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Factors underlying cross-cultural differences in stigma toward autism among college students in Lebanon and the United States

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Abstract

Although stigma negatively impacts autistic people globally, the degree of stigma varies across cultures. Prior research suggests that stigma may be higher in cultures with more collectivistic orientations. This study aimed to identify cultural values and other individual differences that contribute to cross-cultural differences in autism stigma (assessed with a social distance scale) between college students in Lebanon ($n = 556$) and those in the United States ($n = 520$). Replicating prior work, stigma was lower in women than men and in the United States relative to Lebanon. Heightened autism knowledge, quality of contact with autistic people, openness to experience, and reduced acceptance of inequality predicted lower stigma. Collectivism was *not* associated with heightened stigma. Findings highlight the need to address structural inequalities, combat harmful misconceptions, and foster positive contact to combat stigma.

Keywords

autism, contact, cross-cultural, knowledge, stigma, training

Stigma, originally defined by Goffman (1963, p. 3) as “an attribute that is deeply discrediting,” reduces well-being among autistic people and their family members around the world by fostering self-doubt and reducing access to social support, mental health care, employment, and other opportunities (Dehnavi, Malekpour, Faramarz, & Talebi, 2011; Divan, Vajaratkar, Desai, Strik-Lievers, & Patel, 2012; Gray, 2002; Grinker & Cho, 2013; Grinker, Yeargin-Allsopp, & Boyle, 2011; Ha et al., 2014; Mak & Kwok, 2010; Robertson, 2010). The earliest emerging and largest body of research examining stigma toward autism focuses on the parents of autistic people, many of whom report experiencing “courtesy stigma” arising from their close association with autistic people (e.g. Farrugia, 2009; Gray, 2002; Mak & Kwok, 2010; Woodgate, Ateah, & Secco, 2008). More recently, autistic scholars have begun to highlight ways in which the deficit-oriented assumptions that are widespread in the research literature may contribute to stigma toward autism (e.g. Robertson, 2010) and

researchers have begun to examine stigma experienced by autistic people themselves (e.g. Crane, Adams, Harper, Welch, & Pellicano, 2018; Shtayermman, 2009).

Emerging research suggests that stigma toward autism is associated with reduced mental health among autistic adults (Botha & Frost, 2018) and decreased help seeking among autistic college students, a disproportionate number of

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whom face comorbid mental health issues (Jackson, Hart, Brown, & Volkmar, 2018; McMorris et al., 2018). To better support the growing population of autistic college students, a rapidly expanding body of research has begun to examine stigma and associated attitudes toward autism in college students (e.g. Gardiner & Iarocci, 2014; Nevill & White, 2011; Sasson & Morrison, 2017; Tipton & Blacher, 2014; White, Hillier, Frye, & Makrez, 2016). Thus far, such research has focused primarily on college students in Westernized nations. However, the degree to which autism is stigmatized is believed to vary greatly across cultural contexts (e.g. Grinker et al., 2012; Tekola et al., 2016; Tilahun et al., 2017). Indeed, Goffman (1963) highlighted the relational and contextually situated nature of stigma by indicating that stigma does not reside in an attribute itself, but arises when others *interpret* the attribute as an “undesired difference from what we (‘the normals’) had anticipated.” Subsequent researchers have often emphasized the *relative* and *collectively defined* nature of stigma. For example, Stafford and Scott (1986) defined stigma as “a characteristic of persons that is contrary to the norm of a social unit” (p. 80). This description of stigma as a deviation from *collectively defined* norms aligns with the evidence that stigma toward mental health conditions more generally may be heightened in more collectivistic cultures wherein people are encouraged to subordinate their individual needs to the collective goals of their in-groups (e.g. family or tribe) to preserve social harmony (Abdullah & Brown, 2011; Griffiths et al., 2006; Papadopoulos, Foster, & Caldwell, 2013).

Indeed, the first studies to directly compare stigma toward autism across countries revealed that college students in Lebanon and Japan reported higher levels of stigma toward autism (as measured by greater desired social distance from a “person with autism¹”) than college students in the United States (Obeid et al., 2015; Someki, Torri, Brooks, & Gillespie-Lynch, 2018). Lebanon and Japan are often considered slightly more collectivistic than individualistic, although pronounced variation in cultural values within each country is also apparent (e.g. Ayyash-Abdo, 2001; Hofstede Insights, n.d.; Matsumoto, 2007). In contrast, the United States is often considered a primarily individualistic culture, wherein people are encouraged to prioritize personal achievement and autonomy over conformity with group norms. Therefore, Obeid, Someki, and colleagues interpreted their findings as evidence that stigma toward autism is heightened in more collectivistic cultural contexts. However, they did not assess the degree to which their participants actually endorsed collectivistic or individualistic cultural values. Thus, the primary aim of this study was to identify cultural value orientations, and other individual differences, that contribute to differences in stigma (assessed as in prior cross-cultural comparisons using a social distance scale [Obeid et al., 2015; Someki et al., 2018]) among college students in two multicultural

countries: the United States, a vast country (9,161,923 km²) with substantial, but unequally distributed, supports for autistic people (Mandell et al., 2009), and Lebanon, a small (10,452 km²) country in the Middle East with very limited autism resources (Daou, 2014).

What insights can be derived by comparing stigma in Lebanon and the United States?

Autism in Lebanon and other Arab countries has received very little research attention (Hussein & Taha, 2013). Government-based autism services are infrequently available in Lebanon and, when available, they are often of low quality (Daou, 2014). The insufficient autism services in Lebanon may contribute to lack of understanding about and heightened stigma toward autism. Indeed, Obeid and colleagues (2015) found that Lebanese college students expressed less accurate overall knowledge about autism and more stigma (i.e. desired social distance) than college students in the United States. Nevertheless, Lebanese students were more likely to correctly indicate that autism is diagnosed more often in wealthier and more educated families living in countries where richer people have better access to health care.

The United States has higher levels of resources in general (the gross domestic product [GDP per capita] of Lebanon in 2017 was \$8524, while the GDP of the United States was \$59,532; <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>), and autism resources in particular, than Lebanon. Although the United States leads the world in the quantity of autism research produced (Office of Autism Research Coordination, 2012) and the US government is required to provide appropriate educational services to all public school children with disabilities, striking disparities in access to diagnosis and treatment for autism remain apparent in the United States (Durkin et al., 2010). Not only do socioeconomic disparities contribute to deeply problematic inequalities in access to autism resources within and between countries (Divan et al., 2012; Grinker et al., 2011; Mirza, Tareen, Davidson, & Rahman, 2009), how people *respond* to inequalities may amplify the negative effects of inadequate resources by contributing to stigma.

Indeed, conceptualizations of stigma increasingly highlight power *inequalities* as the necessary starting point for stigma. In an attempt to unify the proliferation of diverse ways of defining and measuring stigma that Goffman’s research inspired, Link and Phelan (2001) defined stigma as a process that is *rooted in and exacerbates power inequalities* which consists of the following interrelated components: identifying and labeling differences, linking differences to negative stereotypes, and categorizing people possessing these differences as separate from the categorizers (“us” versus “them”), resulting in status loss and discrimination for those who are stigmatized. This

definition suggests that an investigation of other cultural values besides collectivism, particularly how people respond to power inequalities, may be essential for understanding variations in stigma within and across cultures.

Which cultural value orientations contribute to stigma?

The once myopic focus of cross-cultural psychology on individualism and collectivism as the primary dimension (or dimensions depending on one's perspective) to consider when examining cross-cultural differences has been roundly critiqued (e.g. Voronov & Singer, 2002), with increasing emphasis placed on dynamic context-dependent relationships between varied cultural values and other factors (e.g. Schwartz, 2006; Taras, Steel, & Kirkman, 2012). For example, Triandis and Gelfand (1998) asserted that there are many different forms of individualism and collectivism that arise from variations in the degree to which horizontal (de-emphasizing hierarchy) or vertical (emphasizing hierarchy) social relationships are valued. They developed a scale to assess these cultural value orientations, the Culture Orientation Scale, which we used in this study. The Culture Orientation Scale assesses four domains that may vary independently of one another (Triandis, Chen, & Chan, 1998; Triandis & Gelfand, 1998): vertical individualism (i.e. valuing competitive attempts toward the top of hierarchies), horizontal individualism (i.e. valuing doing one's own thing without comparing oneself to others), vertical collectivism (i.e. valuing being part of a collective (typically the family) where inequality is accepted), and horizontal collectivism (i.e. valuing cooperative union with one's in-groups).

The cultural value verticality, or "acceptance of inequalities among people" (Singelis, Triandis, Bhawuk, & Gelfand, 1995, p. 259), can be measured on either the individual or cultural level and is conceptually similar to Hofstede's culture-level factor, power distance, or "norms establishing and rewarding some forms of inequality" (Singelis et al., 1995, p. 269). The most widely known research assessing power distance and individualism on the *cultural level* is Hofstede's (1983) work wherein he compared the average degree to which "people in a given country" (i.e. a sample of IBM workers who filled out his survey in that country) endorsed specific values *without reference to variation in values between people in the country*. In his work, each *country* was a data point and variation within people in the country was ignored. In research examining cultural values as *individual difference* variables, each person's response is a data point and variability between *people* is a focus of analyses (Kemmelmeyer et al., 2003). Hofstede and McCrae (2004) emphasized the importance of not confusing these levels of analysis: "individuals are to societies as trees are to forests; comparing trees is not comparing forests writ large" (p. 65). To

generalize from individual difference measures of cultural values (e.g. individual responses to the Culture Orientation Scale) to broader cultural values, Triandis (1996) suggested identifying cultural values that 90% of participants from a culture endorse. It is important to note that cultural value orientations as we have conceptualized them in this article are *individual difference characteristics*, or values expressed by individuals.

This distinction is conceptually rather opaque, partially because researchers have been inconsistent in the degree to which they follow it. Although Triandis and colleagues (1988) described individualism versus collectivism on the individual level as a personality dimension, wherein characteristics of individualism were labeled "idocentrism" when assessed on the individual level and characteristics of collectivism were labeled "allocentrism" on the individual level, in subsequent work using the Culture Orientation Scale, they again refer to individualism and collectivism by their more commonly known culture-level labels (Triandis & Gelfand, 1998). To more clearly link our work to prior research, we follow them in their choice of terminology but highlight that individualism and collectivism and vertical and horizontal cultural orientations refer to *individual-level* value orientations in this article.

Although prior research has not related the Culture Orientation Scale to stigma toward autism in particular, prior research suggests that vertical cultural values may contribute to stigma toward disabilities more generally. Rao, Horton, Tsang, Shi, and Corrigan (2010) found that individualism, specifically vertical individualism (assessed using the Culture Orientation Scale), was associated with *heightened* stigma toward job candidates with mental or physical health conditions (i.e. psychosis, substance dependence, HIV, cancer), among employers in China and the United States. Unexpectedly, Chinese employers reported heightened vertical individualism relative to the US employers, which the authors attributed to the rise of capitalism. Similarly, Ditchman, Easton, Batchos, Rafajko, and Shah (2017) found that vertical individualism was associated with more negative attitudes toward the sexuality of people with intellectual disabilities, while horizontal individualism and horizontal collectivism were associated with more positive attitudes. These findings suggest that inconsistencies in observed associations between individualism, collectivism, and stigma may be attributable to the vertical (accepting inequality as a necessary part of social life) versus horizontal (rejecting power differences in favor of equality) dimension of the Culture Orientation Scale rather than the individualism versus collectivism dimension.

Indeed, the first study to our knowledge to examine individualism versus collectivism as a single dimension predicting stigma contained evidence that the vertical versus horizontal dimension is important to consider. Papadopoulos

and colleagues (2013) conducted a survey with different ethnic groups in the United Kingdom which revealed that heightened individualism relative to collectivism (assessed with the Culture Orientation Scale) was associated with reduced stigma toward mental health conditions among people from American and Chinese backgrounds, but was not related to stigma among people from White-English or Greek backgrounds. They interpreted these findings as evidence that individualism versus collectivism helps explain stigma toward mental health conditions among people from cultures where mental health conditions are either more (Chinese) or less (American) stigmatized but not in cultures with intermediate levels of stigma (White-English or Greek). Although they did not include the vertical versus horizontal dimension of the Culture Orientation Scale in analyses predicting stigma from individualism versus collectivism, they provided a graph depicting the vertical and horizontal dimensions of individualism versus collectivism separately for each group. This graph revealed that participants from both American and Chinese backgrounds reported pronounced vertical relative to horizontal cultural tendencies; American heritage participants' vertical tendencies were highly individualistic, while Chinese heritage participants' vertical tendencies were highly collectivistic. In contrast, participants from White-English backgrounds reported heightened horizontal relative to vertical orientations and Greek heritage participants reported similar levels of vertical and horizontal tendencies. This pattern suggests that the vertical versus horizontal dimension may be associated with stigma. To the best of our knowledge, no prior research has examined the independent contributions of individualism versus collectivism and vertical versus horizontal cultural orientations to stigma.

Do other personal characteristics and experiences also contribute to stigma?

In prior cross-cultural work, reduced stigma toward autism (assessed with a social distance scale) has been associated, albeit inconsistently, with the following participant characteristics: being female, heightened autism knowledge, reduced autistic traits, prior contact with an autistic person, and being in a helping major, such as education, psychology, social work, or nursing (Obeid et al., 2015; Someki et al., 2018). Although prior cross-cultural research did not assess associations between prior quality of contact with autism and stigma, quality of contact is more consistently associated with autism acceptance than quantity of contact (Gardiner & Iarocci, 2014). Indeed, contact theory states that high-quality contact between groups can decrease biases (Allport, 1954).

Greater openness to experience (i.e. the tendency to be drawn to novelty and think independently; McCrae & Costa, 1987) among students in some "helping majors," such as psychology, compared to students in professional

majors (Vedel, 2016), may also contribute to differences in stigma. Openness to experience is a more consistent predictor of reduced mental health stigma than prior contact with people with mental health conditions (Brown, 2012). Openness to experience has also been directly associated with less prejudice against gay men and lesbians (Cullen et al., 2002) and indirectly associated with generalized prejudice (racism, sexism, prejudice toward homosexual individuals, and individuals with mental disabilities) through right-wing authoritarianism (Ekehammar, Akrami, Gylje, & Zakrisson, 2004; Sibley & Duckitt, 2008), which in turn is associated with both individual and cultural differences in vertical cultural value orientations (Kimmelmeier et al., 2003). Reduced openness is also associated with heightened acceptance of inequality on a cultural level (Hofstede & McCrae, 2004).

Research hypotheses

We hypothesized that lower quality of prior contact with autistic people (i.e. less enjoyable interactions with autistic people), less openness to experience, and less trait emotional intelligence (a constellation of self-perceptions individuals have about their emotional abilities, including empathy, that facilitates prosocial behaviors; Mavroveli & Sanchez-Ruiz, 2011; Petrides et al., 2016) would be associated with heightened stigma toward autism and underlie cross-cultural differences in stigma. In light of evidence that stigma toward mental health conditions is heightened in collectivistic cultures (Abdullah & Brown, 2011; Griffiths et al., 2006; Papadopoulos et al., 2013) and evidence that stigma toward autism is heightened among college students in Japan and Lebanon relative to the United States (Obeid et al., 2015; Someki et al., 2018), we considered the possibility that stigma toward autism might be positively associated with collectivism. However, other literature suggested that stigma toward autistic individuals may be *reduced* in potentially more collectivistic cultural contexts such as Morocco (Haldane & Crawford, 2010), the Navajo Nation (Kapp, 2011), and Nicaragua (Kim, 2012), and that a preference for social inequality may more closely relate to prejudice (Duckitt & Sibley, 2017; Ekehammar et al., 2004; Sibley & Duckitt, 2008). After discussing these conflicted patterns in the prior literature, the authors of this report were unable to agree upon a unified hypothesis concerning cultural values and stigma. Therefore, analyses of potential associations between cultural values and stigma should be regarded as exploratory. Given that social desirability may influence self-reported preferences for social distance and culture value orientations (Link, Yang, Phelan, & Collins, 2004; Triandis et al., 1998) and was not assessed in prior research comparing social distance toward autism across cultures (Obeid et al., 2015; Someki et al., 2018), we included susceptibility to the social desirability bias in analyses.

Method

This study is a replication and expansion on Obeid and colleagues' (2015) original cross-cultural comparison of stigma toward autism among college students in Lebanon and the United States. We initially obtained approval to conduct this study from the institutional review boards (IRBs) of two urban universities in the United States and two urban universities in Lebanon. However, only one university in each country was able to provide academic credit for participation. Schools that could not provide credit were not able to recruit more than a handful of students, so analyses focus on the two universities that could provide credit for participation.

Participants

College students ($N=1150$) in Lebanon ($n=611$) and the United States ($n=539$) were recruited via online subject pools in the psychology departments of each university. All participants completed an online consent form wherein they were provided with the authors' contact information should any concerns arise, followed by an online survey that included pre-tests (assessing autism knowledge and stigma), an autism training (Gillespie-Lynch et al., 2015; Obeid et al., 2015), and post-tests (identical to pre-tests), as well as assessments of participants' cultural value orientation (individualism–collectivism and vertical–horizontal dimensions), social desirability bias, openness to experience, trait emotional intelligence, autism symptoms, and demographics, including types and quality of contact with individuals with autism. Participants were also invited to share their feedback on the survey at the end of the survey. The findings described in this report focus on pre-test measures of autism stigma in relation to individual differences.² A total of 74 participants were excluded from analyses because they did not indicate that they were fluent in English when asked at the beginning of the survey “Are you fluent in English?” The final sample consisted of 556 students from Lebanon and 520 students from the United States.

Materials

Autism awareness survey. This measure of autism knowledge ($\alpha=0.62$ for Lebanon; $\alpha=0.68$ for the United States) was adapted from an original scale created by Stone (1987). Participants were asked to rate 13 statements about autism using a five-level Likert-type scale (i.e. -2 for *strongly disagree* to 2 for *strongly agree*; seven items were reverse scored). See Gillespie-Lynch and colleagues (2015) for specific items; note that “People with autism have empathy” was replaced in this study with “People with autism care about and feel the pain of those who are suffering” to align with research suggesting that cognitive,

but not affective, empathy may be impaired in autism (Jones, Happé, Gilbert, Burnett, & Viding, 2010). The total autism knowledge score could range from -26 to 26 with a higher score indicating more accurate knowledge of autism.

Autism social distance scale. The measure of stigma used in this study was an adapted version of the Social Distance Scale (Bogardus, 1933), a commonly used measure of stigma that typically exhibits good internal consistency and evidence of validity (Link et al., 2004). We utilized a social distance scale to be able to relate our findings to prior cross-cultural autism stigma research which also used a social distance scale (e.g. Obeid et al., 2015; Someki et al., 2018). To ensure that random responding was not driving cross-cultural differences, we expanded the six-item scale (with no reverse-scored items) used in prior work to include 11 items (5 of which were reverse scored; see Appendix 1). Stigma scores could range from -22 to 22 with higher scores indicating heightened stigma. The internal consistency of our adapted social distance scale remained good in the current sample ($\alpha=0.88$ for Lebanon; $\alpha=0.89$ for the United States). Given that we added additional items to a previously used scale, we also conducted a principal component analysis, which revealed one factor with an eigenvalue greater than 1.00. This factor, with an eigenvalue of 5.24, explained 48% of the variance in the scale. All 11 items had a loading of 0.60 or higher on this factor.

Culture orientation scale. This 16-item measure consists of four four-item subscales: vertical individualism (e.g. “Winning is everything.”), vertical collectivism (e.g. “It is important to me that I respect the decisions made by my groups.”), horizontal individualism (e.g. “I often do ‘my own thing’.”), and horizontal collectivism (e.g. “If a coworker gets a prize, I would feel proud.”) (Triandis & Gelfand, 1998). Following Papadopoulos and colleagues (2013), we assessed the relative degree of individualism versus collectivism by subtracting each individual's total collectivism score from their total individualism score. Similarly, we assessed the relative degree of vertical versus horizontal orientation by subtracting each individual's total horizontal score from their total vertical score. Exploratory factor analysis of this measure in the current sample revealed that all items loaded on a single factor, except for items from the vertical individualism subscale, which comprised their own factor. However, the internal consistency of the overall scale was acceptable ($\alpha=0.75$ for Lebanon; $\alpha=0.79$ for the United States).

Demographic survey. Participants were asked to indicate their age, gender, major (classified as helping majors if education, nursing, occupational/physical therapy, psychology, or social work was reported), country of residence

(United States vs Lebanon), and personal relationships with autism (“Please select as many of the following types of relationships as you have had with people with autism spectrum disorders: yourself, your child, your parent, your sibling, your spouse, your extended family member, your friend, your coworker, your student, your fellow student, your acquaintance, or other.”). Participants were also asked to rate the quality of their prior contact with autism using four Likert-type scale items from Gardiner and Iarocci (2014; e.g. “In the past, my experiences with individuals with autism have been pleasant.”).

Short Marlowe–Crowne Social Desirability Scale. This measure of social desirability bias ($\alpha=0.57$ for Lebanon; $\alpha=0.62$ for the United States) consists of 13 binary items (5 reverse scored; Reynolds, 1982). Higher scores indicate greater susceptibility to the social desirability bias.

Openness to experience (NEO Five-Factor Inventory-3). Openness to experience ($\alpha=0.74$ for Lebanon; $\alpha=0.74$ for the United States) was assessed using a subscale of the NEO Five-Factor Inventory-3 (NEO FFI-3) comprising 12 items (5 reverse scored; McCrae & Costa, 2007). Higher scores indicate greater intellectual curiosity and openness to experience.

RAADS-14. This 14-item measure (1 reverse-scored item) was designed to be a rapid screener for autism risk (Eriksson, Andersen, & Bejerot, 2013). Higher scores indicate more autistic symptoms ($\alpha=0.76$ for Lebanon; $\alpha=0.84$ for the United States).

Trait Emotional Intelligence Questionnaire. This 30-item measure (15 reverse-scored items; $\alpha=0.88$ for Lebanon; $\alpha=0.89$ for the United States) consists of four subscales (well-being, self-control, emotionality, and sociability; Petrides, 2009). Higher overall scores indicate heightened emotional intelligence.

The analytic approach

We evaluated kurtosis (which was excessively high for one variable: age), skew, and multicollinearity. The social distance scale used in this study was far more normally distributed than a prior version of the scale that lacked reverse-scored items (Gillespie-Lynch et al., 2015). Exploratory correlations for each country can separately be viewed in Appendices 2 and 3. For our primary analyses, we conducted independent-sample *t*-tests (for continuous variables) and *chi-square* tests (for categorical variables) to examine differences between participants from Lebanon and the United States. Then, we conducted a regression with gender and country as predictors to evaluate if Obeid and colleagues’ (2015) finding that social distance scores were heightened in Lebanon relative to the

United States replicated in this sample. Next, we conducted a regression analysis to determine which variables predicted social distance scores when other potential predictor variables were accounted for (including individualism vs collectivism and vertical vs horizontal orientations). Given the controversy about whether cultural values should be conceptualized as poles of one dimension or categories that covary, we reran this regression with the same set of variables but replaced vertical versus horizontal and individual versus collectivistic cultural values with the four domains of the Culture Orientation Scale: vertical individualism, horizontal individualism, vertical collectivism, and horizontal collectivism. To protect against Type 1 error, we used a Bonferroni correction for primary analyses, resulting in an alpha level of 0.001.

Results

Differences between participants from Lebanon and the United States

Participants in Lebanon were younger and less likely to be in helping majors than students in the United States (see Table 1). They reported less frequently having had any prior relationships with, as well as lower quality of prior contact with, autistic people, less knowledge about autism, and a higher preference for social distance from autistic people, yet more openness to experience relative to students in the United States. Unexpectedly, students in Lebanon and the United States did not differ in self-reported cultural values overall.

Predictors of stigma toward autism

An initial regression analysis predicting social distance scores from only gender and country replicated prior research (Obeid et al., 2015); males reported greater desire for social distance from autistic people than females, and Lebanese students reported greater desire for social distance than the US students (see Table 2; overall $R^2=0.04$). When all potential predictors (with cultural values operationalized as dimensions of individualism vs collectivism and vertical vs horizontal orientations) were included in a regression model predicting social distance scores across countries (see Table 3), lesser autism knowledge, quality of contact, and openness to experience and greater vertical relative to horizontal cultural value orientation were associated with higher preferred social distance (overall $R^2=0.29$). Heightened individualism relative to collectivism ($p=0.003$) was marginally associated with heightened social distance scores. Country ($p=0.06$), major ($p=0.051$), gender ($p=0.11$), trait emotional intelligence ($p=0.09$), lack of prior contact with autism ($p=0.12^3$), social desirability bias ($p=0.15$), and age ($p=0.66$) were not significantly related to social distance scores in this model.

Table 1. Comparisons of participant characteristics across countries.

	United States	Lebanon	
%Male	40.8	40.1	$p = 0.85$
%Nuclear family ASD	7.3	4.0	$p = 0.02$; $V = 0.07$
%No contact ASD	28.7	48.7	$p < 0.001$; $V = 0.21$
Quality of contact	1.71(4.10)	-1.05(3.75)	$p < 0.001$; $R^2 = 0.11$
Helping majors	39.4	13.8	$p < 0.001$; $V = 0.29$
Age	20.20(4.26)	18.83(1.75)	$p < 0.001$; $R^2 = 0.04$
Autism stigma	-10.59(8.24)	-8.29(8.02)	$p < 0.001$; $R^2 = 0.02$
Autism knowledge	9.99(7.28)	7.23(7.16)	$p < 0.001$; $R^2 = 0.04$
Individualism versus collectivism	-4.06(8.00)	-3.16(8.69)	$p = 0.08$
Vertical orientation	-4.23(6.59)	-4.33(7.05)	$p = 0.81$
Emotional intelligence	54.63(22.68)	55.65(21.94)	$p = 0.46$
Openness to ideas	6.25(6.33)	9.31(6.50)	$p < 0.001$; $R^2 = 0.05$
Social desirability bias	7.18(2.65)	6.76(2.54)	$p = 0.008$; $R^2 = 0.01$
Autism symptoms	10.81(8.39)	10/43(7.27)	$p = 0.42$

ASD: autism spectrum disorder.

Bolded items are significant at the alpha level of 0.001 selected for this study.

Table 2. Regression predicting stigma toward autism from only gender and country.

Predictors	B	SE B	β	t	p
Country	2.32	0.49	0.14	4.71	<0.001
Gender	2.16	0.50	0.13	4.32	<0.001

SE: standard error.

In a follow-up regression wherein the two polar dimensions of cultural values were replaced with vertical collectivism, vertical individualism, horizontal collectivism, and horizontal individualism (Table 4), *lesser* autism knowledge, quality of contact, openness to experience, and *horizontal collectivism* and *more vertical individualism* were associated with heightened preference for social distance from autistic people (overall $R^2 = 0.30$).

Discussion

Contrary to prior research focused on mental health conditions using country-level (e.g. Griffiths et al., 2006) or individual-level (e.g. Papadopoulos et al., 2013) analyses of cultural values, we found *no* evidence that greater collectivism was associated with heightened stigma toward autism, as assessed with a social distance scale. Instead, heightened *acceptance of inequality* was associated with higher stigma toward autism. A trend toward positive associations between *greater* individualism relative to collectivism and stigma toward autism was also observed. A follow-up analysis wherein cultural value orientations were conceptualized as four independent categories rather than two dimensions revealed that vertical individualism was associated with a heightened preference for social distance from autistic people, while horizontal collectivism was associated with reduced social distance scores. These

findings align with the evidence that vertical individualism is associated with heightened stigma toward disabilities (e.g. Ditchman et al., 2017; Rao et al., 2010). Findings also align with a larger body of research linking belief systems and/or personality traits (i.e. social dominance orientation and authoritarian personality) that promote inequality as a desirable aspect of human interaction with stigma toward many ways of being different, including disability status, race, economic status, gender, sexuality, and immigration status (Craig & Richeson, 2014; Duckitt & Sibley, 2017; Ekehammar et al., 2004; Triandis, Davis, & Takezawa, 1965). As Link and Phelan (2001) aptly pointed out, “Stigma is entirely dependent on social, economic and political power—it takes power to stigmatize” (p. 375).

Prior evidence that stigma (assessed with a social distance scale) is heightened among college students in Lebanon relative to the United States (Obeid et al., 2015) was replicated in this study. Contrary to expectations, no differences in cultural value orientations were observed between participants in each country. Although this study was designed to elucidate the underlying factors that may contribute to international differences in stigma, it is important to note that gender and country explained very little of the variance in stigma toward autism even before other factors were accounted for. Autism knowledge and high quality of contact with autistic people, greater openness to experience, and the belief that people *should be* equal (more horizontal cultural value orientations) were more strongly associated with stigma toward autism than what country participants lived in.

Limitations and future directions

The small magnitude of differences in preferred social distance between Lebanese versus the US students in this study might be comparable to variations in stigma between

Table 3. Regression model predicting social distance toward autism with cultural values represented as two polar dimensions.

Predictors	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Country	0.85	0.49	0.05	1.75	0.08
Gender	0.71	0.46	0.04	1.54	0.12
Helping major	-0.89	0.52	-0.05	-1.71	0.09
No contact ASD	-0.80	0.48	-0.05	-1.70	0.09
Quality of contact	-0.40	0.06	-0.20	-6.69	<0.001
Autism symptoms	-0.05	0.03	-0.05	-1.67	0.10
Autism knowledge	-0.32	0.03	-0.29	-10.19	<0.001
Individualism	0.09	0.03	0.09	3.04	0.002
Vertical orientation	0.13	0.04	0.11	3.66	<0.001
Openness to ideas	-0.23	0.04	-0.19	-6.33	<0.001
Emotional intelligence	-0.02	0.01	-0.05	-1.60	0.11
Social desirability bias	-0.13	0.09	-0.04	-1.45	0.15

SE: standard error; ASD: autism spectrum disorder.

Bolded items are significant at the alpha level of 0.001 selected for this study.

Table 4. Regression model predicting social distance toward autism with cultural values represented as four unique categories.

Predictors	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>t</i>	<i>p</i>
Country	1.01	0.49	0.06	2.05	0.04
Gender	0.72	0.46	0.04	1.57	0.12
Helping major	-1.03	0.52	-0.06	-1.98	0.05
No contact ASD	-0.72	0.48	-0.04	-1.51	0.13
Quality of contact	-0.38	0.06	-0.19	-6.38	<0.001
Autism symptoms	-0.05	0.03	-0.05	-1.65	0.10
Autism knowledge	-0.32	0.03	-0.29	-10.31	<0.001
Vertical individualism	0.21	0.05	0.12	4.25	<0.001
Horizontal individualism	-0.10	0.06	-0.05	-1.56	0.12
Vertical collectivism	-0.02	0.07	-0.01	-0.29	0.77
Horizontal collectivism	-0.23	0.07	-0.11	3.25	<0.001
Openness to ideas	-0.22	0.04	-0.18	-5.93	<0.001
Emotional intelligence	-0.02	0.07	-0.04	-1.26	0.21
Social desirability bias	-0.13	0.09	-0.04	-1.42	0.16

SE: standard error; ASD: autism spectrum disorder.

Bolded items are significant at the alpha level of 0.001 selected for this study.

different racial/ethnic groups in a single multicultural country. Indeed, variations in stigma toward mental illness between different ethnic/racial groups within the United States have been well documented (Abdullah & Brown, 2011). Although we asked participants to indicate their racial/ethnic background using an open-ended response, responses were not sufficiently clear to permit analysis of the degree to which variations in racial/ethnic background might contribute to stigma toward autism. For example, many students in Lebanon described themselves as White and many others described themselves as Arabic; both would be considered Caucasian according to the US census categories. Other students indicated that race “does not matter” or provided their religious affiliation instead. Indeed, religious background may impact racial/ethnic self-identification in the Middle East, with Christians being more likely to identify as White (e.g. Gualtieri,

2001). Future research examining individual cultural heritage in relation to cultural value orientations and stigma should use closed-ended options that separately address both race/ethnicity and sectarian/religious background with open-ended opportunities to elaborate.

Our comparison of students from a single college in each country conflates potential differences between specific colleges with potential cultural differences. Although we initially tried to collect data from an additional school in each country, we were only able to provide academic credit for participating at the two schools described in this report; recruitment proved untenable when participation was not incentivized. Our requirement that Lebanese participants be fluent English speakers raises concerns that Lebanese participants in this study might be more Westernized than non-English-speaking Lebanese people might be. Although the majority of Lebanese people are

educated in either English or French and most majors in Lebanese universities require fluency in at least two languages (Esseili, 2017), a study examining variations in individualism versus collectivism among college students in Lebanon revealed that students who elected to take a survey in Arabic tended to be more collectivistic than students who elected to take the same survey in either French or English (Ayyash-Abdo, 2001). However, identifying as Muslim rather than Christian also predicted collectivistic values, further supporting the importance of assessing religious orientation in future research about cultural values and stigma. Such research should also assess degree of Westernization (e.g. Stigler et al., 2010).

Given that our reliance on a convenience sample of college students who might be more individualistic than the general population may have attenuated some of the cross-cultural effects which our study set out to explore, future work with more funding to support it should assess stigma across multiple settings in each country, preferably with a general population sample, using measures that are translated into the various languages people in each country speak. Such work should also compare stigma across a range of countries, to be able to explore the associations between both *culture-level* and *individual-level* cultural value orientations and stigma. The current findings and prior literature suggest that associations between collectivism and stigma may vary depending on the level of analyses, while highlighting the fact that established measures of culture-level value orientations (e.g. Hofstede, 1983) may no longer be accurate (e.g. Rao et al., 2010).

Differences between the current findings and prior work (e.g. Papadopoulos et al., 2013) may be attributable to differences in the conditions studied and the measures used. However, in a follow-up to this study (manuscript in preparation), we found that heightened vertical relative to horizontal cultural value orientations (and *not* heightened collectivism) were associated with heightened stigma toward a range of other conditions (e.g. schizophrenia, social anxiety, depression). Nevertheless, reliance on a single self-report measure of stigma, the social distance scale, is a significant limitation of this study. Although social distance scales have commonly been used in prior research examining stigma toward autism (e.g. Tilahun et al., 2017) and other mental health conditions (e.g. Griffiths et al., 2006) in diverse cultures, it is possible that differences between the current findings and the findings documented by other researchers (e.g. Papadopoulos et al., 2013) might be attributable to their use of a different and more comprehensive measure, the Community Attitudes Toward the Mentally Ill Scale (CAMI; Taylor & Dear, 1981). Although social distance scores and CAMI scores have been correlated in prior research (Lee & Lee, 2016; Smith & Cashwell, 2011), future research should use diverse measures of stigma to allow direct comparisons across studies.

Given that the ways stigma and cultural value orientations are enacted are context dependent, future research examining stigma toward autism internationally should include in-depth qualitative interviews and/or behavioral measures of actual interactions with autistic people in relation to measures of structural stigma (institutional practices and norms that disadvantage people in specific sociopolitical contexts). Given the relatively low alpha of the autism knowledge scale used in this study, future work should develop a comprehensive open-access measure of autism knowledge and stigma in collaboration with the autism community. Such a measure should highlight strengths as well as weaknesses associated with autism and ways in which stigma may be expressed and experienced differently in different cultures, depending on the cultural values that are most salient to a particular group (see Abdullah & Brown, 2011). Most importantly, future research should focus on decreasing structural stigma toward autism by building on promising innovations, including participatory autism research (e.g. Nicolaidis et al., 2011) and autism trainings for students (e.g. Gillespie-Lynch et al., 2015), health care workers in low-resource regions (Tilahun et al., 2017), and employers (e.g. <https://proautism.org.uk/>).

Conclusion

The findings described in this report suggest that, at least in multicultural countries like Lebanon and the United States, cultural values (particularly acceptance of inequality), personal experiences, and individual differences in openness to experience exert a stronger influence on one's stigma toward autism than one's national or gender identity. Findings suggest that equalizing experiences (such as positive contact) and personality characteristics that contribute to such experiences (such as openness to experience and a commitment to fostering equality in social interactions) may reduce stigma toward autism. The evidence described in this report that heightened vertical cultural orientation is associated with more stigma toward autism is striking given that income inequality is a societal-level indicator of vertical cultural orientation (Triandis & Gelfand, 1998) and recent evidence indicates that income inequality is increasing worldwide, particularly within the United States (Alvaredo, Chancel, Piketty, Saez, & Zucman, 2018). Future research should focus on fostering high-quality positive contact with autistic people while identifying effective techniques to resist structural stigma and combat harmful misconceptions to work against societal forces that may, if unchecked, contribute to increased stigma toward people with disabilities.

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Notes

1. To respect the preferences of autistic people who prefer “identity first” terms (e.g. Kapp et al., 2013; Kenny et al., 2016), we use the term “autistic person” throughout this report except when describing measures that used person-first language.
2. Although not the focus of this report, participation in the online training was associated with immediate improvements in autism stigma and knowledge among college students in Lebanon and the United States in the current sample, replicating prior research in different samples from the United States, Lebanon, and Japan (Gillespie-Lynch et al., 2015; Obeid et al., 2015; Someki et al., 2018).
3. Although we focus in primary analyses on the presence or absence of any prior contact with autism, we also examined if a dimensional measure of contact (or the number of different types of relationships with autism participants reported) was associated with social distance. Both measures were associated with reduced social distance in correlations. Aligning with the prior literature (e.g. Gardiner & Iarocci, 2014), such associations were no longer apparent once quality of contact was accounted for.

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Appendix I

Social distance scale

The five-point response scale ranged from strongly disagree to strongly agree

1. I would be willing to move next door to someone with autism.
2. I would NOT be willing to take a class with a student with autism.
3. I would be willing to spend an evening socializing with someone with autism.
4. I would NOT be willing to take a class taught by a professor with autism.
5. I would be willing to start a collaborative project with someone with autism.
6. I would NOT be willing to do a group presentation with a person with autism.
7. I would be willing to make friends with a person with autism.
8. I would NOT be willing to go to a formal event with a person with autism.
9. I would be willing to have a person with autism marry into the family.
10. I would NOT be willing to open a business with a person with autism.
11. I would be willing to marry or date a person with autism.

Appendix 2. Exploratory correlations between variables among US college students.

Measure	2	3	4	5	6	7	8	9	10	11	12	13
1. Stigma	0.15***	-0.32***	-0.02	0.14**	-0.11*	0.21***	0.30***	-0.30***	-0.06	-0.44***	0.11*	-0.34***
2. No experience ASD	-	-0.37***	-0.04	0.12**	-0.10*	0.05	0.11*	-0.05	0.01	-0.17***	-0.05	-0.07
3. Quality contact			0.04	-0.05	0.10*	-0.13**	-0.12**	0.07	0.04	0.26***	0.07	0.05
4. Age			-	-0.04	0.06	-0.07	-0.04	0.18***	0.09*	0.06	-0.09*	0.18***
5. Gender				-	-0.32***	0.13**	0.20***	0.07	0.05	-0.08	-0.07	-0.12**
6. Helping major					-	-0.10*	-0.13**	0.02	-0.02	0.07	0.04	0.01
7. Individualism						-	0.31***	-0.29***	-0.30***	-0.07	0.16***	-0.08
8. Vertical orientation							-	-0.20***	-0.11*	-0.16***	0.12**	-0.28***
9. TEI								-	0.32***	0.22***	-0.52***	0.31***
10. Social desirability									-	-0.07	0.29***	-0.10**
11. ASD knowledge										-	-0.09	0.24***
12. ASD symptoms											-	-0.11*
13. Openness												-

TEI: trait emotional intelligence; ASD: autism spectrum disorder. ***p ≤ 0.001; **p ≤ 0.01; *p ≤ 0.05.

Appendix 3. Exploratory correlations between variables among Lebanese college students.

Measure	2	3	4	5	6	7	8	9	10	11	12	13
1. Stigma	0.03	-0.25***	-0.04	0.13**	-0.06	0.17***	0.23***	-0.08	-0.09*	-0.35***	-0.02	-0.29***
2. No experience ASD	-	-0.36***	0.04	-0.09**	0.05	-0.01	-0.02	-0.07	0.04	-0.08	-0.03	-0.07
3. Quality contact			-0.11**	-0.01	-0.02	-0.06	-0.01	0.06	0.07	0.19***	0.05	0.12**
4. Age			-	-0.03	0.06	0.05	0.06	-0.14***	-0.02	-0.01	0.12	-0.11**
5. Gender				-	-0.17***	0.24***	0.15***	0.01	0.01	-0.06	0.07	-0.10*
6. Helping major					-	-0.07	-0.05	-0.05	0.01	-0.03	-0.01	-0.06
7. Individualism						-	0.40***	-0.24***	-0.30***	0.01	0.16***	0.02
8. Vertical orientation							-	-0.24***	-0.16***	-0.12**	-0.52***	-0.23***
9. TEI								-	0.33***	0.07	0.24***	0.28***
10. Social desirability									-	0.16	0.21	0.03
11. ASD knowledge										-	-0.01	0.28***
12. ASD symptoms											-	-0.10*
13. Openness												-

TEI: trait emotional intelligence; ASD: autism spectrum disorder.

*** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$.