



Do Autistic People's Support Needs and Non-Autistic People's Support for the Neurodiversity Movement Contribute to Heightened Autism Stigma in South Korea vs. the US?

So Yoon Kim¹ · Kristen Gillespie-Lynch²

Accepted: 30 August 2022 / Published online: 7 September 2022

© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2022

Abstract

We examined stigma towards vignette characters representing diverse autistic characteristics (social, non-speaking, or repetitive interests or restricted behaviors; RIRB) among 259 South Korean and 240 American participants (age range = 18 ~ 74). Within each domain, participants were randomized to read a vignette depicting low or high support needs. Koreans reported greater stigma towards autistic characteristics and less awareness of and support for the neurodiversity movement than Americans. Autistic characters' support needs and rater characteristics (autism knowledge, neurodiversity endorsement, and contact quantity) predicted stigma in at least one domain, and after accounting for these variables, participants' nationality was suggestively associated only with stigma towards social characteristics and RIRB. Findings highlight the need for culturally adapted-training that provides contact with diverse autistic people.

Keywords Autism · Stigma · Contexts · Support needs · Neurodiversity · Cross-cultural · Non-speaking

Recent research suggests that non-autistic people in South Korea are less willing to engage with autistic people than their counterparts in the United States (US; Kim et al., 2021) or the United Kingdom (UK; Mac Cárthaigh & Lopez, 2020). Planning to keep one's distance from autistic people is an indicator of public stigma, which includes labeling people as different, stereotyping or making assumptions about differences, distinguishing between us and them, and discriminating against them (Goffman, 1963; Link & Phelan, 2001). Public stigma reduces the social status and material opportunities available to people who are stigmatized (Johnson & Joshi, 2016). Many stigmatized people internalize stigma, viewing themselves as less than others. Given that internalized stigma contributes to poor mental health among autistic individuals (Botha & Frost, 2020), there

has been increasing interest in understanding factors that contribute to stigma towards autistic people such as limited autism knowledge and/or contact with autistic people (e.g., Gillespie-Lynch et al., 2019; Kim et al., 2021).

An emerging body of cross-cultural research suggests that public autism stigma, measured by desired social distance with autistic individuals, is heightened in South Korea (Kim et al., 2021), Japan (Someki et al., 2018), Lebanon (Obeid et al., 2015), and Malaysia (de Vries et al., 2020) compared to the US or UK. This cross-cultural pattern aligns with speculation that stigma more generally may be higher in more collectivistic (i.e., prioritizing group harmony and cohesion) than individualistic (i.e., prioritizing independence and individual success) cultures (e.g., Papadopoulos et al., 2013). However, associations between individuals' cultural values and their desired social distance from autistic people do not support this interpretation. In Lebanon, South Korea, and the US, heightened individual-level horizontal collectivism (or valuing cooperation between ingroups) has been associated with decreased stigma, and heightened vertical individualism (or valuing individual attempts at dominance) has been associated with increased stigma (Gillespie-Lynch et al., 2019; Kim et al., 2021).

In addition to acceptance of inequality (i.e., vertical orientation), many other factors also contribute to stigma.

So Yoon Kim and Kristen Gillespie-Lynch share the first authorship.

✉ So Yoon Kim
soyoonkim@duksung.ac.kr

¹ Department of Teacher Education, Duksung Women's University, 33, Samyang-ro 144-gil, Dobong-gu, Seoul 01369, Republic of Korea

² Department of Psychology, College of Staten Island, Staten Island, 2800 Victory Blvd, Staten Island, NY 10314, USA

Some factors appear to contribute to stigma similarly across cultures (e.g., heightened vertical orientation, less accurate autism knowledge, and reduced pleasantness and frequency of previous contact with autism; Kim et al., 2021), while other factors may only be associated with autism stigma in *some* cultural contexts. For example, cultural tightness (or the strength of a society's norms and rejection of deviant behaviors) was only associated with stigma towards the label "autism" in South Korea and not in the US (Kim et al., 2021). In contrast, in-group favoritism and out-group derogation, which are commonly associated with prejudice toward other minority identities, were associated with stigma towards the label "autism" in the US but not in South Korea. To better understand when and why public stigma towards autistic people is heightened in South Korea vs. the US, the current study examined if characteristics of non-autistic people (e.g., autism knowledge) and/or autistic people (e.g., support needs) contribute to stigma towards adults exhibiting unlabeled characteristics associated with autism in South Korea and the US.

Why Focus on Autism Stigma in South Korea

South Korea is a relatively ethnically, racially, and culturally homogeneous country (Kim-Rupnow, 2005). Such homogeneity may contribute to heightened cultural tightness (Gelfand et al., 2011). Indeed, cultural tightness is higher among South Koreans than Americans (Kim et al., 2021), which may cause individuals who exhibit behaviors that diverge from social norms (e.g., autistic individuals) to become targets of discrimination in South Korea (Kim-Rupnow, 2005). Kim et al. (2021) found that cultural tightness was positively associated with stigma towards the label "autism" in South Korea. However, South Koreans reported greater stigma towards the label "autism" than Americans, even after accounting for rater characteristics such as cultural tightness, vertical orientation, autism knowledge, and pleasantness and quantity of contact with autistic people.

It is possible that limited exposure to the neurodiversity movement, which has been shifting perspectives about autism in many countries since coming into being in the late 1990s (Kapp, 2020), may be magnifying cross-cultural variations in autism stigma between South Korea and the US. The neurodiversity movement frames autism and other neurological differences as valuable aspects of human diversity (Kapp et al., 2013; Singer, 2016). Neurodiversity advocates condemn efforts to "cure" autism and other neurological conditions and instead advocate for support to help autistic individuals thrive. The neurodiversity movement may be increasing autism acceptance by reframing stigmatizing misconceptions, e.g., that autism is an illness, with the recognition that autism is often a valued aspect of people's identities

(Grinker, 2020). However, the neurodiversity movement's reframing of autism as "a way of being" (Sinclair, 2012) is unlikely to be equally appealing in all cultural contexts.

Indeed, prior research suggests that the neurodiversity movement's framing of autism as a pervasive and enduring aspect of personhood may clash with at least some responses to autism in South Korea. For example, South Korean mothers may often reject an autism diagnosis for their child due to multiple intersecting considerations including viewing the "autism" label as an arbitrary classification that does not account for their child's unique strengths and capacity for growth and as both permanent and stigmatizing (e.g., limits the educational opportunities of autistic children and the marriageability of relatives; Grinker & Cho, 2013). This desire to view autism as transient and context-dependent may be a key reason that autism has often been misdiagnosed in South Korea as reactive attachment disorder, which is caused by negative parenting practices (Kang-Yi et al., 2013). Viewing autism in terms of temporary limitations that are not intrinsic to a person is not consistent with the neurodiversity movement's recognition of autism as a consistent aspect of a person's neurology. Additionally, widespread prioritization of academic and professional competitiveness, concerns about how autistic individuals may influence other students' academic productivity, and high pressure to conform in South Korea (Grinker & Cho, 2013; Kim et al., 2021) could lead Koreans to view the neurodiversity movement as not well suited to Korean society. Therefore, we hypothesized that agreement with the neurodiversity movement would be lower in South Korea than in the US and that lower neurodiversity movement endorsement would contribute to heightened autism stigma in South Korea relative to the US.

Focusing on Stigma Towards Autistic Behaviors

We focused on stigma towards unlabeled characteristics associated with autism rather than the label "autism" as recommended by stakeholders in South Korea (Grinker & Cho, 2013, p. 58):

Mothers suggested that our research on autism would be more feasible if we did not use the word autism at all, or used it only "in secret," by which they meant we should talk about the symptoms but not the classification itself. This sentiment was shared by teachers as well.

However, explorations of stigma toward autistic behaviors may be complicated by the diversity of characteristics associated with autism. Although Autism Spectrum Disorder is considered one broad diagnosis by the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5; American Psychiatric Association, 2013), autistic people are so diverse that autism is increasingly conceptualized as "autisms" or "an autism constellation" (Fletcher-Watson &

Happé, 2019). Given this diversity, all autistic people may not experience the same level of stigma. However, existing stigma literature has barely scratched the surface of the autism constellation. Most studies examining “autism stigma” have either asked participants to evaluate a vignette about *one* autistic individual who exhibits unlabeled (e.g., Nevill & White, 2011) or labeled autistic characteristics (Gardiner & Iarocci, 2014; O’Connor et al., 2020) or to indicate desired social distance from a generic diagnostic label (e.g., “autistic person”; Gillespie-Lynch et al., 2015; Lu et al., 2021).

Such universalizing approaches leave us largely in the dark about *why* different autistic people might experience different levels of stigma (and thus provide limited information about how we can help protect the most vulnerable autistic people from discrimination). According to the DSM-5 (APA, 2013), autism is defined by social communication and interaction difficulties and restricted interests and repetitive behaviors (RIRBs). Non-autistic people may have different conceptualizations (or levels of stigmatization) about different types of autistic behaviors. For instance, RIRBs (e.g., flapping hands) may be more stigmatized than social difficulties (e.g., difficulty making friends) because they are more visibly recognizable and therefore seem like a more explicit violation of social norms.

Further, approximately 25–30% of autistic people do not communicate with others using spoken speech (i.e., non-speaking; Anderson et al., 2007; Lord et al., 2004; Norrelgen et al., 2014). Yet, non-speaking autistic people have been insufficiently represented in autism research and advocacy more generally (Bailin, 2019; Peña, 2019), and stigma towards non-speaking autistic people has been almost entirely overlooked in the autism stigma literature. Therefore, a primary aim of the current study was to examine predictors of stigma towards non-speaking autistic people, as well as those experiencing primarily social difficulties or RIRBs. Although being non-speaking would have been one way to demonstrate the social communication difficulties needed for an autism diagnosis in the DSM-IV, difficulties with structural language have become a specifier rather than an aspect of the core diagnostic criteria for ASD in the DSM-5 (APA, 2013). Therefore, we regarded being non-speaking as representing a different domain than social difficulties, rather than as a subset of social difficulties.

The level of support an autistic individual needs may also influence the stigma they experience. Some people may seek to distance themselves from autistic people to whom they think they would need to make greater efforts to adapt. Indeed, non-autistic undergraduates in the US expressed heightened social distance towards an individual exhibiting characteristics of Asperger’s Syndrome (e.g., perseverating on one topic and looking down when talking to others) relative to an individual showing milder social difficulties

(e.g., shy and quiet) or no social difficulties (Butler & Gillis, 2011). Whether the character was labeled as having “Asperger’s disorder” did not impact stigma. Similarly, college students in the US and Lebanon expressed more desire to keep their distance from an autistic peer exhibiting “disruptive” behaviors (e.g., often calling out in class) compared to an autistic peer who exhibited “withdrawn” behaviors (e.g., frequently staring at an iPad rather than engaging; Gillespie-Lynch et al., 2021b). In this case, labeling the students as autistic led to lower stigma than leaving the vignettes unlabeled. Perceived dangerousness, but *not* perceived responsibility for one’s condition, was associated with greater stigma. In a study in which non-autistic college students rated their first impressions of 20 autistic and 20 non-autistic adults (Sasson & Morrison, 2019), first impressions of both autistic and non-autistic adults were more negative when the people being rated had higher levels of autistic traits.

In direct contrast to the research with adult raters just discussed, middle school students in the US expressed *more* willingness to interact with a child actor exhibiting “severe” signs of autism (e.g., flapping hands, rocking body, smelling a ball, and immediate echolalia) compared to a child exhibiting “milder” autistic behaviors (e.g., plays basketball, talks excessively about one topic, and uses literal language; Griffin, 2018). The middle school participants were not informed that the child was autistic. The author speculated that the children were less interested in engaging with the child with “milder” autistic characteristics because he did not clearly have a disability and therefore the children expected him to be able to “control his behavior.” Consistent with this interpretation, autistic middle school children in the UK with better social-communication abilities reported higher levels of victimization than autistic youth who experienced more social-communicative difficulties (Rowley et al., 2012). Similarly, in a very small sample of ten autistic adolescents and young adults in the US, *lower* levels of autistic traits were associated with self-reports of having experienced *more* autism stigma (Shtayermman, 2009). Various possible explanations have been proposed to explain these associations, including greater social awareness and social experience among autistic people with more advanced social-communication skills.

Contrasting associations across studies suggest a key reason why autism stigma might differ across cultural contexts. People may be less likely to recognize autism as a valid reason for not following norms in some cultural and developmental contexts. Phelan and colleagues (2008) proposed three main functions shared by both stigma and prejudice (which they viewed as manifestations of the same overarching construct): (1) domination (e.g., keeping people who have less power down so that the powerful can continue to profit from their oppression), (2) norm enforcement (e.g., using punishment to force people to conform), and

(3) disease avoidance (e.g., avoiding people because they are viewed as ill). They asserted that the norm enforcement function of stigma could only be applied when people are viewed as capable of adapting to norms. This distinction provides a possible explanation for why autism stigma was positively associated with cultural tightness in South Korea; perhaps Koreans are less likely to view autism as a valid reason for not adjusting to norms than Americans.

The Current Study

To the best of our knowledge, only one prior study compared stigma towards unlabeled and labeled characteristics associated with autism across cultural contexts (Lebanon and the US; Gillespie-Lynch et al., 2021b). This omission is problematic because culture shapes how we interpret others' behaviors and may thus cause specific characteristics of autism to be more or less accepted in different cultural contexts (Golson et al., 2022). For example, refraining from making expressive facial expressions is often considered an appropriate social behavior in South Korea due to the influence of Confucianism in the past (Lee & Lee, 2012). This suggests that showing a few social characteristics of autism may *not* be associated with heightened stigma in South Korea, as long as they are not marked by the "autism" label, which is more stigmatized in South Korea than in the US (Kim et al., 2021). Alternatively, even small deviations from social norms might evoke a desire to keep one's distance in South Korea relative to the US, given the greater emphasis in Korea on abiding by social norms.

Therefore, using vignettes depicting characters who primarily exhibited a specific domain of autistic behavior (social difficulties, being non-speaking, or RIRBs), we conducted a cross-cultural comparison of stigma toward unlabeled autistic behaviors in South Korea and the US. We examined the following research questions (RQs):

RQ 1a. Does non-autistic adults' stigma towards characters in vignettes depicting unlabeled behaviors associated with autism vary as a function of the character's support needs?

We hypothesized that non-autistic people would report heightened stigma toward characters with greater support needs because high support needs may place greater demands on others.

RQ 1b. Do associations between stigma and support needs vary across countries?

We did not have a hypothesis regarding potential variations across countries in associations between support needs and stigma due to the lack of relevant prior research.

RQ 2. Which characteristics of non-autistic adults (i.e., raters) are associated with their stigma towards unlabeled behaviors associated with autism?

As in past studies (e.g., Gillespie-Lynch et al., 2019; Kim et al., 2021; Obeid et al., 2021), *we hypothesized that being Korean, having inaccurate autism knowledge, reporting less positive and frequent contact with autistic individuals, expressing greater acceptance of inequality (and not collectivism), and less accurate identification of autism would predict stigma toward unlabeled behaviors indicative of autism. We also hypothesized that cultural tightness would predict stigma among South Korean participants only, similar to Kim et al.'s (2021) findings. Further, we hypothesized that reduced neurodiversity endorsement, but not neurodiversity awareness, would be associated with more stigma. We did not have specific hypotheses regarding demographic variables (age and education level) due to mixed findings in previous studies* (e.g., Aubé et al., 2021; Campbell et al., 2004; Kim, 2021; Surmen et al., 2015).

For all RQs, we examined if patterns remained consistent or diverged across different domains of autistic behaviors. We did not have specific hypotheses about how findings might differ depending on the domains of behaviors focused on because previous research did not examine this issue. However, a recent vignette study revealed initial evidence that job applicants exhibiting RIRBs (i.e., sensory sensitivities and rigidity) might be rated more negatively than those exhibiting social difficulties (McMahon et al., 2021).

Method

Participants

A total of 842 adult (> 18 years old) participants (490 Americans and 352 Koreans) were recruited from Amazon's MTurk and DataSpring (i.e., a crowdsourcing marketplace similar to MTurk, recruiting Asian research panels), respectively, in September 2021 and completed our online survey. We included two attention check items ("please mark strongly disagree for this item") and excluded data from 101 American and 75 Korean participants who failed at least one attention check. We also asked participants to identify their autism diagnostic status twice, eliminating data from 33 American and 13 Korean participants who identified as autistic on one item but not on the other.¹ Additionally, because we aimed to assess

¹ One question asked participants to indicate whether they are autistic and the other question asked them if they have a formal autism diagnosis, identify as autistic without a formal diagnosis, are not autistic but have a different diagnosis, or have no disabilities. If participants did not indicate that they were autistic in response to both questions, they were excluded from analyses.

Table 1 Participant characteristics

Demographic Variable	Mean (SD)		p-values ^a
	US	South Korea	
Age	37.0 (11.2)	38.3 (10.4)	.2
Percent male	63.3%	48.6%	.001
Percentage of participants with a disability that is not autism	8%	5%	.09
Education ^b	3.8 (.8)	3.7 (.9)	.12
Autism knowledge	3.6 (.5)	3.3 (.3)	<.0001
Quantity of previous contact ^c	2.6 (1.0)	1.6 (0.8)	<.0001
Pleasantness of previous contact	4.9 (1.7)	3.5 (1.2)	<.0001
Neurodiversity awareness	.4 (.5)	.1 (.3)	<.0001
Neurodiversity endorsement	3.2 (.7)	2.6 (.8)	<.0001
Collectivistic orientation	0.7 (2.1)	0.2 (1.5)	.01
Vertical orientation	−1.1 (1.8)	−.3 (1.2)	<.0001
Cultural tightness	3.8 (.6)	4.0 (.8)	.001
Total autism stigma	2.5 (.7)	3.1 (.4)	<.0001
Stigma in Social domain	2.4 (.7)	3.0 (.7)	<.0001
Low support needs	2.3 (.7)	2.9 (.7)	<.0001
High support needs	2.4 (.8)	3.2 (.6)	<.0001
Percentage of participants who identified characters as having autism	41.3%	42.9%	.72
Percentage of participants who identified characters as having a disability other than autism ^d	42.1%	27.8%	.0008
Percentage of participants who identified characters as having no disability	16.7%	29.3%	.0008
Stigma in Non-speaking domain	2.5 (.8)	3.1 (.7)	<.0001
Low support needs	2.5 (.8)	2.8 (.7)	<.0001
High support needs	2.6 (.7)	3.3 (.7)	<.0001
Percentage of participants who identified characters as having autism	42.5%	43.2%	.87
Percentage of participants who identified characters as having a disability other than autism ^d	40.8%	27.8%	.002
Percentage of participants who identified characters as having no disability	16.7%	29.3%	.0008
Stigma in RIRB domain	2.6 (.8)	3.2 (0.7)	<.0001
Low support needs	2.4 (.7)	3.2 (0.7)	<.0001
High support needs	2.7 (.9)	3.3 (0.7)	<.0001
Percentage of participants who identified characters as having autism	32.5%	41.3%	.04
Percentage of participants who identified characters as having a disability other than autism ^d	48.3%	37.5%	.01
Percentage of participants who identified characters as having no disability	19.2%	21.2%	.57

SD standard deviation; *US* United States; *RIRB* restricted interests and repetitive behavior

^ap-values calculated from t-tests comparing the US and South Korea

^b1, Less than high school; 2, Received high school diploma/GED; 3, Vocational/Trade/Technical school; 4, Bachelor's degree; 5, Advanced degree (MA, PhD)

^cMeasured by asking how often they spend time with autistic people

^dattention-deficit/hyperactivity disorder, intellectual disability (ID), learning disability, cerebral palsy, other

autism stigma among non-autistic individuals only, we excluded data from the 116 American and five Korean participants who self-identified as autistic (i.e., identifying as autistic in both questions regardless of having a formal autism diagnosis) from analyses.² Two-hundred and forty American and 259 Korean participants were included in

the analysis. Table 1 presents detailed demographic information on participants included in the final analysis.

Procedure

After completing an online consent form, participants read three unlabeled vignettes representing three domains of autistic characteristics: social difficulties, being non-speaking, and RIRB. Participants were randomly assigned to read either low- or high-support vignettes within each domain.

² Including participants who self-identified as autistic (i.e., reported having autism in the former question and indicated having a formal diagnosis or self-identified as autistic in the latter question) also did not change the significance patterns of all analyses.

They indicated their desired social distance from the character in each vignette and selected diagnostic labels for each character. Subsequently, all participants completed surveys assessing autism knowledge, pleasantness and quantity of previous contact with autistic individuals, cultural orientation, cultural tightness, awareness and endorsement of the neurodiversity movement, and demographics (i.e., age, gender, education level, and ethnicity). A professional translator translated the instruments that had not previously been translated (i.e., the vignettes and the items on and descriptions of the neurodiversity movement) from English to Korean. SYK, who is fluent in both Korean and English, back-translated the translation and compared the original survey with the back-translated survey to revise and finalize the Korean version of the survey. SYK, who is Korean, chose gender-neutral names for the Korean vignettes, and the professional translator confirmed that Korean names are gender-neutral. Supplementary Material A presents the full list of items and vignettes used in this study. The Institutional Review Board of Duksung Women's University approved all data collection procedures.

Measures

Vignettes and Social Distance Scale (SDS)

We developed six vignettes depicting a character with a gender-neutral name exhibiting autistic characteristics. Each vignette focused on one of three domains: social difficulties, RIRB, and non-speaking. Each domain was further divided into low vs. high support needs. Characters with low support needs were depicted as living an independent life with a job, while characters with high support needs were depicted as unemployed and being supported by close family members in terms of daily chores and going out. A doctoral-level autism researcher, who has lived in both South Korea and the US for more than 10 years, confirmed that the vignettes appropriately reflected low and high support needs in both Korean and American cultures. See Supplementary Table S1 for the number of participants who read each vignette type.

The development of vignettes was guided by the description of social interactions and RIRBs in the DSM-5 and the authors' expertise and experiences with autism. No vignette labeled the character's diagnosis, and each vignette matched the other vignettes in terms of the numbers of autistic characteristics described, strengths, clues suggesting support needs, and other demographic information. We aimed to have each vignette depict someone who could be autistic (i.e., someone who has both social difficulties and RIRBs). We highlighted the primary focus of a given vignette by referring to it multiple times while suggesting that the non-prioritized domain was present much more subtly. For

example, the vignettes depicting RIRBs included multiple RIRBs with a single reference to potential social difficulties (i.e., attending a peer group to have an opportunity to socialize). An autistic male adult reviewed all vignettes and indicated that the vignettes accurately described behaviors and characteristics that could be exhibited by autistic people. Supplementary Table S2 lists each vignette's components.

After reading each vignette, participants responded to a Social Distance Scale (Bogardus, 1933). We adapted a social distance scale used in prior work (Gillespie-Lynch et al., 2015), which included seven items assessing one's willingness to interact with an autistic individual at varying degrees of intimacy. We adapted this measure so that participants indicated their willingness to interact with the character described in the vignette (i.e., changed the wording from a generic "autistic person" to "the character described in the vignette"). Additionally, we revised and added items to capture participants' willingness to interact with the character in a wide range of contexts (i.e., professional, studying, friendship, and dating contexts).³ All 12 items utilized a 5-point Likert response scale, with higher scores representing higher levels of stigma. The alpha coefficients of the SDS for the social, non-speaking, and RIRB domains were 0.88, 0.88, and 0.90, respectively (0.87, 0.87, and 0.90 for the US subsample and 0.83, 0.87, and 0.88 for the South Korean subsample).

Identification of Likely Diagnosis

After responding to the Social Distance Scale for each of the three vignettes, participants were asked to choose the single most likely diagnosis of each character from several options: attention-deficit/hyperactivity disorder (ADHD), autism or Asperger syndrome, intellectual disability (ID), learning disability, cerebral palsy, other, and no diagnosis.⁴

³ We expanded the existing Social Distance Scale to include 3 items representing each of the four contexts. Likely due to the small number of items representing each context, the alpha coefficients for each context were often low (.54~.72). Therefore, we used the full scale, which had strong internal consistency, in analyses rather than analyzing possible sub-scales.

⁴ When split by each diagnosis, the numbers of participants who indicated that the characters have a disability other than autism were too small to include them as separate variables. Whether participants identified characters as having a disability other than autism or no disability was not included in the main analysis because we did not have a theory-driven hypothesis or empirical evidence to support the inclusion of these variables and these variables were not correlated with stigma across vignettes.

Participatory Autism Knowledge-Measure (PAK-M)

Autism knowledge was measured using PAK-M, an instrument adapted from the Autism Awareness Survey (Stone, 1987) through collaboration with autistic students (Gillespie-Lynch et al., 2021a). Participants responded to 29 statements (e.g., “Autistic people show affection”) scored on a 5-point Likert scale, and higher mean scores represented more accurate autism knowledge. The PAK-M was reported to have acceptable internal consistencies in the US, Lebanon, and South Korea (Gillespie-Lynch et al., 2021a; Kim et al., 2021). The alpha coefficient of the PAK-M in the current study was 0.82 (0.62 for the US and 0.87 for South Korea).

To better understand the low internal consistency of the PAK-M in the US sample, we checked the internal consistency of the non-reverse-scored (i.e., regular) and reverse-scored items, separately, because simultaneous use of regular and reverse-scored items may introduce uncontrolled variance due to participants’ response styles, which impact consistency and factor structure (Suárez-Alvarez et al., 2018; Vigil-Colet et al., 2020). The alpha coefficient of regular items was 0.88 (0.88 for the US and 0.73 for South Korea), and that of reverse-scored items was 0.88 (0.93 for the US and 0.69 for South Korea). We repeated all analyses with the version that consisted of only regular items and again with the version that consisted only of reverse-scored items. We note in footnotes if using the regular or reverse-scored versions altered findings from main analyses conducted with the full measure.

Previous Contact

We measured the quantity of participants’ previous contact with autistic individuals with an item, “How often do you spend time with an autistic individual?” to which participants responded on a 5-point Likert scale (1, “don’t spend time”; 5, “very often”). We also assessed the types of previous contact by asking participants to indicate any relationships they have had with an autistic person (e.g., your romantic partner is autistic, your co-worker is autistic, or your acquaintance is autistic). We coded participants into either knowing or having no experience with autistic individuals. Participants were also categorized into those who are a nuclear family member (i.e., parents, children, or siblings of an autistic person) of an autistic person and those who are not.

Pleasantness of previous contact was assessed with an item “In the past, were your overall experiences with individuals with ASD pleasant?” to which participants responded on a 7-point Likert scale (1, “strongly disagree”; 7, “strongly agree”).

Cultural Tightness

Four items from Gelfand et al.’s (2011) Tightness-Looseness Scale, which measures the degree to which social norms within nations are defined and enforced, were used to measure cultural tightness (e.g., “There are many social norms that people are supposed to abide by in this country”). Participants responded on a 6-point Likert scale, with a higher score representing higher levels of cultural tightness. The alpha coefficient was 0.88 (0.82 for the U.S. and 0.91 for South Korea). Participants completed two additional items, but these items were dropped from analyses because they reduced the internal consistency of the instrument to 0.67 (0.59 for the U.S. and 0.73 for South Korea). Any changes in main analysis results due to excluding these items are reported in footnotes (See Supplementary Materials A for the full list of included and eliminated items).

Cultural Orientation Scale

Triandis and Gelfand (1998)’s Culture Orientation Scale was used to measure participants’ cultural orientation. The Culture Orientation Scale consists of four subscales: vertical collectivism (e.g., ‘It is important to me that I respect the decisions made by my groups’), vertical individualism (e.g., ‘Winning is everything’), horizontal collectivism (e.g., ‘I feel good when I cooperate with others’), and horizontal individualism (‘e.g., I often do ‘my own thing’). Each subscale consists of four items scored on a 7-point scale. Each individual’s total individualism score was subtracted from their collectivism score to yield their relative degree of collectivism vs. individualism; higher scores represented higher degree of collectivism. Each individual’s total vertical orientation scores were subtracted from their horizontal orientation scores to yield their relative degree of vertical vs. horizontal orientation; higher scores represented a higher degree of vertical orientation. The alpha coefficient of the overall scale was 0.91 (0.84 for the U.S. and 0.83 for Korea); the alpha coefficients of all subscales were higher than 0.80.

Neurodiversity Movement Awareness and Endorsement

We created two items measuring participants’ neurodiversity awareness and their endorsement of the neurodiversity movement. Participants responded either yes or no to a question, “Do you know what the neurodiversity movement is?” Subsequently, participants read descriptions of the neurodiversity movement and responded to a question “how much do you agree with the neurodiversity movement?” on a 4-point scale (1, strongly disagree, 4, strongly agree).

Demographic Information

Participants responded to five demographic questions asking about their gender, age, ethnicity, education level, and diagnostic status.

Analytic Approach

To account for the large number of analyses conducted, we applied an alpha level of 0.005 to all analyses and considered p -values between 0.05 and 0.005 as suggestive based on the recommendations of Wasserstein et al. (2019). First, we computed independent samples t -tests by country to examine cultural differences in all variables. We then conducted a one-way ANOVA examining if the stigma varies across domains of autistic behaviors highlighted (i.e., social vs. non-speaking vs. RIRB).⁵

To address the first RQs, we conducted regression analyses by domain predicting stigma towards autistic characteristics with country, support needs condition, and their interaction as predictors. To address the second RQ, we first examined zero-order correlations in the combined sample between stigma in each domain and rater characteristics to identify variables that were initially associated with stigma. Then, we included variables that were suggestively correlated ($p < 0.05$) with stigma in their respective domain in the regression model. We entered country first, followed by at least suggestively correlated variables frequently examined in previous autism attitudes literature (autism knowledge, pleasantness, and quantity of contact⁶), personality traits (cultural orientation and tightness), correct autism identification, demographic variables, and neurodiversity-related variables. We eliminated 5, 4, and 4 outliers with studentized residuals > 3 (UCLA, n.d.) from regressions conducted in social, non-speaking, and RIRB domains, respectively.⁷ All three final models met the assumptions of multicollinearity (examined using variance inflation factor and condition number), homoscedasticity (tested using White's test for heteroskedasticity and Breusch-Pagan test for heteroskedasticity), and normality of residuals (assessed using kernel density estimation and standardized normal probability plot) based on the Statistical Methods and Data Analytics (UCLA,

n.d.). Finally, we conducted exploratory zero-order correlations between autism stigma toward each vignette and key variables among both the combined sample and by country to further explore if the associations between rater characteristics and stigma vary across contexts.

Results

Initial Comparisons Across Countries and Domains

Exploratory t -tests showed that Koreans reported heightened stigma towards unlabeled autistic behaviors across vignettes, less accurate autism knowledge, and less frequent and pleasant contact with autistic individuals compared to Americans ($ps < 0.0001$). Koreans were also less likely to report that they were aware of the neurodiversity movement ($\chi^2 = 80.8$, $p < 0.0001$) and reported less neurodiversity endorsement (Mann–Whitney $U = 9.0$, $p < 0.0001$) than Americans. When examining only those who were aware of the neurodiversity movement, Koreans still reported less neurodiversity endorsement than Americans (Mann–Whitney $U = 2.8$, $p = 0.005$). Koreans also reported heightened cultural tightness relative to Americans ($p = 0.001$).

A one-way repeated ANOVA revealed that there was a significant effect of domain on stigma, $F = 10.64$; $p < 0.001$. Tukey's post-hoc tests revealed that participants reported significantly more stigma toward characters exhibiting primarily RIRBs ($M = 2.89$) than characters exhibiting primarily social ($M = 2.73$; $p < 0.0001$) or non-speaking characteristics ($M = 2.78$; $p = 0.003$). There was evidence suggestive of heightened stigma towards non-speaking relative to social characteristics ($p = 0.02$). A one-way repeated ANOVA also revealed that there was a suggestive effect of domain on whether participants identified the characters as having a disability other than autism ($p = 0.007$). Follow-up analyses revealed that the percentages of participants identifying the characters as having a disability other than autism in the non-speaking and social domains were higher than that in the RIRB domain ($p = 0.004$ and 0.002 , respectively). The percentages of participants identifying the characters as having a disability other than autism in the non-speaking and social domains did not differ from each other ($p = 0.83$). There was no effect of domain on the percentage of participants identifying the characters having autism or no disability (both $ps > 0.05$).

Exploring Country, Support Needs, and their Interaction as Predictors of Stigma

Separate regression analyses predicting stigma toward each of the domains of unlabeled behaviors from country, support needs condition, and their interaction demonstrated that

⁵ The number of participants assigned to the low support needs group in the RIRB domain was lowest (241 participants). We randomly selected 241 participants from each vignette to conduct this analysis.

⁶ Among the three types of contact quantity variables (i.e., frequency of contact, having an autistic nuclear family member, having no experience with autism), the variable that explained the most variance in zero-order regressions predicting stigma was selected in the final model.

⁷ Removing outliers did not influence the significance patterns of all findings.

Table 2 Regression analysis predicting stigma toward unlabeled autistic characteristics with support needs, country, and their interaction

Domains	Predictors	B	SE B	β	t	p-value
Social: $F=42.50$; $R^2=.20$						
	Country^a	.60	.09	.39	6.97	<.0001
	Support needs ^b	.10	.09	.07	1.13	.26
	I (Country * Support need)	.13	.12	.08	1.08	.28
Non-Speaking: $F=32.22$; $R^2=.16$						
	Country^a	.38	.09	.24	4.14	<.0001
	Support needs ^b	.10	.09	.07	1.10	<.27
	I (Country* Support need)	.34	.13	.18	2.61	.009
Restricted Interests and Repetitive Behaviors: $F=32.16$; $R^2=.16$						
	Country^a	.74	.10	.45	7.50	<.0001
	Support needs^b	.28	.10	.17	2.82	.004
	I (Country * Support need)	-.18	.14	-.09	-1.32	.19

Bolded items are significant predictors of stigma in each domain ($p < .005$)

SE Standard Error.

^areference group: the United States

^breference group: low support needs condition

Korean nationality predicted heightened autism stigma in all three domains ($ps < 0.0001$). Heightened support needs predicted greater autism stigma only in the RIRB domain ($p = 0.004$).⁸ The interaction between country and support needs did *not* predict stigma towards social ($p = 0.28$) and RIRB characteristics ($p = 0.19$). Evidence suggestive of an interaction between country and support needs was evident for non-speaking characteristics ($p = 0.009$). Koreans reported greater stigma toward the non-speaking character with high support needs ($M = 3.28$) than toward the character with low support needs ($M = 2.84$; $t = -5.19$; $p < 0.001$). There was no difference between Americans' stigma toward the non-speaking character with high support needs ($M = 2.56$) and low support needs ($M = 2.46$; $t = -1.04$; $p < 0.30$). See Table 2 for the results of regression analyses predicting stigma with support needs, country, and their interaction.

Do Individual Differences Account for Differences in Stigma Across Countries?

Exploratory zero-order correlations between stigma and other characteristics in each domain can be seen in Supplementary Tables S3-S5. In the regression predicting stigma in the social domain from individual differences (Table 3), less accurate autism knowledge and lower neurodiversity

movement endorsement (both $ps < 0.001$) predicted greater stigma. Korean nationality ($p = 0.02$) and less frequent contact ($p = 0.01$) were suggestively associated with greater stigma towards social characteristics.

In the regression predicting stigma in the non-speaking domain, less accurate autism knowledge ($p = 0.001$) and less frequent contact ($p < 0.001$) predicted greater stigma. Country was no longer associated with stigma in this domain ($p = 0.50$). Evidence suggestive of associations between stigma towards non-speaking characteristics and the interaction between country and support needs was observed ($p = 0.04$).

Less accurate knowledge ($p < 0.001$), lower neurodiversity movement endorsement ($p < 0.001$), and less frequent contact ($p < 0.001$) predicted greater stigma in the RIRB domain.^{9, 10} Support needs ($p = 0.003$) remained associated with stigma in this model, while country ($p = 0.01$) and greater cultural tightness ($p = 0.02$) suggestively predicted heightened stigma towards RIRBs.

⁸ In the baseline correlations among combined samples, higher support needs were correlated with stigma in all three domains ($p = .003$, $.001$, and $.03$ in social, non-speaking, and RIRB domains, respectively). When the interaction term was not included in these regression models, higher support needs also predicted greater autism stigma in the social ($p = .003$) and non-speaking domains ($p < .001$).

⁹ When the full measure of cultural tightness that consists of six items was included, more neurodiversity endorsement suggestively predicted less stigma towards non-speaking characteristics ($p = .04$) and higher cultural tightness significantly predicted more stigma toward RIRB characteristics ($p = .001$).

¹⁰ Replacing the full measure of PAK-M with the non-reverse-coded version did not change the significance patterns of the findings. The reverse-coded version was not correlated with stigma in the social ($p = .15$) and non-speaking domains ($p = .31$). More accurate knowledge measured by the reverse-coded version was correlated with greater stigma towards RIRB characteristics ($p = .004$), but it did not predict stigma towards RIRB characteristics in the final model ($p = .33$).

Table 3 Summary of regression analysis by domain predicting stigma toward unlabeled autistic characteristics

Domain	Predictors	B	SE	β	t	p-value
Social: $F = 25.10$; $R^2 = .36$						
	Country ^a	.25	.10	.15	2.39	.02
	Support needs ^b	.11	.08	.07	1.30	.19
	I (Country* Support need)	.15	.13	.08	1.20	.23
	Autism knowledge	-.53	.09	-.30	-6.06	< .001
	Pleasantness of contact	.04	.02	.08	1.91	.06
	Contact quantity	-.09	.04	-.12	-2.56	.01
	Collectivism	-.03	.02	-.06	-1.51	.13
	Vertical orientation	.02	.02	.04	.72	.47
	Neurodiversity endorsement^c	-.17	.05	-.17	-3.72	< .001
Non-Speaking: $F = 12.38$; $R^2 = .26$						
	Country ^a	.08	.12	.05	.68	.50
	Support needs ^b	.14	.09	.09	1.61	.11
	I (Country* Support need)	.29	.14	.15	2.10	.04
	Autism knowledge	-.33	.10	-.19	-3.47	.001
	Pleasantness of contact	-.01	.02	-.02	-.48	.63
	Contact quantity	-.15	.04	-.20	-3.85	< .001
	Cultural tightness	.03	.03	.04	.88	.38
	Vertical orientation	.03	.03	.06	1.13	.26
	Gender ^d	.10	.07	.06	1.46	.15
	Neurodiversity awareness ^e	.06	.08	.04	.72	.47
	Neurodiversity endorsement ^c	-.10	.05	-.09	-1.84	.07
Restricted interests and repetitive behaviors: $F = 20.84$; $R^2 = .37$						
	Country ^a	.27	.11	.17	2.48	.01
	Support needs^b	.26	.09	.16	2.96	.003
	I (Country* Support need)	-.17	.13	-.09	-1.30	.20
	Autism knowledge	-.52	.09	-.29	-5.59	< .001
	Pleasantness of contact	-.01	.02	-.02	-.54	.59
	Contact quantity	-.14	.04	-.18	-3.70	< .001
	Cultural tightness	.08	.03	.10	2.40	.02
	Collectivism	-.04	.02	-.08	-1.97	.05
	Vertical orientation	.04	.03	.07	1.40	.16
	Neurodiversity awareness ^e	.05	.08	.03	.58	.56
	Neurodiversity endorsement^c	-.29	.05	-.27	-5.99	< .001

Bolded items are significant ($p < .005$)

SE Standard Error

^areference group: the United States

^breference group: the low support needs condition

^creference group: agreed with neurodiversity movements

^dreference group: male

^ereference group: unaware of neurodiversity movement

Exploratory Analyses: Do Individual Differences Associated with Stigma Vary Across Contexts?

See Supplementary Table S6~S23 for the correlation matrices of the combined sample, American participants, and Korean participants for each vignette. Zero-order correlations split by vignette and country revealed that less accurate autism knowledge and less neurodiversity endorsement were

associated with greater stigma toward a character exhibiting social difficulties and high support needs among Americans (all $ps < 0.005$). Evidence suggestive of associations between stigma and collectivism ($p = 0.01$) and vertical orientation ($p = 0.01$) were observed among Americans. No factors were associated with stigma towards this character among Koreans. Less autism knowledge and neurodiversity awareness and endorsement and greater vertical orientation and

education were correlated with heightened stigma toward a character exhibiting social difficulties and low support needs among Americans (all $ps < 0.005$). Evidence suggestive of associations between autism stigma, less accurate identification of autism in the vignette character, not having an autistic nuclear family member, and less collectivism was also observed among Americans (all $ps < 0.05$). Only cultural tightness was suggestively associated with stigma towards this character among Koreans ($p = 0.03$).

Less autism knowledge, frequent contact, and neurodiversity endorsement (all $ps < 0.005$), and greater vertical orientation (suggestive; $p = 0.03$) and collectivism (suggestive; $p = 0.02$) were correlated with heightened stigma towards a non-speaking character with high support needs among Americans. Not having a nuclear member was suggestively associated with greater stigma towards this character among Koreans ($p = 0.03$). Among Americans, less knowledge ($p = 0.002$) and less neurodiversity endorsement ($p = 0.001$) was correlated with heightened stigma toward a non-speaking character with low support needs. Among Koreans, greater cultural tightness ($p = 0.004$) and not having a nuclear family member ($p = 0.04$) were significantly and suggestively, respectively, associated with heightened stigma towards this character.

Less frequent contact with autistic people, less neurodiversity endorsement (all $ps < 0.005$), and less collectivism (suggestive; $p = 0.04$) were associated with greater stigma towards a character exhibiting RIRB and high support needs among Americans. Evidence suggestive of negative associations between stigma, neurodiversity endorsement, autism knowledge, and pleasantness of contact were observed among Koreans (all $ps < 0.05$). Among Americans, less knowledge ($p < 0.001$), less neurodiversity endorsement ($p = 0.0001$), and greater vertical orientation (suggestive; $p = 0.01$) were correlated with heightened stigma toward a character exhibiting RIRB and low support needs. Greater cultural tightness, less collectivism, and less neurodiversity endorsement were suggestively associated with stigma towards this character among Koreans (all $ps < 0.05$).

Discussion

Our findings generalize upon prior research by: (1) demonstrating that heightened stigma towards the *label* autism in South Korea versus the US (Kim et al., 2021) is also apparent for *unlabeled* autistic characteristics representing social, non-speaking, and RIRB domains, and (2) determining that, as in prior work focused on predictors of stigma towards the *label* autism (e.g., Kim et al., 2021), greater autism knowledge and more contact with autistic people predicted greater stigma towards at least some *unlabeled* autistic behaviors. Our findings extend upon prior research by: (1) examining

stigma towards non-speaking autistic people, who are under-represented in autism research more generally and autism stigma research in particular, (2) examining the degree to which autism stigma varies in relation to autistic people's support needs, and (3) exploring cross-cultural variations in awareness of and agreement with the neurodiversity movement in relation to autism stigma.

Are Support Needs of Autistic People Associated with Stigma?

We observed partial support for our hypothesis that participants would report heightened stigma toward characters with higher support needs. While this pattern was apparent in baseline correlations, once country and the interaction between country and support needs were accounted for in regression analyses, support needs were only associated with stigma in the RIRB domain and not in the social and non-speaking domains. Evidence suggestive of an interaction between support needs and country was observed in the non-speaking domain. While South Koreans stigmatized a non-speaking character with high support needs more than a non-speaking character with lower support needs, Americans did not differentiate based on the support needs of non-speaking characters. Together, these findings suggest that what “support needs” means may vary as a function of the type of characteristic being examined and the cultural context in which it is being examined. Future mixed-methods research should examine intersections between how people interpret different types of “support needs” and stigma in different cultural contexts.

Stigma towards characters exhibiting primarily RIRBs was higher than stigma towards both non-speaking people and those exhibiting primarily social difficulties. Our findings build on prior work demonstrating that job applicants exhibiting RIRBs might be rated more negatively than those exhibiting social difficulties (McMahon et al., 2021) and that non-autistic adults may be more likely to avoid people whose behaviors may be perceived as more disruptive (Gillespie-Lynch et al., 2021b). The characterization of RIRBs in our RIRB vignettes included focused interests, sensory differences, difficulty adjusting to change, and stimming (e.g., jumping up and down and flapping one's hands). Given recent evidence that focused interests may *not* impact stigma towards autistic people (Stockwell et al., 2021), future studies should explore if specific types of repetitive behaviors are associated with heightened autism stigma.

Which Rater Characteristics Are Associated with Stigma?

Initial regressions including only country, support needs, and their interaction showed that Koreans reported higher

autism stigma than Americans across all three domains. Except for accurate identification of autism, the other hypothesized individual-level variables (i.e., more inaccurate autism knowledge, less positive and frequent contact with autistic individuals, and greater acceptance of inequality and cultural tightness) were correlated with stigma in at least one domain. Once these individual differences of raters were included in models, impacts of nationality on stigma were attenuated for social and RIRB characteristics and no longer apparent in the non-speaking domains.

In regressions including rater characteristics, autism knowledge was associated with stigma across all three behavioral domains as in previous studies (Gillespie-Lynch et al., 2019; Kim et al., 2021; Obeid et al., 2015). Having accurate knowledge may dispel negative stereotypes about autism, resulting in reduced stigma (Gillespie-Lynch et al., 2015). Frequency of contact with autistic individuals was significantly associated with stigma in the non-speaking and RIRB domains and suggestively associated with stigma in the social domain. Frequent high-quality contact with marginalized people is one of the most effective strategies for reducing stigma (Corrigan & Penn, 1999).

Given that support for the neurodiversity movement was associated with reduced stigma towards social and RIRB characteristics, our findings suggest that the neurodiversity movement is indeed associated with reduced stigma towards autistic people. However, baseline correlations by vignette and country revealed that neurodiversity movement support was associated with reduced stigma in *all* domains among Americans, and was only associated with reduced stigma towards a character exhibiting RIRBs among Koreans. Neurodiversity movement support was also low among Koreans, even after accounting for reduced awareness of the neurodiversity movement. These findings suggest that at least some principles of the neurodiversity movement are not well-aligned with current social norms in South Korea. Therefore, creative work is needed to adapt existing autism trainings, which often emphasize the principles of the neurodiversity movement (e.g., Gillespie-Lynch et al., 2021a; Jones et al., 2021), for South Korean contexts.

As was the case in baseline correlations examining stigma towards the label “autism” (Kim et al., 2021), exploratory zero-order correlations revealed that cultural tightness was correlated with stigma towards unlabeled autistic characteristics *only* among Koreans. Further, among Koreans, cultural tightness was associated with stigma towards characters exhibiting low support needs across all three behavioral domains, but *not* towards their counterparts with high support needs. These findings align with Phelan and colleagues’ (2008) reminder that the norm enforcement function of stigma can only be applied when people are viewed as capable of adapting to norms. Our findings suggest that South Koreans are more likely to expect autistic people with

lower support needs to adapt to social norms than people with higher support needs. Given that attribution theory proposes that the perceived responsibility for negative behaviors influences emotional and sympathetic responses, resulting in stigmatization (Weiner, 1993) but perceived responsibility was *not* associated with stigma in a combined sample of college students in Lebanon and the US (Gillespie-Lynch et al., 2021b) and *was* associated in China (Lu et al., 2021), findings suggest that attribution theory may be more relevant for understanding autism stigma in more culturally tight contexts, like South Korea and China.

Practical Implications

This study has practical implications for designing anti-stigma interventions. Training that aims to increase autism knowledge and endorsement of the neurodiversity movement and provide frequent high-quality contact with autistic people could mitigate autism stigma. However, the lack of consistent associations between neurodiversity awareness and autism stigma in the current study indicates that providing only basic facts about the neurodiversity movement during autism trainings is unlikely to mitigate autism stigma; rather, helping people understand the strengths and benefits of the neurodiversity movement may begin to promote support for the neurodiversity movement, and, consequently, a reduction in autism stigma.

Since high cultural tightness was only suggestively associated with stigma among Koreans, helping Koreans understand how the social appropriateness of different types of behaviors varies across contexts by introducing direct and mediated contact with autistic people who are successful in idiosyncratic ways may help reduce autism stigma in South Korea. Indeed, anecdotal accounts suggest that autism stigma was reduced via a popular show, *Marathon*, which depicted an autistic person who was happy and successful as a runner (Hwang & Charnley, 2010). Helping Koreans understand the functions served by different autistic behaviors could also help broaden social norms in South Korea. For example, training could highlight work by Kapp et al., (2019) exploring the importance of stimming as a coping mechanism. By emphasizing the functions of “deviant” behaviors, autism training designed for more culturally tight contexts can help people understand that behaviors that look different on the surface may have similar underlying functions to behaviors they themselves do. Finally, interventions to reduce autism stigma should strive to comprehensively address the full spectrum of autism, by ensuring fair representation of non-speaking autistic people and people with other co-occurring conditions.

Limitations

These findings should be considered in light of the following limitations. First, similar to the limitation of previous cross-cultural studies (Kim et al., 2021; Someki et al., 2018), by dichotomizing participants as “Korean” or “American,” we treated each country as a proxy for a single culture. This does not account for the diversity within countries, particularly the US, which is an ethnically, culturally, and racially diverse country. Second, data collection was conducted during the COVID-19 pandemic, and participants’ experiences with COVID-19 may have impacted the findings of the study particularly because ecological catastrophes may activate cultural tightness (Jackson et al., 2019). Third, most participants who self-identified as autistic and were subsequently excluded from the analysis were American. It is possible that some Korean participants were in fact autistic but did not reveal their diagnosis or were unaware of their diagnosis due to the low autism awareness and heightened autism stigma in South Korea.

Fourth, one instrument, the adapted Social Distance Scale, was used to measure autism stigma, but the stigma is influenced by various contextual factors, such as the types of relationships expected to be maintained with autistic individuals. For instance, some non-autistic individuals may be more willing to casually spend time with an autistic individual than to start a business together. Fifth, although vignettes allow researchers to manipulate specific components of variables to examine how participants’ responses vary (Gould, 1996), there are drawbacks to using vignettes. Characters described in the vignettes do not comprehensively capture autistic behaviors and characteristics, and participants’ responses to those depicted in the vignettes might not be applicable to other autistic individuals with different characteristics. Sixth, particularly for those who thought that the characters have a disability other than autism, their attitudes toward other disabilities (e.g., ID) may have influenced their ratings of the desired social distance, but we did not examine this due to the small number of participants who identified characters as having a disability other than autism when split by diagnosis type.

Seventh, because we provided the definition of the neurodiversity movement only *after* participants answered the neurodiversity awareness question, some participants who indicated that they were aware of the neurodiversity movement may not have actually had an accurate understanding of the concept. Finally, the alpha of the PAK-M was relatively low among American participants, raising concerns about the consistency of findings related to autism knowledge. Future research should examine if and how reverse-coded items impact internal consistencies and factor structures of autism knowledge measures across cultures (perhaps via

cultural differences in response styles; Suárez-Alvarez et al., 2018; Vigil-Colet et al., 2020).

Conclusions

The current study demonstrates that stigma towards *unlabeled* autistic behaviors is heightened in South Korea relative to the US, as has been evident in past work examining stigma towards the label “autism.” However, findings also indicate that the mechanisms underlying autism stigma are complex and context-dependent. Extending upon prior work suggesting that individual differences may contribute more to autism stigma than country differences (e.g., Gillespie-Lynch et al., 2019), when characteristics of autistic individuals (i.e., how much support they need and the types of autistic behaviors they demonstrate) and individual differences among raters (autism knowledge, contact quantity, and neurodiversity endorsement) were accounted for, raters’ nationality did not predict stigma towards unlabeled autistic characteristics in the non-speaking domain in the current study. Exploratory correlations revealed that the patterns of associations between other variables and stigma towards autistic characteristics often differed as a function of participants’ nationality as well as the types of autistic characteristics highlighted in the vignettes. Findings suggest that stigma towards the same condition, autism, may vary as a function of cultural context and the degree to which an autistic individual is perceived as needing help from others. These findings highlight the need for further studies examining how contexts influence associations between rater characteristics and autism stigma (e.g., using mediation/moderation analyses).

Together, these findings highlight the need to develop culturally adapted anti-stigma trainings that include representations of non-speaking autistic people and other people who are often overlooked in autism research, e.g., those with ID (Russell et al., 2019). We suggest that the efforts to increase autism knowledge and help individuals appreciate and endorse the neurodiversity movement (e.g., by helping people understand both autistic strengths and the underlying reasons for behaviors that may look different) may help reduce autism stigma in both South Korea and the US.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10803-022-05739-0>.

Acknowledgments This study was supported by Duksung Women's University Research Grants 2021 – 3000006025.

Author Contributions Conceptualization: So Yoon Kim, Kristen Gillespie-Lynch; Methodology: So Yoon Kim, Kristen Gillespie-Lynch; Formal analysis and investigation: So Yoon Kim; Writing - original draft preparation: So Yoon Kim; Writing - review and editing:

Kristen Gillespie-Lynch; Funding acquisition: So Yoon Kim; Supervision: So Yoon Kim.

Declarations

Conflict of interest The authors have no conflicts of interests to disclose.

References

- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Anderson, D. K., Lord, C., Risi, S., DiLavore, P. S., Shulman, C., Thurm, A., Welch, K., & Pickles, A. (2007). Patterns of growth in verbal abilities among children with autism spectrum disorder. *Journal of Consulting and Clinical Psychology, 75*, 594–604.
- Aubé, B., Follenfant, A., Goudeau, S., & Derguy, C. (2021). Public stigma of autism spectrum disorder at school: Implicit attitudes matter. *Journal of Autism and Developmental Disorders, 51*(5), 1584–1597.
- Bailin, A. (2019). Clearing up some misconceptions about neurodiversity. *Scientific American*.
- Botha, M., & Frost, D. M. (2020). Extending the minority stress model to understand mental health problems experienced by the autistic population. *Society and Mental Health, 10*(1), 20–34.
- Bogardus, E. S. (1933). A social distance scale. *Sociology & Social Research, 17*, 265–271.
- 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*, 741–749.
- Campbell, J. M., Ferguson, J. E., Herzinger, C. V., Jackson, J. N., & Marino, C. A. (2004). Combined descriptive and explanatory information improves peers' perceptions of autism. *Research in Developmental Disabilities, 25*(4), 321–339.
- Corrigan, P. W., & Penn, D. L. (1999). Lessons from social psychology on discrediting psychiatric stigma. *American Psychologist, 54*(9), 765.
- de Vries, M., Cader, S., Colleer, L., Batteux, E., Yasdiman, M. B., Tan, Y. J., & Sheppard, E. (2020). University students' notion of autism spectrum conditions: A cross-cultural study. *Journal of Autism and Developmental Disorders, 50*(4), 1281–1294.
- Fletcher-Watson, S., & Happé, F. (2019). *Autism. A new introduction to psychological theory and current debate*. Routledge.
- 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 Disorders, 44*(5), 1008–1017.
- Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., & Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. *Science, 332*(6033), 1100–1104.
- Gillespie-Lynch, K., Bisson, J. B., Saade, S., Obeid, R., Kofner, B., Harrison, A. J., Daou, N., Tricarico, N., Delos Santos, J., Pinkava, W. Jordan, & A. (2021a). If you want to develop an effective autism training, ask autistic students to help you. *Autism*. <https://doi.org/10.1177/13623613211041006>
- Gillespie-Lynch, K., Daou, N., Rita, O., Reardon, S., Khan, S., & Goldknopf, E. J. (2021b). What contributes to stigma toward autistic university students and students with other diagnoses? *Journal of Autism and Developmental Disorders, 51*, 459–475.
- Gillespie-Lynch, K., Brooks, P. J., Someki, F., Obeid, R., Shane-Simpson, C., Kapp, S. K., Daou, N., & Smith, D. S. (2015). Changing college students' conceptions of autism: An online training to increase knowledge and decrease stigma. *Journal of Autism and Developmental Disorders, 45*, 2553–2566.
- Gillespie-Lynch, K., Daou, N., Sanchez-Ruiz, M., Kapp, S. K., Obeid, R., Brooks, P. J., Someki, F., Siltan, N., & Abi-Habib, R. (2019). Factors underlying cross-cultural differences in stigma toward autism among college students in Lebanon and the United States. *Autism, 23*(8), 1993–2006.
- Goffman, E. (1963). *Stigma. Notes on the management of spoiled identity*. Simon & Schuster.
- Golson, M. E., Ficklin, E., Haverkamp, C. R., McClain, M. B., & Harris, B. (2022). Cultural differences in social communication and interaction: A gap in autism research. *Autism Research, 15*(2), 208–214.
- Gould, D. (1996). Using vignettes to collect data for nursing research studies: How valid are the findings? *Journal of Clinical Nursing, 5*(4), 207–212.
- Griffin, W. B. (2018). Peer perceptions of students with autism spectrum disorders. *Focus on Autism and Other Developmental Disorders, 34*(3), 183–192.
- Grinker, R. R. (2020). Autism, “stigma”, disability: A shifting historical terrain. *Current Anthropology, 61*(S21), S55–S67.
- Grinker, R. R., & Cho, K. (2013). Border children: Interpreting autism spectrum disorder in South Korea. *Journal of the Society for Psychological Anthropology, 41*(1), 46–74.
- Hwang, S. K., & Charnley, H. (2010). Making the familiar strange and making the strange familiar: Understanding Korean children's experiences of living with an autistic sibling. *Disability & Society, 25*(5), 579–592.
- Jackson, J. C., Egmond, M. V., Choi, V. K., Ember, C. R., Halberstadt, J., Balanovic, J., Basker, I. N., Boehnke, K., Buki, N., Fischer, R., Fulop, M., Fulmer, A., Homan, A. C., van Kleef, G. A., Kreemers, L., Schei, V., Szabo, E., Ward, C., & Gelfand, M. J. (2019). Ecological and cultural factors underlying the global distribution of prejudice. *PLOS ONE, 14*(9), e0221953.
- Johnson, T. D., & Joshi, A. (2016). Dark clouds or silver linings? A stigma threat perspective on the implications of an autism diagnosis for workplace well-being. *Journal of Applied Psychology, 101*(3), 430.
- Jones, D. R., DeBrabander, K. M., & Sasson, N. J. (2021). Effects of autism acceptance training on explicit and implicit biases toward autism. *Autism, 25*(5), 1246–1261.
- Kang-Yi, C. D., Grinker, R. R., & Mandell, D. S. (2013). Korean culture and autism spectrum disorders. *Journal of Autism and Developmental Disorders, 43*(3), 503–520.
- Kapp, S. K. (2020). *Autistic community and the neurodiversity movement: Stories from the frontline* (p. 330). Springer Nature.
- Kapp, S. K., Gillespie-Lynch, K., Sherman, L. E., & Hutman, T. (2013). Deficit, difference, or both? Autism and neurodiversity. *Developmental Psychology, 49*, 59–71.
- Kapp, S. K., Steward, R., Crane, L., Elliott, D., Elphick, C., Pellicano, E., & Russell, G. (2019). ‘People should be allowed to do what they like’: Autistic adults' views and experiences of stimming. *Autism, 23*(7), 1782–1792.
- Kim-Rupnow, W. (2005). Disability and Korean culture. In J. H. Stone (Ed.), *Culture and disability: providing culturally competent services* (pp. 115–138). SAGE.
- Kim, S. Y. (2021). *College disability service office staff members' autism attitudes and knowledge*. Online Advance Publication.
- Kim, S. Y., Cheon, J. E., Gillespie-Lynch, K., & Kim, Y. (2021). *Is autism stigma higher in South Korea than the United States? Examining cultural tightness, intergroup bias, and concerns about heredity as contributors to heightened autism stigma*. Online Advance Publication.
- Lee, S. Y., & Lee, S. H. (2012). A study on the non-verbal communication comparing the inaugural address with special reference to the

- president of United States and Korea. *Journal of Speech, Media & Communication Research*, 18, 269–309.
- Link, B. G., & Phelan, J. C. (2001). Conceptualizing stigma. *Annual Review of Sociology*, 27, 363–385.
- Lord, C., Shulman, C., & DiLavore, P. (2004). Regression and word loss in autistic spectrum disorders. *Journal of Child Psychology and Psychiatry*, 45, 936–955.
- Lu, M., Wang, R., Zou, Y., & Pang, F. (2021). Chinese college students' knowledge of autism spectrum disorder (ASD) and social distance from individuals with ASD: The mediating role of negative stereotypes. *Journal of Autism and Developmental Disorders*. <https://doi.org/10.1007/s10803-021-05252-w>
- Mac Cárthaigh, S., & Lopez, B. (2020). Factually based autism awareness campaigns may not always be effective in changing attitudes towards autism: Evidence from British and South Korean nursing students. *Autism*, 24(5), 1177–1190.
- McMahon, C. M., Henry, S., & Linthicum, M. (2021). Employability in autism spectrum disorder (ASD): Job candidate's diagnostic disclosure and asd characteristics and employer's ASD knowledge and social desirability. *Journal of Experimental Psychology: Applied*, 27(1), 142–157.
- Nevill, R. E. A., & White, S. W. (2011). College students' openness toward autism spectrum disorders: Improving peer acceptance. *Journal of Autism and Developmental Disorders*, 41, 1619–1628.
- Norrelgen, F., Fernell, E., Eriksson, M., Hedvall, Å., Persson, C., Sjölin, M., Gillberg, C., & Kjellmer, L. (2014). Children with autism spectrum disorders who do not develop phrase speech in the pre-school years. *Autism*, 19, 934–943.
- Obeid, R., Bisson, J. B., Cosenza, A., Harrison, A. J., James, F., Saade, S., & Gillespie-Lynch, K. (2021). Do implicit and explicit racial biases influence autism identification and stigma? An implicit association test study. *Journal of Autism and Developmental Disorders*, 51(1), 106–128.
- 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, 3520–3536.
- O'Connor, C., Burke, J., & Rooney, B. (2020). Diagnostic disclosure and social marginalisation of adults with ASD: Is there a relationship and what mediates it? *Journal of Autism and Developmental Disorders*, 50(9), 3367–3379.
- Papadopoulos, C., Foster, J., & Caldwell, K. (2013). 'Individualism-collectivism' as an explanatory device for mental illness stigma. *Community Mental Health Journal*, 49(3), 270–280.
- Pennsylvania State University. (2018). Lesson 9: Influential points [Lecture notes]. STAT 462. Retrieved from <https://online.stat.psu.edu/stat462/node/247>
- Peña, E. V. (Ed.). (2019). *Communication Alternatives in Autism: Perspectives on Typing and Spelling Approaches for the Nonspeaking*. McFarland.
- Phelan, J. C., Link, B. G., & Dovidio, J. F. (2008). Stigma and prejudice: One animal or two? *Social Science & Medicine*, 67(3), 358–367.
- Rowley, E., Chandler, S., Baird, G., Simonoff, E., Pickles, A., Loucas, T., & Charman, T. (2012). The experience of friendship, victimization and bullying in children with an autism spectrum disorder: Associations with child characteristics and school placement. *Research in Autism Spectrum Disorders*, 6(3), 1126–1134.
- Russell, G., Mandy, W., Elliott, D., White, R., Pittwood, T., & Ford, T. (2019). Selection bias on intellectual ability in autism research: A cross-sectional review and meta-analysis. *Molecular Autism*, 10(1), 1–10.
- Sasson, N. J., & Morrison, K. E. (2019). First impressions of adults with autism improve with diagnostic disclosure and increased autism knowledge of peers. *Autism*, 23, 50–59.
- Shtayermman, O. (2009). An exploratory study of the stigma associated with a diagnosis of Asperger's syndrome: The mental health impact on adolescents and young adults diagnosed with a disability with a social nature. *Journal of Human Behavior in the Social Environment*, 19(3), 298–313.
- Sinclair, J. (2012). Don't Mourn for Us. *Autonomy, the Critical Journal of Interdisciplinary Autism Studies*, 1(1).
- Singer, J. (2016). *Neurodiversity: The birth of an idea [Kindle Edition]*. Amazon Digital Services LLC.
- Someki, F., Torri, M., Brooks, P. J., & Gillespie-Lynch, K. (2018). Stigma associated with autism among college students in Japan and the United States. *Research in Developmental Disabilities*, 76, 88–98.
- Stockwell, K. M., Bottini, S., Jaswal, V. K., & Gillis, J. M. (2021). Brief report: Social behavior and special interests in the stigmatization of autistic college students. *Journal of Autism and Developmental Disorders*, 51(9), 3356–3364.
- Stone, W. L. (1987). Cross-disciplinary perspectives on autism. *Journal of Pediatric Psychology*, 12(4), 615–630.
- Suárez-Alvarez, J., Pedrosa, I., Lozano, L. M., García-Cueto, E., Cuesta, M., & Muñoz, J. (2018). Using reversed items in Likert scales: A questionable practice. *Psicothema*, 30(2), 149–158.
- Surmen, A. A., Hidiröglü, S., Usta, H. H., Awiwi, M., Oguz, A. S., Karavus, M., & Karavus, (2015). A study exploring knowledge, attitudes and behaviours towards autism among adults applying to a Family Health Center in Istanbul. *Northern Clinics of Istanbul*, 2(1), 13–18.
- Triandis, H. C., & Gelfland, M. J. (1998). Converging measurement of horizontal and vertical individualism and collectivism. *Journal of Personality and Social Psychology*, 74, 118–128.
- Vigil-Colet, A., Navarro-González, D., & Morales-Vives, F. (2020). To reverse or to not reverse Likert-type items: That is the question. *Psicothema*, 32(1), 108–114.
- Wasserstein, R. L., Schirm, A. L., & Lazar, N. A. (2019). Moving to a world beyond “p < 0.05”. *The American Statistician*, 73(1), 1–19.
- Weiner, B. (1993). On sin versus sickness: A theory of perceived responsibility and social motivation. *American Psychologist*, 48, 957–965.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.