Loneliness and vertical and horizontal collectivism and individualism: A multinational study ☆

Julie Aitken Schermer [a,*], Marija Branković [b], Đorđe Čekrlija [c], Kristi Baerg MacDonald [a], Joonha Park [d], Eva Papazova [e], Tatiana Volkodav [f], Dzintra Iliško [g], Anna Wlodarczyk [h], Maria Magdalena Kwiatkowska [i], Radosław Rogoza [i], Oscar Oviedo-Trespalacios [j], Truong Thi Khanh Ha [k], Christopher Marcin Kowalski [a], Sadia Malik [l], Samuel Lins [m], Ginés Navarro-Carrillo [n], Sibele D. Aquino [o], Marta Doroszuk [p], Ognjen Riđić [q], Natalia Pylat [r], Emrah Özsoy [s], Chee-Seng Tan [t], Agim Mamuti [u], Rahkman Ardi [v], Tomislav Jukić [w], Osman Uslu [s], Laura Martinez Buelvas [x], Kadi Liik [y], Gert Kruger [z]

[a] Department of Psychology, Faculty of Social Science, The University of Western Ontario, London, Ontario N6A 5C2, Canada
[b] Institute for Philosophy and Social Theory, Singidunum University, University of Belgrade, Serbia
[c] Faculty of Philosophy, University of Banja Luka, Bosnia and Herzegovina
[d] NUCB Business School, Japan
[e] Institute for Research in Education, Bulgaria
[f] Kuban State University, Russia
[g] Daugavpils University, Latvia
[h] Universidad Católica del Norte, Antofagasta, Chile
[i] Cardinal Stefan Wyszyński University in Warsaw, Poland
[j] Delft University of Technology, The Netherlands
[k] University of Social Sciences and Humanities, Vietnam National University, Hanoi, Vietnam
[l] University of Sargodha, Pakistan
[m] University of Porto, Portugal
[n] University of Jaén, Spain
[o] Pontificia Universidade Catolica do Rio de Janeiro, Brazil
[p] Jagiellonian University, Kraków, Poland
[q] The International University of Sarajevo (IUS), Bosnia and Herzegovina
[r] Ukrainian Catholic University, Ukraine
[s] Sakarya University, Turkey
[t] Universiti Tunku Abdul Rahman, Perak Campus, Malaysia
[u] University Mother Theresa, Skopje, Northern Macedonia
[v] Airlangga University, Indonesia
[w] University Josip Juraj Strossmayer, Republic of Croatia
[x] Universidad Tecnológica de Bolívar, Colombia
[y] Tallinn University, Estonia
[z] University of Johannesburg, Republic of South Africa

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ABSTRACT

This paper investigates how horizontal and vertical individualism and collectivism predict self-report loneliness in addition to the variance accounted for by age and sex in 28 countries ($N = 8,345$). Horizontal and vertical aspects of individualism and collectivism had small but significant contributions to predicting loneliness. Horizontal-collectivism (for 19 country samples) and, to a lesser extent, horizontal-individualism (for seven country samples), significantly predicted lower loneliness scores. Vertical-individualism (for 16 country samples), and to a lesser

extent, vertical-collectivism (for six country samples), predicted feeling more loneliness among our participants. Adjusted R^2 values suggested that between 0.6% and 27.7% of self-report loneliness was predicted. These results suggest that those who value egalitarian social relations also tend to report being less lonely whereas those who value individuality and competitiveness endorse the loneliness items more. These results are of importance to those investigating and helping lonely individuals by appreciating the influence of perceived culture.

1. Introduction

1.1. Individualism/Collectivism constructs

Individualism and collectivism are widely studied constructs in cross-cultural research. Both constructs are deeply rooted in culture and show the extent to which people are self-oriented or other-centered, independent or interdependent. For example, typically in Western cultures, an individual is considered to be an individual or someone who is separate from other people, while in Eastern collectivist cultures, an individual is viewed as being connected to other people (Markus and Kitayama, 1991). In Eastern cultures, people typically look for support from within social networks with an emphasis on social adjustment and accommodation to others while maintaining harmonious relationships in those networks. Hence, those in Eastern cultures may feel very cautious in disclosing their problems and seeking help. Findings from a study carried out in 63 countries suggest that the representatives of collectivist cultures display more emphatic concern towards others (Chopik, O'Brien, and Konrath, 2017). In contrast, Westerners have been reported to talk freely about their problems to achieve their personal goals (Zheng et al., 2021).

People from different cultures differ in their understanding of the world, themselves, others, and the relationships that they build with others. The understanding of a person as separate, or connected with others, differs from culture to culture. Cultures vary in how people in these cultures construct the self as interdependent with others or autonomous (Oyserman, Coon, and Kemmelmeier, 2002). For collectivist cultures, the group's goals guide the behaviours of the members and take priority over an individual's goals and obligations. In collectivist cultures, people try to resolve interpersonal issues in a way to maintain good relationships with others (Triandis and Gelfand, 2012). The construct of individualism/collectivism implies a different understanding of how individuals are embedded in social relationships.

The operationalized definition of individualism refers to the norms, values, and beliefs that all individuals are born to be independent and will pursue values of autonomy, self-decision making, and personal benefits over a group's benefits (Triandis, 1994). Individualists are more self-oriented, self-directed, egocentric, autonomous, self-contained, separate from others, and determine their own actions independently of others, while collectivists are described as valuing communal ties. Individualists will rate their own value and success more than the collective good (Hofstede and Hofstede, 2001; Hollinger and Haller, 1990) and focus on personal goals over in-group goals while collectivists give priority to in-group goals (Markus, and Kitayama, 2010; Saha, et al., 2018; Triandis, 1990).

Studies which included the collectivism/individualism construct, found mixed support for some of its theoretical descriptions. For example, several studies have shown that individualism is associated with less social support, a reduction in social capital, and increased levels of stress (Alik and Realo, 2004). However, studies have also found that members of an individualistic culture tended to show more positive in-group interactions and emotional support (Liu et al., 2021), whereas members of collectivistic cultures reported relying less on social support for coping with stress (Taylor et al., 2004).

Burton et al. (2021) compared Italian and American groups and reported that greater individualism was associated with greater neuroticism while greater collectivism was associated with lower neuroticism. In this regard, Ng et al. (2003) argued that collectivistic cultures value emotional stability more than positive affect, whereas individualistic cultures place more value on positive experiences. Burton et al. (2021) also found that collectivism showed positive relationships with extraversion, conscientiousness, and agreeableness, which they argue are personality traits favoring harmonious group functioning. However, on both an individual (Hofstede and McCrae, 2004), as well as a national level (McCrae et al., 2005), earlier studies found that extraversion and agreeableness correlated positively with individualism (see also Park and Pinel, 2020).

The reports regarding cultural orientation and well-being have also been mixed (Humphrey and Bliuc, 2021). For example, individualism has been associated with greater well-being at both the national (Diener et al., 1995) and individual level (Okely et al., 2018), however, recently, Nezlek and Humphrey (2021) found a negative relationship between individualism and well-being. Regarding inconclusive results, Kitayama et al. (2010) argued that well-being is achieved when people act according to their cultural values or mandates. Based on their findings in American and Japanese groups, Hartanto et al. (2020) concurred, stating that cultural norms tend to guide behaviors, even when members do not endorse those norms. Thus, perceptions of having personal autonomy lead to better well-being in individualistic cultures, whereas this outcome might only be evident in collectivistic cultures when the latter experienced relational harmony.

Findings regarding trust have also been contradictory. Huff and Kelley (2003) reported that collectivist cultures showed lower levels of trust, which is contrary to Hofstede's (1980) notion of collectivist cultures as trust-based societies, whereas Zeffane (2017) found a positive relationship between trust and collectivism. Westjohn et al. (2021) also reported a positive correlation on both individual and societal levels and explained these results in terms of social projection, i.e., the tendency to believe that others think, feel, and behave similar to oneself, especially when they belong to the in-group (see also Robbins and Krueger, 2005). In addition, Guo et al. (2022) recently suggested, based on samples from 48 countries, that trust is more strongly linked to well-being in individualistic countries because trust in collectivist societies is influenced by conformity.

People from collectivist cultures give priority to the group rather than to the individual and value harmonious relationships with in-group members and show some exploitative attitude towards out-group members (Hofstede, 1980). One of the basic needs of a human being is belonging to a group that helps them to rely on each other and make sense of the world. Humans are essentially relational beings. Collectivism requires self-sacrifice and the subordination of one's interests to the interests of others as individuals in collectivist cultures tend to be interdependent on others and more holistic and relational. According to Kim and Markan (2006), people from Eastern cultures experience greater chronic fear of isolation and loneliness and a fear of negative evaluation from in-group members compared to Westerners.

Collectivism and individualism can be considered as core values that are situated at the opposite ends of one continuum. Shulruf et al. (2011) argue that even being conceptual opposites, there is a positive relationship between these two concepts. One person can have both collectivist and individualist features. People may selectively utilize both dimensions in different settings and circumstances for their own benefit. Chen et al. (2015) asserts that people who do not embrace either individualism or collectivism may run a risk of health issues, and

individuals who deny collectivism, will lack social support and will not develop resilience.

In addition, scholars propose that the individualism-collectivism construct is intertwined with another dimension, horizontality-verticality (Singelis et al., 1995; Triandis, 1995). All individualistic or collectivistic countries are not uniform on the horizontal-verticality dimension, resulting in different patterns in social relations. In horizontal and collectivistic societies (e.g., Israeli kibbutz), equality is the important value, whereas in vertical-collectivistic societies (e.g., rural village in India), individuals accept differences in individual power and inequality within the group. Similarly, in horizontal-individualistic societies (e.g., Sweden, Finland), everyone is more or less equal in status, whereas in vertical-individualistic societies (e.g., United States, France), inequality is accepted and individual competence is rewarded. The present study looks at how the dimensions of horizontal and vertical individualism and collectivism predict loneliness, adding to an understanding of how these constructs influence loneliness across samples from a variety of countries.

1.2. Loneliness

Loneliness is defined as, 'the perceived lack of social ties' (Weiss, 1973, p.37). Emotional loneliness results from both social and relational isolation, representing a lack of engagement within societal networks (Cacioppo and Cacioppo, 2012). Research highlights loneliness as a new pandemic of the digital age which can result in depression, anxiety, and social isolation (MacDonald and Schermer, 2021). In the Western lifestyle, a lack of physical contact and bonding experiences are associated with higher levels of loneliness (Griffin, 2010; Tejada, Dunbar, and Montero, 2020). Loneliness has been related to negative experiences and results from a lack of social embeddedness (Stickley et al., 2013) or dissatisfaction with personal relationships.

Maes et al. (2019) assert that loneliness rates are higher among men, although women are more likely report that they are lonely. With respect to individualism-collectivism, the relationship with loneliness is less clear. For example, Lykes and Kemmelmeier (2014) reported that loneliness is higher in collectivistic countries when 12 European countries were examined. In contrast, Heu et al. (2019), reported that collectivism was negatively related to loneliness based on five European countries and Barreto et al. (2021) reported that individualism had a positive relationship with loneliness based on a sample encompassing 237 countries, islands, and territories. As Swader (2019) asserts, even if individualistic societies offer a social infrastructure to support individualistic lifestyles and encourage an increasing tolerance for being alone, people may experience social isolation and loneliness.

1.3. Present study

The present study is a multinational investigation of how each dimension of horizontal and vertical individualism and collectivism predicts self-report loneliness above and beyond the variance due to age and sex in samples from 28 separate countries. Because past research has tended to focus on how individualism and collectivism alone influence loneliness and has reported conflicting results, for example, Lykes and Kemmelmeier (2014) versus Heu, van Zomeran, and Hansen (2019) and Barreto et al. (2021), our study adds to the understanding of how the added dimension of horizontal and vertical, applied to the individualism and collectivism construct, possibly accounts for some of the variance in self-report loneliness.

As reviewed above, individualism-collectivism is a cultural dimension that relates to an individual's identity within their social world. At the social level, cultures of high individualism are characteristic of societies where people identify themselves as independent agents with high levels of autonomy and freedom. People within a culture of high collectivism, in contrast, are likely to identify themselves as members of their in-group and emphasize maintaining harmony and common group

goals rather than pursuing personal achievement and personal goals. At the individual level, individualists tend to focus on self-concepts that are autonomous from the group, whereas collectivists tend to define themselves as parts of the groups they are affiliated with and regard relationships with people within those social groups with the greatest importance in social interactions (Triandis, 1995). To relate these self-construals to loneliness, it is plausible that individualists who locate themselves separate from the in-group, or are more individualistic, are more likely to feel loneliness than collectivists who locate themselves in relation with others. Indeed, a recent cross-national study suggests that people in individualistic cultures report more loneliness than those in collectivistic cultures (Barreto et al., 2021). In contrast, Lykes and Kemmelmeier (2014) reported that loneliness was higher in collectivist country samples, than for individualistic country samples, for 12 European country samples.

What is more, it is noted that the dimension of horizontality/verticality is related to social relations (Shavitt et al., 2011), or whether one construes the self as the same as others, or different from others. At the social level, this bipolar domain is related to social (in)equality. In literature, social inequality is suggested to predict individuals' mental health and exaggerate social exclusion and loneliness. For example, those who receive financial support due to low income during the COVID-19 pandemic reported a less strong social network and more loneliness (Jaspal and Breakwell, 2022). At the individual level, however, there is little understanding about the relationship between inequality and loneliness. One's sense of verticality (hierarchy or inequality) in social relations may separate the self from others, regardless of how coherent one's identity is with those of other members. Thus, it is probable that loneliness is associated with the orientations of horizontality-verticality of social relations. Accordingly, we hypothesize that those who have greater vertical orientations would be more likely to experience loneliness (*verticality-loneliness hypothesis*) and that those who endorse individualistic values will score higher on self-report loneliness (*individualism-loneliness hypothesis*).

2. Method

2.1. Participants and procedure

Participants (*N* = 8345; 3107 men and 5238 women) from 28 countries completed questionnaires either online (19 country samples) or paper-and-pencil (nine country samples) after indicating consent to participate. The results of an independent humor styles measure have been previously reported with this sample (see Schermer et al., 2019) and specifies which country samples completed the measures on-line versus paper and pencil. These adult individuals (*M* = 23.23 years, *SD* = 6.42, range = 18 to 82) completed the two measures described below in addition to other self-report scales. Table 1 lists the sample sizes for each country by sex as well as the average age and standard deviation.

2.2. Materials

Loneliness was assessed with the Three-item Loneliness Scale (TILS; Hughes et al., 2004) which was designed for the needs of large survey studies. The TILS items are from the Revised UCLA Loneliness Scale (Russell, Peplau, and Cutrona, 1980) and were selected based on factor analyses of the complete scale and then adapted for interviews (e.g., "How often do you feel left out?"). Items, written as questions, are responded to using 3-point Likert-type scale (1 = *hardly ever*, 2 = *some of the time*, 3 = *often*). For the German, Polish, and Spanish languages, published adaptations of the TILS were used (Hawkley et al., 2015; Rico-Uribe et al., 2016). For the Portuguese, Bulgarian, Estonian, Russian, Serbian, Korean, and Ukrainian language samples, newly translated versions of the TILS were used. These translations followed the standard translation and backward translation methodology. The internal consistencies of the TILS are listed in Table 1. Cronbach's coefficient *α* and

Table 1

Scale descriptives for Loneliness and the four Vertical and Horizontal Individualism and Collectivism scales for each country.

Country	Sample Size	Mean Age (SD)	Lonely M (SD, α, ω)	Horizontal-Individualism M (SD, α, ω)	Vertical-Individualism M (SD, α, ω)	Horizontal-Collectivism M (SD, α, ω)	Vertical-Collectivism M (SD, α, ω)
Bosnia &	297 women	20.91	4.88	6.77	4.40	7.14	5.51
Herzegovina	203 men	(2.70)	(1.43, 0.63, 0.64)	(1.80, 0.70, 0.76)	(1.92, 0.60, 0.61)	(1.75, 0.81, 0.82)	(1.90, 0.60, 0.61)
Brazil	209 women	28.76	5.59	6.70	4.21	8.01	5.39
	95 men	(11.38)	(1.88, 0.82, 0.83)	(1.56, 0.56, 0.64)	(1.89, 0.68, 0.70)	(1.32, 0.86, 0.85)	(1.66, 0.52, 0.62)
Bulgaria	128 women	19.94	4.76	6.66	5.75	6.93	5.08
	131 men	(1.49)	(1.60, 0.76, 0.77)	(1.66, 0.57, 0.63)	(1.71, 0.57, 0.59)	(1.70, 0.80, 0.80)	(1.99, 0.67, 0.68)
Canada	109 women	24.30	5.32	6.90	5.32	7.57	5.19
	119 men	(5.20)	(1.76, 0.81, 0.82)	(1.49, 0.80, 0.83)	(1.65, 0.56, 0.67)	(1.30, 0.83, 0.83)	(1.51, 0.55, 0.62)
Chile	164 women	20.97	5.71	6.92	3.83	7.62	4.35
	69 men	(3.10)	(1.94, 0.81, 0.82)	(1.72, 0.72, 0.80)	(1.78, 0.68, 0.76)	(1.45, 0.88, 0.88)	(1.74, 0.60, 0.60)
Colombia	142 women	21.06	5.15	7.36	4.79	7.91	5.57
	114 men	(3.22)	(1.90, 0.82, 0.83)	(1.43, 0.64, 0.70)	(1.65, 0.56, 0.64)	(1.31, 0.87, 0.87)	(1.69, 0.55, 0.60)
Croatia	185 women	21.35	4.81	6.48	3.85	6.32	4.64
	64 men	(2.61)	(1.50, 0.70, 0.73)	(2.09, 0.85, 0.86)	(1.93, 0.76, 0.76)	(2.18, 0.90, 0.90)	(1.81, 0.69, 0.75)
Estonia	153 women	24.28	4.86	6.92	5.44	7.35	4.83
	215 men	(6.96)	(1.63, 0.76, 0.77)	(1.40, 0.70, 0.76)	(1.38, 0.47, 0.59)	(1.18, 0.71, 0.72)	(1.56, 0.57, 0.61)
Germany	258 women	26.83	5.24	6.56	4.84	7.23	4.59
	75 men	(6.56)	(1.49, 0.62, 0.63)	(1.57, 0.68, 0.73)	(1.80, 0.65, 0.69)	(1.33, 0.75, 0.75)	(1.71, 0.64, 0.65)
Hungary	243 women	30.11	5.51	6.42	5.13	7.29	5.47
	43 men	(11.81)	(1.42, 0.51, 0.60)	(1.49, 0.38, 0.49)	(1.72, 0.52, 0.52)	(1.43, 0.73, 0.73)	(1.87, 0.70, 0.73)
Indonesia	147 women	21.28	5.34	7.01	6.04	7.30	6.73
	147 men	(2.51)	(1.66, 0.74, 0.74)	(1.19, 0.73, 0.76)	(1.34, 0.54, 0.54)	(1.13, 0.77, 0.77)	(1.20, 0.54, 0.57)
Iran	172 women	28.79	5.56	6.70	6.02	7.95	5.48
	156 men	(8.30)	(1.84, 0.78, 0.79)	(1.48, 0.59, 0.85)	(1.41, 0.35, 0.49)	(1.20, 0.81, 0.82)	(1.75, 0.51, 0.54)
Japan	65 women	19.64	4.86	5.47	5.40	6.61	5.15
	132 men	(1.16)	(1.77, 0.83, 0.83)	(1.70, 0.71, 0.72)	(4.13, 0.38, 0.38)	(1.51, 0.76, 0.77)	(1.52, 0.54, 0.59)
Latvia	142 women	26.65	6.19	5.94	5.38	6.41	5.88
	61 men	(8.36)	(1.99, 0.90, 0.90)	(1.51, 0.77, 0.77)	(1.57, 0.74, 0.76)	(1.47, 0.84, 0.84)	(1.40, 0.71, 0.71)
Malaysia	94 women	21.72	6.39	4.79	4.90	5.21	5.16
	106 men	(1.31)	(1.74, 0.84, 0.86)	(1.36, 0.59, 0.74)	(1.18, 0.48, 0.50)	(1.41, 0.72, 0.72)	(1.11, 0.53, 0.55)
Pakistan	289 women	21.20	5.73	6.31	5.74	6.86	6.38
	63 men	(1.30)	(1.52, 0.44, 0.44)	(1.92, 0.76, 0.77)	(1.75, 0.47, 0.66)	(2.03, 0.85, 0.85)	(1.83, 0.67, 0.68)
Poland	167 women	23.75	5.67	5.07	4.05	5.45	4.58
	78 men	(4.43)	(1.90, 0.82, 0.83)	(1.12, 0.66, 0.71)	(1.14, 0.52, 0.57)	(0.96, 0.63, 0.65)	(1.17, 0.55, 0.62)
Portugal	375 women	22.82	5.26	6.79	4.42	7.95	5.32
	94 men	(7.46)	(1.80, 0.79, 0.80)	(1.56, 0.66, 0.73)	(1.68, 0.61, 0.66)	(1.11, 0.84, 0.84)	(1.70, 0.60, 0.63)
Romania	100 women	20.06	5.65	6.45	5.40	6.69	5.26
	100 men	(1.14)	(1.49, 0.65, 0.67)	(1.76, 0.59, 0.68)	(1.69, 0.53, 0.53)	(1.60, 0.72, 0.75)	(1.76, 0.54, 0.56)
Russia	189 women	19.64	5.19	5.89	5.25	6.31	5.95
	125 men	(1.64)	(1.78, 0.80, 0.80)	(1.80, 0.72, 0.78)	(1.75, 0.61, 0.67)	(1.75, 0.76, 0.76)	(1.65, 0.54, 0.59)
Serbia	302 women	21.73	5.53	6.94	3.26	7.53	4.79
	102 men	(4.86)	(1.52,. 62, 0.68)	(1.52, 0.64, 0.76)	(1.73, 0.63, 0.64)	(1.44, 0.78, 0.78)	(1.72, 0.53, 0.54)
South Africa	217 women	20.71	6.29	7.70	5.66	7.67	5.67
	148 men	(3.57)	(1.77, 0.73, 0.80)	(1.29, 0.66, 0.68)	(1.77, 0.52, 0.53)	(1.42, 0.79, 0.80)	(1.88, 0.55, 0.59)
South Korea	96 women	21.77	4.47	4.82	4.02	5.48	4.19
	88 men	(2.13)	(1.50, 0.73, 0.76)	(1.12, 0.70, 0.72)	(1.04, 0.47, 0.59)	(0.98, 0.73, 0.73)	(1.08, 0.49, 0.55)
Spain	226 women	23.71	5.24	6.60	4.11	7.79	5.21
	100 men	(5.84)	(1.86, 0.82, 0.83)	(1.59, 0.62, 0.71)	(1.77, 0.66, 0.70)	(1.20, 0.81, 0.82)	(1.74, 0.62, 0.65)
Turkey	140 women	20.40	5.47	6.00	5.39	7.30	6.48
	62 men	(2.24)	(1.55, 0.78, 0.78)	(1.93, 0.66, 0.90)	(1.72, 0.55, 0.60)	(1.72, 0.70, 0.70)	(1.88, 0.55, 0.57)
Ukraine	270 women	26.93	4.93	7.31	5.82	7.08	4.31
	71 men	(9.82)	(1.74, 0.78, 0.79)	(1.24, 0.62, 0.70)	(1.44, 0.45, 0.52)	(1.34, 0.67, 0.67)	(1.80, 0.68, 0.69)
United States	233 women	26.75	5.52	6.59	4.94	6.71	5.14
	188 men	(3.26)	(2.14, 0.88, 0.88)	(1.59, 0.75, 0.77)	(1.61, 0.57, 0.59)	(1.66, 0.85, 0.85)	(1.67, 0.64, 0.67)
Vietnam	126 women	20.22	4.95	6.29	5.82	6.60	6.06
	158 men	(1.67)	(1.66, 0.80, 0.81)	(1.71, 0.71, 0.75)	(1.59, 0.52, 0.64)	(1.53, 0.73, 0.74)	(1.76, 0.72, 0.72)
Total Sample	5238 women	23.23	5.36	6.54	4.95	7.10	5.31
	3107 men	(6.42)	(1.77, 0.76, 0.77)	(1.70, 0.70, 0.74)	(1.81, 0.61, 0.64)	(1.63, 0.82, 0.82)	(1.80, 0.63, 0.64)

Notes: α = Cronbach's Alpha; ω = McDonald's Omega.

McDonald's ω was 0.44 for the sample from Pakistan, suggesting that the results for this scale for this country sample should be interpreted with caution. The remaining values ranged from 0.51 (α) and 0.60 (ω) for the sample from Hungary to 0.90 (both α and ω) for the sample from Latvia.

Vertical and horizontal individualism and collectivism were assessed based on three items extracted for each of the four dimensions from the longer, 32-item scale by Singelis et al. (1995). Specifically, *horizontal-individualism* was assessed by using the fourth ("I prefer to be direct and forthright when discussing with people"), fifth, ("I am a unique individual"), and seventh ("I enjoy being unique and different from others in many ways") items from the original scale (Singelis et al., 1995). *Vertical-individualism* was assessed by using the first ("It annoys me when other people perform better than I do"), fourth ("Without competition, it is not possible to have a good society"), and sixth ("It is important that I do my job better than others") items. *Horizontal-collectivism* was assessed by using the first ("The well-being of my co-workers is important to me"), fourth ("It is important to maintain harmony within my group"), and sixth ("I feel good when I cooperate with others") items. To assess vertical-collectivism, the second ("I would do what would please

my family, even if I detested that activity"), fourth ("I usually sacrifice my self-interest for the benefit of my group"), and fifth ("Children should be taught to place duty before pleasure") items were selected. Items were responded to using a *1 = definitely no* to *9 = definitely yes* response key. Although the initial scale consisted of eight items per scale, three were chosen for each scale for this study to keep the overall survey to a minimum length.

Examining the values for the internal consistency values in Table 1, the scales do appear to be fairly consistent for the three items, and, for the total sample, are similar to the values reported by Singelis et al. (1995), who report coefficient alphas ranging from a low of 0.67 for horizontal-individualism to a high of 0.74 for both vertical-individualism and horizontal-collectivism. It should be noted that for some of the individual country samples, the coefficient alpha values were found to be relatively low. For horizontal-individualism, the sample from Hungary had a coefficient alpha of 0.38 and a McDonald's omega of 0.49. For the vertical-individualism scale, the samples from Estonia, Pakistan, and South Korea had a coefficient alpha of 0.47 (although the McDonald's omega values were higher for these countries with values of 0.59, 0.66, and 0.59, respectively), the sample from Ukraine had a coefficient alpha of 0.45 and McDonald's omega of 0.52, the sample from Japan had a coefficient alpha and a McDonald's omega of 0.38, and the sample from Iran had a coefficient alpha and a McDonald's omega of 0.35. For these scale and country samples, the results should be taken with caution. The internal consistency values for the horizontal-collectivism scale was acceptable for each of the country samples. For the vertical-collectivism scale, the South Korean sample had the lowest coefficient alpha of 0.49 and a McDonald's omega value of 0.55. In general, because the scales only have three items, the lower internal consistency values may be expected, but for those samples with particularly low values, the results should be interpreted as preliminary.

2.3. Statistical analyses

After descriptive analyses, the measurement invariance of the scales across country samples was examined. How the vertical and horizontal individualism and collectivism scale scores, in addition to age and sex, predict loneliness is examined using direct entry regression analyses with ordinary least squares for the entire sample as well as for each country individually as a means of assessing possible general trends in the prediction of loneliness.

3. Results

3.1. Descriptive statistics

Table 1 lists the descriptive statistics (means, standard deviations, and scale coefficient alpha and omega values) for each country sample and the total sample. To help visualize the pattern of responses, the mean values reported in Table 1 are plotted in Figs. 1 to 5. Fig. 1 plots the mean loneliness scores. As depicted, there was variability across the countries with the highest mean score for the sample from Malaysia and the lowest mean score from the sample from South Korea.

Fig. 2 depicts the mean horizontal-individualism scale scores for each country. The highest mean score was from the sample from South Africa and the lowest mean score was from the sample from Malaysia. Of interest, the samples from Bosnia and Herzegovina through to the sample from Iran, shows little variability when the samples from Japan to Vietnam are compared.

Fig. 3 plots the mean vertical-individualism scores for each country sample. The sample from Indonesia had the highest mean and was almost tied with the sample from Iran (although it should be noted that the internal consistency estimate for the sample from Iran for this scale was low). The sample from Serbia had the lowest mean value.

Fig. 4 presents the mean horizontal-collectivism scores for each country sampled. The highest mean score was for the sample from Brazil,

followed by the samples from Iran and Portugal, which had the same mean score. The lowest mean score was for the sample from Malaysia.

Fig. 5 plots the mean vertical-collectivism scores for each country sample. The highest mean score was for the sample from Indonesia and the lowest mean score was for the sample from South Korea.

3.2. Measurement invariance

The issue of measurement invariance in large-scale international studies has been under examination in recent literature. Strong invariance, using the traditional method of multi-group confirmatory factor analysis, with a large number of groups is rare because there are many more sources of potential invariance with more than two groups. An added complication in the present study is that the measures each have three items, which means the measures are just-identified in factor analysis and fit statistics are not meaningful. Asparouhov and Muthén (2014) proposed the alignment method which evaluates an approximate invariance using analysis that is similar to rotation in exploratory factor analysis. The alignment analysis allows researchers to examine specific sources of non-invariance by scale items, groups, intercepts, and loadings. Table 2 displays the results of the alignment analysis. The total non-invariance rates ranged from 4.76% for the loneliness scale to 14.88% for the vertical-individualism scale. Muthén and Asparouhov (2013) recommend a maximum of 25% non-invariance for comparing latent means and relations, which suggests that at least a partial measurement invariance for the measures in the present study.

We also examined the measurement invariance of the questionnaire method (online versus paper and pencil), by the multi-group confirmatory factor analysis method (since there are only two groups). Using the recommendation that the change in comparative fit index (CFI) be < 0.01 (Cheung and Rensvold, 2002), the loneliness scale met the criteria for strict measurement invariance (the measure was invariant across groups when evaluating loadings, intercepts, and residuals), the horizontal-individualism and horizontal-collectivism scales met the criteria for strong measurement invariance (loadings and intercepts), and the vertical-individualism and vertical-collectivism scales met the criteria for metric invariance (loadings only).

3.3. Predicting loneliness scores

Table 3 lists the results of direct-entry regression analyses, using ordinary least-squares, in predicting loneliness for each country sample and for the total sample. With respect to demographic variables, age was found to typically have a negative predictive regression weight for loneliness scores and was found to be significant for the samples from Brazil, Colombia, Estonia, Hungary, Iran, Latvia, Poland, Portugal, the United States, and for the total sample. These results suggest that loneliness scores were higher for the younger participants. Age-squared was also examined as a possible predictor to assess possible curvilinear relationships. The results suggested that age-squared did not add significantly to the models outlines above with linear age effects assessed alone. Loneliness scores had significant negative prediction weights for sex, such that women had higher loneliness scores, for the samples from Colombia, Japan, Russia, the United States, and for the total sample.

In predicting loneliness, horizontal-individualism had significant negative predictor weights for the samples from Brazil, Bulgaria, Germany, Poland, Portugal, Serbia, Ukraine, and the total sample, suggesting that for those who reported feeling less autonomous and more unequal, also endorsed higher loneliness responses. Vertical-individualism had significant positive predictor weights for predicting loneliness for the samples from Brazil, Bulgaria, Colombia, Croatia, Hungary, Indonesia, Japan, Latvia, Pakistan, Portugal, Russia, Serbia, South Africa, South Korea, Spain, Turkey, Vietnam, and the total sample. These results suggest that those who report feeling more autonomous and unequal are more likely to endorse the loneliness items.

Table 2

Summary of the number of samples with approximate measurement invariance following an alignment analysis.

Measure	Item	Mean (*SD*)	Number of samples with approximate measurement invariance	
			Intercept	Loadings
Loneliness	1	1.89(0.45)	25	26
	2	1.74(0.51)	28	28
	3	1.74(0.55)	27	26
Horizontal Individualism	1	6.82(3.87)	24	22
	2	6.40(5.24)	25	28
	3	6.40(4.80)	28	28
Vertical Individualism	1	3.78(5.26)	20	27
	2	5.26(6.86)	17	28
	3	5.81(5.49)	25	26
Horizontal Collectivism	1	6.85(3.79)	26	28
	2	7.36(3.21)	22	27
	3	7.10(3.78)	22	28
Vertical Collectivism	1	5.21(6.15)	27	27
	2	5.20(5.13)	24	28
	3	5.52(5.66)	15	27

Notes: The item number corresponds with the descriptions in the Measures section. There are 28 country samples.

For the individual samples, significant negative regression predictor weights for horizontal-collectivism, in predicting loneliness, were found for Bulgaria, Canada, Croatia, Estonia, Hungary, Indonesia, Iran, Japan, Latvia, Pakistan, Poland, Portugal, Russia, Serbia, South Africa, Spain, Turkey, Ukraine, the United States, and for the total sample. These results suggest that those who perceive themselves as equal to others and as part of a community are less likely to endorse the loneliness items. In contrast, vertical-collectivism had significant positive predictor regression weights, in predicting loneliness, for the samples of Bosnia and Herzegovina, Chile, Croatia, Latvia, Portugal, Romania, and the total sample. These results suggest that those who reported feeling unequal to others, even though they did feel that they belonged to a community, were also more likely to report higher loneliness.

4. Discussion

This paper investigated how horizontal and vertical individualism and collectivism predicted self-report loneliness variance along with age and sex in samples from 28 independent countries. Adjusted *R*-squared

values suggested that between 0.6% to 27.7% of the variance in self-report loneliness could be explained by age, sex, and the horizontal and vertical individualism and collectivism scales. We found that the horizontal and vertical aspects of the individualism/collectivism dimension had a small but significant contribution to predicting loneliness. Horizontal-collectivism and, to a lesser extent, horizontal-individualism predicted *less* loneliness for the total sample. On the other hand, vertical-individualism, and to a lesser extent, vertical collectivism, predicted *more* loneliness across all participants. These results lend support to both the individualism-loneliness hypothesis and the vertical-loneliness hypothesis (Barreto et al., 2021; Heu et al., 2019; Lykes and Kemmelmeier, 2014).

Although we found some support for our hypotheses, there were slight differences in which variables significantly predicted loneliness for each of the country samples. The general pattern tended to hold with a small negative predictor weight for horizontal-individualism, a stronger positive regression weight for vertical-individualism, a stronger negative weight for horizontal-collectivism, and a weaker positive weight for vertical-collectivism. Exceptions to the regression weight di-
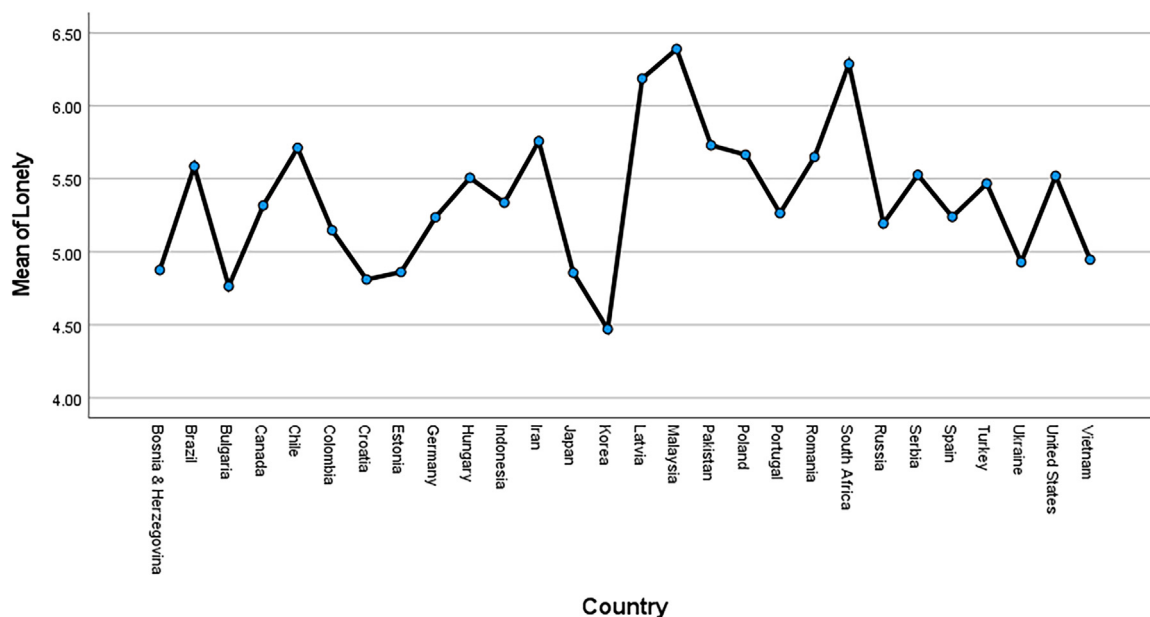

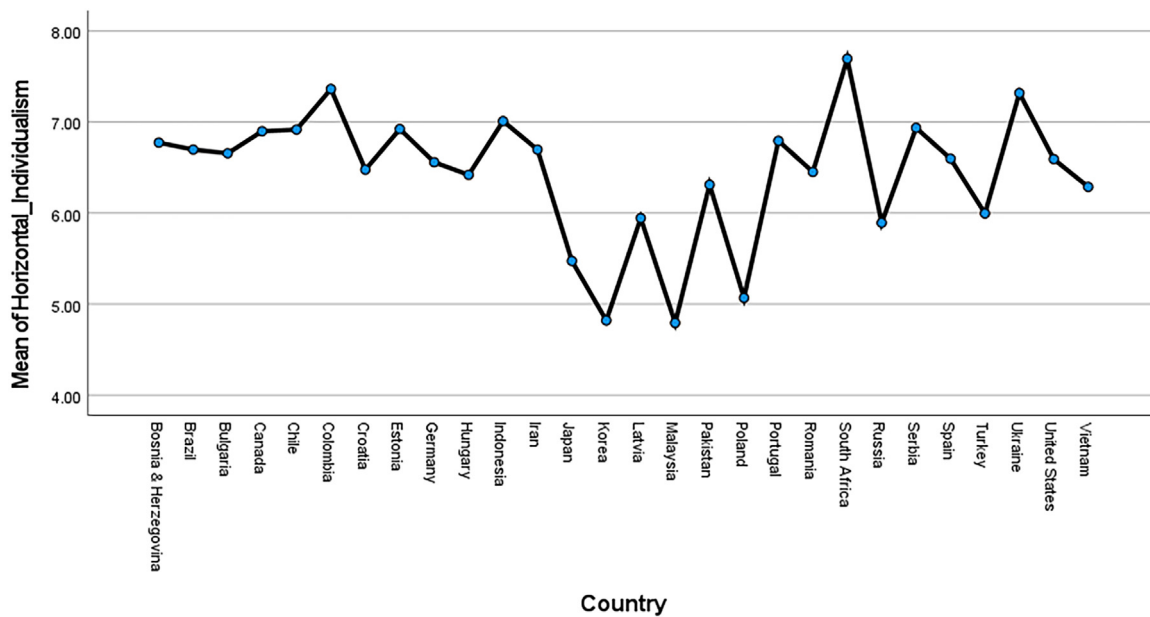**Fig. 1.** Mean loneliness scores for each country sample.

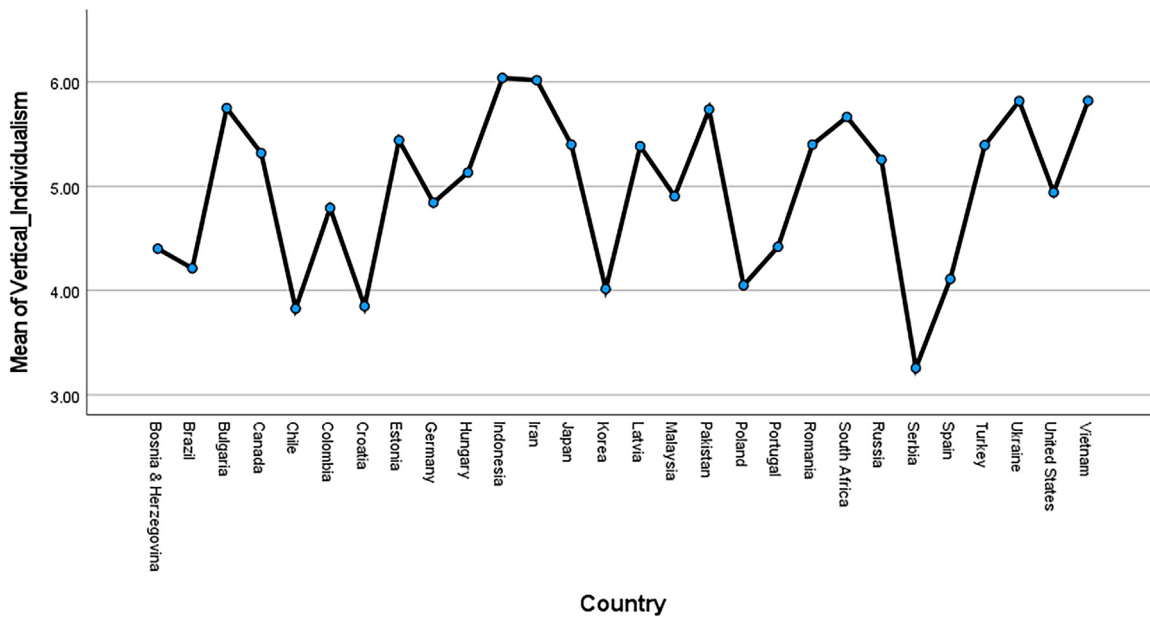**Fig. 2.** Mean horizontal-individualism scores for each country.

Fig. 3. Mean vertical-individualism scores for each country.

rections, such as the samples from Canada, Croatia, Japan, Malaysia, South Africa, South Korea, Spain, and Vietnam, all had non-significant regression weights. For example, for the Canadian sample, horizontal-individualism had a positive regression weight in predicting loneliness scores but the value was not significant.

Our study adds to the previous literature on the relationship between loneliness and value orientations in several ways. First, the overall pattern of findings suggests that loneliness is better predicted by the horizontal/vertical dimension than by the more commonly studied individualism/collectivism dimension of value orientations. Namely, the horizontal dimensions of both individualism and collectivism predicted less loneliness in our study, while the vertical aspects predicted more loneliness.

These findings align with the previous literature highlighting the equality versus dominance of value orientations as an essential dimension related to distinct values, goals, and cognitive schemes

(Shavitt et al., 2011; Singelis et al., 1995). The inequality of social relations, whether conceptualized within an individualistic or collectivistic framework, appears more important for an individual's sense of connectedness with others than whether one construes themself as independent or interdependent. These findings are novel but relate to other lines of work suggesting that social inequality undermines social cohesion and a sense of community (Dragolov et al., 2016; Wilkinson and Pickett, 2009). At the individual level, endorsement of social inequality, for example, social dominance orientation, has been interpreted as a belief in a "dog-eat-dog" world or perceiving the social world as a "jungle" in which competitive relations between individuals or groups are the rule (Duckit & Sibley, 2010; Pratto, Sidanius, and Levin, 2006). A prominent feature of this worldview is the "zero-sum" belief or that valued outcomes are limited and that not all people or groups in society can have equal access to these outcomes. In line with this belief, social dominance orientation has been related to personality traits character-
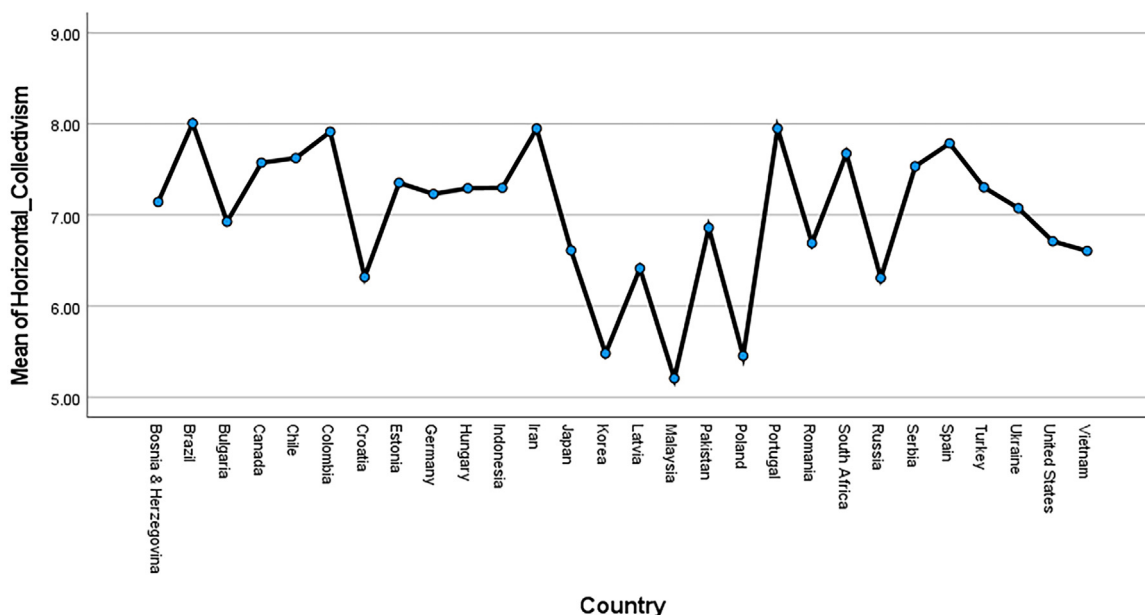
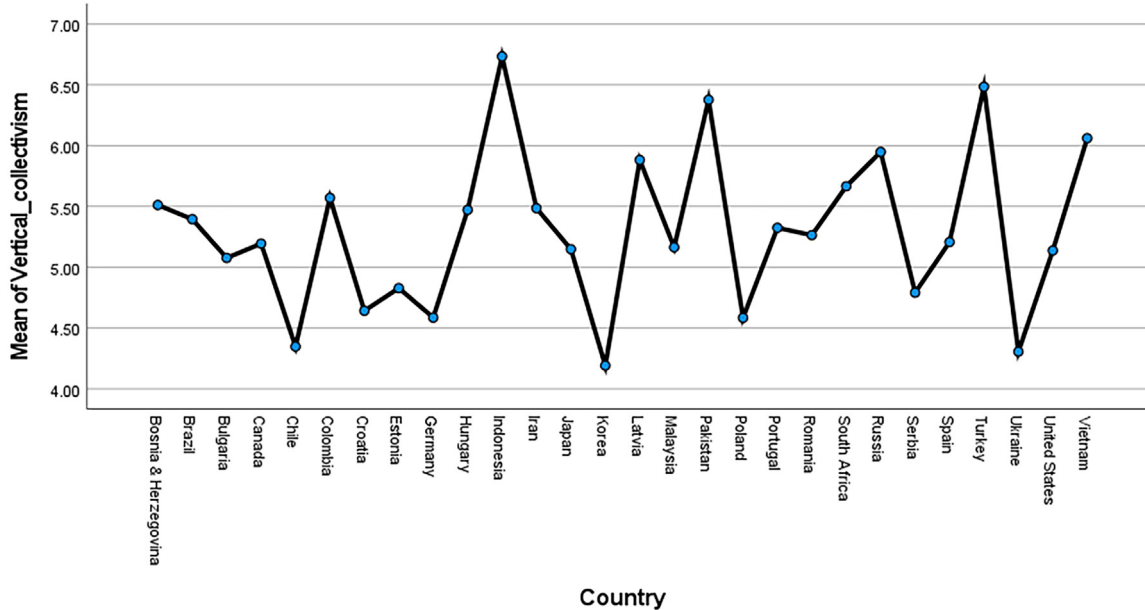**Fig. 4.** Mean horizontal-collectivism scores for each country.

Fig. 5. Mean vertical-collectivism scores for each country.

ized by lower interpersonal empathy and agreeableness (Duckitt and Sibley, 2010; Ekehammar et al., 2004). Such a picture of the social world could emphasize feeling more distant from others, even the members of one's own group, thus leading to loneliness. Some types of loneliness, in particular emotional isolation (Cacioppo and Cacioppo, 2012) and existential loneliness (Yalom, 1980), may be more pronounced even in collectivist settings where relational isolation is rare.

Furthermore, we can also expect that individuals are lonelier in more unequal societies. From a social identity perspective, the unequal status of individuals highlights the status differences, negative stereotyping, and perceptions of threat among low- and high-status groups (Jay et al., 2019; Jetten et al., 2017). For instance, low-status group members can feel the burden of their low status and consequent strain on their self-

esteem in a context where status differences are pronounced. In contrast, high-status group members can feel threatened by the possibility of status loss and status-related guilt, which they legitimize through negative perceptions of lower-status groups. Such a context would clearly lead to a threatened sense of self-worth, lower solidarity, and empathy, and could therefore lead to poor social relations and loneliness. Further research is warranted that should cast more light on the relationship between social dominance orientation as a basic social attitude with social connectedness and loneliness.

Our findings add further context to the interpretation of previous findings on the role of individualism/collectivism in loneliness. The studies that investigated the role of the societal level individualism/collectivism yielded some inconsistent findings – while some stud-

Table 3

Direct-entry regression results predicting loneliness for each country sample.

Country and Predictors	Standardized Beta	95% Beta Confidence Interval	Partial Correlation	t	Model Fit F R² Adjusted R²
Bosnia & Herzegovina					
Age	−0.030	−0.063, 0.031	−0.030	−0.659	F (6493)
Sex (1=women, 2=men)	−0.004	−0.277, 0.253	−0.004	−0.086	=2.101
Horizontal-Individualism	−0.082	−0.142, 0.012	−0.074	−1.651	R² = 0.025
Vertical-Individualism	.043	−0.037, 0.101	.041	.901	Adj. R² = 0.013
Horizontal-Collectivism	−0.064	−0.134, 0.030	−0.056	−1.247	
Vertical-Collectivism	.144	.035, 0.182	.129	2.896*	
Brazil					
Age	−0.269	−0.062, −0.027	−0.274	−4.904*	F (6297)
Sex (1=women, 2=men)	−0.068	−0.722, 0.168	−0.071	−1.226	=8.170*
Horizontal-Individualism	−0.219	−0.396, −0.129	−0.219	−3.863*	R² = 0.142
Vertical-Individualism	.177	.058, 0.292	.169	2.949*	Adj. R² = 0.124
Horizontal-Collectivism	.040	−0.116, 0.229	.037	.645	
Vertical-Collectivism	.014	−0.111, 0.142	.014	.240	
Bulgaria					
Age	−0.096	−0.230, 0.025	−0.100	−1.588	F (6252)
Sex (1=women, 2=men)	.101	−0.071, 0.715	.101	1.615	=5.557*
Horizontal-Individualism	−0.139	−0.262, −0.005	−0.128	−2.043*	R² = 0.117
Vertical-Individualism	.197	.060, 0.308	.181	2.918*	Adj. R² = 0.096
Horizontal-Collectivism	−0.261	−0.366, −0.123	−0.243	−3.978*	
Vertical-Collectivism	.075	−0.039, 0.159	.075	1.189	
Canada					
Age	.111	−0.012, 0.083	.106	1.486	F (6194)
Sex (1=women, 2=men)	−0.074	−0.765, 0.249	−0.072	−1.005	=1.808
Horizontal-Individualism	.082	−0.105, 0.298	.068	.944	R² = 0.053
Vertical-Individualism	.051	−0.106, 0.213	.047	.661	Adj. R² = 0.024
Horizontal-Collectivism	−0.246	−0.561, −0.100	−0.199	−2.825*	
Vertical-Collectivism	.016	−0.162, 0.200	.015	.208	
Chile					
Age	−0.107	−0.147, 0.013	−0.109	−1.643	F (6226)
Sex (1=women, 2=men)	−0.023	−0.649, 0.457	−0.023	−0.342	=2.822
Horizontal-Individualism	−0.107	−0.283, 0.042	−0.097	−1.462	R² = 0.070
Vertical-Individualism	.050	−0.092, 0.202	.049	.739	Adj. R² = 0.045
Horizontal-Collectivism	−0.117	−0.349, 0.035	−0.107	−1.611	
Vertical-Collectivism	.138	.003, 0.305	.132	2.004*	
Colombia					
Age	−0.156	−0.163, −0.021	−0.160	−2.562*	F (6249)
Sex (1=women, 2=men)	−0.135	−0.980, −0.048	−0.136	−2.173*	=3.847*
Horizontal-Individualism	−0.068	−0.276, 0.095	−0.061	−0.960	R² = 0.085
Vertical-Individualism	.123	.001, 0.283	.125	1.982*	Adj. R² = 0.063
Horizontal-Collectivism	−0.138	−0.403, 0.004	−0.121	−1.931	
Vertical-Collectivism	.092	−0.003, 0.239	.094	1.941	
Croatia					
Age	.006	−0.065, 0.072	.006	.096	F (6242)
Sex (1=women, 2=men)	.048	−0.301, 0.631	.045	.699	=5.518*
Horizontal-Individualism	.046	−0.093, 0.159	.033	.516	R² = 0.120
Vertical-Individualism	.202	.050, 0.265	.182	2.880*	Adj. R² = 0.099
Horizontal-Collectivism	−0.184	−0.253, −0.001	−0.127	−1.991*	
Vertical-Collectivism	.208	.058, 0.285	.188	2.975*	
Estonia					
Age	−0.107	−0.050, −0.001	−0.107	−2.031*	F (6355)
Sex (1=women, 2=men)	.067	−0.133, 0.575	.065	1.229	=4.027*
Horizontal-Individualism	−0.015	−0.146, 0.110	−0.015	−0.278	R² = 0.064
Vertical-Individualism	.062	−0.052, 0.201	.061	1.156	Adj. R² = 0.048
Horizontal-Collectivism	−0.225	−0.469, −0.161	−0.208	−4.016*	
Vertical-Collectivism	.123	.016, 0.245	.119	2.249*	
Germany					
Age	.072	−0.009, 0.041	.071	1.267	F (6319)
Sex (1=women, 2=men)	.005	−0.382, 0.417	.005	.084	=2.169*
Horizontal-Individualism	−0.125	−0.228, −0.012	−0.121	−2.185*	R² = 0.039
Vertical-Individualism	.017	−0.079, 0.107	.017	.295	Adj. R² = 0.021
Horizontal-Collectivism	−0.111	−0.253, 0.002	−0.107	−1.930	
Vertical-Collectivism	.012	−0.088, 0.109	.011	.202	

Table 3 (*continued*)

Country and Predictors	Standardized Beta	95% Beta Confidence Interval	Partial Correlation	t	Model Fit F R²Adjusted R²
Hungary					
Age	−0.341	−0.055, −0.027	−0.333	−5.901*	F (6279)
Sex (1=women, 2=men)	−0.010	−0.471, 0.390	−0.011	−0.185	=9.274*
Horizontal-Individualism	−0.004	−0.108, 0.101	−0.004	−0.070	R^2 = 0.166
Vertical-Individualism	.133	.020, 0.199	.143	2.409*	Adj. R^2 = 0.148
Horizontal-Collectivism	−0.143	−0.255, −0.029	−0.147	−2.482*	
Vertical-Collectivism	.049	−0.050, 0.124	.050	.841	
Indonesia					
Age	−0.086	−0.131, 0.017	−0.089	−1.514	F (6287)
Sex (1=women, 2=men)	−0.086	−0.657, 0.089	−0.088	−1.497	=4.516*
Horizontal-Individualism	−0.038	−0.216, 0.110	−0.037	−0.635	R^2 = 0.086
Vertical-Individualism	.222	.130, 0.418	.216	3.739*	Adj. R^2 = 0.067
Horizontal-Collectivism	−0.189	−0.464, −0.091	−0.171	−2.933*	
Vertical-Collectivism	.068	−0.081, 0.271	.062	1.061	
Iran					
Age	−0.211	−0.073, −0.020	−0.192	−3.507*	F (6320)
Sex (1=women, 2=men)	−0.063	−0.634, 0.170	−0.063	−1.134	=5.110*
Horizontal-Individualism	−0.066	−0.225, 0.060	−0.063	−1.136	R^2 = 0.087
Vertical-Individualism	.097	−0.020, 0.272	.094	1.694	Adj. R^2 = 0.070
Horizontal-Collectivism	−0.194	−0.474, −0.118	−0.180	−3.264*	
Vertical-Collectivism	.065	−0.052, 0.190	.062	1.114	
Japan					
Age	−0.035	−0.267, 0.159	−0.036	−0.501	F (6189)
Sex (1=women, 2=men)	−0.158	−1.115, −0.064	−0.156	−2.215*	=2.586*
Horizontal-Individualism	.045	−0.103, 0.197	.045	.621	R^2 = 0.076
Vertical-Individualism	.200	.063, 0.430	.189	2.646*	Adj. R^2 = 0.047
Horizontal-Collectivism	−0.203	−0.431, −0.044	−0.174	−2.423*	
Vertical-Collectivism	.015	−0.174, 0.209	.013	.177	
Latvia					
Age	−0.192	−0.076, −0.016	−0.209	−2.992*	F (6196)
Sex (1=women, 2=men)	−0.039	−0.710, 0.374	−0.044	−0.613	=13.878*
Horizontal-Individualism	−0.094	−0.323, 0.076	−0.087	−1.222	R^2 = 0.298
Vertical-Individualism	.311	.212, 0.574	.292	4.275*	Adj. R^2 = 0.277
Horizontal-Collectivism	−0.400	−0.772, −0.309	−0.313	−4.610*	
Vertical-Collectivism	.418	.346, 0.838	.321	4.748*	
Malaysia					
Age	.090	−0.071, 0.311	.089	1.239	F (6193)
Sex (1=women, 2=men)	−0.083	−0.786, 0.212	−0.081	−1.135	=0.791
Horizontal-Individualism	−0.064	−0.304, 0.139	−0.053	−0.732	R^2 = 0.024
Vertical-Individualism	.083	−0.102, 0.345	.077	1.074	Adj. R^2 = 0.006
Horizontal-Collectivism	.079	−0.116, 0.310	.065	.900	
Vertical-Collectivism	−0.055	−0.333, 0.161	−0.049	−0.688	
Pakistan					
Age	−0.026	−0.152, 0.092	−0.026	−0.482	F (6345)
Sex (1=women, 2=men)	−0.041	−0.576, 0.254	−0.041	−0.762	=3.079*
Horizontal-Individualism	−0.054	−0.140, 0.056	−0.046	−0.850	R^2 = 0.051
Vertical-Individualism	.215	.086, 0.287	.193	3.648*	Adj. R^2 = 0.034
Horizontal-Collectivism	−0.167	−0.230, −0.020	−0.125	−2.335*	
Vertical-Collectivism	.064	−0.065, 0.171	.048	.884	
Poland					
Age	−0.125	−0.107, 0.000	−0.127	−1.979*	F (6238)
Sex (1=women, 2=men)	−0.075	−0.810, 0.202	−0.076	−1.183	=4.089*
Horizontal-Individualism	−0.155	−0.480, −0.044	−0.152	−2.369*	R^2 = 0.093
Vertical-Individualism	.103	−0.039, 0.379	.104	1.605	Adj. R^2 = 0.071
Horizontal-Collectivism	−0.148	−0.547, −0.035	−0.144	−2.243*	
Vertical-Collectivism	.058	−0.111, 0.298	.059	.904	
Portugal					
Age	−0.163	−0.061, −0.018	−0.164	−3.580*	F (6462)
Sex (1=women, 2=men)	−0.049	−0.628, 0.187	−0.049	−1.063	=7.168*
Horizontal-Individualism	−0.128	−0.251, −0.043	−0.129	−2.789*	R^2 = 0.085
Vertical-Individualism	.102	.011, 0.207	.101	2.192*	Adj. R^2 = 0.073
Horizontal-Collectivism	−0.119	−0.340, −0.043	−0.117	−2.536*	
Vertical-Collectivism	.105	.014, 0.208	.104	2.239*	

Table 3 (*continued*)

Country and Predictors	Standardized Beta	95% Beta Confidence Interval	Partial Correlation	t	Model Fit F R^2 Adjusted R^2
Romania					
Age	−0.076	−0.290, 0.090	−0.075	−1.040	F (6193)
Sex (1=women, 2=men)	.008	−0.407, 0.456	.008	.113	=1.565
Horizontal-Individualism	−0.092	−0.204, 0.048	−0.088	−1.225	R^2 = 0.046
Vertical-Individualism	.004	−0.131, 0.138	.004	.052	Adj. R^2 = 0.017
Horizontal-Collectivism	−0.097	−0.229, 0.048	−0.092	−1.287	
Vertical-Collectivism	.185	.031, 0.281	.175	2.468*	
Russia					
Age	−0.001	−0.120, 0.117	−0.002	−0.027	F (6307)
Sex (1=women, 2=men)	−0.150	−0.945, −0.146	−0.151	−2.685*	=4.289*
Horizontal-Individualism	−0.047	−0.166, 0.073	−0.043	−0.760	R^2 = 0.077
Vertical-Individualism	.190	.073, 0.315	.178	3.166*	Adj. R^2 = 0.059
Horizontal-Collectivism	−0.178	−0.316, −0.048	−0.151	−2.668*	
Vertical-Collectivism	.032	−0.107, 0.176	.027	.479	
Serbia					
Age	−0.077	−0.054, 0.006	−0.079	−1.582	F (6397)
Sex (1=women, 2=men)	.094	−0.009, 0.663	.096	1.914	=4.805*
Horizontal-Individualism	−0.113	−0.212, −0.012	−0.110	−2.201*	R^2 = 0.068
Vertical-Individualism	.147	.042, 0.214	.145	2.914*	Adj. R^2 = 0.054
Horizontal-Collectivism	−0.119	−0.233, −0.019	−0.116	−2.320*	
Vertical-Collectivism	.013	−0.077, 0.099	.013	.252	
South Africa					
Age	−0.069	−0.086, 0.018	−0.068	−1.291	F (6358)
Sex (1=women, 2=men)	−0.098	−0.730, 0.026	−0.096	−1.832	=4.039*
Horizontal-Individualism	.017	−0.135, 0.181	.015	.286	R^2 = 0.063
Vertical-Individualism	.178	.073, 0.283	.174	3.344*	Adj. R^2 = 0.048
Horizontal-Collectivism	−0.126	−0.302, −0.012	−0.112	−2.123*	
Vertical-Collectivism	.049	−0.051, 0.143	.049	.932	
South Korea					
Age	.071	−0.082, 0.182	.056	.743	F (6177)
Sex (1=women, 2=men)	−0.143	−0.990, 0.133	−0.112	−1.506	=1.323
Horizontal-Individualism	−0.100	−0.349, 0.083	−0.091	−1.218	R^2 = 0.043
Vertical-Individualism	.183	.042, 0.479	.174	2.357*	Adj. R^2 = 0.010
Horizontal-Collectivism	−0.024	−0.274, 0.200	−0.023	−0.308	
Vertical-Collectivism	−0.012	−0.223, 0.188	−0.012	−0.166	
Spain					
Age	.014	−0.030, 0.039	.014	.257	F (6319)
Sex (1=women, 2=men)	−0.106	−0.865, 0.010	−0.107	−1.923	=5.582*
Horizontal-Individualism	.030	−0.095, 0.165	.030	.529	R^2 = 0.095
Vertical-Individualism	.140	.024, 0.269	.131	2.358*	Adj. R^2 = 0.078
Horizontal-Collectivism	−0.263	−0.584, −0.232	−0.247	−4.561*	
Vertical-Collectivism	.069	−0.046, 0.192	.068	1.214	
Turkey					
Age	−0.060	−0.138, 0.055	−0.061	−0.845	F (6194)
Sex (1=women, 2=men)	−0.131	−0.898, 0.024	−0.133	−1.868	=2.802*
Horizontal-Individualism	−0.034	−0.145, 0.091	−0.032	−0.450	R^2 = 0.080
Vertical-Individualism	.165	.015, 0.282	.156	2.194*	Adj. R^2 = 0.051
Horizontal-Collectivism	−0.206	−0.319, −0.052	−0.193	−2.736*	
Vertical-Collectivism	.131	−0.016, 0.231	.122	1.717	
Ukraine					
Age	−0.089	−0.034, 0.003	−0.091	−1.674	F (6334)
Sex (1=women, 2=men)	−0.067	−0.730, 0.156	−0.070	−1.274	=4.845*
Horizontal-Individualism	−0.138	−0.351, −0.038	−0.132	−2.439*	R^2 = 0.080
Vertical-Individualism	.104	−0.005, 0.255	.103	1.895	Adj. R^2 = 0.064
Horizontal-Collectivism	−0.137	−0.321, −0.035	−0.133	−2.444*	
Vertical-Collectivism	.084	−0.021, 0.183	.085	1.567	
United States					
Age	−0.110	−0.133, −0.011	−0.113	−2.316*	F (6414)
Sex (1=women, 2=men)	−0.151	−1.051, −0.241	−0.152	−3.135*	=5.768*
Horizontal-Individualism	−0.089	−0.260, 0.022	−0.081	−1.664	R^2 = 0.077
Vertical-Individualism	.068	−0.040, 0.221	.067	1.363	Adj. R^2 = 0.064
Horizontal-Collectivism	−0.136	−0.318, −0.031	−0.117	−2.390*	
Vertical-Collectivism	−0.045	−0.191, 0.077	−0.041	−0.835	

Table 3 (continued)

Country and Predictors	Standardized Beta	95% Beta Confidence Interval	Partial Correlation	t	Model Fit F R² Adjusted R²
Vietnam					
Age	−0.046	−0.162, 0.070	−0.047	−0.786	F (6277)
Sex (1=women, 2=men)	.080	−0.141, 0.674	.077	1.289	=3.199*
Horizontal-Individualism	.122	−0.015, 0.253	.104	1.744	R² = 0.065
Vertical-Individualism	.162	.029, 0.310	.142	2.381*	Adj. R² = 0.045
Horizontal-Collectivism	−0.148	−0.328, 0.005	−0.114	−1.910	
Vertical-Collectivism	.114	−0.028, 0.244	.093	1.559	
Total Sample					
Age	−0.066	−0.024, −0.012	−0.067	−6.109*	F (6,8295)
Sex (1=women, 2=men)	−0.067	−0.325, −0.169	−0.068	−6.204*	=57.177*
Horizontal-Individualism	−0.044	−0.070, −0.021	−0.04	−3.641*	R² = 0.039
Vertical-Individualism	.117	.092, 0.135	.111	10.197*	Adj. R² = 0.039
Horizontal-Collectivism	−0.113	−0.149, −0.096	−0.100	−9.170*	
Vertical-Collectivism	.072	.049, 0.094	.068	6.238*	
Total Sample including country as a predictor variable	−0.065	−0.024, −0.012	−0.066	−6.052*	F (7,8294)
Age	−0.066	−0.318, −0.162	−0.066	−6.030*	=50.463*
Sex (1=women, 2=men)	−0.043	−0.069, −0.020	−0.039	−3.593*	R² = 0.041
Horizontal-Individualism	.115	.090, 0.134	.110	10.044*	Adj. R² = 0.040
Vertical-Individualism	−0.110	−0.146, −0.093	−0.097	−8.897*	
Horizontal-Collectivism	.071	.047, 0.092	.067	6.094*	
Vertical-Collectivism	.034	.003, 0.012	.034	3.133*	
Country					

*$p < .05$, two-tailed.

ies (Lykke and Kammelmeier, 2014; Swader, 2019) suggested that individualist societies are less lonely, others still suggest the opposite pattern (Barretto et al., 2021; Heu et al., 2019), that individualistic societies are lonelier or that collectivist countries are less lonely. These societal-level inconsistencies should probably be interpreted with respect to social norms. Namely, the study conducted by Barretto and associates (2021) drew on a larger sample of countries, representing a greater range along the individualism/collectivism dimension than the previous studies that mainly included the relatively more individualistic European countries (Lykes and Kammelmeier, 2014; Swader, 2019). Thus, we can speculate that, on average, in more collectivist countries, social connections are more valued and nurtured, leading to less loneliness. On the other hand, when we compare more individualist societies among themselves, those that are relatively more individualist promote social norms that emphasize the social connections to a lesser extent and provide better resources for an individualist lifestyle, consequently leading to less loneliness. To understand the overall picture, studies that represent the full spectrum of collectivist countries, and that also take into account the complex interrelations between the societal and the individual-level orientations, are thus warranted.

However, our current findings suggest an alternative or additional interpretation. The differences within the European countries with respect to individualism appear to be confounded by the general level of inequality within the country. When we related the Gini index (World Bank Development Research Group, 2015) with the country-level individualism data for the countries included in the study by Swader (2019), we found a moderate negative correlation ($r = −0.38$, $p = .058$). Thus, more collectivist countries are those that are also more unequal. Because there were only 21 countries in Swader (2019), these analyses should be replicated with larger and more diverse samples. However, our findings suggest that the actual level of inequality and the verticality of value orientations should be further studied in relation to loneliness.

The present findings are in line with previous research with regard to the role of the socio-demographic characteristics in loneliness, in particular, that younger people and women report being lonelier (Barretto et al., 2021). Our conclusions regarding the relationship between age

and loneliness remain, however, limited, as our samples included predominantly younger participants and did not cover the entire age range. However, as our study included a large number of different social and cultural contexts, we also report between-country differences in these patterns, suggesting that a more differentiated view of loneliness patterns depends on the specific context.

4.1. Limitations

The present study has several limitations. As the 28 countries included in our sample do not represent all the cultural value orientation patterns, the results may be somewhat limited. As mentioned, our participants were also mainly young adults, which limited our ability to capture thoroughly the variance due to age. Our study is also limited in that it only offered a cross-sectional look at the relationship between value orientations and loneliness, precluding any causal interpretations, which would require longitudinal data. Next, we measured only the general sense of loneliness, not tapping into more differentiated aspects of being lonely. For example, Lykes and Kemmelmeier (2014) reported that for those in collectivist societies, loneliness is more from a lack of contact with family members, but for individualistic cultures, people report greater loneliness when separated by friends. Further, in terms of measurement, although we were able to assess the same constructs in different countries, the invariance analysis suggest that the same indicators (items) are not recognized as equally important aspect of individualism/collectivism in different countries. These findings highlight the need to develop more refined and contextualized measures of individual/collectivism. Finally, our measures of individualism/collectivism reflect the individual value orientations and not the value orientations of the societies, with which the individual orientations can interact (Gebauer et al., 2014).

Despite these limitations, our study provides a unique contribution to the study of value orientations and loneliness based on insights provided by our large and both demographically and culturally diverse sample. Our main finding suggests that loneliness is better predicted by the horizontal/vertical dimension than by the more commonly studied individualism/collectivism dimension of value orientations. Further studies

are needed to validate our findings and further investigate the roles of social level inequalities and how the individual endorsement of inequalities correlate with the experience of loneliness. In a world of rising inequality, we hope to have given the initial impetus for pursuing this important line of study.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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