</i>			

Table 2

Pattern Matrix Coefficients for Knowledge of Autism Measure Following Principal Axis Factor Analysis

Item	Factor	
	1	2
General Knowledge		
Emotional factors major cause	.63	.09
Outgrow with proper treatment	.55	.06
Exists only in childhood	.48	-.13
Is an emotional disorder	.45	.09
Children “untestable”	.41	-.21
Usually become schizophrenic adults	.38	-.19
More common in higher SES	.36	.07
Difficult to distinguish from childhood schizophrenia	.35	-.11
Withdrawal due to cold, rejecting parents	.34	-.06
Behavioral Knowledge		
Do no show social attachments	-.02	-.73
Do not show affectionate behaviors	-.01	-.67
<u>Deliberately negativistic and noncompliant</u>	<u>.25</u>	<u>-.37</u>

Note: Item wording shortened from actual measure.

Table 3

Summary of Participant's Questionnaire Responses

<u>Measure</u>	<u>Mean (observed range)</u>	<u>SD</u>
General Knowledge	39.58 (13-54)	5.59
Behavioral Knowledge	14.15 (3-18)	2.81
Contact Quantity	4.00 (1-8)	2.47
Contact Quality	16.55 (0-35)	10.93
Anxiety	7.60 (4-15)	2.77
Behavioral Control Attributions	4.42 (1-9)	1.47
Causal Control Attributions	2.19 (1-8)	1.68
Social Desirability	13.15 (2-26)	4.99
Social Distance	45.82 (23-56)	5.29
Academic Integration	16.50 (7-24)	2.91
<u>Private Rights</u>	<u>8.58 (4-12)</u>	<u>1.78</u>

Note: Maximum possible range for each scale: General Knowledge 9-54, Behavioral Knowledge 3-18, Contact Quantity 1-10, Contact Quality: 0-35, Anxiety 4-20, Behavioral Control Attributions 1-9, Causal Control Attributions 1-9, Social Desirability 0-33, Social Distance 14-56, Academic Integration 6-24, and Private Rights 3-12.

Table 4

Intercorrelations Between Predictor Variables and Attitude Dimensions

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. General Knowledge	1.00	.39**	.23**	.30**	-.16**	.07	-.32**	-.11*	.03	.37**	.12*	.06	.06
2. Behavioral Knowledge		1.00	.25**	.28**	-.28**	.08	-.19**	-.09	-.05	.32**	.29**	.06	.16**
3. Contact Quantity			1.00	.68**	-.25**	.14*	-.05	-.19**	-.01	.20**	.05	.07	.14*
4. Contact Quality				1.00	-.24**	.16**	-.10	-.18**	.06	.29**	.16**	.05	.08
5. Anxiety					1.00	-.19**	.07	.12*	-.14**	-.41*	-.31**	-.18**	-.26**
6. Behavioral Control Attributions						1.00	.19**	-.17**	-.08	.13*	.25**	.07	-.08
7. Causal Control Attributions							1.00	.01	-.05	-.22**	-.05	.02	-.04
8. Gender ^a								1.00	.01	-.21**	-.22**	.02	-.22**
9. Social Desirability									1.00	.06	-.03	.01	.00
10. Social Distance										1.00	.48**	.30**	.31**
11. Academic Integration											1.00	.24**	.29**
12. Private Rights												1.00	.19**
13. Behavioral Intention													1.00

^a variable coding: female-0, male-1

Table 5

Summary of Regression Results for Predictors on the Set of Dependent Variables

Predictor	Wilks' Λ	F^a	partial η^2
General Knowledge	.95	5.16**	.04
Behavioral Knowledge	.96	4.38**	.04
Contact Quantity	.97	3.13*	.02
Contact Quality	.98	2.68*	.02
Anxiety	.89	13.47**	.11
Behavioral Control Attributions	.96	3.82**	.03
Causal Control Attributions	.98	2.23	.02
Gender	.95	5.18**	.04
<u>Social Desirability</u>	.99	.37	.00

^a df = 3,310.

* $p < .05$, ** $p < .01$

Table 6

Summary of Regression Results for Social Distance

Predictor	<i>b</i>	<i>SE</i>	<i>t</i>	partial η^2
General Knowledge	.18**	.05	3.39	.03
Behavioral Knowledge	.17	.10	1.64	.00
Contact Quantity	-.17	.14	-1.26	.00
Contact Quality	.08*	.03	2.35	.01
Anxiety	-.59**	.09	-5.96	.10
Behavioral Control Attributions	.21	.18	1.12	.00
Causal Control Attributions	-.36	.16	-2.22	.01
Gender	-1.32*	.55	-2.39	.01
Social Desirability	-.00	.05	-.02	.00

* $p < .05$, ** $p < .01$.

Table 7

Summary of Regression Results for Academic Integration

Predictor	<i>b</i>	<i>SE</i>	<i>t</i>	partial η^2
General Knowledge	-.02	.03	-.65	.00
Behavioral Knowledge	.21**	.06	3.56	.03
Contact Quantity	-.22**	.08	-2.72	.02
Contact Quality	.03	.02	1.74	.01
Anxiety	-.24**	.06	-4.11	.05
Behavioral Control Attributions	.37**	.11	3.39	.03
Causal Control Attributions	-.06	.09	-.59	.00
Gender	-.93**	.33	-2.88	.02
Social Desirability	-.03	.03	-.94	.00

** $p < .01$.

Table 8

Summary of Regression Results for Private Rights

<u>Predictor</u>	<i>b</i>	<i>SE</i>	<i>t</i>	<u>partial η^2</u>
General Knowledge	.02	.02	.80	.00
Behavioral Knowledge	.01	.04	.21	.00
Contact Quantity	.04	.05	.70	.00
Contact Quality	-.01	.01	-.45	.00
Anxiety	-.11**	.04	-2.85	.02
Behavioral Control Attributions	.03	.07	.43	.00
Causal Control Attributions	.04	.06	.64	.00
Gender	.27	.22	1.25	.00
<u>Social Desirability</u>	-.01	.02	-.43	.00

** $p < .01$.

Table 9

Summary of Logistic Regression Results for Behavioral Intention

<u>Predictor</u>	<i>b</i>	<i>SE</i>	Wald	Odds Ratio
General Knowledge	-.01	.03	.16	.99
Behavioral Knowledge	.10	.05	3.42	1.10
Contact Quantity	.10	.07	2.16	1.10
Contact Quality	-.02	.02	1.74	.97
Anxiety	-.21**	.05	15.93	.81
Behavioral Control Attributions	-.31**	.09	10.80	.73
Causal Control Attributions	.03	.08	.12	1.02
Gender	-1.03**	.29	12.82	.36
<u>Social Desirability</u>	-.02	.03	.35	.98

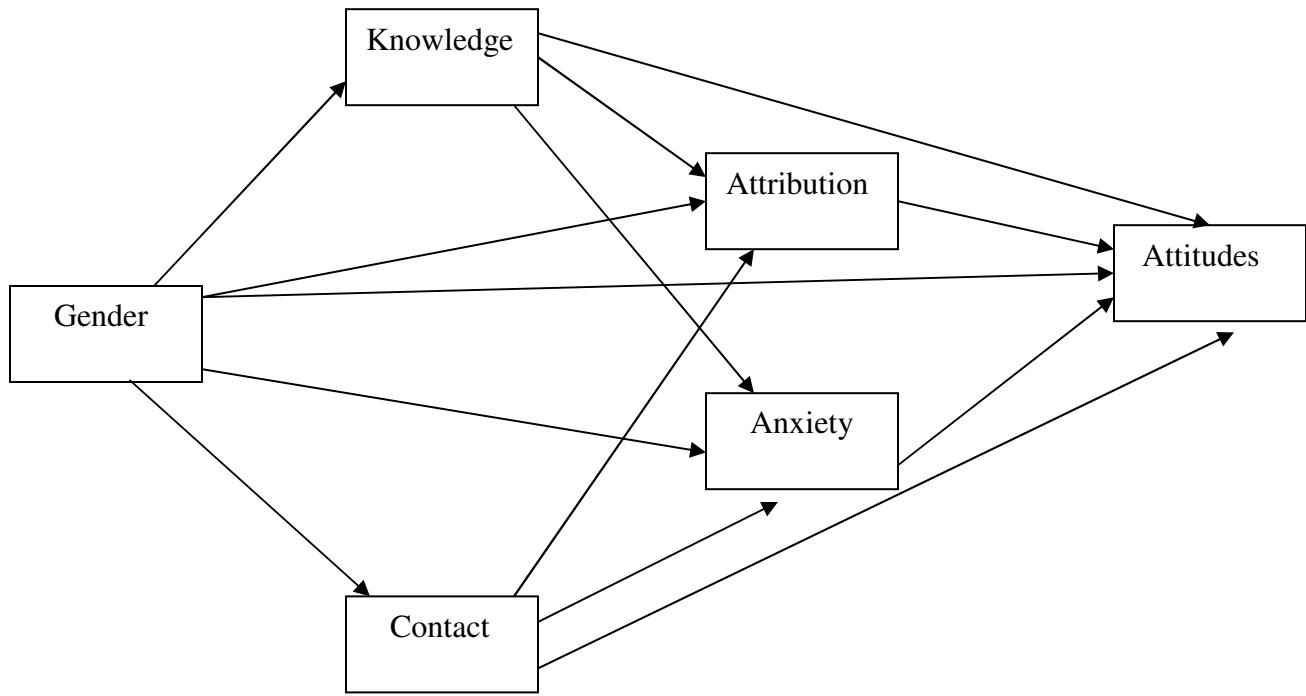
** $p < .01$.

Table 10

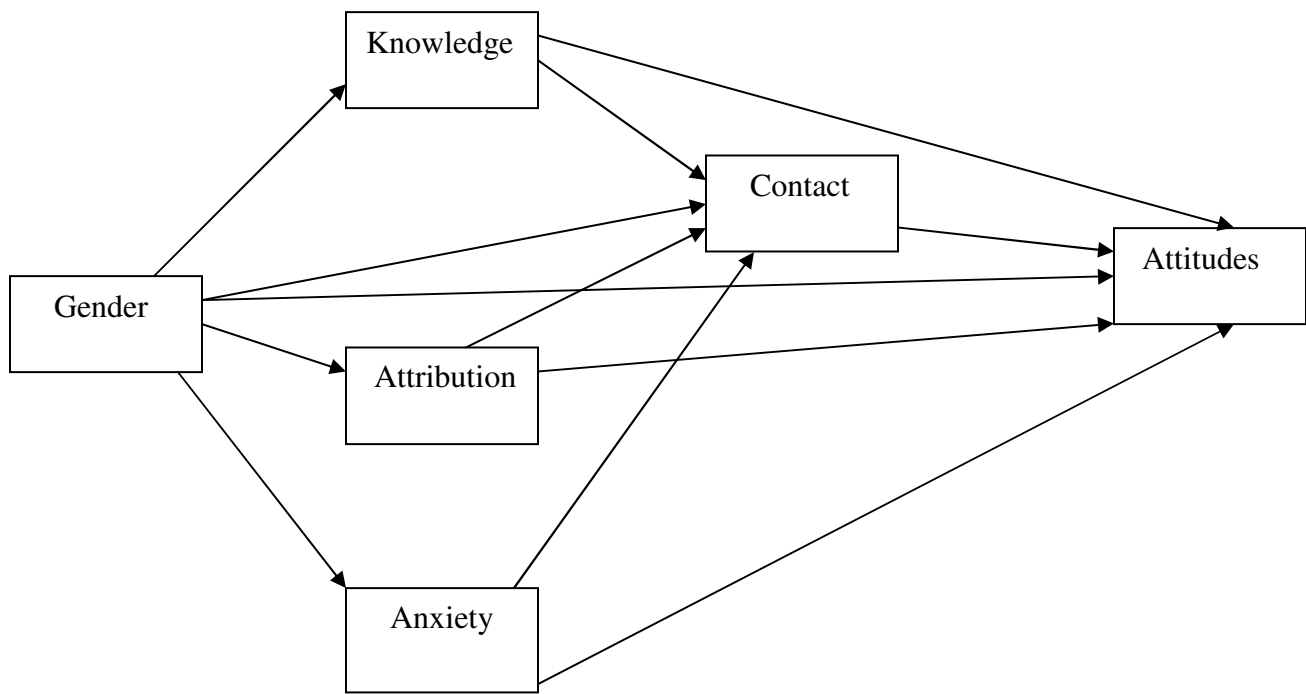
Overall Summary of Study Results

<u>Predictor</u>	<u>Outcome</u>
Greater general knowledge	Desire for less social distance
Greater behavioral knowledge	Greater support for academic integration
Less contact	Greater support for academic integration
More positive contact quality	Desire for less social distance
Lower anxiety	Desire for less social distance Greater support for academic integration Less support for right of businesses not to serve people with autism Greater likelihood of volunteer intent
Attributions of more behavioral control	Greater support for academic integration
Attributions of less behavioral control	Greater likelihood of volunteer intent
Female gender	Desire for less social distance Greater support for academic integration Greater likelihood of volunteer intent

Note: causal control attributions and social desirability were not significant predictors of any attitude dimension.

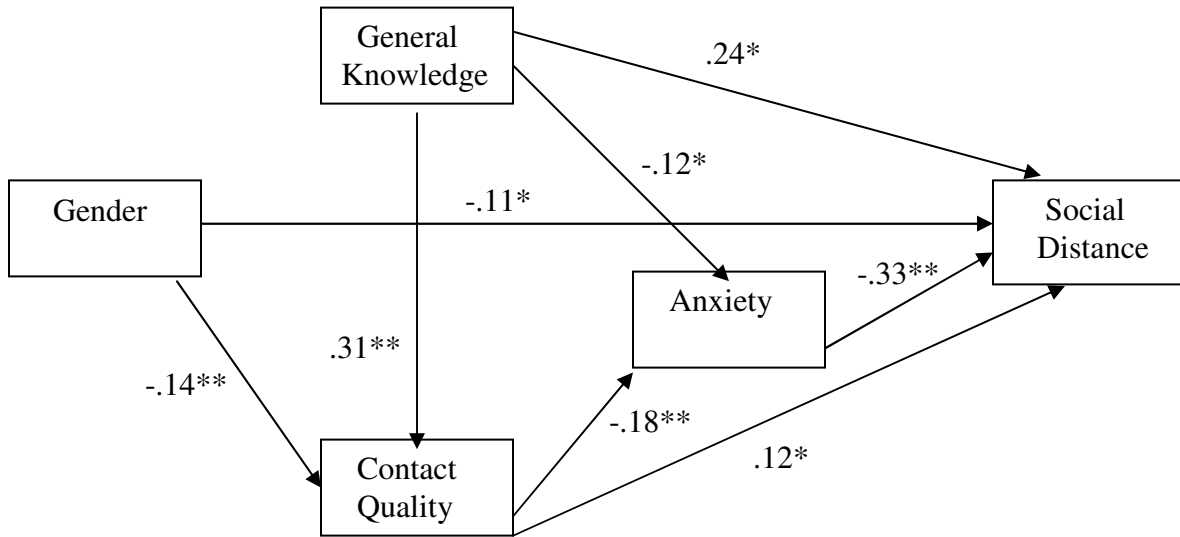


Model A

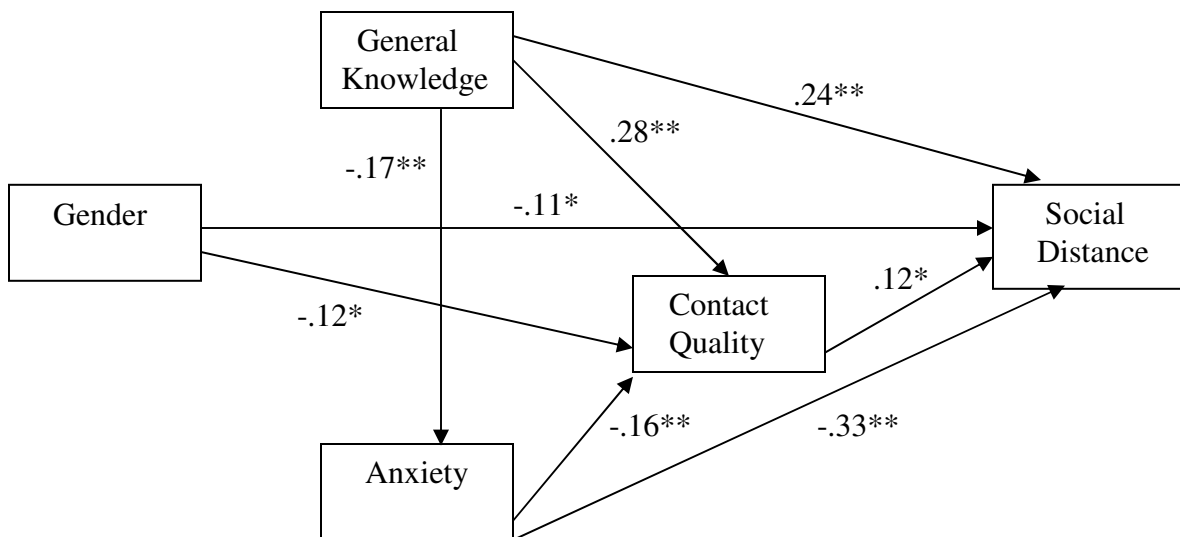


Model B

Figure 1. Path Diagrams of Proposed Mediation Models.



Model A-1

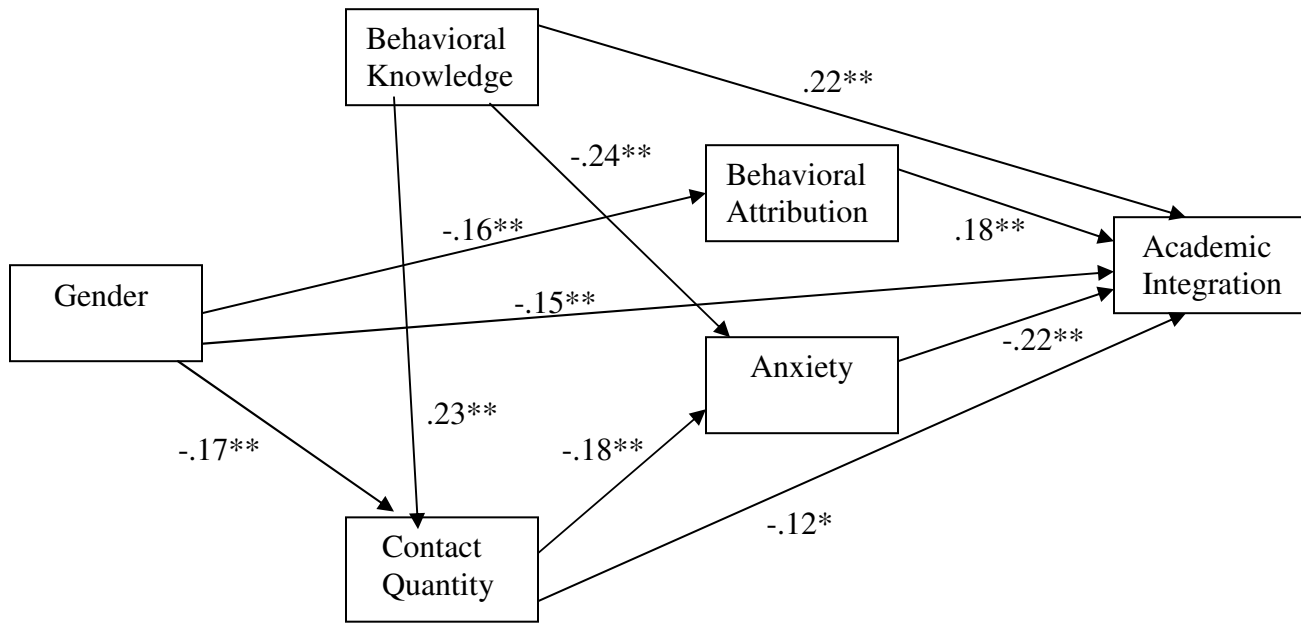


Model B-1

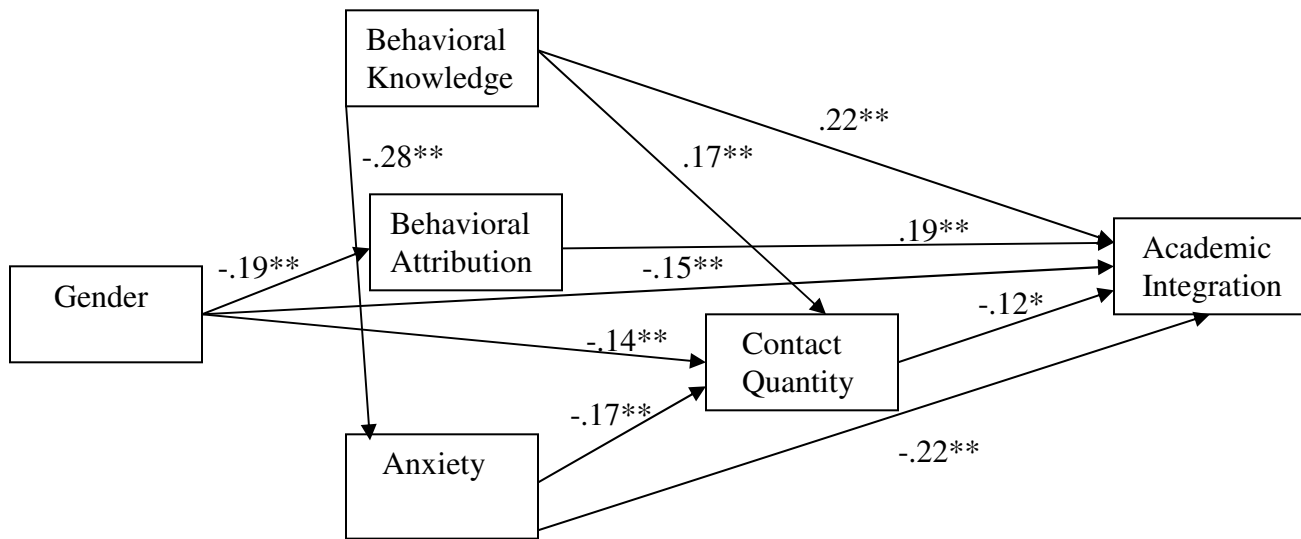
Figure 2. Final Mediation Models for Social Distance.

Note: Standardized regression parameters reported and non-significant paths are not shown.

* $p < .05$, ** $p < .01$.



Model A-2

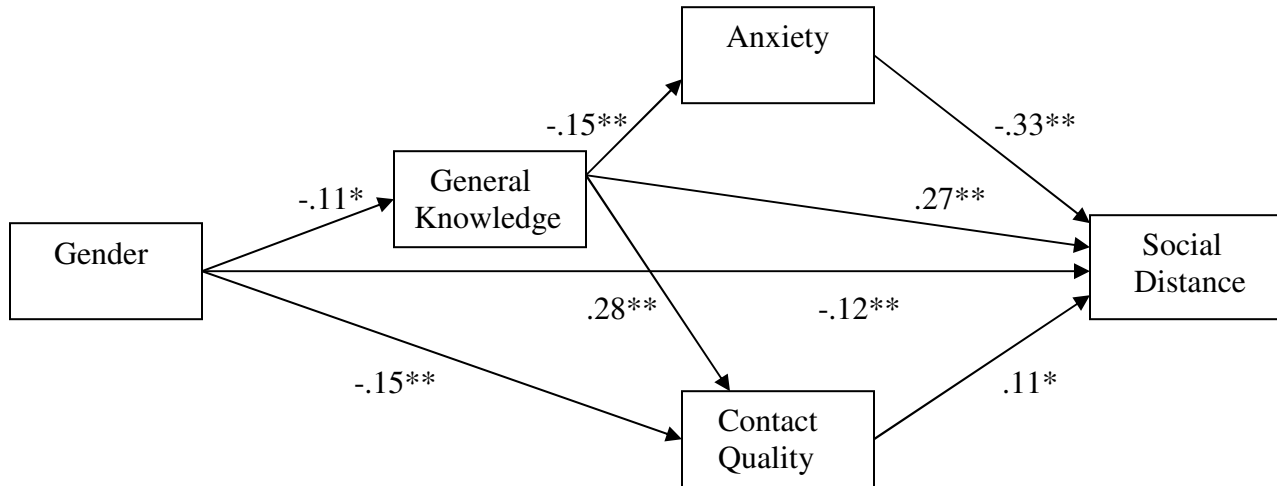


Model B-2

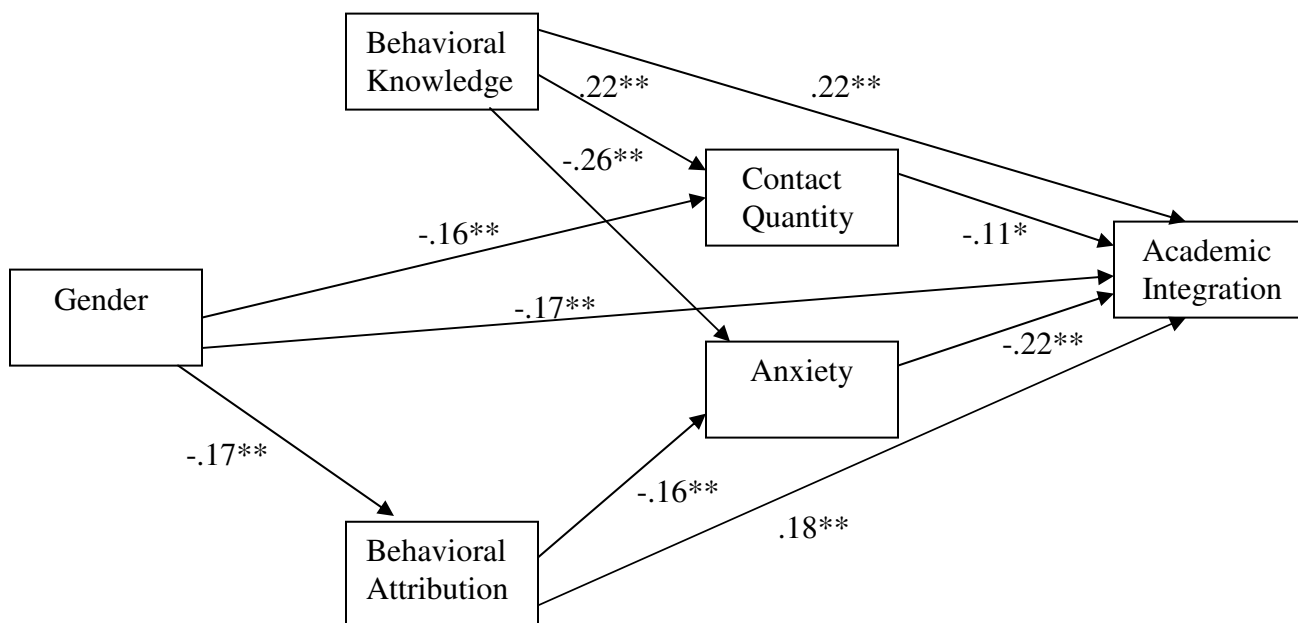
Figure 3. Final Mediation Models for Academic Integration.

Note: Standardized regression parameters reported and non-significant paths are not shown.

* $p < .05$, ** $p < .01$.



Model A



Model B

Figure 4. Path Diagrams of Alternative Mediation Models for Social Distance and Academic Integration.

Note: Standardized regression parameters reported and non-significant paths are not shown.

* $p < .05$, ** $p < .01$.

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