Impacts of vocational interest on undergraduate students' attitudes toward persons with disabilities

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ABSTRACT

Research into the concerning persistence of disability bias in the U.S. indicates that increased knowledge about disabilities promotes more positive attitudes toward persons with disability. This study explored higher education, specifically academic major and vocational interest, as one venue through which to better understand the attitudes that young adults hold toward persons with disability. Drawing on a sample population of 766 undergraduate students, it examined respondents' social distance, attitudes held toward entering into social relationships with persons with disability. It first compared the social distance expressed by students majoring in human service-oriented fields of study, where interactions and contact with individuals with disabilities is expected and disability-related training is integrated into their academic curriculum, versus students in non-service-oriented fields of study, where contact with persons with disabilities is considered incidental to the profession. No statistically significant differences in social distance attitudes were found between these groupings. When academic major was analyzed individually, several majors showed meaningful patterns in reported social distance, though none were statistically significant. However, lower social distance attitudes did appear to correlate with respondents who have had regular contact experiences with persons with disability, a finding which raises particular opportunities for higher education institutions. Implications for research, educational training, and program development are discussed.

Keywords: Attitudes, disabilities, vocational interest, undergraduate students, social distance theory

INTRODUCTION

Although nearly three decades have passed since the adoption of the Americans with Disabilities Act (1990), educators, service providers, researchers, and policymakers have noted with concern that improvement in public attitudes toward persons with disability has been inadequate. A number of studies have suggested that an important mechanism for change lies in deepening individual experience with and knowledge about disability conditions. Greater familiarity with disabilities has been shown to lead to more accepting attitudes toward inclusion of persons with disabilities across education, work, and social contexts (Campbell, Gilmore, & Cuskelly, 2003; Center & Ward 1987; Forlin, Douglas, & Hattie, 1996; Rice, 2009). However, the nature and sources through which a person acquires greater knowledge about disabilities are diffuse and difficult to pinpoint.

One line of inquiry has focused on the impact of higher education in disability-related issues (Chan, Lee, Huen, & Chan, 2002; Hampton & Xiao, 2013). As a learned disposition, attitudes are constructed within particular social and historical contexts (Tregaskis, 2000). Understanding the influences within higher education which impact undergraduate students' disability bias offers an important nuance in disability studies. As the percentage of young adults entering college rises, higher education settings function as an increasingly important setting through which individuals gain knowledge of and experiences with disability.

A range of studies have focused on the attitudes which college students hold toward persons with disability, including their thoughts and actions in areas of dating and marriage, work, and education (Hunt & Hunt, 2000; Seo & Chen, 2004; Hergenrather & Rhodes, 2007). Some research suggests that choice of academic major, and by implication vocational interest, has an effect on students' compassionate attitudes toward disability and could be "an indicator of acceptance of persons with disability" (Luck, 2011; Seo & Chen, 2009, p. 4). Proportionately higher positive attitudes have been reported among students majoring in health sciences, education/special education, social work, and psychology, as compared to majors such as business, economics, engineering, and the physical sciences (Hampton & Xiao, 2013; Horner-Johnson et al., 2000; MacLean & Gannon, 1995; Yazbeck, McVilly, & Parmenter, 2004). More broadly, Shannon, Tansey, and Tansey (2009) found a significant difference in positive attitudes between human service majors and students majoring in fields not related to human services.

Such findings, however, have not been universal. Utilizing the Scale of Attitudes toward Disabled Persons (SADP), Tervo, Palmer, and Redinius (2004) observed that health professional students held less favorable attitudes than SADP instrument norms. Further, in their study of college students, Gordon, Tantillo, Feldman, and Perrone asked participants to report the "number of courses or workshops they had taken part in that focuses on disability issues" (2004, p. 52). They determined that workshop education had little impact on the attitudes students held toward social relationships with persons with disability.

Given these mixed findings, this study endeavors to assess the degree to which choice of college major, and by implication, vocational interest, is associated with variations in attitudes toward persons with disabilities (Chan et al., 2002; Hampton & Xiao, 2013; Horner-Johnson et al. 2000). It specifically measures the nature and extent to which students indicate they would engage in various social relationships with individuals with different disability types. Rather than focusing on one specific vocational area, such as kinesiology, nursing, or education, the study examines an entire spectrum of disciplines, including majors from the humanities, fine arts, social sciences, physical sciences, pre-health fields, engineering, business, and education. It

considers each major individually, while also grouping students majoring in human service-oriented fields of study, where interactions and contact with individuals with disabilities is expected, compared to students in non-service-oriented fields of study, where contact with persons with disabilities is considered incidental to the profession.

Research suggests that such professional and personal contact experiences with persons with disabilities can have a significant impact in shaping an individual's attitudes toward disability. Many studies have found that increased contact experiences correlate with more positive attitudes toward persons with disability, provided the contact experiences are meaningful ones (Hunt and Hunt, 2000; Kalyva and Agaliotis, 2009; McDougall, DeWit, King, Miller, & Killip, 2004; Seo and Chen, 2009). Significantly, it seems that the quality of contact – including regular, sustained, and personal interactions with persons with disability – may be more important in shaping attitudes than the quantity of contact experiences (Barr and Bracchitta 2012, 2015; Ishige & Hayashi, 2005; McManus, Feyes, & Saucier, 2010). If this pattern applies in a higher education context, it has potential implications for the powerful role that higher education might play in reducing disability bias through program and curriculum development.

To this end, the study surveys and analyzes the attitudes of undergraduate college students enrolled at a mid-sized public university in the southwestern US. The choice of sample population is notable because the current generation of undergraduate students represents the first age cohort to have been raised entirely within the legislated culture of inclusion that followed the major successes of the Disabilities Rights Movement. They have attended schools, patronized places of employment, and lived in neighborhoods with legally-mandated inclusion of persons with disabilities. Their attitudes toward persons with disability may therefore be a particularly important signpost in understanding contemporary attitudes toward disability.

Attitudes Research: Utilizing Social Distance Scales

Given that attitudes encompass several elements, including beliefs (a cognitive component), feelings (an affective component), and actions or the intention to act (a behavioral component), it is important to situate how attitudes are operationalized within this study (Kowalska & Winnicka, 2013; Lam et al., 2010; Morin et al., 2013; ten Klooster, 2009; Tervo et al., 2004). Within the context of disability studies, a positive attitude signals a belief that persons with disability can participate as full members in society and are capable of self-determination (Tervo et al., 2004; Morin, Rivard, Crocker, Boursier, & Arsenault, 2013). Attitudes can also be translated, as explained by Oulette-Kuntz, Burge, Brown, and Arsenault (2010), as the degree of interactional distance that individuals prefer to maintain between themselves and persons with a disability. A positive attitude may therefore be indicated by a person's willingness to engage in increasingly close social relationships with a person with disability, a concept and methodology developed by Bogardus (1932) and known as a social distance scale. Social distance scales commonly measure a person's disposition toward entering into relationships ranging in familiarity from workplace colleagues to neighbors to friends to dating and marriage.

This study investigates attitudes held toward persons with disability by utilizing a refined version of Bogardus' Social Distance Scale (SDSB). Research has indicated that the study of attitudes in disability research may be especially sensitive when attention is paid to both (a) the social context of attitude creation and operation, and (b) specific disability type (Antonak & Livneh, 1988; Hergenrather & Rhodes, 2007; Shannon, Tansey, & Schoen, 2009; Tregaskis, 2000; Wong, Chan, Cardoso, Lam, & Miller, 2004). Many studies have focused on attitudes

toward persons with disabilities without parsing differences in attitudes toward specific disabilities, or have focused on one disability type, such as intellectual disability (Hampton & Xiao 2007; Krajewski & Flaherty 2000; Ouellette-Kuntz et al., 2010). Researchers have pointed out the need for studies which examine comparative social distance attitudes toward multiple groups (Ouellette-Kuntz et al., 2010). Toward this end, this study distinguishes ten types of disability, such as physical disabilities, sensory disabilities, intellectual disabilities, and mental illness. Further, it measures social distance attitudes toward persons with disabilities across a range of social relationships, including marriage, kinship, friendship, co-workers, and neighbors. It considers how these responses are influenced by contact experiences with persons with disability, differentiating among no contact, infrequent contact, regular contact as classmates, co-workers, or friends, and regular contact as kin members. Building on the findings, the study assesses how higher education programs might tailor their curricular and co-curricular components to encourage the kinds of experiences that might lessen disability bias.

Purpose of the Study

The purpose of this research was threefold:

1. To investigate the degree to which academic major (and thereby vocational interest) is associated with variations in attitudes and acceptance of persons with disabilities, across multiple disability types.
2. To ascertain if students in human service-oriented fields of study hold differing attitudes toward a variety of social relationships with persons with disabilities when compared to students majoring in non-service-oriented fields of study.
3. To take into consideration the degree to which prior contact experience with persons with disability is associated with academic major and attitudes toward disability.

METHOD

Procedure

This research study utilized a cross-sectional design, the procedures of which were reviewed and approved for human subject ethics compliance by the Institutional Review Board at the participating university. The study was conducted at a mid-sized, Hispanic-serving public university located in the southwestern US. Questionnaires were administered to undergraduate students enrolled in classroom settings from a variety of undergraduate majors and all grade levels. The questionnaires were distributed to purposively selected classes representing human service-oriented majors/fields of study and non-service-oriented majors/fields of study. After a brief introduction to the study, students signed the consent forms and completed the questionnaires. Once completed, consent form identifiers were separated from the questionnaire and both were returned to the proctor. The consent process and questionnaire took about 20 minutes to complete.

Participants

The sample consisted of 766 undergraduate students, ranging in age from 18 to 70 years, with a mean age of 22.71 years (SD = 4.66). Whereas many studies have targeted participants

with personal connections to individuals with disability (Horner-Johnson et al., 2002), this study targeted conceptual perceptions of the young adult public broadly, regardless of personal connection to individuals with disability. Of the participants, 54% (n = 415) were female and 46% (n = 351) were male. Adhering to census separation of race and ethnicity, respondents were asked to indicate their race and, secondly, whether they identify as Hispanic/Latino. In describing their race, 60.4% indicated they were White, 6.9% were Black, 1.6% were Asian American, 1.5% were American Indian, 1.9% were multiracial, and a large number of respondents (27.8%) self-identified as "Other" racial groups (likely a reflection of the large number of respondents who reported Hispanic ethnicity). The majority of participants self-identified as Hispanic (72%, n = 550). Participants were asked questions to determine their relative SES, including their mother and father's highest level of education and typical yearly household income growing up. Median income for the annual family income was between $40,000 and $49,999, and more than half of parents completed at least a high school education. Table 1 presents respondents' sociodemographic characteristics (Appendix).

Participants self-reported their college major, including a total of seventeen majors which spanned the colleges of Engineering, Arts and Sciences, Business, Agriculture, and Education and Human Performance. The authors grouped the majors into two categories: human service-oriented fields and non-service-oriented fields (following similar models in Horner-Johnson et al., 2002; Shannon, Schoen, & Tansey, 2009), as represented in Table 2 (Appendix). A total of 59% of students identified a major classified as a human service-oriented major.

Instruments

To measure social distance attitudes, the study utilized the Baseline Survey on Public Attitudes toward Persons with a Disability (PATPWD) survey instrument, which was implemented in 1998 and again in 2010 by the Equal Opportunities Commission of Hong Kong (Policy 21 LTD, 2011). The instrument carries the advantages of measuring attitudes toward ten disability types and across a range of relationships, including marriage, kinship, friendship, co-workers, and neighbors. The authors requested and received permission to use and modify the instrument. The PATPWD instrument was revised by the authors, shortening the content for length and relevance to the study's purpose.

The survey instrument contained a ten-item demographic sheet and four content items which measure social distance attitudes toward ten disability types (physical impairment, sensory impairment, chronic illness, HIV/AIDS, mental illness, intellectual disability, specific learning disability, ADD/ADHD, autism, and visceral disability).

Data Analysis

Descriptive analyses were first conducted for all variables. A t-test was performed to examine how social distance differs by college majors (e.g., human service-oriented majors vs. non-service-oriented majors). All analyses were conducted using Stata 14.0 (StataCorp. 2015).

RESULTS

The study first assessed respondents' social distance (SDSB) by querying their willingness to engage in social relationships with persons with ten disability types, in the

following situations: (1) marriage; (2) becoming a close kin by marriage; (3) becoming a next door neighbor; (4) becoming a friend; (5) becoming a fellow employee (co-worker); (6) avoiding contact. Participants were asked to 'check' each type of social relationship to declare their consent or 'uncheck' to withhold it. Social distance was therefore measured as a sum of the 'unchecked' answers for the first five situations together with 'checked' for the "avoiding contact" response. Each type of relationship was weighted differently: 1 point was given for unchecked "marriage," 2 points for unchecked "a close kin by marriage," 3 points for unchecked "a neighbor," 4 points for unchecked "a friend," 5 points for unchecked "co-worker," and 6 points for checked "avoid contact," following Bogardus' Social Distance Scale, which is a cumulative scale (Guttman scale). The scale values were arranged so as to cover a 6-point scale. A higher score signaled a greater social distance and therefore that the respondent held more negative attitudes toward persons with disabilities. The study excluded from the dataset respondents who checked only one type of relationship consistently across all types of disabilities because their responses were invalid for analysis. As such, the analyses on SDSB were based on 422 samples.

Figure 1 reports descriptive statistics for respondents' expressed social distance (SDSB) by type of disability (Appendix). The average SDSB results were 7.08, with standard deviation of 0.95, on a scale where 1 indicates the least possible social distance and 10 represents the greatest. The least social distance was expressed toward persons with physical impairment (M = 6.24, SD = 3.38), chronic illness (M = 6.26, SD = 3.51), learning disabilities (M = 6.28, SD = 3.46), sensory impairment (M = 6.41, SD = 3.42), ADD/ADHD (M = 6.43, SD = 3.66), and visceral disability (M = 6.74, SD= 3.57). Respondents specified the greatest social distance from persons with HIV/AIDS (M = 9.17, SD = 5.53), following by mental illness (M = 8.02, SD = 4.47), intellectual disability (M = 7.32, SD = 3.81), and autism (M = 7.13, SD = 3.59).

Respondents consistently indicated that the relationship in which they were most willing to engage was friendship, followed by neighbor and co-worker. For these three relationship scenarios there was relatively little variation in acceptance across types of disability, with the exception of HIV/AIDS, and to a lesser degree, mental illness. Across all ten disability types, respondents were least willing to marry a person with disability; few respondents were willing to marry an individual with HIV/AIDS (5%), mental illness (12%), intellectual disability (21%) or autism (15%). They displayed greater openness to marrying a person with physical impairment (51%), chronic illness (61%), learning disability (54%), and ADD/ADHD (57%). A similar pattern was noted with attitudes toward close kin relationships. Most respondents did not indicate that they would "avoid" a person with disability, with the exception of HIV/AIDS, which had a substantial positive response rate for the prompt "would avoid contact" (81%), as indicated in Figure 2 (Appendix).

Majors and social distance scale

Having established this baseline understanding of the sample population's average social distance values according to relationship and disability type, the study investigated whether social distance varies based on academic major and its implied vocational interest. The seventeen majors reported by the respondents were grouped into two categories: human service-oriented majors (e.g., psychology, sociology, social work, etc.) and non-service-oriented majors (e.g., engineering, business, computer science, etc.). Table 3 (Appendix) displays SDSB for human-service-oriented majors compared to students in non-service-oriented majors. The researchers

failed to find any statistically significant differences. There was negligible difference in the SDSB mean for seven of the ten disability types, including: physical impairment (d = 0.01), ADD/ADHD (d = 0.02), sensory impairment (d = 0.05), intellectual disability (d = 0.07), learning disability (d = 0.07), visceral disability (d = 0.07), chronic illness (d = 0.12). A more notable difference was observed for HIV/AIDS (d = 0.28), mental illness (d = 0.33), and autism (d = 0.43); human service-oriented majors displayed a lower SDSB compared to non-service-oriented majors for each of these disability types. It is worth noting that these three disability types had three of the four highest SDSB means of the ten disability types, both in the overall sample and when separated into human service-oriented versus non-service-oriented majors.

In the event that the grouping of majors into human service-oriented and non-service-oriented groups reflected analytical bias or masked individual academic major differences this study also examined SDSB by each major separately. The pattern of association between majors and SDSB was not consistent across types of disability and no statistically significant differences were detected; however, overall patterns were observed for three human service-oriented majors: communication sciences and disorders (CSDO), kinesiology, and education. It was expected that these three majors would express lower SDSB compared to the average of other majors because of the explicit training and instruction that students in those majors receive in disability-related topics. For instance, the CSDO curriculum includes instruction and/or clinical experience in physical impairment, sensory impairment, intellectual disability, learning disability, autism, and visceral disability. While CSDO tended to be lower than the average level of SDSB in each type of disability, kinesiology appeared to be higher than the average level of SDSB across almost all types of disability, as seen in Figure 3 (Appendix). The SDSB in education majors showed a mixed pattern – lower than average in most types of disability, but higher SDSB in certain types of disability, including autism, ADD/ADHD, and visceral disability.

Influence of Prior Contact Experiences

To further understand some of the key variables which might influence the respondents' social distance attitudes, the study probed the extent to which they have had prior contact experiences with persons with disability. Following recommendations by Miller et al. (2009, p. 214), the survey queried contact in a way that assessed (1) type of relationship, (2) category of disability, and (3) frequency of contact with persons with each disability type. Participants were asked to indicate if they have never had contact with a person with disability, do not have regular contact but sometimes meet, or have regular contact with a person with disability as (1) a classmate or co-worker, (2) friend, or (3) family member. For analytical simplicity, the contact experience with disabilities was constructed using three dummy variables: '1' indicated that the respondents had no contact, '2' indicated that the respondents had no regular contact but sometimes met a person with disability, '3' indicated that respondents had regular contact, either as family members or relatives, and '4' indicated that respondents had regular contact either as friends, classmates or colleagues. The item measured responses for each of the ten specific disability types.

As indicated in Table 4 (Appendix), respondents reported the most regular contact with individuals with chronic illness (67%, n = 547), ADD/ADHD (59%, n = 454), and learning disabilities (49%, n = 378). They had less regular contact with persons with visceral disability (34%, n = 262), autism (32%, n = 243), mental illness (30%, n = 227), intellectual disability (28%, n = 213), sensory impairment (28%, n = 216), and physical impairment (21%, n = 163). It

was very rare for the respondents to have regular contact with persons with HIV/AIDS (less than 5%).

Generally, across all types of disability, people who had regular contact with persons with disabilities tended to have lower social distance than those who either never had contact or sometimes met individuals with that disability type, as indicated in Table 5 (Appendix). Contact experiences appeared to have significant association with a lower social distance for six of the ten disability types, including ADD/ADHD (F (2,146) = 11.08, p <.001), intellectual disability (F (2,146) = 6.69, p <.05), mental illness (F (2,146) = 6.95, p <.01), visceral disability (F (2,146) = 6.58, p <.01), autism (F (2,146) = 4.84, p <.01), and chronic illness (F (2,416) = 3.44, p <.05). In the case of autism, respondents who reported that they sometimes met persons with autism reported a lower SDSB mean (M = 6.71) than those who had regular contact with persons with autism (M = 6.81). As a supplementary analysis, the researchers also tested whether there were any significant differences across different forms of regular contact – family members/relatives, classmates/colleagues at work, and friends. No significant differences were detected.

The study then analyzed whether contact experience correlated with human service-oriented majors versus non-service-oriented majors. Three statistically significant findings were detected, including that human service-oriented majors were less likely to have never had a contact experience with a person with a learning disability and that non-service-oriented majors were more likely to have regular contact experiences with persons with mental illness and with persons with physical impairment. None of these statistically significant findings hold considerable explanatory value. However, there were several non-statistically significant patterns which were noteworthy. For seven of the ten disability types, human service-oriented majors were more likely to have never met a person with that particular disability type (HIV/AIDS, autism, and visceral disability being the exceptions). Across all ten disability types there was very little difference between human service-oriented versus non-service-oriented majors in their reported rates for casual interactions with persons with disability ("no regular contact, but sometimes meet"). Although human service-oriented majors were slightly more likely to report having a family member with a disability, indicating more regular interaction for six of the ten disability types, the amount of difference compared to non-service-oriented majors was negligible. With one exception (visceral disability), human service-oriented majors were actually less likely to have regular contact as friends, classmates, or co-workers with a person with disability, though there was less than a 10% difference in the reported rates.

DISCUSSION

A number of studies have found that academic major may be an "indicator of acceptance" of persons with disability (Seo & Chen, 2009, p. 4; Shannon, Tansey, & Schoen, 2009). In this study, two approaches were used to analyze the impact of academic major upon attitudes. The first was to group academic majors broadly into human service-oriented and non-service-oriented majors and to analyze differences in social distance attitudes between these two groupings. While some studies have found patterns of statistical significance based upon similar groupings (Horner-Johnson et al., 2002; Shannon, Tansey, & Schoen, 2009), no statistically significant differences were found in this study when respondents were categorized into human service-oriented and non-service-oriented majors.

When each major was examined individually as a second strand of analysis, several majors showed meaningful patterns in their reported SDSB as compared to average SDSB,

although none were statistically significant. Some majors that have been shown in prior studies to be associated with more positive attitudes, such as social work and psychology (Horner-Johnson et al., 2002), were not correlated in this study with pronounced patterns in lowered social distance. General patterns did emerge for three academic majors which are tied to vocations in which interaction with and services to persons with disability is characteristic of the profession and training in such matters is integrated into curriculum: communication sciences and disorders (CSDO), kinesiology, and education. Communication sciences and disorders majors reported a lower than average SDSB across almost all types of disability, while kinesiology majors displayed a higher than average SDSB. Education majors had mixed results, with lower than average SDSB for some disability types and higher than average SDSB for others. However, the category of 'education major' is a broad one, and encompasses students pursuing specializations in secondary, primary, and special education contexts. This may mask important distinctions, as Hampton and Xiao (2013) found that special education majors held more positive attitudes toward persons with intellectual disabilities than education majors, a difference they attributed to coursework on disabilities.

Beyond choice of academic major, the impact of such explicit coursework or training in disability-related matters may be an important one in promoting more positive attitudes toward persons with disability (Folsom-Meek, Nearing, Groteluschen, & Krampf, 1999; Hampton & Xiao, 2007; Seo & Chen 2009; Wang et al., 2003). Chan et al. (2002), for instance, found that after one year of study occupational therapy students held more positive attitudes toward disability than business students, which they credited to clinical curriculum. In this study, respondents were queried regarding their academic major, but not their academic standing in school (freshmen, sophomore, etc.) or specific disability-related training completed. Consequently, it was not possible to control for level of education or educational training within the analysis of academic major (MacLean & Gannon, 1995). While the academic majors categorized into the human service-oriented grouping share in common that each degree program contains some amount of formal training in disability-related topics, it is not known on the basis of the survey results which aspects of the curriculum the students had already encountered at the time of their survey completion. In future research, it would be beneficial to be able to distinguish between the respondents' grade level in school and precise disability-related training completed.

The lack of statistically significant findings by academic major or human service-oriented field of study may also be complicated by respondents' level of education. Several studies have found that higher levels of education (in any field of study) are correlated with more positive attitudes (Lau & Cheung, 1999; McDonald & MacIntyre, 1999; Morin et al., 2013; Ouellette-Kuntz et al., 2010; Yazbeck, McVilly, & Parmenter, 2004). Since all of the respondents in this study had completed some level of college education, it may flatten differences in attitudes within the sample population by academic major. A comparative sample to respondents who have completed more and less education may display important distinctions.

In order to assess other key variables which might impact social distance attitudes the study queried the extent to which respondents had prior contact experiences with disability. Previous studies have indicated that regular, sustained, and emotionally-engaged interactions with persons with disability tends to lower a person's attitudes toward social distance, indicating more positive attitudes. For six of the ten disability types, the sample population showed that regular contact with a person with that disability correlated with a lower social distance. Notably, as evident in Table 5 (Appendix) three of the four disability types for which respondents reported

the lowest regular contact rates (HIV/AIDS, regular contact = 5%; physical impairment, regular contact = 21%; sensory impairment, regular contact = 28%) were three of the four disability types for which there was no statistically significant correlation with a lower SDSB mean.

Although contact experiences with a person with disability as a classmate, co-worker, friend, or family member appeared to lessen social distance attitudes, it did not surface that regular contact experiences corresponded with respondents' pursuit of a human service-oriented versus non-service-oriented major. No statistically significant associations were found when contact experience was analyzed between these two groupings. While quality contact experiences therefore seemed to be significant in lessening disability bias, in this study they did not have a strong association with the choice of vocational pursuit, as indicated by academic major.

Limitations of the Study

To more precisely understand the nature of disability-related bias, the results of the present study must be viewed within its limitations, including the confines of its generalizability. In addition to those considerations discussed above, it is important to note that all of the study participants were university students attending the same southwestern Hispanic-serving university, and the majority of participants were Hispanic (72%, n = 550). As such, the findings of this study may not be representative of populations outside of the sample and general geographic region.

Secondly, there are limitations related to the instrument the study used to measure contact, attitudes, and social distance. The survey instrument may have forced respondents into making a choice that was not accurately reflective of their individual beliefs and attitudes. It also required that respondents be able to recognize and understand categories of some disability types. Furthermore, the study used cross-sectional data from a single year, which does not allow evaluation of causal associations with regard to contact experience and social distance, including distinctions between contact experiences made inside or outside of a higher education setting. Further studies would benefit from addressing the frequency, extent, type, and context of interactions that participants may have had with persons with disabilities in relationship to attitudes held and contact experiences.

Finally, the weaknesses of this study are those inherent to survey research. It is possible that the respondents gave 'socially desirable' responses. These survey responses may not have been consistent with their actual behavior or attitudes, but rather what they considered to be socially acceptable. The study did not control for spurious effects of response set bias and social desirability. The survey is a snapshot of attitudes and perceptions at a moment in time and does not necessarily predict future opinions or behavior.

Implications for Higher Education and Research

The manner in which disability attitudes are influenced by interacting variables of vocational interest, contact experience, and education are complex, affording practitioners in higher education opportunities both for further research and for applied programmatic development. Although this study did not find correlations of statistical significance in the attitudes held by human service-oriented majors versus non-service-oriented majors, it did corroborate studies which have found a link between contact experiences with persons with

disability and attitudes held toward those disability types. Consistent with previous research, this study indicates that the quality and quantity of contact experience with individuals with disabilities is highly influential on the attitudes held toward disability (Hunt & Hunt, 2000; Kalyva & Agaliotis, 2009; McDougall et al., 2004; Seo & Chen, 2009). A study conducted by Antonak, Mulick, Kobe, and Fiedler (1995) on attitudes held toward persons with intellectual disabilities determined that higher levels of education were associated with more positive attitudes toward persons in need of intermittent support (correlating with mild intellectual disabilities). However, when it came to persons with limited to extensive support needs (correlating with moderate to several intellectual disabilities), education level was not the most important variable impacting positive attitudes; rather, it was familiarity or contact (Antonak et al., 1995).

In this study, the general pattern shows that more sustained contact with persons with a specific disability type appeared to contribute to reduced social distance toward that disability group. This is noteworthy for colleges and universities tasked with the preparation of human service-oriented professionals, educators, health providers, and rehabilitation professionals. Early and frequent contact with individuals with disabilities, such as field- or practice-based opportunities as part of a preparation program, may have significant bearing on shaping positive attitudes for future human service-oriented professionals. Importantly, the most transformative experiences may be those in which the nature of interactions are emotionally engaging, as well as regular or sustained. Facilitating such quality, contact-based, interactional settings within the curriculum of an educational program may be particularly important, since this study, as well as previous studies, have shown mixed results regarding the impact that academic major and formal training on disabilities-related topics has on attitudes or biases (Gordon et al., 2004). Providing future human service-oriented students with positive interactional experiences within their program of studies has potential for influencing a paradigm shift toward full-inclusion for persons with disabilities within their communities.

University preparation programs have additional fortuity to influence societal attitudes and change the broader perceptions and opportunities of persons with disabilities. The current demographic group in higher education – young millennial generation students who have come of age wholly in an era of legally mandated civil rights and societal inclusion – may be particularly well poised to build on previous contact experiences with the kind of more sustained, regular relationships that lead to meaningful attitudinal shifts. The present study can support researchers and higher education preparation programs in understanding how best to meet the needs of educating and shaping attitudes toward persons with disabilities in their pursuit of human service-oriented professions. Future research should further consider the intricacies of professional preparation contact experiences and their potential outcomes for diminishing disability bias.

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APPENDIX

Table 1. Respondents' sociodemographic characteristics

Variable	Mean/Percentage	SD	N
Gender			766
Female	54.00%		
Male	46.00%		
Age	22.71	4.66	738
Hispanic	71.79%		748
Race			748
White	60.43%		
African American	6.91%		
Human service-oriented majors	58.66%		765
Cultural background			767
American	38.85%		
Mexican American	38.46%		
Languages			767
English	57.37%		
Spanish	9.13%		
Both English and Spanish	30.38%		
Religious affiliation			765
Christian	36.34%		
Catholic	47.84%		
Mother's highest level of education			765
Some high school	11.76%		
High school	34.12%		
Associate's degree/technical degree	16.73%		
≥College graduates	30.98%		

Father's highest level of education		764
Some high school	14.53%	
High school	35.90%	
Associate's degree/technical degree	14.14%	
≥College graduates	23.44%	
	Income level	
Annual household income		750
Lower quartile (25th percentile)	< $25,000	
Median (50th percentile)	$ 40,000-$49,999	
Upper quartile (75th percentile)	≥$75,000	

Table 2. College Majors reported by respondents, categorized into human service-oriented and non-service-oriented majors

Human Service Oriented Majors		Non-Human Service-Oriented Majors	
	Percentage (N)		Percentage (N)
Psychology	3.92 % (N=30)	Engineering	10.20% (N=78)
Sociology	1.31 % (N=10)	Business	9.93% (N=16)
Criminology/Criminal Justice	11.76 % (N= 90)	Agriculture	12.81% (N=98)
Education	6.93 % (N=53)	Computer Science	0.92% (N=7)
Social Work	2.35 % (N=18)	Natural Science	1.18%(N=9)
Biomedical Sciences	4.18 % (N=32)	Liberal Arts	2.35% (N=18)
Kinesiology	4.84 % (N=37)	Political Science/History	1.70% (N=13)
Human Sciences	3.53 % (N=27)		
Communication Sciences & Disorder	16.21% (N=124)		

Table 3. SDSB by Service Oriented Majors and Non-Service Oriented Majors (N=419)

Type of Disability	Human Service-Oriented Majors	Non-Human Service-Oriented Majors
	Mean	Mean
Physical Impairment	6.26	6.25
Sensory Impairment	6.40	6.45
Chronic Illness	6.31	6.19
HIV/AIDS	9.07	9.35
Mental Illness	7.90	8.23
Intellectual Disability	6.31	6.24
Learning Disability	6.31	6.24
ADD/ADHD	6.44	6.46
Autism	6.99	7.42
Visceral Disability	6.78	6.71

Note: Mean of SDSB by majors was tested using t-test.

Table 4. Percentage of students who have contact with the following persons with a disability

Type of disability	No, never	No, regular contact but sometimes meet	Yes, have regular contact	
			As family or relatives	As classmates/colleagues or as friends
	% (n)	% (n)	% (n)	% (n)
Physical Impairment	30.90 (n=237)	47.07 (n=361)	10.04 (n=77)	11.21 (n=86)
Sensory Impairment	27.90 (n=214)	43.02 (n=330)	12.78 (n=98)	15.38 (n=118)
Chronic Illness	9.78 (n=75)	17.60 (n=135)	50.76 (n=420)	16.56 (n=127)
HIV/AIDS	76.40 (n=586)	16.95 (n=130)	1.96 (n=15)	3.00 (n=23)
Mental Illness	30.25 (n=232)	39.37 (n=302)	17.08 (n=131)	12.52 (n=96)
Intellectual Disability	29.60 (n=227)	41.33 (n=317)	12.26 (n=94)	15.51 (n=119)
Learning Disability	19.95 (n=153)	29.73 (n=228)	17.99 (n=138)	31.29 (n=240)
ADD/ADHD	16.17 (n=124)	23.21 (n=178)	24.12 (n=185)	35.07 (n=269)
Autism	27.38 (n=210)	40.55 (n=311)	17.08 (n=131)	14.60 (n=112)
Visceral Disability	33.12 (n=254)	32.20 (n=247)	28.29 (n=217)	5.87 (n=45)

Note: Number in parentheses is number of cases in each category.
Percentage may not add up to 100% due to missing cases and rounding

Table 5. Mean of SDSB by contact experience and type of disability (*n*=419)

	Never	Sometimes meet	Regular contact	Total	*F* Statistics
Physical Impairment	6.35	6.30	5.96	6.23	0.44
Sensory Impairment	6.50	6.46	6.14	6.37	0.43
Chronic Illness	7.51	6.46	6.01	6.22	3.44*
HIV/AIDS	9.45	8.31	8.23	9.18	1.6
Mental Illness	8.98	8.15	6.94	8.01	6.95**
Intellectual Disability	7.86	7.7	6.32	7.32	6.69**
Learning Disability	6.83	6.48	5.95	6.27	2.26
ADD/ADHD	8.01	6.84	5.8	6.39	11.08***
Autism	8.06	6.75	6.9	7.12	4.84**
Visceral Disability	7.42	6.87	5.95	6.71	6.58**

*** $p < .001$; ** $p < .01$; * $p < .05$
Note: between groups degree of freedom = 2; within group degree of freedom = 416.

Table 6. Percentage of students who have contact with the following persons with a disability by majors

Type of disability	Majors	No, never	No, regular contact but sometimes meet	Yes, I have regular contact As family or relatives	Yes, I have regular contact As classmates/colleagues or as friends
		% (n)	% (n)	% (n)	% (n)
Physical Impairment ***	Service oriented major	34.67(n=173)	43.89(n=219)	10.04 (n=77)	9.22(n=46)
	Non-service oriented major	24.06(n=64)	53.01(n=141)	11.02(n=55)	14.66(n=39)
	Total	30.98(n=237)	47.06(n=360)	10.07(n=360)	11.11(n=85)
Sensory Impairment	Service oriented major	28.86(n=144)	41.48(n=207)	8.27(n=22)	14.43(n=72)
	Non-service oriented major	26.32(n=70)	45.86(n=122)	10.15(n=27)	16.92(n=45)
	Total	27.97(n=214)	43.01(n=329)	12.81(n=98)	15.29(n=117)
Chronic Illness	Service oriented major	11.42(n=57)	18.44(n=92)	54.71(n=273)	14.03(n=70)
	Non-service oriented major	6.77(n=18)	16.17(n=43)	55.26(n=147)	20.68(n=55)
	Total	9.80(n=75)	17.65(n=135)	54.90(n=420)	16.34(n=125)
HIV/AIDS	Service oriented major	77.15(n=385)	16.43(n=82)	1.80(n=9)	3.21(n=16)
	Non-service oriented major	79.19(n=200)	17.67(n=47)	2.26(n=6)	2.63(n=7)
	Total	76.47(n=585)	16.86(n=129)	1.96(n=15)	3.01(n=23)
Mental Illness*	Service oriented major	31.46(n=157)	38.48(n=192)	18.24(n=91)	10.62(n=53)
	Non-service oriented major	28.20(n=75)	40.98(n=109)	14.66(n=39)	16.17(n=43)
	Total	30.33(n=232)	39.35(n=301)	16.99(n=130)	12.55(n=96)
Intellectual Disability	Service oriented major	30.46(n=152)	39.88(n=199)	13.83(n=69)	14.23(n=71)
	Non-service oriented major	28.20(n=75)	43.98(n=117)	9.40(n=25)	17.67(n=47)
	Total	29.67(n=227)	41.31(n=316)	12.29(n=118)	15.42(n=118)
Learning Disability**	Service oriented major	21.64(n=108)	30.66(n=150)	20.04(n=100)	27.66(n=138)
	Non-service oriented major	16.92(n=45)	29.32(n=78)	14.29(n=38)	37.59(n=100)
	Total	20.00(n=153)	29.80(n=228)	18.04(n=138)	31.11(n=238)
ADD/ADHD	Service oriented major	16.43(n=82)	23.45(n=117)	25.85(n=129)	32.87(n=164)
	Non-service oriented major	15.79(=42)	22.03(n=61)	21.05(n=56)	39.10(n=104)
	Total	16.21(n=124)	23.27(n=178)	24.18(n=185)	35.03(n=268)
Autism	Service oriented major	25.85(n=129)	41.48(n=207)	18.64(n=93)	13.63(n=68)
	Non-service oriented major	30.45(n=81)	38.72(n=103)	14.29(n=38)	16.17(n=43)
	Total	27.45(n=210)	40.52(n=310)	17.12(n=131)	14.51(n=111)
Visceral Disability	Service oriented major	31.26 (n=156)	31.66(n=158)	30.46(n=152)	6.01(n=30)
	Non-service oriented major	36.84 (n=98)	33.08(n=88)	24.06(n=64)	5.64(n=15)
	Total	33.20(n=254)	32.16(n=246)	28.24(n=216)	5.88(n=765)

Note: Contact experiences by majors was tested using chi-square test. * p<.05; ** p<.01; ***p<.001

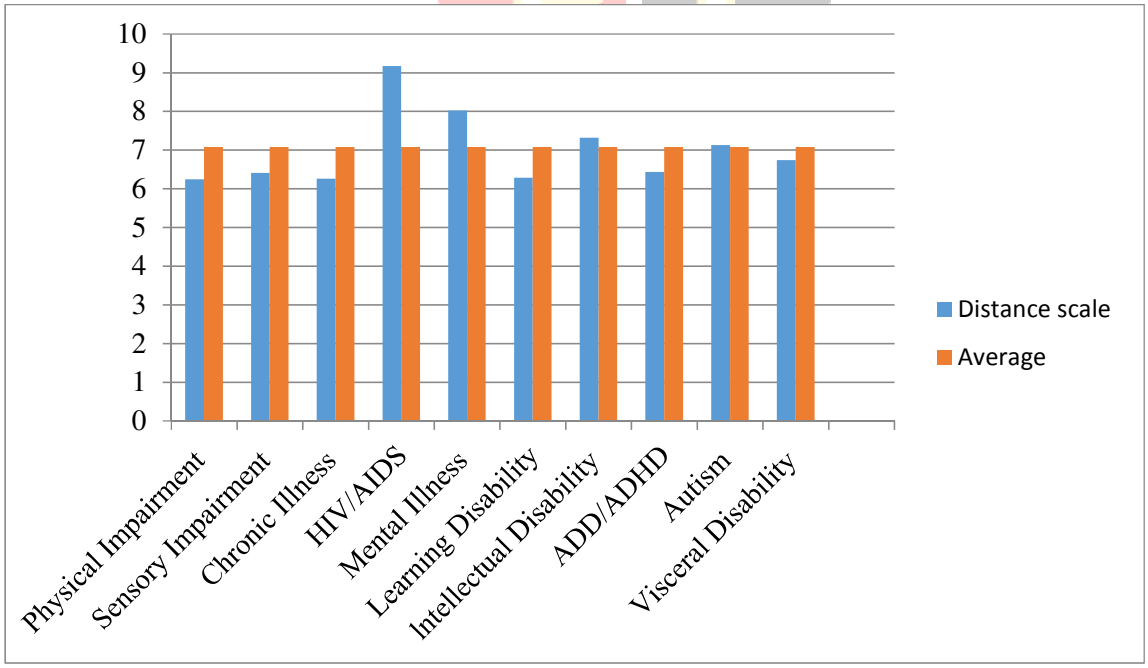

Figure 1. Social Distance Scale Bogardus (SDSB) by Type of Disability

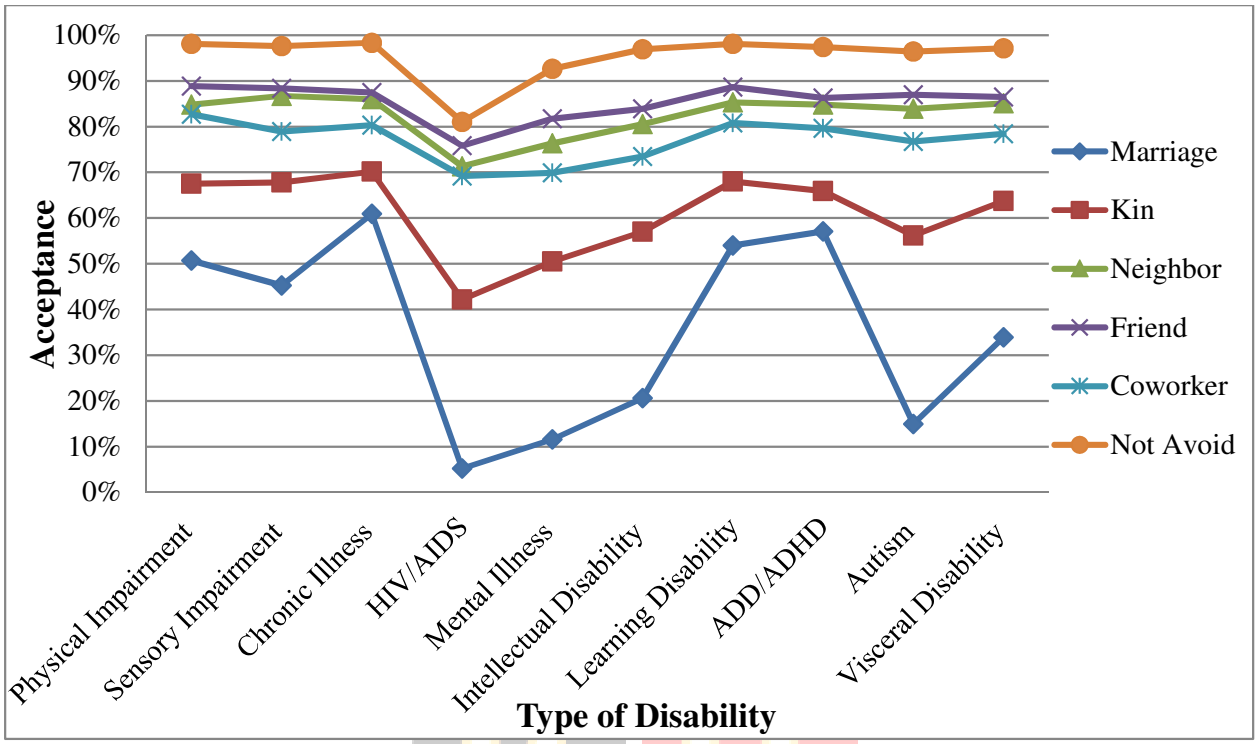

Figure 2. Percentage of respondents who accept a person with disabilities by the type of relationship (n = 422).

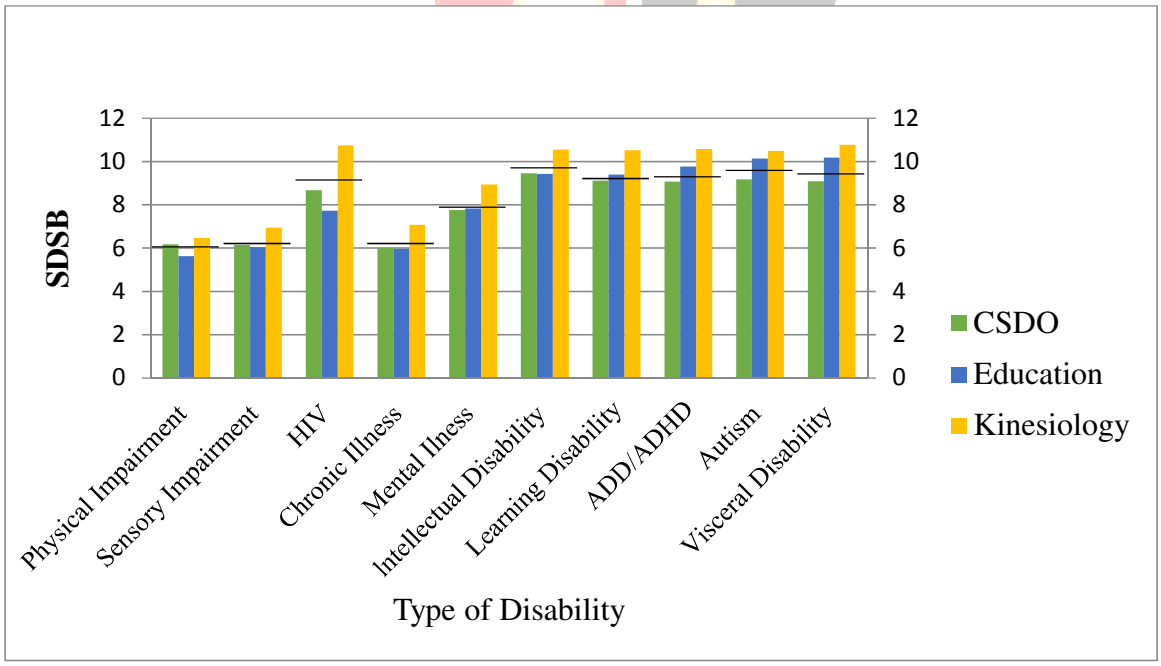

Figure 3. SDSB for three human service-oriented majors