



Stigma associated with autism among college students in Japan and the United States: An online training study

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ABSTRACT

Misconceptions and stigma associated with autism vary across cultures and may be influenced by various factors. Undergraduates in Japan ($N = 212$) and the United States (US) ($N = 365$) completed an online autism training, with pre- and posttest surveys assessing autism-related stigma (i.e., social distance) and knowledge. Aims were to examine differences in autism stigma and knowledge in Japan and the US, while extending prior research demonstrating benefits of an online autism training in the US and Lebanon to Japan. The results revealed that Japanese students indicated greater autism-related stigma than US students, which was not attributable to differences in autism knowledge, prior experience with autism, or college major. In both countries, students majoring in “helping professions” exhibited greater willingness to engage with people with autism. Japanese and US students varied in their misconceptions about autism, with significant differences on about half of the knowledge items. Japanese students showed decreased stigma after completing the autism training, yet continued to exhibit greater social distance towards people with autism relative to US students. Future research should focus on identifying specific cultural factors (e.g., conformity to social norms and homogeneity within communities) that contribute to fear and exclusion of people with autism in different societies.

What this paper adds?

The current study adds to a small but growing body of research examining determinants of knowledge and attitudes associated with autism in the general public. In particular, this study focuses on autism-related stigma among typically developing young adults cross-culturally in Japan and the US. The current study’s findings suggest that Japanese college students distance themselves (i.e., social distance; indicator of stigma) more so from those with autism when compared to US students; however, participation in online autism training with a focus on stigma decreased the social distance for Japanese students. This finding is consistent with the previous reports of efficacy of online autism training decreasing autism-related stigma in the US and Lebanon. At the same time, the current study revealed that stigma associated with autism is more closely tied to local cultural contexts than it is to the availability of autism expertise, as previously reported. Therefore, greater understanding of how cultural factors influence stigma towards people with

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autism is needed to develop anti-stigma interventions that are adapted to local cultural contexts.

1. Introduction

1.1. Stigma associated with autism

Stigma, or negative attitudes toward attributes that do not match culturally established norms (Goffman, 1963), adversely affects access to needed supports for people with autism and their families across cultures by decreasing help seeking behaviors and increasing social isolation (e.g., Divan, Vajaratkar, Desai, Strik-Lievers, & Patel, 2012; Gray, 2002; Grinker, Yeargin-Allsopp, & Boyle, 2011). However, the degree to which autism is stigmatized varies across cultures (e.g., Obeid et al., 2015). Cross-cultural variations in stigma are not surprising given that stigma develops through the process of being socialized into a particular culture (reviewed in Link & Phelan, 2001). However, very little is known about the specific differences between cultures that contribute to cross-cultural variations in stigma associated with autism. To the best of our knowledge, only one prior study has directly compared stigma associated with autism in two different countries: United States (US) and Lebanon (Obeid et al., 2015).

The primary aim of the current study was to compare stigma associated with and misconceptions about autism among college students in the US and Japan to identify specific factors that might contribute to cross-cultural differences in stigma. We evaluated the hypotheses that cross-cultural differences in autism knowledge would mirror the availability of autism resources and expertise (i.e. knowledge would be about the same in Japan relative to the US as both countries have strong autism research traditions; e.g., Office of Autism Research Coordination, 2012) while cross-cultural differences in stigma towards people with autism would be more closely aligned with overarching cultural differences between the two countries (i.e. stigma would be decidedly heightened in Japan relative to the US as Japanese people tend to value conforming to social conventions more than people in Westernized nations do, although variability in value orientations is apparent within countries; Gray et al., 2006; Matsumoto, Yoo, & Fontaine, 2008).

1.2. Japanese culture

Markus and Kitayama (1991) have referred to Japanese culture (as well as other East Asian cultures) as *interdependent cultures*, in which the major cultural task is not to stand out but rather to fit in, and in which there is a need to pay more attention to others than to oneself. In such cultures, *uniqueness* is perceived negatively, as it may threaten relationships and interpersonal harmony within the community. These *collectivistic* cultures are distinctly different from more *independent or individualistic cultures*, such as the US, in which differentiating oneself from others and being unique is considered desirable. Furthermore, group processes are reported to be qualitatively different in Japan and the US (e.g., Takemura, Yuki, & Ohtsubo, 2010). East Asians are more oriented towards *intragroup relationships* and motivated to maintain harmonious relationships among in-group members (Yuki, 2003); in contrast, North Americans tend to think about social groups as categories of depersonalized members and are motivated to maintain positive intergroup distinctiveness (Yuki, 2003; Yuki, Maddux, Brewer, & Takemura, 2005). Further, North Americans make ingroup-outgroup differentiations based on categorical distinctions, while East Asians differentiate each group based on the presence or absence of interpersonal connectedness (Yuki et al., 2005). Prior work suggests that the desire to conform to social norms leads to heightened stigma towards mental health issues more generally in Japan (Ng, 1997; Gray et al., 2006). When taking cultural differences and their influence into consideration, it is reasonable to assume that stigma associated with autism in particular, a condition marked by pronounced difficulty adapting to social norms, might be more pronounced in a society with more emphasis on harmony (e.g., Japan) than in one that perceives social groups as composed of depersonalized members (e.g., the US) because being *unique* is perceived as a threat in *interdependent cultures*.

1.3. Stigma and social distance

Indeed, recognition of unique characteristics is the first step in the enactment of stigma. Link and Phelan (2001) described that a perception that someone is *undesirably different* from a societal norm results in stigma. Stigma results in social distance, which is a “deliberate effort to avoid another or exclude that other from social interaction” (Lucas & Phelan, 2012; p. 311). The authors explained how stigma leads to social distance: the presence of a stigmatized characteristic causes discomfort for so-called *normal* people (i.e., those who do not have that characteristic) because they do not know what to expect from or how to interact with someone with the stigmatized characteristic (Goffman, 1963; Jones et al., 1984). As a result, to avoid this discomfort, *normal* people try not to interact with the person with the stigmatized characteristic.

The present study uses self-reported social distance towards “people with autism” as an indicator of the autism-related stigma. More specifically, the study focuses on individuals’ willingness (or unwillingness) to interact with people with autism. Stigma associated with autism can be elicited by two different sets of discriminative stimuli: the term autism itself and behaviors associated with autism. These two may seem synonymous, but are, in fact, separate factors. For example, one study found that behaviors associated with autism were linked to stigmatizing conceptions among college students in the US, while the term, “Asperger’s Disorder,” was not (Butler & Gillis, 2011). However, only 59% of the sample indicated having any knowledge of Asperger’s Disorder prior to the study. The term “autism” is probably better known than the term “Asperger’s Disorder” as it has been shown to elicit stigma among college students (e.g., Gillespie-Lynch et al., 2015; Obeid et al., 2015).

Although the term “autism spectrum disorder (ASD)” has been in use in the US since the publication of the Diagnostic and Statistical Manual for Mental Disorders, Fifth Edition (American Psychiatric Association, 2013), the current study examines stigma

associated with the term “autism” as this is the most publicly recognized term among the general population in the US (Holt & Christensen, 2013). In Japan, the term “autism” is also the most recognized term. The Japanese Ministry of Health, Labour and Welfare officially utilizes the International Classification of Diseases, Tenth Revision (ICD-10; WHO, 1992; Ministry of Health, Labour and Welfare, 2018), and the term ASD is not used in the ICD-10. In addition, since more than 70% of psychiatrists in 44 countries reported the use of the ICD-10 as a classification system (Reed, Correia, Esparza, Saxena, & Maj, 2011), for the purposes of cross-country comparison, the use of term “autism” is the most appropriate.

1.4. Changing stigma and knowledge

Stigma associated with autism is often heightened among people with limited knowledge about autism (e.g., Ling, Mak, & Cheng, 2010; Mahoney, 2007; but see Butler & Gillis, 2011 for evidence that autism knowledge is not always associated with reduced stigma). Therefore, by increasing autism knowledge, one may decrease autism-related stigma. Indeed, participation in an online training containing up-to-date scientific knowledge about autism was associated with decreases in autism-related stigma and increases in autism knowledge among college students in the US and Lebanon (Gillespie-Lynch et al., 2015; Obeid et al., 2015). Another primary aim of the current study was to determine if benefits observed when students from culturally diverse countries like the US and Lebanon participated in the online autism training would replicate among college students in Japan, a more socially and linguistically homogenous country.

Stigma towards people with autism is elicited by behaviors that are inconsistent with accepted social norms (Butler & Gillis, 2011). Deviation from group norms may be particularly problematic in a country like Japan that has traditionally framed its national identity as uniquely homogenous with a shared orientation toward collective cultural norms (Burgess, 2004). Heightened cultural homogeneity may make it easier to identify people who do not match cultural norms. Therefore, it is important to determine if a brief autism training can help reduce stigma in a country where deviation from social norms may be particularly salient.

1.5. Research objectives and hypotheses

The objectives of the current research were to: 1) Compare stigma towards people with autism and misconceptions about autism among Japanese and US college students; 2) Examine the extent to which individual differences in autism knowledge, prior experience with autism, college major, age, and gender are associated with stigma towards people with autism in each country; and 3) Examine if benefits of participation in an online autism training in terms of increasing autism knowledge and diminishing autism-related stigma extend to Japanese college students.

We developed the following hypotheses to address each aim:

Aim 1) We hypothesized that Japanese college students would self-report greater social distance towards people with autism compared to their US counterparts because Japanese culture tends to be more interdependent. Thus, unique characteristics (such as having autism) may be perceived as negative. We expected Japanese students to demonstrate slightly lower overall autism knowledge relative to US students due to the moderately reduced availability of autism expertise in Japan relative to the US (Office of Autism Research Coordination, 2012). We also expected Japanese students to view autism more often as arising from poor parenting practices, given that mothers in another predominantly interdependent region, South Korea, seek out diagnoses such as reactive attachment disorder that shift the “blame” for autism to their own parenting practices in order to minimize the spread of stigma through the bloodline (Grinker & Cho, 2013). Such a finding would be consistent with a prior study conducted with a general population sample in Japan wherein 21% of their sample attributed autism to upbringing while only 16.6% of their sample attributed autism to genetics (Koyama et al., 2009).

Aim 2) Based on prior literature (Gardiner & Iarocci, 2014; Gillespie-Lynch et al., 2015; Obeid et al., 2015; Tipton & Blacher, 2014), we hypothesized that heightened autism knowledge, prior contact with people with autism, being a woman and being enrolled in a “helping major” (e.g., Education, Psychology, Social Work, Nursing) would all be associated with reduced stigma towards people with autism among college students. However, it is important to note that patterns of association between individual characteristics and stigma towards people with autism in prior work have been inconsistent (e.g., Obeid et al., 2015). Such findings raise the alternative possibility that associations between individual characteristics and stigma towards people with autism are not pronounced in interdependent countries such as Japan.

Aim 3) Lastly, we hypothesized that participation in the online autism training would be related to decreased stigma associated with and increased knowledge about autism in Japan, replicating benefits of the training observed in the US and Lebanon (Gillespie-Lynch et al., 2015; Obeid et al., 2015).

2. Material and methods

2.1. Participants and procedure

Recruitment of participants was conducted through college classes in seven cities in Japan and in one city in the eastern US. A total of 446 US students (231 women, 215 men) from a public college and 283 Japanese students (139 women, 144 men) from seven universities (five in a metropolitan area and two in a rural area) participated, with 365 US students (81.8%) and 212 Japanese students (74.9%) completing the entire procedure. Those who did not check a box indicating consent to participate and/or did not complete the entire training (including the posttest) were excluded. The US data were previously reported (Gillespie-Lynch et al.,

2015); these data are used here solely as comparison to the Japanese data. The descriptive statistics for the US sample reported in the current study are slightly different than those reported in the prior work due an error (one participant who did meet inclusion criteria was replaced by a participant who did not meet inclusion criteria).

All participants were compensated for their time with either research participation credit or extra credit (depending on the institution). Participants were given a link to SurveyMonkey and asked to complete the survey and training by a given deadline. All participants were asked to indicate their consent by reading the informed consent statement and checking a box stating that they had done so. The training began with a demographic survey and pretest, followed by the online autism training, and a posttest identical to the pretest. The survey and training process was approved by the IRB at each institution.

2.2. Materials and design

All of the study materials, including the training, were translated into Japanese by the first author, who is Japanese-English bilingual with expertise in autism. Each item was double-checked by the second author, who is an expert in autism and related fields in Japan to ensure the accuracy of the translation and contents. Thus, the materials used in the two countries can be considered comparable.

2.2.1. Demographic survey

Before starting the pretest, the participants were asked to answer questions about their demographic and academic background: gender, age, ethnicity, name of institution (to identify a geographic region), and academic major. Additionally, they were asked to indicate their relationship, if any, to people with autism (e.g., self, child, parent, sibling, friend, co-worker, fellow student or acquaintance). Students who indicated any of the aforementioned relationships with autism were classified for analyses as having prior contact with autism.

2.2.2. Autism awareness survey

This measure of autism knowledge is adapted from an original scale created by Stone (1987); for the purpose of the current study, items were updated based on the most current version of the DSM-5 (American Psychiatric Association, 2013) and other recent research findings (Gillespie-Lynch et al., 2015, see Table 2 below for items). Participants were asked to rate 13 statements about autism using a 5-level Likert scale (i.e., –2 for *strongly disagree* to 2 for *strongly agree*). Scores for false statement items are reported reverse scored for ease of interpretation; i.e. higher scores always indicate more accurate responses. The total autism knowledge score could range from –26 to 26 with a higher score indicating more accurate knowledge of autism. The alpha for the Autism Awareness Survey was lower in the Japanese sample ($\alpha = 0.30$) than it was in the US sample ($\alpha = 0.56$). Given this result, we decided to focus primary analyses on the items comprising the scale rather than the overall score.

2.2.3. Beliefs about the etiology of autism

Participants were asked “What causes autism? Select as many choices as needed.” Possible answers included: genes passed down from parents to children, new changes in the genes of affected children, environment, vaccines, parenting and other. Participants had the opportunity to indicate additional factors in an open-response text box.

2.2.4. Autism social distance scale

This measure of stigma was adapted to focus on autism (Gillespie-Lynch et al., 2015) from a widely used measure of stigma, the Social Distance Scale (Bogardus, 1933). Items on this 6-item scale were rated using a 4-level Likert scale (1 for *definitely willing* to 4 for *definitely unwilling*) with higher scores indicating greater social distance (i.e., less willingness to engage with someone with autism). Total scores could range from 6 to 24 with a higher score indicating greater stigma. This scale had acceptable internal consistency in both the Japanese ($\alpha = 0.84$) and the US ($\alpha = 0.86$) samples.

2.2.5. Online autism training

The online training (Gillespie-Lynch et al., 2015; also available at https://www.researchgate.net/publication/274139661_ASD_training_Open_access) was developed to reduce stigma associated with and increase knowledge about autism. It includes 71 PowerPoint slides providing information about the following aspects of autism: how it is defined and diagnosed, prevalence and factors that affect identification, etiology, common misconceptions about autism (e.g., that people with autism lack empathy or that autism is defined by cognitive difficulties), interventions, challenges faced by adults with autism and neurodiversity (i.e., autism is a minority identity like race or sexuality that contributes to human diversity). The content mainly focused on adults, particularly college students, with autism as it was designed to help other members of college communities be more accepting of students with autism. Given that the training was conducted online, each participant completed it at his or her own pace.

2.3. Analytic approach

The dependent variables in this study did not meet the assumptions required for commonly used parametric analyses (e.g., the overall social distance score was excessively skewed, the individual items in the knowledge and stigma scales reflect an ordinal scale of measurement, and the items assessing the perceived cause of autism were on a categorical scale). Therefore, nonparametric analyses were used for all primary data analyses: Mann-Whitney *U* and Chi-square tests were used for the between-country

Table 1
Participant Characteristics in Each Country.

	US	Japan	<i>p</i> value
Mean Age (<i>SD</i>)	19.93 (4.41)	20.43 (4.70)	.19
Gender			.91
Female	198 (54.2%)	114 (53.8%)	
Male	167 (45.8%)	98 (46.2%)	
College Major			< .001
Helping professions major	187 (51.2%)	73 (34.4%)	
Non-Helping professions/undecided	178 (48.8%)	132 (62.3%)	
Unknown	0 (0%)	7 (3.3%)	
Prior contact with people with autism			< .001
Reported prior contact	365 (100%)	99 (46.7%)	
No contact	0 (0%)	113 (53.3%)	

comparisons of baseline conceptions of autism; Spearman's rank-order correlations were used to examine associations between stigma and participant characteristics within each country; and Wilcoxon signed-rank tests were used to examine changes in autism-related stigma associated with participating in the online autism training. To examine if participant characteristics that varied significantly across cultures (i.e., prior contact with autism, choice of major) explained cross-cultural differences in stigma, we log-transformed the stigma variable to use it as an outcome variable in a regression analyses with country and these characteristics as predictors. Due to the large numbers of analyses and the resultant heightened possibility of Type 1 error, the significance level was set at $p \leq .001$. All analyses were conducted using SPSS 23.

3. Results

3.1. Participant demographics

The largest ethnicity group represented in the US was Caucasian (47.7%) followed by Hispanic (20.8%), Black (13.2%) and Asian (8.2%), whereas in Japan, ethnicity was highly homogeneous with 99.5% Asians and 0.5% (1 person) of mixed race. The participants' age ranged from 18 to 55 in the US and 18 to 54 in Japan (Table 1). Participants' gender, average age, prior contact with autism and college majors, namely "helping profession" (e.g., Education, Psychology, Social Work, Nursing) or not, in each country are shown in Table 1. Of the total number of participants, 4 (1.1%) of the participants in the US and 2 (0.9%) of the Japanese participants self-reported having autism; further, 15 of the participants in the US (4.1%) and 3 of the Japanese participants (1.4%) reported having immediate family members with autism.

3.2. Baseline ASD knowledge

The total scores for the 13 questions of the Autism Awareness Survey ranged from -7 to 26 at pretest, with higher scores indicating more overall knowledge. A Mann-Whitney U test revealed that the overall autism knowledge scores of students in the US (mean rank = 308.47) were higher than the scores of Japanese students (mean rank = 255.47), $U = 31582$, $z = -3.69$, $r = -.15$, $p < .001$. However, this finding is not likely to be reliable as the Autism Awareness Survey had low internal consistency in Japan. More informatively, there were significant differences between the two countries on about half of the items. For some items, college students in the US scored higher; on others, Japanese students scored higher (see Table 2).

Chi-square tests were conducted to examine associations between country and accurate knowledge about the causes of autism. All expected cell frequencies were greater than five. Participants in the US were more likely to endorse inherited genes and vaccination as causes of autism than students in Japan (see Table 3). Conversely, students in Japan were more likely to endorse new mutations and cold parenting as the causes of autism.

3.3. Baseline social distance scores

A Mann-Whitney U test was used to determine if there were differences in total Social Distance scores between students in Japan and the US. Social Distance scores for students in the US (mean rank = 226.38) were significantly lower than for students in Japan (mean rank = 395.16), indicating more willingness to engage with people with autism among students in the US, with a large effect size (Table 4). This tendency was observed across all items of the scale except the "How willing would you be to marry or date a person with autism?" item of the Social Distance scale. More than half of the students in both countries indicated unwillingness (i.e., answered either "Somewhat unwilling" or "Definitely unwilling") in response to the item "How willing would you be to marry or date a person with autism?" (60.9% US, 74.5% Japan). This tendency was also quite apparent for the item "How willing would you be to have a person with autism marry into the family?" for Japanese students (67.0%), but not students in the US (25.2%).

Table 2
College Students' Autism Awareness Survey Scores by Country (Pretest) ($N = 365$ in the US, $N = 212$ in Japan).

	US		Japan			
	Mean	SD	Mean	SD	z	r
Autism is more frequently diagnosed in males.	0.42	1.12	0.26	1.21	−1.32	−.05
^R Children with autism do not show attachments, even to parents/caregivers.	0.38	1.27	0.82	1.02	−3.96 ⁺	−.16
^R People with autism are deliberately uncooperative.	0.60	1.20	1.34	0.83	−7.30 ⁺	−.30
Children with autism can grow up to go to college and marry.	1.23	1.09	1.19	0.78	−2.34	−.10
^R There is one intervention that works for all people with autism.	0.65	1.16	−0.05	1.09	−6.76 ⁺	−.28
Autism can be diagnosed as early as 15 months of age.	0.70	1.15	0.23	0.96	−5.72 ⁺	−.24
^R With proper treatment, most children with autism eventually outgrow autism.	0.34	1.12	−0.14	0.97	−4.93 ⁺	−.21
People with autism show affection.	0.75	1.18	1.08	0.83	−2.67 ⁺	−.11
^R People with autism have low intelligence.	0.99	1.08	0.10	1.06	−9.14 ⁺	−.38
^R People with autism tend to be violent.	0.26	1.06	0.38	0.87	−1.54	−.06
^R People with autism are generally disinterested in making friends.	0.37	1.14	0.43	0.95	−0.62	−.03
People with autism care about and feel the pain of those who are suffering.	0.38	0.98	−0.01	0.93	−4.58 ⁺	−.19
Autism is a lifelong disability.	0.60	1.01	0.28	1.00	−3.65 ⁺	−.15
Total Score	7.68	5.80	5.92	4.10	−3.69 ⁺	−.15

Note. Score for each item ranges from −2 to 2, with higher scores indicating accurate knowledge about autism; Mean and SD are reported to help interpretation; ^R indicates reverse items (i.e., greater agreement is incorrect), and scores are flipped.

* $p < .001$, $p < .01$.

Table 3
Chi-Square Analysis of College Students' Understanding of the Causes of Autism.

	US	Japan	χ^2	ϕ	p
	% Yes	% Yes			
Causes of Autism					
Genes passed down from parents to children	77.3	51.4	41.01	−0.27	< .001
New changes in the genes of affected children	45.5	61.3	13.47	0.15	< .001
Environment	26.0	20.8	2.04	−0.06	.15
Vaccines	20.3	1.9	38.78	−0.26	< .001
Cold Parenting	5.5	14.2	12.74	0.15	< .001

Note: Percentage of “Yes” that reached significance level ($p < .001$) are bolded.

Table 4
College Students' Social Distance Scale Item Scores by Country (Pretest).

	US			Japan				
	<i>n</i>	Score		<i>n</i>	Score		<i>z</i>	<i>r</i>
		<i>Mean</i>	<i>SD</i>		<i>Mean</i>	<i>SD</i>		
Live next door	365	1.59	0.76	212	2.53	0.73	−12.90 ⁺	−.53
Spend an evening with	365	1.60	0.77	212	2.66	0.73	−13.79 ⁺	−.57
Collaborate with	365	1.85	0.86	212	2.75	0.79	−11.39 ⁺	−.47
Be a friend of	365	1.54	0.79	212	2.00	0.84	−7.14 ⁺	−.30
Have someone with autism marry into the family	365	1.95	0.94	212	2.78	0.97	−9.37 ⁺	−.39
Date/Marry someone with autism	364	2.74	0.99	212	2.92	0.95	−2.27	−.09
Total Score	364	11.29	3.94	222	15.65	3.78	−11.77 ⁺	−.49

Note: Total possible score for each item is 4, with higher scores indicating less willingness to engage with individuals with autism; Mean and SD are reported to help interpretation.

* $p < .001$.

3.4. Associations between baseline measures

Spearman's correlations were conducted to examine associations between individual difference measures and stigma among participants (Table 5). A linear regression with the log-transformed stigma score as the outcome variable was run to evaluate if differences in stigma between Japan and the US were accounted for by individual differences that differed across samples, with college major (i.e., “helping professions” majors or not), total autism knowledge scores, prior contact with people with autism, and country entered as predictors in this model. The multiple regression model was significant in predicting log-transformed stigma scores, $F(4, 564) = 53.99$, $p < .001$, adjusted $R^2 = 0.22$. Country, college major, and total autism knowledge scores were significant

Table 5

Correlation Coefficient Values (Spearman's rho) Examining Total Social Distance Scores in Relation to Individual Differences Measures (Pretest) for the US (N = 365) and Japanese sample (N = 212).

		Social Distance Total	Knowledge Total	Prior Contact with Autism	Age	Gender
Knowledge Total	US	–.26*	–			
	Japan	–.20*	–			
Prior Contact with Autism	US	–	–	–		
	Japan	–.22*	.22*	–		
Age	US	–.10	.03	–	–	
	Japan	–.05	.00	.11	–	
Gender	US	–.18*	.00	–	.05	–
	Japan	.01	–.09	.07	.22*	–
College Major	US	–.18*	.05	–	.05	–.37*
	Japan	–.28*	.05	.20	.18	–.10

Note: Correlation coefficients that reached significance level are bolded.

* $p < .001$, $\hat{p} < .01$.

predictors of stigma, $p < .001$, whereas prior contact with people with autism was not. Regression coefficients and standard errors are provided in Table 6.

3.5. Effectiveness of the online autism training

Of the total 212 Japanese college students, the online autism training associated with a decrease in total social distance posttest scores in 101 participants, as compared to the pretest, whereas 65 students exhibited no change and 46 students showed increases in the total score. A Wilcoxon signed-rank test determined that there was a statistically significant decrease in social distance towards a person with autism across the sample after completing the online autism training ($Mdn = 15.5$) compared to the pretest ($Mdn = 16.0$), $z = 5.76$, $r = -.40$, $p < .001$.

Of the total 212 Japanese college students, participation in the online autism training was associated with an increase in total autism knowledge posttest scores in 170 participants compared to the pretest, whereas 10 students showed no change and 32 students decreased in total scores. A Wilcoxon signed-rank test determined that there was a statistically significant increase ($Mdn = 4.0$) in overall autism knowledge after completing the autism training ($Mdn = 10.0$) compared to the pretest ($Mdn = 6.0$), $z = 9.94$, $r = -.68$, $p < .001$. However, this improvement in knowledge may be unreliable given the low internal consistency of the knowledge scale. Post-hoc tests with individual items of the Autism Awareness Survey revealed significant ($p \leq .001$) improvements in autism knowledge following training in that: males are more frequently diagnosed with autism than females, autism can be diagnosed as early as 15 months, autism cannot be outgrown, people with autism are not violent, autism is distinct from intellectual disability, and people with autism have empathy and want to make friends. However, reduced knowledge following training was observed on two items: people with autism can grow up to go to college and marry (perhaps because the training describes specific challenges in these areas that adults with autism face) and one intervention works for all people with autism.

4. Discussion

4.1. Misconception about autism

As mentioned earlier in Section 3.2, we focused on the individual items of the Autism Awareness Survey. Some misconceptions were more common among US college students (such as that children with autism do not show attachments and are deliberately uncooperative). Other misconceptions were more common among students in Japan (such as that autism is not lifelong and can be outgrown with appropriate treatment, that people with autism have low intelligence and limited empathy, that autism cannot be

Table 6

Summary of Analysis to Predict the Log-Transformed Stigma Score by Country, College Major, Total Autism Awareness Survey Score and Prior Contact with People with Autism.

Variable	B	SE _B	β
Intercept	3.58	0.15	
Country	–0.45	0.07	–.31*
College major	0.20	0.05	.14*
Total autism knowledge score	0.03	0.01	.19*
Prior contact with people with autism	0.23	0.08	.13*

Note: B = Unstandardized regression coefficient; SE_B = Standard error of the coefficient; β = Standardized regression coefficient; Regression coefficients that reached significance level are bolded.

* $p < .001$, $\hat{p} < .01$.

diagnosed among toddlers, and that one intervention works for all people with autism). Consistent with our hypothesis, students in Japan were more likely to attribute autism to negative parenting than students in the US. Although students in Japan were less likely to recognize hereditary genetic contributions to autism relative to students in the US, they were more likely to accurately recognize that de novo mutations contribute to autism and were also more accurate in less frequently identifying vaccines as a cause of autism relative to students in the US. This evidence that students in the US and Japan have different areas of expertise in regards to autism is consistent with our overarching speculation that knowledge would be more evenly distributed between countries like the US and Japan that share a strong autism research tradition than in a prior comparison between the US and Lebanon (Obeid et al., 2015).

Together these findings provide some support for our overarching hypothesis that stigma associated with autism is more closely aligned with cultural factors than with the availability of autism expertise. These findings suggest that interdependent value orientations, such as a desire to conform to societal norms, might contribute to heightened stigma in countries like Japan and Lebanon. Future research should investigate this possibility directly by assessing interdependence, particularly orientations toward social conformity, and stigma associated with autism in multiple regions. Given that Japan and Lebanon have been theorized to be very similar in the degree to which individualistic value orientations are reduced relative to the US (Matsumoto et al., 2008) but stigma associated with autism was higher in Japan ($M = 15.65$) than in Lebanon ($M = 12.94$; Obeid et al., 2015), these findings also suggest that other cultural factors lead to particularly heightened stigma associated with autism in Japan. One possibility that should be evaluated in future studies where stigma can be assessed in a number of countries that differ in terms of key dimensions that may contribute to stigma is that stigma associated with autism is particularly heightened in regions where limited ethnic and cultural diversity co-occur with heightened appreciation of harmony and conformity.

In both Japan and the US, more than half of the students indicated unwillingness on their own part to marry or date someone with autism. This response may reflect one component of stigma, cognitive separation, namely recognizing stigmatized people as *them* to separate from the group one belongs to (Lucas & Phelan, 2012). Although many students in the US indicated that they were willing to live next door to or collaborate with someone with autism, this willingness may be based on the assumption that they can entertain these types of distant relationships with people with autism while still belonging to a different group than those with autism. Indeed, prior work has shown that the majority of a college student sample were perfectly willing to engage with people on the spectrum in distant ways (i.e. by living in the same building) but far fewer were willing to hang out with the person in their free time (Gardiner & Iarocci, 2014). Marrying or dating someone with autism means that one is bringing those with autism into the group one belongs to, and thus not separating oneself from those with autism cognitively. The fact that approximately three in four US students were willing to have someone with autism marry into their family, whereas more than half of Japanese students were unwilling to do so, may be due to a difference in societal constructions of the meaning of family. In Japan, the extended family is considered as a unit in society, as extended family members often co-habit (Morgan & Hiroshima, 1983). Thus, having someone with autism marry into the family in Japan may equate to bringing that person with autism into the same group one belongs to more than it does in the US.

4.2. Factors related to within and between country social distance

Students in “helping majors,” such as education, psychology, social work, and nursing, self-reported less social distance towards people with autism than students in other majors in both the US and Japan. Prior work has demonstrated that students who are in arts and social science majors report more willingness to engage with people with autism than those in other majors (Gardiner & Iarocci, 2014; but see Nevill & White, 2011 for evidence that social science majors are not always more accepting of autism). Students who are drawn to “helping professions” may be more accepting of differences to begin with. In addition, majoring in a “helping profession” may expose students to curriculum that emphasizes acceptance of diversity and may also lead to opportunities to interact with people with autism, with increased exposure to people with autism associated with less social distance (Edyvean, 2009). Gardiner and Iarocci (2014) found that both the quantity and quality of contact is associated with increased acceptance of autism. In fact, Corrigan et al. (2000) suggested that one of the solutions to mental health stigma-related problems more generally is to provide high quality contact with people with the stigmatized label (in this case, autism).

In addition to the effect of college major, we observed a significant association between the presence of a prior relationship with people with autism and stigma in the Japanese sample. A greater proportion of the college students in the US reported at least a distant type of prior relationship with someone with autism relative to students in Japan. In contrast, a greater proportion of the Japanese participants in the current study indicated that they were in “helping majors” relative to the participants from the US. However, neither of these differences accounted for the effect of country on stigma associated with autism, lending support to our speculation that cultural factors contribute more strongly to stigma towards people with autism than differences in expertise. It should be emphasized, however, that our measure of prior contact did not evaluate the quality or quantity of contact nor was it possible to systematically investigate more intimate forms of contact, such as having a person with autism in the nuclear family, as only three participants from Japan reported a nuclear family member on the spectrum. Further research is needed to examine relationships between the quality and quantity of contact and social distance cross-culturally.

4.3. Training-related changes in misconceptions and stigma about autism in Japan

Replicating prior work conducted in the US and Lebanon, Japanese participants' overall social distance scores decreased following the online autism training. Although not analyzed systematically, the effect size of the training appeared to be larger in Japan ($r = .68$) than in the US ($r = .43$, Gillespie-Lynch et al., 2015) for social distance. Increased knowledge was also observed across many items of the Autism Awareness Survey. However, findings also indicate that the training should be adapted to more effectively

teach students that there are multiple evidence-based treatments for autism (with efficacy often depending on characteristics of the individual being treated) and that people with autism do go to college and marry. The latter point may be particularly important to emphasize as understanding that people with autism can grow up to contribute productively to society, as college students and spouses, was the only Autism Awareness Survey item that was associated with significantly reduced autism-related stigma in Japan. Decreases in misconceptions and stigma towards people with autism following training may have been enhanced in Japan because there may be more stereotypes associated with autism in Asian cultures (e.g., Bie & Tang, 2015; Kang-Yi, Grinker & Mandell, 2013). Online training may be an efficient means of beginning to address stigma associated with autism, as increasing autism knowledge may be easier to accomplish than providing opportunities for college students to have high quality contact with people with autism.

4.4. Limitations and future directions

In the current study, we compared differences in stigma between two countries and within each country. The former approach was used to determine if there were cross-cultural differences in stigma associated with and misconceptions about autism. This approach is a valuable *first step* as the current study is only the second study to our knowledge to systematically examine cross-cultural differences in stigma towards people with autism. Nevertheless, treating each country as a proxy for a single culture is a vast oversimplification as it overlooks cultural diversity in both countries. Evidence suggests that cultural diversity has been increasing in Japan (Burgess, 2004). The US is often defined in terms of its cultural diversity as in “a melting pot.” Indeed, the sample of students from the US contained a small proportion of students from Asian backgrounds (8.2%). This proportion was too small to investigate ethnic differences systematically in the US sample. In addition, we did not ask students which Asian country in particular they were from or if they had immigrated to or been born in the US. Asian Americans who were born in Asia have reported greater desire for social distance towards people with disabilities than those who were born in the US (Saetermoe, Scattone, & Kim, 2001). Although we did not systematically investigate ethnic differences in the sample of students from the US, an exploratory analysis revealed a very weak trend ($p = .04$) toward heightened stigma among students in the US from Asian backgrounds relative to Caucasian students. This suggests that future studies using purposive sampling should systematically examine associations between autism-related stigma, country of origin and whether or not one immigrated to or was born in the US. Unlike level of autism knowledge and quality/quantity of contact with people with autism, these factors mentioned above (i.e., age, nativity) cannot be manipulated through an intervention; however, further studies that closely examine these factors may reveal related mechanisms that are modifiable targets to include in efforts to reduce autism-related stigma.

To the best of our knowledge, all interventions to decrease stigma associated with autism in the general population (i.e., except those targeting families of people with autism), including this study, have focused on either school-age or college students (e.g., Swaim & Morgan, 2001; Staniland & Byrne, 2013). Since seniors (e.g., 65 or older) are reported to hold less knowledge and greater stigma towards people with disabilities in different countries (e.g., Koyama et al., 2009; Tipton & Blacher, 2014), it is critical to reduce autism-related stigma in older populations. In fact, a lack of understanding by grandparents of children with autism is reported to interfere with early intervention (e.g., Hillman, 2007), indicating the importance of targeting this population in future research.

It is important to remember that autism is a diagnosis originally defined in Western cultures (Silberman, 2015). The concept is still less familiar and understood in Asian cultures (e.g., China: Bie & Tang, 2015; Macau: Qi, Zaroff, & Bernardo, 2016; Vietnam: Ha, Whittaker, Whittaker, & Rodger, 2014). Indeed, an adaptation of one of the most commonly used measures of autism knowledge, the Autism Awareness Survey, exhibited far less internal reliability in Japan than it had in the US and Lebanon. This difference supports a recent call for accurate reporting of the internal consistency of autism knowledge measures used internationally (which is often lacking) and the development of autism knowledge measures that are specifically adapted to local cultural contexts (Harrison, Slane, Hoang, & Campbell, 2016). Future research assessing autism knowledge cross-culturally could use a newly developed autism knowledge measure with promising psychometrics, the ASK-Q (Harrison et al., 2016).

Further, the inconsistency of the terminology used for autism adds more complexity to this issue of autism knowledge in various countries. As mentioned earlier, while the DSM-5 is used in the US, the majority of the psychiatrists in the world use the ICD-10 for classification of mental disorders (Reed et al., 2011); thus, ASD is not a widely recognized term in countries other than the US. When conducting cross-cultural comparisons of autism knowledge, it is essential that the participants in all the countries refer to the same condition. Moreover, stigma may also be perceived differently in various cultures, with different ethics of care for those who are stigmatized, such as people with intellectual disabilities and mental health problems (e.g., Hong Kong: Tait, Fung, Hu, Sweller, & Wang, 2016; Asian Indian: Zechella & Raval, 2016). Thus, further research that investigates cultural factors related to stigma and autism knowledge more closely is greatly needed.

5. Conclusions

The current study contributes to research examining the intersections between autism and culture (e.g., Daley, 2002). People with autism report that many, although not all, of the challenges associated with autism are attributable to lack of understanding about autism on the part of others (e.g., Milton, 2012). The current findings suggest that autism-related stigma is more closely tied to local cultural contexts than it is to the availability of autism expertise. Therefore, greater understanding of how cultural factors influence autism-related stigma is needed to develop anti-stigma interventions that are adapted to local cultural contexts. To build upon these findings, future studies should involve comparisons of conceptions of autism across a range of countries and should also involve close qualitative analyses of how people in specific cultural contexts, with specific relationships to autism, understand autism.

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References

- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Author: Washington, DC.
- Bie, B., & Tang, L. (2015). Representation of autism in leading newspapers in China: A content analysis. *Health Communication*, 30(9), 884–893. <http://dx.doi.org/10.1080/10410236.2014.889063>.
- Bogardus, E. S. (1933). A social distance scale. *Sociology and Social Research*, 22, 265–271.
- Burgess, C. (2004). Maintaining identities: Discourses of homogeneity in a rapidly globalizing Japan. *Electronic Journal of Contemporary Japanese Studies* Retrieved from: <http://www.japanesestudies.org.uk/articles/Burgess.html>.
- Butler, R. C., & Gillis, J. M. (2011). The impact of labels and behaviors on the stigmatization of adults with Asperger's disorder. *Journal of Autism and Developmental Disorders*, 41(6), 741–749. <http://dx.doi.org/10.1007/s10803-010-1093-9>.
- Corrigan, P. W., River, L. P., Lundin, R. K., Wasowski, K. U., Campion, J., Mathisen, J., et al. (2000). Stigmatizing attributions about mental illness. *Journal of Community Psychology*, 28(1), 91–102. [http://dx.doi.org/10.1002/\(SICI\)1520-6629\(200001\)28:1<91::AID-JCOP9>3.0.CO;2-M](http://dx.doi.org/10.1002/(SICI)1520-6629(200001)28:1<91::AID-JCOP9>3.0.CO;2-M).
- Daley, T. C. (2002). The need for cross-cultural research on the pervasive developmental disorders. *Transcultural Psychiatry*, 39(4), 531–550. <http://dx.doi.org/10.1177/136346150203900409>.
- Divan, G., Vajaratkar, V., Desai, M. U., Strik-Lievers, L., & Patel, V. (2012). Challenges, coping strategies, and unmet needs of families with a child with autism spectrum disorder in Goa, India. *Autism Research*, 5(3), 190–200. <http://dx.doi.org/10.1002/aur.1225>.
- Edyvean, C. (2009). *Attitudes toward autism*. (Undergraduate thesis) Retrieved from: Cardinal Scholar. <http://cardinalscholar.bsu.edu/handle/123456789/194217>.
- Gardiner, E., & Iarocci, G. (2014). Students with autism spectrum disorder in the university context: Peer acceptance predicts intention to volunteer. *Journal of Autism and Developmental Disorder*, 44(5), 1008–1017. <http://dx.doi.org/10.1007/s10803-013-1950-4>.
- Gillespie-Lynch, K., Brooks, P. J., Someki, F., Obeid, R., Shane-Simpson, C., Kapp, S. K., et al. (2015). Changing college students' conceptions of autism: An online training to increase knowledge and decrease stigma. *Journal of Autism and Developmental Disorders*, 45(8), 2553–2566. <http://dx.doi.org/10.1007/s10803-015-2422-9>.
- Goffman, E. (1963). *Stigma: notes on the management of a spoiled identity*. New York: Simon & Schuster.
- Gray, D. E. (2002). 'Everybody just freezes. Everybody is just embarrassed': Felt and enacted stigma among parents of children with high functioning autism. *Sociology of Health & Illness*, 24(6), 734–749.
- Gray, K. M., Nakane, Y., Christensen, H., Yoshioka, K., Jorm, A. F., & Nakane, H. (2006). Stigma in response to mental disorders: A comparison of Australia and Japan. *BMC Psychiatry*, 6(1), 21. <http://dx.doi.org/10.1186/1471-244X-6-21>.
- Grinker, R. R., & Cho, K. (2013). Border children: Interpreting autism spectrum disorder in South Korea. *Ethos*, 41(1), 46–74. <http://dx.doi.org/10.1111/etho.12002>.
- Grinker, R. R., Yeargin-Allsopp, M., & Boyle, C. (2011). Culture and autism spectrum disorders: The impact on prevalence and recognition. In D. G. Amaral, G. Dawson, & D. H. Geschwind (Eds.), *Autism spectrum disorders* (pp. 112–136). Oxford, UK: Oxford University Press.
- Ha, V. S., Whittaker, A., Whittaker, M., & Rodger, S. (2014). Living with autism spectrum disorder in Hanoi, Vietnam. *Social Science & Medicine*, 120, 278–285. <http://dx.doi.org/10.1016/j.socscimed.2014.09.038>.
- Harrison, A. J., Slane, M. M., Hoang, L., & Campbell, J. M. (2016). An international review of autism knowledge assessment measures. *Autism*, 21(3), 262–275. <http://dx.doi.org/10.1177/1362361316638786>.
- Hillman, J. (2007). Grandparents of children with autism: A review with recommendations for education, practice, and policy. *Educational Gerontology*, 33(6), 513–527. <http://dx.doi.org/10.1080/03601270701328425>.
- Holt, J. M., & Christensen, K. M. (2013). Utahns' understanding of autism spectrum disorder. *Disability and Health Journal*, 6(1), 52–62. <http://dx.doi.org/10.1016/j.dhjo.2012.08.002>.
- Jones, E., Farina, A., Hastorf, A., Markus, H., Miller, D. T., & Scott, R. (1984). *Social stigma: The psychology of marked relationships*. New York: Freeman and Company.
- Kang-Yi, C. D., Grinker, R. R., & Mandell, D. S. (2013). Korean culture and autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 43, 503–520. <http://dx.doi.org/10.1007/s10803-012-1570-4>.
- Koyama, T., Tachimori, H., Sawamura, K., Koyama, A., Naganuma, Y., Makino, H., & Takeshima, T. (2009). Mental health literacy of autism spectrum disorders in the Japanese general population. *Social Psychiatry and Psychiatric Epidemiology*, 44(8), 651–657. <http://dx.doi.org/10.1007/s00127-008-0485-z>.
- Ling, C. Y., Mak, W. W., & Cheng, J. N. (2010). Attribution model of stigma towards children with autism in Hong Kong. *Journal of Applied Research in Intellectual Disabilities*, 23(3), 237–249. <http://dx.doi.org/10.1111/j.1468-3148.2008.00456.x>.
- Link, B. G., & Phelan, J. C. (2012). Conceptualizing stigma. *Annual Review of Sociology*, 27(1), 363–385. <http://dx.doi.org/10.1146/annurev.soc.27.1.363>.
- Lucas, J. W., & Phelan, J. C. (2012). Stigma and status: The interrelation of two theoretical perspectives. *Social Psychology Quarterly*, 75(4), 310–333. <http://dx.doi.org/10.1177/0190272512459968>.
- Mahoney, D. (2007). *College students' attitudes toward individuals with autism* (Doctoral Dissertation). UMI Dissertations Publishing3289131 Retrieved from: ProQuest.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98(2), 224–253. <http://dx.doi.org/10.1037/0033-295X.98.2.224>.
- Matsumoto, D., Yoo, S. H., & Fontaine, J. (2008). Mapping expressive differences around the world the relationship between emotional display rules and individualism versus collectivism. *Journal of Cross-Cultural Psychology*, 39(1), 55–74. <http://dx.doi.org/10.1177/0022022107311854>.
- Milton, D. E. (2012). On the ontological status of autism: The 'double empathy problem'. *Disability & Society*, 27(6), 883–887. <http://dx.doi.org/10.1080/09687599.2012.710008>.
- Ministry of Health, Labour and Welfare (2018). *Sippe, shogai oyobi shin no toukei bunrui*. [Statistical classification of injuries, diseases and deaths] Retrieved from: <http://www.mhlw.go.jp/toukei/sippe/>.
- Morgan, S. P., & Hiroshima, K. (1983). The persistence of extended family residence in Japan: Anachronism or alternative strategy? *American Sociological Review*, 28(2), 269–281. <http://dx.doi.org/10.2307/2095111>.
- Nevill, R. E., & White, S. W. (2011). College students' openness toward autism spectrum disorders: Improving peer acceptance. *Journal of Autism and Developmental Disorders*, 41(12), 1619–1628. <http://dx.doi.org/10.1007/s10803-011-1189-x>.
- Ng, C. H. (1997). The stigma of mental illness in Asian cultures. *Australian and New Zealand Journal of Psychiatry*, 31(3), 382–390. <http://dx.doi.org/10.3109/00048679709073848>.
- Obeid, R., Daou, N., DeNigris, D., Shane-Simpson, C., Brooks, P. J., & Gillespie-Lynch, K. (2015). A cross-cultural comparison of knowledge and stigma associated with autism spectrum disorder among college students in Lebanon and the United States. *Journal of Autism and Developmental Disorders*, 45(11), 3520–3536. <http://dx.doi.org/10.1007/s10803-015-2499-1>.
- Office of Autism Research Coordination (OARC), National Institute of Mental Health and Thomson Reuters, Inc. on behalf of the Interagency Autism Coordinating Committee (IACC). (2012, July). IACC/OARC Autism Spectrum Disorder Research Publications Analysis Report: The Global Landscape of Autism Research.

- Retrieved from the Department of Health and Human Services Interagency Autism Coordinating Committee website: <http://iacc.hhs.gov/publications-analysis/july2012/index.shtml>.
- Qi, X., Zaroff, C. M., & Bernardo, A. B. (2016). Autism spectrum disorder etiology: Lay beliefs and the role of cultural values and social axioms. *Autism*, 20(6), 673–686. <http://dx.doi.org/10.1177/1362361315602372>.
- Reed, G. M., Correia, J. M., Esparza, P., Saxena, S., & Maj, M. (2011). The WPA-WHO global survey of psychiatrists' attitudes towards mental disorders classification. *World Psychiatry*, 10(2), 118–131. <http://dx.doi.org/10.1002/j.2051-5545.2011.tb00034.x>.
- Saetermoe, C., Scattone, D., & Kim, K. H. (2001). Ethnicity and the stigma of disabilities. *Psychology and Health*, 16(6), 699–713. <http://dx.doi.org/10.1080/08870440108405868>.
- Silberman, S. (2015). *Neurotribes: The legacy of autism and the future of neurodiversity*. Penguin.
- Staniland, J. J., & Byrne, M. K. (2013). The effects of a multi-component higher-functioning autism anti-stigma program on adolescent boys. *Journal of Autism and Developmental Disorders*, 43(12), 2816–2829. <http://dx.doi.org/10.1007/s10803-013-1829-4>.
- Stone, W. L. (1987). Cross-disciplinary perspectives on autism. *Journal of Pediatric Psychology*, 12(4), 615–630. <http://dx.doi.org/10.1093/jpepsy/12.4.615>.
- Swaim, K. F., & Morgan, S. B. (2001). Children's attitudes and behavioral intentions toward a peer with autistic behaviors: Does a brief educational intervention have an effect? *Journal of Autism and Developmental Disorders*, 31(2), 195–205. <http://dx.doi.org/10.1023/A:1010703316365>.
- Tait, K., Fung, F., Hu, A., Sweller, N., & Wang, W. (2016). Understanding Hong Kong Chinese families' experiences of an autism/ASD diagnosis. *Journal of Autism and Developmental Disorders*, 46(4), 1164–1183. <http://dx.doi.org/10.1007/s10803-015-2650-z>.
- Takemura, K., Yuki, M., & Ohtsubo, Y. (2010). Attending inside or outside: A Japanese–US comparison of spontaneous memory of group information. *Asian Journal of Social Psychology*, 13(4), 303–307. <http://dx.doi.org/10.1111/j.1467-839X.2010.01327.x>.
- Tipton, L. A., & Blacher, J. (2014). Autism awareness: Views from a campus community. *Journal of Autism and Developmental Disorders*, 44(2), 477–483. <http://dx.doi.org/10.1007/s10803-013-1893-9>.
- World Health Organization (1992). *The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines*. Geneva, Switzerland: Author.
- Yuki, M., Maddux, W. W., Brewer, M. B., & Takemura, K. (2005). Cross-cultural differences in relationship- and group-based trust. *Personality and Social Psychology Bulletin*, 31(1), 48–62. <http://dx.doi.org/10.1177/0146167204271305>.
- Yuki, M. (2003). Intergroup comparison versus intragroup relationships: A cross-cultural examination of social identity theory in North American and East Asian cultural contexts. *Social Psychology Quarterly*, 66(2), 166–183. <http://dx.doi.org/10.2307/1519846>.
- Zechealla, A. N., & Raval, V. V. (2016). Parenting children with intellectual and developmental disabilities in Asian Indian families in the United States. *Journal of Child and Family Studies*, 25(4), 1295–1309. <http://dx.doi.org/10.1007/s10826-015-0285-5>.