

# Students with Autism Spectrum Disorder in the University Context: Peer Acceptance Predicts Intention to Volunteer

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**Abstract** With growing numbers of individuals with autism spectrum disorder (ASD) entering post-secondary institutions, strategies are needed to facilitate the social integration of these students. The goal of this study was to examine the role of various factors in university students' acceptance of, and intention to volunteer with, a peer with ASD. Both contact quantity and quality emerged as significant predictors of acceptance; however, for those who had experienced direct contact with individuals with ASD, only perceived quality emerged as significant. Moreover, acceptance played a significant role in participants' likelihood of signing up to volunteer. These findings point to the central role that positive experiences play in attitude formation for this population.

**Keywords** Autism spectrum disorder · Acceptance · Post-secondary education · Behavioral intent · Peers

## Introduction

As we gain a better understanding that individuals on the autism spectrum represent a range of functioning levels (Charman et al. 2011), and research and societal attention subsequently turn to issues surrounding post-high school educational and vocational options, it is expected that post-secondary education institutions will be increasingly opening their doors and including students with autism spectrum disorder (ASD). This is supported by data from a recent national longitudinal study conducted for the United

States Department of Education indicating that approximately 35 % of individuals with ASD went on to enroll in a two- or four-year college program (Shattuck et al. 2012). From the perspective of the World Health Organization's (WHO) International Classification of Functioning, Disability, and Health (ICF) model, individual characteristics and surrounding contextual factors are continually engaged in a dynamic interaction that impacts upon one's perceived level of functioning: "in ICF disability and functioning are viewed as outcomes of interactions between *health conditions* (diseases, disorders and injuries) and *contextual factors*" (WHO 2002, p. 11; emphasis theirs). Societal attitudes, in particular, are seen as a critical environmental factor. In the context of post-secondary education, typically developing peers' attitudes toward students with ASD may play a significant role in the extent to which such students are able to participate in their college or university community.

Although high functioning individuals with ASD have the intellectual capacity necessary to meet the demands of a college or university curriculum, it may be the characteristic social-communication difficulties and co-morbid anxiety that present the greatest obstacles to achieving academic success (White et al. 2011). Moreover, typically developing peers' lack of awareness and understanding regarding the origins of related behaviours may exacerbate such difficulties. There is a small but growing body of literature that addresses the difficulties students with ASD may encounter in post-secondary settings, and that proposes strategies for college and university support staff to implement to ease this critical transition (Geller and Greenberg 2012; Hart et al. 2010; Stodden and Zucker 2004; Welkowitz and Baker 2010). However, there is a paucity of work that examines how surrounding contextual factors may facilitate or hinder the success of students with

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ASD. From the perspective of the ICF model, it is important to determine whether typically developing college and university students have an accurate understanding of ASD, how such knowledge impacts their attitudes, as well as their willingness to engage in interaction. An important first step, which is the purpose of this research, is to identify important contributors to typically developing peers' acceptance of a peer with ASD, as well as how acceptance translates into action. Such knowledge will shed light on areas that, if targeted, could improve typically developing students' attitudes toward classmates with a social disability and, in turn, facilitate the educational success and social integration of students with ASD in post-secondary settings. This information is helpful for developing efforts directly for students with ASD, as well as for informing the development of more comprehensive programs that target and promote a broader educational milieu of acceptance. For example, this research is particularly relevant to peer mentorship programs that aim to promote integration and inclusion of diverse students, as results provide insight into the relationship between peers' cognitions (i.e., attitude) and behaviour, and highlight components to be included within training that promote acceptance, and in turn, foster prosocial behaviour.

The majority of research investigating peers' attitudes toward individuals with ASD has been conducted with elementary-aged children (Campbell et al. 2004; Morton and Campbell 2008; Swaim and Morgan 2001) or with pre-service or practicing teachers (Helps et al. 1999; Park and Chitiyo 2011; Park et al. 2010), and in contexts that vary significantly from that of a post-secondary education environment. Emerging adulthood, which is the developmental stage of the majority of undergraduate students, is characterized by improved perspective taking abilities, and likely increased tolerance, acceptance, and openness to diversity (Balswick et al. 2005). As such, this may be a unique opportunity in which incorporating elements identified as critical to promoting acceptance of others could further facilitate typically developing peers' openness as well as establish an environment in which students with ASD can experience greater social and academic success.

Two studies have focused on college students' attitudes toward peers with ASD. Nevill and White (2011) presented participants with a vignette describing a student living in the same apartment building, and examined how openness differed depending on a number of factors, including gender, family history of ASD (i.e., having a first degree relative), academic program (social sciences, engineering, physical sciences, or 'other,' which included those with a dual-major), and presence of ASD symptoms [as measured by the Autism-Spectrum Quotient (AQ); Baron-Cohen et al. 2001]. The hypothetical target individual, "Jamie," was not explicitly identified as having ASD, although the vignette

described social-communication difficulties, as well as instances of restricted behavioural patterns. Overall, there were no significant differences between males' and females' openness, although there were differences on a few individual items. In comparing a small subset of students ( $n = 18$ ) with a first-degree relative with ASD to a randomly selected matched sample of those without, those with a relative demonstrated significantly higher openness. There were also no overall differences across those with different academic majors, although there were significant differences across groups on three individual items. Students in the social sciences were the least fearful of "Jamie", and engineering students the most. Physical science majors indicated the greatest openness to spending time with the target individual, and those in the 'other' category the least. Finally, those in the 'other' group saw "Jamie" as most different from themselves, whereas engineering students saw the fewest differences. Interestingly, although no significant differences emerged on overall openness between matched samples of students with and without clinically significant AQ scores, those with more ASD characteristics ( $n = 13$ ) were less likely to see themselves as different from the target individual. The significant association between having a first-degree relative with ASD and openness points to the potential importance of exposure; however, only limited conclusions about the nature of this relationship can be drawn. Although having an affected relative likely increases one's awareness of the disorder, great variability regarding the degree of contact, as well as the quality of such relationships is expected, and these mediating factors were not specifically examined. Moreover, only very small samples of individuals with and without a relative ( $n = 18$ ) and high AQ scores ( $n = 13$ ) could be examined, and new information may be gleaned if these variables are examined in a continuous, predictive capacity.

Mahoney (2008) examined some of these questions in more detail. Predictors of college students' attitudes (students' desired social distance, views regarding academic integration, and perceptions of the rights of business owners not to serve people with ASD) toward, and intention to volunteer with, individuals with ASD were investigated, including gender, knowledge (of ASD), quantity and quality of previous interpersonal contact experiences, anxiety about mental health (i.e., feelings of fear and uneasiness about people with ASD), attributions of controllability (i.e., the extent to which respondents believe that the 'target' individual or group can control their behaviour), and socially desirable response tendency. With the exception of the latter two, all emerged as significant predictors of attitude. Gender, anxiety, and beliefs about control were significant predictors of behavioural intent. Overall, females reported more positive attitudes, a finding that is generally consistent in the literature (lobst et al.

2009; Morton and Campbell 2008; Park and Chitiyo 2011; Park et al. 2010), and also demonstrated greater intention to interact. The finding that knowledge was a significant predictor of attitude mirrors research with elementary-aged children in the ID field indicating that improvements in disability-related knowledge are accompanied by improvements in attitude (Ison et al. 2010; MacDonald and MacIntyre 1999; Swaim and Morgan 2001). The knowledge measure utilized in this study is well-known, though outdated; yet, the research provides insight into the complementary roles of contact quantity and quality. However, the attitude dimensions examined may serve as a limitation, as views regarding the rights of business owners not to serve people with ASD, for example, likely represent contexts that are unfamiliar to participants. As such, respondents may have been inclined to provide answers that they believed were socially appropriate, thereby providing little variability or insight into the nature of these processes. This may also be the case with the behavioural intention item, as participants were asked to indicate whether they were interested in receiving more information about volunteer opportunities. Such phrasing may have encouraged individuals with little intention of following through to be spuriously scored as having positive intent.

The findings are also consistent with those found in elementary schools. For example, previous exposure to individuals with ASD appears to be particularly important for elementary-aged students, whether structured (Gus 2000; Ison et al. 2010; Whitaker et al. 1998) or unstructured (McHale and Simeonsson 1980). Research with teachers also demonstrates that those who had previously interacted with children with ASD felt more comfortable teaching them and demonstrated more positive attitudes toward them (McGregor and Campbell 2001; Park et al. 2010). However, as demonstrated by Prather and Chovan (1984), the quality of past interaction experiences may be more important than simply quantity, as they found that elementary students' attitudes towards peers with ASD actually became more negative following an academic intervention. They hypothesized that this was due to the nature of the intervention (i.e., focused academic activities vs. free-play), although Kamps et al. (1998) did not find such a preference, as participating children enjoyed the interpersonal nature of peer-to-peer interaction regardless of activity type. The importance of the quality of previous contact with individuals with intellectual disabilities (ID), above and beyond contact quantity and disability-related knowledge, is further corroborated by McManus et al.'s (2010) research with undergraduate students. This research needs to be expanded within the specific context of ASD, so the role of different kinds of contact (i.e., both direct and indirect exposure) can be examined, as well as how these experiences interact with perceived positivity to influence acceptance.

The purpose of this study was to examine how various factors influence university students' acceptance of, and intention to volunteer with, a peer with ASD. This study will expand on previous work in indicating potentially important factors related to peer attitudes and their intentions to volunteer with students with ASD in a university setting.

## Method

### Participants

Participants included 202 undergraduate students ( $M = 20.31$  years of age) enrolled in an introductory Psychology course, 74 % ( $n = 150$ ) of whom were female.

**Table 1** Participant demographic characteristics

	<i>n</i> (%)
Gender	
Male	52 (25.7)
Female	150 (74.3)
Age (years)	
17–19	69 (34.2)
20–22	57 (28.2)
23–25	15 (7.4)
26+	61 (30.2)
Ethnicity	
Asian	116 (57.4)
Canadian	50 (24.8)
Mixed <sup>a</sup>	21 (10.4)
European	11 (5.4)
Other <sup>b</sup>	4 (2)
Academic program	
Arts and social sciences	109 (54)
Other <sup>c</sup>	40 (19.8)
Sciences	27 (13.4)
Interdisciplinary <sup>d</sup>	26 (12.9)
Academic progress	
Year 1	75 (37.1)
Year 2	66 (32.7)
Year 3	47 (23.3)
Year 4+	14 (6.9)

<sup>a</sup> This category included individuals who identified themselves as representing more than one ethnicity (e.g., European and Asian)

<sup>b</sup> This category included individuals who identified themselves as Black ( $n = 3$ ) or Latin American ( $n = 1$ )

<sup>c</sup> This category included communication, art and technology ( $n = 10$ ), business ( $n = 10$ ), health science ( $n = 7$ ), applied science ( $n = 5$ ), education ( $n = 4$ ), and undecided ( $n = 4$ )

<sup>d</sup> This category included individuals whose declared double majors or major and minor were in different faculties

Participants represented a diverse range of ethnicities, academic programs, and academic progress (i.e., year of study). With regard to ethnicity, a large proportion of the sample (57.4 %) self-identified as being Asian in cultural or ethnic background. This included East Asian (e.g., Chinese, Japanese, Korean, Polynesian), South Asian (e.g., Indian, Pakistani, Sri Lankan, Bangladeshi), Southeast Asian (e.g., Burmese, Cambodian, Filipino, Laotian, Malaysian, Thai, Vietnamese), and West Asian (e.g., Arabian, Armenian, Iranian, Israeli, Lebanese, Palestinian, Syrian, Turkish), and is characteristic of the student population diversity of the university where the research was conducted (SFU Teaching and Learning Centre 2011). Moreover, when the ethnicity variable was dummy coded and entered into the regression model, it was not significant ( $p = .15$ ). Ethnicity was therefore excluded from further analyses. See Table 1 for participant demographic characteristics.

## Measures

### *Autism Characteristics*

The AQ (Baron-Cohen et al. 2001) is a 50-item self-report questionnaire that assesses ASD characteristics across five areas: social skills, attention switching, attention to detail, communication, and imagination. Item responses are based on a 4-point Likert-type scale, ranging from “definitely agree” to “definitely disagree”. Item responses receive a score of 1 or 0 based on whether they are consistent with behaviours characteristic of ASD or not, and total scores range from 0 to 50. Respondents scoring 32 and above are considered to demonstrate a high number of ASD-like characteristics. Test–retest reliability was high ( $r = .70$ ), as measured over 2 weeks (Baron-Cohen et al. 2001). Internal consistency, as measured by Cronbach’s alpha, was .74 in our sample.

### *Quantity of Past Contact*

The Level-of-Contact Report (Holmes et al. 1999) provides individuals with a list of 12 statements describing varied levels of exposure to a person with mental illness, each of which is assigned a relative rank. Respondents are asked to check all those that describe their own experience, and the associated rank of the item representing the most intimate exposure level is assigned as the score. For example, if a participant endorses the highest-ranked item, “I have a severe mental illness,” the individual would be assigned a score of 12, regardless of the other items checked. Item wording was changed to reflect the purposes of this research (i.e., “a person with severe mental illness” was changed to “a person with autism”), with permission of the authors.

### *Quality of Past Contact*

Quality (i.e., perceived positivity) of previous exposure to individuals of ASD was assessed with a 6-item scale developed by McManus et al. (2010) to assess quality of contact with individuals with ID. Item responses are based on a 9-point Likert-type scale ranging from “strongly disagree” (1) to “strongly agree” (9), with higher scores indicating better quality contact. “Individuals with intellectual disabilities” was changed to “individuals with autism” with permission of the authors. As not all participants had previously had direct contact with individuals with ASD, it was determined that only those individuals who had actually interacted with an individual with ASD (as indicated by endorsing at least item 6 on the Level-of-Contact Report) would be scored on the Quality measure. Cronbach’s alpha on the overall scale was .84; however, an item was later removed (see explanation below), improving reliability to .91.

### *Knowledge*

The Autism Survey (Swiezy et al. 2005) is a 20-item questionnaire that assesses respondents’ knowledge of ASD. This is an updated version of Stone’s (1987) original Autism Survey that has been modified to reflect current knowledge of the disorder (e.g., changes in our understanding of comorbid mental retardation). Questions inquire about social and emotional features, cognitive characteristics, and general descriptive features. Respondents are asked to rate statements on a 6-point Likert-type scale that ranges from “fully agree” (1) to “fully disagree” (6). As per the scoring procedures outlined by Campbell and colleagues (1996), true items were reverse-scored, and higher scores indicate more accurate ASD-related knowledge. As we were interested in participants’ relative level of knowledge, we opted to use the measure as a continuous scale (as used by Campbell et al. 1996). As such, the ten items determined to be the most unambiguously true or false (e.g., “Autism is more frequently diagnosed in males than in females”), based on current understanding, were chosen for scoring (as determined by PhD- and PhD Candidate-level autism experts).

### *Acceptance*

The Openness Scale was originally developed by Harnum et al. (2007) to assess children’s attitudes towards a peer with autism, a peer with ADHD, and a typically developing child. This self-report instrument includes a vignette describing an individual who exhibits ASD-like behaviours, to which respondents rate 7 questions on a 5-point Likert scale ranging from 1 (“strongly disagree”) to 5

**Table 2** Scale descriptive statistics

Scale	<i>M (SD)</i>	Range
Autism characteristics	16.95 (5.93)	5–32
Contact quantity	5.70 (2.87)	1–12
Contact quality <sup>a</sup>	35.18 (7.93)	14–49
Knowledge	42.91 (5.19)	31–59
Acceptance item 1*	4.41 (.77)	1–5
<i>This person makes me feel afraid</i>		
Acceptance item 2	3.71 (.86)	1–5
<i>This person is probably as smart as I am</i>		
Acceptance item 3	4.40 (.70)	1–5
<i>I would not mind having Jamie living in my hallway or apartment building</i>		
Acceptance item 4	3.43 (.86)	1–5
<i>I would hang out with Jamie in my free time</i>		
Acceptance item 5	3.70 (.79)	1–5
<i>I would feel comfortable around this person</i>		
Acceptance item 6*	2.60 (1.0)	1–5
<i>This person is different from me</i>		
Acceptance item 7	4.01 (.71)	2–5
<i>Overall, I think I would like Jamie as a person</i>		
Acceptance total	26.26 (3.45)	13–35

\* Item was reverse-scored

<sup>a</sup> As noted, these statistics were calculated for the 89 participants who indicated that they had engaged in direct contact with an individual with ASD, and as such were scored on the Quality of Contact instrument

(“strongly agree”), although items 1 and 6 are reverse-scored. Scale items are presented in Table 2. Higher scores indicate greater openness. Internal consistency was acceptable (Cronbach’s alpha = .71). In this study, the measure was altered slightly to include a statement specifying that “Jamie” has a diagnosis of autism. Permission was granted to do so.

### *Intention to Volunteer*

Including a measure of respondents’ behavioural intention was used to investigate the degree to which individuals were willing to put their attitudes into action. This approach has been used in research examining attitudes toward various populations, including ID (Fortini 1987), ASD (Mahoney 2008), Down syndrome (Hall and Minnes 1999), and schizophrenia (Penn et al. 2003; Penn and Nowlin-Drummond 2001). This measure consisted of 1 item, and asked participants to provide their contact information if they were willing to sign up to volunteer with a local ASD organization. Those who provided contact information were scored as having positive ‘intention to volunteer’. It was expected that this would provide a

more accurate indication of behavioural intent than simply asking participants to provide their details if they wanted more information about opportunities, as they were led to believe that providing their information constituted signing up.

### Procedure

After obtaining approval from the University Research Ethics Board, study details were posted to the Psychology Department’s online Research Participation System. Participating undergraduate Psychology students provided their informed, written consent, completed the questionnaires in person, and were given 1 % course credit toward their final grade as incentive for participation.

### Results

All data analyses were conducted using SPSS Statistics, Version 19. The data were first converted to z-scores and screened for significant outliers, skew, and kurtosis. One outlier was detected on the contact quality variable. Upon further examination, it was revealed that the participant responded with a non-valid rating (‘0’) to 83 % of the scale items. This individual was therefore eliminated from all further analyses. An additional outlier was present on the acceptance variable, reflecting a low level of acceptance. As this particular score was not determined to be due to recording, entry, or instrumentation error, the outlier was retained (Stevens 2009). There were no significant deviations from normality. Descriptive statistics are provided in Table 2.

The level of autism characteristics reported is consistent with other research with same-aged university students (Baron-Cohen et al. 2001). In terms of previous contact, a slightly greater proportion had experienced only indirect (52.7 %) contact with someone with ASD, and 3 % of participants had no previous exposure. For those who had experienced indirect contact, the majority (42.3 %) had been exposed through the media (e.g., movie, television show, or documentary). For those who had experienced direct contact (44.3 %), it was either through a place of employment that served this population (14 %), or through contact with an affected friend or family member (29.9 %). One individual endorsed the item “I have autism.” Interestingly, this individual did not score above the autism cut-off on the AQ. Those who had experienced direct contact ( $n = 89$ ) indicated that these interactions were generally positive, as quality scale item responses demonstrated a negatively skewed pattern, with a mean response of 6.59 on a 9-point scale. The only exception was on item 3 (“Over the course of my life, I have had many friends who have

autism”), to which responses were positively skewed (mean response was 2.22). This is not unexpected as it is quite unlikely that individuals would have had “many friends” with autism. Cronbach’s alpha was examined to determine whether this item should be removed. The scale was found to demonstrate high internal consistency ( $\alpha = .84$ ) with item 3 included; however, reliability was significantly improved when item 3 was deleted ( $\alpha = .91$ ). As such, the decision was made to remove it. In terms of ASD-related knowledge, participants were generally quite knowledgeable. Relatively speaking, participants knew more about treatment (e.g., early intervention) and the capacity for attachment and affection, and relatively less about epidemiology (i.e., heritability and occurrence rates across gender) and prognosis. Overall, participants were quite accepting of “Jamie.” Most indicated that Jamie did not make them feel afraid (89 %), he was probably as smart as them (60.2 %), they would not mind him living in the same hallway or apartment building (94.1 %), felt comfortable around him (66.1 %), and would like him as a person (80.6 %). However, relatively fewer (48.8 %) indicated they would actually hang out with Jamie in their free time, and most (60.7 %) saw themselves as different from him. In terms of intention to volunteer, the sample was split with regard to demonstrating positive (47.8 %) and negative (52.2 %) intent.

### Acceptance

In order to examine the relations among the predictor variables and acceptance, two correlation analyses were conducted ( $\alpha$  was set at .01 to control for Type I error). The first analysis examined the relations among gender, autism characteristics, contact quantity, knowledge, and acceptance, in the full sample. Greater contact quantity was associated with being more accepting of ASD ( $r = .21$ ,  $p < .01$ ; see Table 3).

The second correlation analysis was conducted including only those individuals who had experienced direct contact ( $n = 89$ ), and examined the same relations with the addition of the contact quality variable (see Table 4). A significant association emerged between contact quality

**Table 3** Correlations between the predictors and acceptance (N = 201)

Predictor variables	Acceptance
1. Gender	.03
2. Autism characteristics	-.15
3. Contact quantity	<b>.21*</b>
4. Knowledge	.11

Bold indicates significant value

\*  $p < .01$

**Table 4** Correlations among the subset with direct ASD contact ( $n = 89$ )

Predictor variables	Acceptance
1. Gender	-.03
2. Autism characteristics	-.19
3. Contact quantity	.05
4. Contact quality	<b>.33*</b>
5. Knowledge	.14

Bold indicates significant value

\*  $p < .01$

**Table 5** Predictors of acceptance (N = 201)

	$\beta$	$t$	$p$
Gender	.05	.72	.47
Autism characteristics	-.13	-1.80	.07
Contact quantity	.19	2.64	<b>.01</b>
Knowledge	.04	.49	.62

Bold indicates significant value

and acceptance, such that more positive interaction experiences (i.e., those perceived as higher in quality) were associated with greater acceptance ( $r = .33$ ,  $p < .01$ ).

As all necessary assumptions were satisfied, a multiple regression analysis (forced entry method) was subsequently conducted with gender, autism characteristics, contact quantity, and knowledge entered as independent variables, and acceptance as the dependent variable. This model was significant,  $F(4, 196) = 3.28$ ,  $p < .05$ , indicating that the specified predictor variables accounted for 6.3 % of the variance in acceptance. Within the model, contact quantity was the only significant variable, and accounted for an additional 3.3 % of the variance in acceptance, above and beyond the other predictors ( $\Delta R^2 = .03$ ,  $p < .05$ ; see Table 5).

A second regression analysis was conducted including only those participants who had experienced direct interaction with an individual with ASD, and contact quality was included as a predictor in the model. This model significantly accounted for more of the variance in acceptance, as 13.6 % was explained,  $F(5, 83) = 2.62$ ,  $p < .05$ . Within this model, only contact quality was significant, and accounted for an additional 7 % above and beyond the other predictors ( $\Delta R^2 = .07$ ,  $p < .05$ ; see Table 6).

### Intent to Volunteer

As all necessary assumptions were satisfied, a logistic regression analysis (forced entry) was then conducted to predict intent to volunteer with gender, ASD characteristics, contact quantity, knowledge, and acceptance entered as predictors. Academic program (arts and social sciences

**Table 6** Predictors of acceptance among the subset with direct ASD Contact (n = 89)

	$\beta$	<i>t</i>	<i>p</i>
Gender	.07	.71	.48
Autism characteristics	-.12	-1.13	.26
Contact quantity	.09	.88	.38
Contact quality	.29	2.60	<b>.01</b>
Knowledge	.08	.78	.44

Bold indicates significant value

**Table 7** Predictors of intent to volunteer (N = 201)

	<i>b</i>	<i>Wald</i>	<i>p</i>	Odds ratio
Gender	-.74	4.24	<b>.04</b>	.48
Academic program	.69	4.88	<b>.03</b>	1.99
Autism characteristics	-.01	.14	.71	.99
Contact quantity	.07	1.37	.24	1.07
Knowledge	-.05	2.72	.10	.95
Acceptance	.14	7.91	<b>.01</b>	1.15

Bold indicates significant values

vs. other) was also added as a predictor, as we hypothesized that there would be more emphasis placed on community service in arts and social sciences programs as compared to that present in other disciplines (e.g., sciences, applied sciences), and wanted to account for this possibility. This analysis was conducted with the full sample, as we wanted to examine what predicted intention to act for all students, as opposed to only those who had already experienced direct contact, with the hope that factors amenable to intervention would be revealed. The model was statistically significant, indicating that the predictors (as a set) reliably distinguished between positive and negative intent, and accounted for approximately 15 % of the variance ( $\chi^2(6) = 24.25$ ,  $p < .001$ , Nagelkerke's  $R^2 = .15$ ). Prediction success overall was 65.7 %, with 59.4 % for positive intent and 71.4 % for negative intent. The Wald Criterion indicated that gender ( $Wald = 4.24$ ,  $p < .05$ ), academic program ( $Wald = 4.88$ ,  $p < .05$ ), and acceptance ( $Wald = 7.91$ ,  $p < .01$ ) made significant contributions to the model (see Table 7). Females and students enrolled in an arts and social sciences program were more likely to volunteer.

## Discussion

This study sought to examine the role of various factors in predicting university students' acceptance of, and intention to volunteer with, individuals with ASD. With regard to acceptance, gender, autism characteristics, and knowledge

were found to be unrelated. The findings regarding gender were somewhat surprising, as research with school-aged children has consistently found a gender bias, in that females tend to demonstrate more positive disability-related attitudes (e.g., Campbell et al. 2004). However, the literature examining this relationship in university-aged students yields mixed findings. Nevill and White (2011) found no significant differences in overall openness across gender, although there were differences on two individual items. In Mahoney's (2008) study, gender was a significant predictor of attitude toward ASD. This inconsistent pattern is also reflected in research examining college students' perceptions of individuals with ID (Ahlborn et al. 2008; Griffin et al. 2012; McManus et al. 2010). It is possible that the lack of a significant finding is related to the uneven gender distribution of males to females in our sample, although it was comparable to that of the undergraduate student population across Canada (AUCC 2011). Given that individuals who participated were enrolled in introductory Psychology courses, it is also possible that our findings are reflective of a more open-minded and accepting group of students overall, and gender differences may have emerged had we surveyed students from a broader population. However, Introductory Psychology is a required course for many disciplines, and our participants came from a broad range of academic programs. Moreover, approximately only one-quarter (27.4 %) of our sample actually intended to go on to pursue a major in Psychology, affirming the diversity of our sample.

The finding that knowledge was not a significant predictor is consistent with McManus et al. (2010), but inconsistent with Mahoney (2008), although an outdated version of the measure was used in the latter. The lack of significance in our sample may also be related to the utilized knowledge measure, which inquired about treatment, etiology, and behavioural characteristics of young children with ASD. Such items may not be sensitive enough to capture aspects that are relevant to how university-aged students form perceptions pertaining to acceptance and openness of diverse students. Participant scores on an instrument that assesses knowledge of the more subtle and complex impairments facing older, high-functioning individuals with ASD, such as restricted interests, manifestations of social anxiety, sensory sensitivities, and low social insight, may more accurately predict typically developing peers' openness.

Both contact quantity and quality were significant predictors of openness; however, for individuals who had actually experienced direct contact, only quality was significant. These findings are consistent with other research examining undergraduates' attitudes toward ASD (Mahoney 2008) and ID (Griffin et al. 2012; May 2012; McManus et al. 2010), and underscore the importance of exposure that is perceived as

positive. Given these findings, consideration must be given to the uniquely important role of contact (both quantity and quality). It may be that positive interactions with individuals with ASD result in decreased anxiety and increased comfort, which moderates the relations between contact and openness. For example, Griffin et al. (2012) found that undergraduate students who indicated that they were more comfortable with individuals with ID also held more positive attitudes about them. Exposure, and particularly if that exposure is positive, may ease concerns, thus enabling one to be more open and accepting. This has also been the suggested mechanism in research examining teachers' perceptions of students with ASD (McGregor and Campbell 2001; Park et al. 2010). This likely plays a more meaningful role in attitude formation and acceptance than simply providing basic facts that increase knowledge, but lack experiential context. Future research must investigate how the construct of comfort relates to acceptance of ASD, and whether the association is one of mediation.

Interestingly, a different pattern of variables emerged as significant in predicting intent to act. In this model, autism characteristics, contact quantity, and knowledge were unrelated, and gender, academic program, and acceptance were significant. Females were more willing to volunteer than males, a finding that is consistent with previous research in this area (Mahoney 2008), as well as with cross-gender rates of volunteerism in post-secondary students (Mark and Jones 2004) and across Canada (Statistics Canada 2012). Our hypothesis that students enrolled in an arts and social sciences program would be more likely to volunteer was confirmed. This is consistent with previous research examining community service participation across academic disciplines (Cruce and Moore 2006), and may also be related to the finding that arts and social sciences faculty are more likely to volunteer themselves, as well as to emphasize the importance of such citizenship-building activities to their students (Antonio et al. 2000). Acceptance made the most significant contribution to the model. To our knowledge this is the first study to examine the role of acceptance in intent to act with regard to this population. Our finding that those who were more accepting were significantly more likely to follow through with consistent behaviour is very encouraging, as it suggests that a positive attitude toward students with ASD is likely to predict positive changes in behaviour toward them. Given that the factors identified as most relevant to intent to volunteer are not amenable to change (e.g., gender and academic program), it is critical that the factors most related to acceptance can be capitalized upon within post-secondary settings to maximize all students' engagement. However, the findings also highlight populations that may require targeted efforts (e.g., males).

A few limitations are worth noting. This study is based on self-report instruments, and may be subject to social

desirability respondent bias. Moreover, with no complementary observational data, we do not know the extent to which participants' responses are reflective of their day-to-day behaviour. It is also possible that bias was present in our sample, as the study description noted that the research was about knowledge of, exposure to, and feelings toward ASD. It is possible that individuals who had greater awareness of ASD were drawn to participate. Finally, the correlational nature of our research precludes us from making any claims about causality. For example, although contact quality emerged as a uniquely important predictor of acceptance, we do not know the true direction of this association. It is possible that individuals who are more accepting are more likely to seek out interaction opportunities and/or view the contact experience as positive.

Despite these limitations, this study revealed that contact is a critical factor associated with student acceptance of ASD in the post-secondary educational context, and that acceptance plays a meaningful role in intent to volunteer with peers with ASD. Future research could expand on this work in a number of ways. First, researchers must seek to involve students with ASD in this kind of work. Involving members of this group and tracking their college or university experience can garner a more complete picture regarding the impact of peers' positive and negative attitude perceptions in terms of educational, social, and vocational outcomes. Second, research could be conducted in other post-secondary settings, such as in community colleges and technical schools where there are proportionally more students with ASD. These environments have more flexible enrollment options and smaller class sizes, both of which may encourage students with ASD to register and the student body may be generally more diverse. Finally, programs that pair students with and without ASD, such as peer mentorship initiatives, should be followed, so that inclusion of the elements identified as most central to acceptance (i.e., positive contact) can be incorporated within mentor training, and associated acceptance-related outcomes (both cognitive and behavioural) subsequently examined, possibly within a longitudinal design. Such initiatives exert reciprocally positive effects as students with ASD can develop and refine their social skills, study habits, self-advocacy abilities, and gain access to a critical peer support network. Typical peers may also experience great benefit, as they gain insight into diverse ways of learning, and further develop their social-emotional competencies in terms of improved empathy, patience, and sensitivity.

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