

# Is individualism suicidogenic? Findings from a multi-national study of young adults from 12 countries

Mehmet Eskin<sup>1</sup>, Ulrich S. Tran<sup>2, 3\*</sup>, Mauro Carta<sup>4</sup>, Senel Poyrazli<sup>5</sup>, Chris Flood<sup>6</sup>, Anwar Mechri<sup>7</sup>, Amira Shaheen<sup>8</sup>, Mohsen Janghorbani<sup>9</sup>, Yousef S. Khader<sup>10</sup>, Kouichi Yoshimasu<sup>11</sup>, Jian-Min Sun<sup>12</sup>, Omar Kujan<sup>13, 14</sup>, Jamila Abuidhail<sup>15</sup>, Khouala Aidoudi<sup>7</sup>, Seifollah Bakhshi<sup>9</sup>, Hacer Harlak<sup>16</sup>, Maria Moro<sup>4</sup>, Louise Phillips<sup>6</sup>, Motasem Hamdan<sup>17</sup>, Abdulwahab Abuderman<sup>18</sup>, Kanami Tsuno<sup>19</sup>, Martin Voracek<sup>20, 3</sup>

<sup>1</sup>Koç University, Turkey, <sup>2</sup>School of Psychology, University of Vienna, Austria, <sup>3</sup>Wiener Werkstaette for Suicide Research, Austria, <sup>4</sup>University of Cagliari, Italy, <sup>5</sup>Penn State Harrisburg, United States, <sup>6</sup>University of London, United Kingdom, <sup>7</sup>University of Monastir, Tunisia, <sup>8</sup>An-Najah National University, Palestine, <sup>9</sup>Isfahan University of Medical Sciences, Iran, <sup>10</sup>Jordan University of Science and Technology, Jordan, <sup>11</sup>Wakayama Medical University, Japan, <sup>12</sup>The University of Auckland, New Zealand, <sup>13</sup>AlFarabi Colleges of Medicine, Dentistry, and Nursing, Saudi Arabia, <sup>14</sup>University of Western Australia, Australia, <sup>15</sup>Hashemite University, Jordan, <sup>16</sup>Adnan Menderes University, Turkey, <sup>17</sup>Al-Quds University, Palestine, <sup>18</sup>Prince Sattam Bin Abdulaziz University, Saudi Arabia, <sup>19</sup>Kanagawa University of Human Services, Japan, <sup>20</sup>University of Vienna, Austria

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ME designed the study, organized the database, contributed to the statistical analysis, and wrote the first draft of the manuscript. UST performed the statistical analysis and wrote sections of the manuscript. All authors contributed to manuscript revision, and read and approved the submitted version.

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### *Abstract*

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The associations of individualistic versus collectivistic value orientations with suicidal ideation and attempts, attitudes towards suicide and towards suicidal individuals, and psychological distress were investigated across 12 nations (N = 5572 university students). We expected differential associations of value orientations with suicidal behavior and moderating effects of the prevailing value orientations in the various countries. Findings showed that intermediate levels of individualism appeared protective against suicide attempts across all investigated nations, but that, otherwise, there seemingly are no universal associations of individualism and collectivism with suicidal behaviors. High collectivism was associated with less suicidal ideation only in individualistic countries. Low individualism appeared to be a risk factor for suicidal ideation specifically in Muslim collectivistic cultures, whereas high individualism in Asian collectivistic cultures. Collectivistic values are uniformly associated with less permissive attitudes to suicide, whereas individualistic values with a more stigmatized view of suicidal behavior. Both individualistic and collectivistic values were associated with socially accepting attitudes to a suicidal peer, helping a suicidal friend, and emotional involvement. The associations of individualistic and collectivistic values with disapproving attitudes to suicidal disclosure were complex. Beliefs in punishment after death for suicide, seeing suicide as mental illness, and emotional involvement with a suicidal friend were lower in high-suicide-rate countries. These evidence patterns are discussed in the light of related research evidence, along with directions for future research in this area.

### *Contribution to the field*

In this study, we tested whether individualistic and collectivistic values are related to self-reported suicidal behavior, attitudes and psychological distress in samples of young adults from 12 countries. According to the current findings, higher individualism appears to be protective against suicidal ideation and suicide attempts in Muslim collectivistic cultures but appears to be a risk factor for suicidal ideation among Asian collectivistic cultures. Higher collectivism appears to protect against suicidal ideation among individualistic cultures, but not among Asian and Muslim collectivistic cultures. It is possible that individualistic values have a personally liberating and protective effect in some Muslim countries, where social pressure to conform is high. In other countries, where there is a generally lower level of social cohesion and/or less pressure to conform, higher individualism might further drive people at risk into isolation. In this research we adopted the view that, in their modest dosages, individualistic and collectivistic values correspond to individuality and relatedness, which in turn correspond to the two universal social human needs. If gratified at an optimum level, both value orientations could benefit people in many ways. In contrast, overly individualistic or collectivistic values may shatter such possible benefits of these two fundamental value orientations.

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In review

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In review

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1 Mehmet Eskin<sup>1\*</sup>, Ulrich S. Tran<sup>2,3\*</sup>, Mauro Giovanni Carta<sup>4</sup>, Senel Poyrazli<sup>5</sup>, Chris Flood<sup>6</sup>,  
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4 Seifollah Bakhshi<sup>9</sup>, Hacer Harlak<sup>16</sup>, Maria Francesca Moro<sup>4</sup>, Louise Phillips<sup>6</sup>, Motasem  
5 Hamdan<sup>17</sup>, Abdulwahab Abuderman<sup>18</sup>, Kanami Tsuno<sup>19</sup>, Martin Voracek<sup>2,3</sup>

6 <sup>1</sup>Department of Psychology, College of Social Sciences and Humanities, Koç University, Istanbul,  
7 Turkey

8 <sup>2</sup>Department of Basic Psychological Research and Research Methods, School of Psychology,  
9 University of Vienna, Vienna, Austria

10 <sup>3</sup>Wiener Werkstaette for Suicide Research, Vienna, Austria

11 <sup>4</sup>Department of Public Health, Clinical and Molecular Medicine, University of Cagliari, Italy

12 <sup>5</sup>School of Behavioral Sciences and Education, Pennsylvania State University-Harrisburg,  
13 Middletown, Pennsylvania, USA

14 <sup>6</sup>School of Health Sciences, City, University of London, London, UK

15 <sup>7</sup>Department of Psychiatry, University Hospital of Monastir, Monastir, Tunisia

16 <sup>8</sup>Faculty of Medicine and Health Sciences, An-Najah National University, Nablus, West Bank,  
17 Palestine

18 <sup>9</sup>School of Public Health, Isfahan University of Medical Sciences, Isfahan, Iran

19 <sup>10</sup>Department of Community Medicine, Public Health and Family Medicine, Faculty of Medicine,  
20 Jordan University of Science & Technology, Irbid, Jordan

21 <sup>11</sup>Department of Hygiene, School of Medicine, Wakayama Medical University, Wakayama, Japan

22 <sup>12</sup>Department of Management and International Business, Faculty of Business and Economics,  
23 University of Auckland, Auckland, New Zealand

24 <sup>13</sup>Department of Oral and Maxillofacial Sciences, Al-Farabi College for Dentistry and Nursing,  
25 Riyadh, Saudi Arabia

26 <sup>14</sup>School of Dentistry/Oral Health Center of Western Australia, University of Western Australia, Perth,  
27 Australia

28 <sup>15</sup>Faculty of Nursing, The Hashemite University, Zarqa, Jordan

29 <sup>16</sup>Department of Psychology, Faculty of Arts and Sciences, Adnan Menderes University, Aydin,  
30 Turkey

31 <sup>17</sup>School of Public Health, Al-Quds University, Jerusalem, Palestine

32 <sup>18</sup>College of Medicine, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia

33 <sup>19</sup>School of Health Innovation, Kanagawa University of Human Services, Yokosuka, Japan

34 \* **Correspondence:**

35 Mehmet Eskin, Ulrich S. Tran

36 meskin@ku.edu.tr or meskin48@gmail.com, ulrich.tran@univie.ac.at

37 **Keywords: suicidal behavior, attitudes, psychological distress, individualism, collectivism,**  
38 **multi-nation study**

39 **Abstract**

40 The associations of individualistic versus collectivistic value orientations with suicidal ideation and  
41 attempts, attitudes towards suicide and towards suicidal individuals, and psychological distress were  
42 investigated across 12 nations ( $N = 5572$  university students). We expected differential associations  
43 of value orientations with suicidal behavior and moderating effects of the prevailing value  
44 orientations in the various countries. Findings showed that intermediate levels of individualism  
45 appeared protective against suicide attempts across all investigated nations, but that, otherwise, there  
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49 cultures, whereas high individualism in Asian collectivistic cultures. Collectivistic values are  
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51 more stigmatized view of suicidal behavior. Both individualistic and collectivistic values were  
52 associated with socially accepting attitudes to a suicidal peer, helping a suicidal friend, and emotional  
53 involvement. The associations of individualistic and collectivistic values with disapproving attitudes  
54 to suicidal disclosure were complex. Beliefs in punishment after death for suicide, seeing suicide as  
55 mental illness, and emotional involvement with a suicidal friend were lower in high-suicide-rate  
56 countries. These evidence patterns are discussed in the light of related research evidence, along with  
57 directions for future research in this area.

58 **1 Introduction**

59 Suicidal behavior shows both interpersonal and intersocietal variations (Bertolote et al., 2005;  
60 Värnik, 2012). The cultural contents such as values, codes, and attitudes with regards to suicide  
61 oftentimes are seen as contributing to such variations. For instance, research suggests that cultural  
62 approval of or permissive cultural attitudes towards suicide are associated with increased propensity  
63 toward suicide (Jeon et al., 2013; Lenzi et al., 2012; Stack and Kposowa 2008). Culture is a self-  
64 evident and ubiquitous, yet elusive, concept. To achieve scientific precision and progress, there is a  
65 need to unpack the contents and components of this all-inclusive concept. What exactly is meant and  
66 implied by culture? Are the contents, or ingredients of culture associated with an increased or  
67 decreased propensity for suicidal behavior and psychological distress?

68 Cultural or cross-cultural psychology has identified individualism-collectivism as a meaningful  
69 dimension, along which cultures and/or cultural groups can be compared and contrasted (Hofstede et  
70 al., 2010; Kagitcibasi and Berry, 1989). Qualities such as personal autonomy, self-reliance,  
71 uniqueness, and independence are valued in individualistic cultures but person-other relatedness or  
72 interdependence, and the person as being a part of a collective are the qualities that are valued in  
73 collectivistic cultures (Triandis, 1995). Individualistic and collectivistic values (Oyserman, 1993),  
74 influence psychological variables, such as self-concept, motivation, affect, cognition, cognitive  
75 processing style, attribution, emotion regulation, and social support provisions (Cross et al., 2011;  
76 Kitayama and Uskul, 2011; Kühnen and Oyserman, 2002; Matsumoto et al., 2008; Oyserman et al.,  
77 2002; Oyserman and Lee, 2008).

78 The debate on the influence of individualism and collectivism on suicidal behavior is not new in  
79 suicidology. For instance, Durkheim (1897) saw the causes of suicidal behavior in the relationship  
80 between the person and the collective. Hence, individualism and collectivism are about the  
81 relationship between the individual and the collective. Values such as self-reliance, personal  
82 uniqueness, independence, and those setting priority on personal goals are regarded central in  
83 individualistic cultures, but interdependence, relatedness, and values setting priority on group goals  
84 (Triandis, 1995) are seen central in collectivistic cultures. Although the cultural dimension of  
85 individualism-collectivism provides an important source of information about intersocietal and  
86 interindividual differences, it nevertheless has not yet been fully integrated into suicide research.

87 As societies differ on individualism-collectivism dimension, they also differ on the prevalence of  
88 suicidal behaviors. For instance, Hansen and Pritchard (2008) showed that suicide rates in 22  
89 developed countries presented consistent patterns over time. Like most human behavior, culture  
90 exerts an influence on suicide (Kral, 1998; Maharajh and Abdool, 2005). For a better understanding  
91 of suicidal phenomena, some suicidologists therefore have called for an inclusion of culture in  
92 suicide research (Chu et al., 2010; Hjelmeland, 2010). Such an inclusion of culture in suicide  
93 research raises three questions. The first one is: What do we mean by culture, and how do we  
94 conceptualize it, in order to include it in suicide research? This relates to the issue of precision. The  
95 second question is: How does culture affect suicide? This relates to the issue of mechanisms or  
96 processes. The third one is: Do we conceptualize culture at the group level or individual level? This  
97 relates to the level of measurement.

98 Eskin (2013) has argued that individualistic and collectivistic values might influence the onset,  
99 maintenance, and aggravation of suicidal feelings in two important ways. In the first, during times of  
100 crises persons with individualistic values may take responsibility for what happened and thus may  
101 blame themselves. This may further aggravate the predominant feelings in a suicidal process such as  
102 anger, unhappiness, and hopelessness. On the other hand, in a similar situation, individuals with  
103 collectivistic values may attribute responsibility to others or to situations, which in turn may diminish  
104 the impact of these feelings.

105 Second, individualism and collectivism may exert influences on attitudes to suicide and attitudes to  
106 suicidal persons. The defining features of individualism include independence, freedom, choice,  
107 personal responsibility, and competition (Bryerton, 2016; Waterman, 1981). The act of suicide  
108 frequently is depicted as involving personal freedom and choice (Wexler and Gone, 2012;  
109 Wiesenhutter, 1971). In line with this, suicidal individuals usually do not seek help (Bruffaerts et al.,  
110 2011; Husky et al., 2009). Scientific studies indicate that perceived stigma, embarrassment, and a  
111 preference for self-reliance are the most common barriers to help-seeking (Clement et al., 2015;  
112 Curtis, 2010; Gulliver et al., 2010). Within a psychological value matrix like this one, it is reasonable

113 to assume that people with an individualistic worldview will see suicide as an act that is compatible  
114 with a worldview that stresses personal freedom and choice. Subsequently, they might show higher  
115 acceptance levels of suicide than those with a collectivistic worldview. Persons with an  
116 individualistic value orientation have a context-independent information processing style (Kühnen  
117 and Oyserman, 2002), and hence they may see the causes for a suicidal act as situated within the  
118 person and hence blame the person for what happened. On the contrary, persons with a collectivistic  
119 value orientation have a context-dependent information processing style (Kühnen and Oyserman,  
120 2002), with a collectivistic mind set they may see the agent of a suicidal act as a victim and blame the  
121 situation or others for what happened. Extant evidence from cross-national comparative research  
122 suggests that suicide attempters who live in individualistic cultures may not receive the help they  
123 need. In contrast, suicide attempters who live in collectivistic cultures may receive the help they need  
124 (Eskin, 1995; Eskin et al., 2011, 2014). However, opposing findings have also been reported in a  
125 comparative investigation of Australia, India, and Italy (Colucci, 2012).

126 The interaction between culture and person variables is seen as a determinant of suicidal behavior.  
127 Individualistic and collectivistic values relate to the relationship between the person and the  
128 collective. Being situated at a certain point on this dimension may involve advantages or  
129 disadvantages for both the collective and the person. Researchers seem to hold conflicting views  
130 about the benefits and harms of being situated on a certain point on the individualism-collectivism  
131 dimension with regards to mental health and well-being. For instance, Eckersley (2006) opines that  
132 materialism and individualism are health hazards for population health. On the other hand, for  
133 Veenhoven (1999) individualism fits human nature better than collectivism. If indeed this is the case,  
134 then individualism should promote better social and personal mental well-being. It is informative to  
135 review what empirical evidence is available on this point.

136 Research suggests that, for both societies and individuals, having individualistic values is associated  
137 with increased rates of completed suicide and suicidal behavior. Ecologic (group-level, or  
138 geographic) studies yield positive associations between individualism and suicide (Eckersley and  
139 Dear, 2002; Lenzi et al., 2012; Lester, 2003; Rudmin et al., 2003). Evidence from individual-level  
140 investigations research confirms these group-level effects. For example, Leeuwen et al. (2010) found  
141 individualistic values to be risk factor for suicidal ideation among immigrant adolescents in France.  
142 In a study of Australian university students Scott, Ciarrochi, and Deane (2004) found students with  
143 strong individualistic values (idiocentrism) to be less satisfied with, and less inclined to seek social  
144 support, and presenting higher levels of hopelessness and suicide ideation. In Turkish adolescents  
145 and young adults, Eskin (2013) showed suicidal thoughts and attempts to be more common among  
146 participants with individualistic than among those with collectivistic tendencies. The same study  
147 further showed that, although participants with individualistic tendencies held more permissive  
148 attitudes to suicide, they were less accepting of a suicidal close friend than those with collectivistic  
149 tendencies. In yet another study with Chinese participants Du et al. (2014) similarly showed  
150 individualistic orientation to be associated with increased hopelessness and substance use, along with  
151 reverse associations for collectivistic orientation.

152 Other lines of research, however, are suggestive for beneficial effects of individualism on  
153 psychological well-being. In these investigations, it is assumed that individualism exerts a positive  
154 effect on mental well-being via its potentials for creating a context for freedom and choice. Some  
155 aggregate-level data suggest positive associations of individualistic values with happiness and  
156 psychological well-being (Ahuvia, 2002; Fischer and Boer, 2011; Veenhoven, 1999). However, one  
157 should be aware of the fact that these findings mostly stem from ecologic studies. From a



158 methodological point of view, ecologic research designs are prone to confounders (cross-level bias)  
159 and need to be confirmed by individual-level evidence.

160 Yet another line of inquiry has argued that what matters for a better mental health is the person-  
161 environment fit (Triandis, 2000). This line of reasoning assumes that persons at the extreme ends of  
162 the individualism-collectivism dimension, which, when incompatible with the societal values, have  
163 disadvantages for personal adaptation. The data seem to support this view. For instance, evidence  
164 (Caldwell-Harris and Ayçiçeği, 2006) from Turkish and US students residing in the respective  
165 countries showed that having a value orientation inconsistent with societal values was associated  
166 with poor mental health. An investigation of Japanese and US students residing in the respective  
167 countries (Ogihara and Uchida, 2014) yielded evidence that individualistic values were negatively  
168 correlated with the number of close friends and with subjective well-being among Japanese students,  
169 but not among US students.

170 There are some clear gender differences in suicidal behavior. In general, women contemplate and  
171 attempt suicide more often than men, but more men than women kill themselves (Rhodes et al.,  
172 2014). **This is known** as "gender paradox" in suicidal behavior (Canetto and Lester, 1998; Schrijvers  
173 et al., 2012) **and** relates to the gender culture. The paradox has usually been explained through  
174 reference to the choice of method for and intent involved in suicidal behavior. The scientific  
175 investigations provide support for the view that men make use of more lethal methods for their  
176 suicidal behavior than women (Callanan and Davis, 2012) but women and men are found to be  
177 similar in their intent lethality (Denning et al., 2000). The choice of more lethal methods for suicidal  
178 behavior by men is in line with the cultural gender stereotypes (Payne et al., 2008).

179 **There is considerable scholarly debate on the conceptualization and measurement of individualism**  
180 **and collectivism constructs (Wong, Wang, & Klann, 2018). Although most researchers view**  
181 **individualism and collectivism as opposites of a dimension, others see it as two separate orthogonal**  
182 **constructs (Freeman, & Bordia, 2001; Kagitcibasi, & Berry, 1989). Utilizing confirmatory factor**  
183 **analysis, Li and Aksoy (2007) showed that individualism and collectivism represent two different**  
184 **constructs. Although we have introduced individualism and collectivism as one dimension for ease of**  
185 **comprehension, we use them as two orthogonal constructs in analysis in this multinational study.**  
186 **This approach may better enable us to see the individual effects of the two value orientations on**  
187 **suicidal behavior, suicidal attitudes, and psychological distress.**

188 To sum up, the research literature suggests that individualistic and collectivistic values may have  
189 advantages and disadvantages for psychological well-being. Empirical evidence for possible relations  
190 of individualism-collectivism to suicidal behavior and psychological well-being seems inconsistent.  
191 Further, evidence suggests that individualism indeed is associated with suicidal phenomena, but the  
192 studies underlying this conclusion are of weak design, either being ecologic or single-nation studies.  
193 Hence, it is unwarranted to assume cross-cultural generality from these. Considering the inconclusive  
194 nature of research findings in this field, we designed the present study to explore the associations of  
195 individualistic-collectivistic value orientations with suicidal behavior, attitudes, and psychological  
196 distress in university students from 12 countries. From a methodological perspective, cross-national  
197 comparative studies require comparable samples. We assume that university students are similar in  
198 important aspects, such as their age, educational level, or cognitive abilities, and, to some extent,  
199 media exposure. **Besides, collecting data with university students is a convenient way of getting**  
200 **sufficient data.** Therefore, we have chosen to test our hypotheses in university students. Specifically,  
201 we tested the following five hypotheses:

- 202 1. Individualistic values are associated with more suicidal behavior and psychological distress,  
203 whereas collectivistic values with less suicidal behavior and psychological distress.
- 204 2. The prevailing culture (individualistic vs. collectivistic) in the investigated countries  
205 moderates the associations of individualistic and collectivistic values with suicidal behavior  
206 and psychological distress.
- 207 3. Individualistic values are associated with more permissive attitudes to suicide, whereas  
208 collectivistic values with less permissive attitudes to suicide.
- 209 4. Collectivistic values are associated with more socially accepting and helping attitudes to  
210 suicidal persons, whereas individualistic values with less socially accepting and helping  
211 attitudes to suicidal persons.
- 212 5. Across the investigated countries, the prevalence of completed suicide (i.e., national suicide  
213 rates) moderates attitudes towards suicide and towards suicidal persons.  
214

## 215 2 Materials and Methods

### 216 2.1 Participants

217 A total of 5572 (55.3% women) university students (age  $M = 22.1$ ,  $SD = 3.5$  years) from 12 countries  
218 volunteered to participate in the study. Samples originated from countries belonging to four culture  
219 zones (Inglehart and Welzel, 2010): (1) the Confucian (China  $n = 627$ ; Japan  $n = 246$ ), (2) the Islamic  
220 (Iran  $n = 1000$ ; Jordan  $n = 436$ ; Palestine (West Bank)  $n = 358$ ; Saudi Arabia  $n = 413$ ; Turkey  $n =$   
221  $497$ ; Tunisia  $n = 484$ ), (3) the English-speaking (UK  $n = 150$ ; USA  $n = 239$ ) and (4) the Catholic  
222 zone (Austria  $n = 627$ ; Italy  $n = 471$ ). Across countries, participants were recruited from one public  
223 university, with the exception of Jordan and Palestine (with recruitment at two public universities).

224 Across countries, the distributions of participants' gender ( $\chi^2 = 294.56$ ,  $df = 11$ ,  $p < .001$ ) and age  
225 ( $F(11, 5407) = 105.61$ ,  $p < .001$ ) differed significantly (see Table 1). Overall, samples were slightly  
226 skewed towards female participants (55.3% women). The Japanese and Saudi Arabian samples  
227 showed a surplus of men. The youngest sample was from the USA, and the oldest one from the UK.  
228 There were significant sample differences regarding participants' stated sibship size, with the  
229 samples from Jordan and Palestine reporting the highest, and the sample from China reporting the  
230 lowest number of siblings. Further details of the sociodemographic characteristics of the participants  
231 and study procedural details, see Eskin et al. (2016a).

### 232 2.2 Materials

233 All data were collected through self-administered questionnaire forms, which included items about  
234 nonfatal suicidal behavior, religious affiliation and strength of religious belief, attitudes towards  
235 suicide and towards suicidal individuals, and individualistic-collectivistic value orientations,  
236 alongside a measure of psychological distress. The prevalence of nonfatal suicidal behavior and  
237 psychological distress, attitudes towards suicide and suicidal persons, and the associations of religion  
238 with suicidal behavior and attitudes and psychological distress have been reported elsewhere (Eskin  
239 et al., 2016a, 2016b, 2019). The focus of the present account is the associations of individualistic-  
240 collectivistic value orientations with suicidal behavior, suicidal attitudes, and psychological distress.

### 241 2.2.1 Demographics

242 Participants reported their gender, age, and number of siblings.

### 243 2.2.2 Individualism-Collectivism

244 Based on their face and content validity, five items each were selected (Eskin, 2013) from the  
 245 Turkish version (Wasti and Erdil, 2007) of the INDCOL scale (Individualism and Collectivism scale;  
 246 Singelis et al., 1995) for the assessment of individualism and collectivism. The five items tapping  
 247 individualism were: 1. I rely on myself most of the time; I rarely rely on others; 2. I would rather  
 248 depend on myself than others; 3. Competition is the law of nature; 4. Winning is everything; 5. Being  
 249 a unique individual is important to me. The five items tapping collectivism were: 1. I like sharing  
 250 little things with others; 2. It is important to me that I respect the decisions made by my others; 3. My  
 251 happiness depends very much on the happiness of those around me; 4. I would feel proud, if another  
 252 person gets recognition; 5. Group members should stick together, no matter what sacrifices are  
 253 required. Whereas this shortened INDCOL scale was administered in the respective national  
 254 language version in Austria, China, Iran, Italy, Japan, Turkey, the UK, and the United States, the  
 255 English version was used in Jordan, Palestine, Saudi Arabia, and Tunisia. Participants responded to  
 256 the INDCOL items on 5-point Likert-type scales, ranging from 1 = “completely disagree” to 5 =  
 257 “completely agree”. The internal consistency (Cronbach  $\alpha$ ) for the individualism scale was .61 and  
 258 .62 for the collectivism scale. For analysis, factor scores were used (see Statistical Analysis  
 259 subsection).

### 260 2.2.3 Suicidal Behavior

261 Five questions queried past and current suicidal behavior, with response alternatives Yes = 1 vs. No =  
 262 0. These questions were: 1. Have you ever thought of killing yourself? 2. Have you, during the past  
 263 12-months, thought of killing yourself? 3. Do you have thoughts of killing yourself right now? 4.  
 264 Have you ever made an attempt to kill yourself? 5. Have you, during the past 12-months, made an  
 265 attempt to kill yourself?

266 The scores of participants who responded affirmatively to at least one (or more) of the first three  
 267 questions were dichotomized into the categories having suicidal ideation (vs. not), and the scores of  
 268 participants who responded affirmatively to one (or both) of the questions 4 and 5 were dichotomized  
 269 into the categories having attempted suicide (vs. not).

### 270 2.2.4 Psychological Distress

271 The 12-item General Health Questionnaire (GHQ-12; Goldberg and Williams, 1988) was  
 272 administered to assess psychological distress. Reliability and validity of the GHQ-12 have been  
 273 established (Goldberg et al., 1997). The standard scoring method (of 0-0-1-1) was applied, i.e., a  
 274 score of 0 is assigned to the first two low-stress response alternatives, and a score of 1 is given to the  
 275 two high-stress response alternatives. This method yields individual scores ranging from 0 to 12. The  
 276 Cronbach’s  $\alpha$  for the GHQ-12 was .87, with item-total correlations ranging from .45 to .62. Previous  
 277 research (Goldberg et al., 1997) has evidenced a variety of cut-off points for the GHQ-12, ranging  
 278 from a low of 2 to a high of 4, across 15 centers. We thus applied three cut-off points (GHQ-12  $\geq$  3,  
 279 4, or 5). The GHQ-12 was not administered in the UK.

### 280 2.2.5 Attitudes towards Suicide

281 Eskin’s 24-item Attitudes Towards Suicide Scale (E-ATSS; Eskin, 2004, 2013; Eskin et al., 2016b),  
 282 with 5-point Likert-type response options, ranging from 1 = “completely disagree” to 5 =

283 “completely agree” was used to measure participants’ attitudes towards suicide. Principal component  
284 analysis with varimax rotation extracted six factors: 1. Acceptability of suicide (8 items,  $\alpha = .91$ ); 2.  
285 Punishment after death (5 items,  $\alpha = .93$ ); 3. Suicide as a sign of mental illness (3 items,  $\alpha = .94$ ); 4.  
286 Communicating psychological problems (4 items,  $\alpha = .79$ ); 5. Hiding suicidal behavior (2 items,  $\alpha =$   
287  $.83$ ); and 6. Open reporting and discussion of suicide (2 items,  $\alpha = .62$ ) that accounted for 73.1% of  
288 the total variance. Scale scores were computed by summing up the items of a factor, divided by the  
289 number of items. Thus, scale scores ranged from 1 to 5, with higher scores indicating higher levels of  
290 factor content.

### 291 **2.2.6 Attitudes towards Suicidal Persons**

292 Eskin’s Social Reactions to Suicidal Persons Scale (E-SRSPS) was used to measure social reactions  
293 to a suicidal peer. The introductory part of this instrument comprises a short description of “an  
294 imagined suicidal close friend” who decides to kill him/herself and shares this information with the  
295 respondent. By means of 20 possible reactions to this friend, participants were asked how they would  
296 react or feel on 5-point Likert-type scales ranging from 1 = “completely disagree” to 5 = “completely  
297 agree” (Eskin, 2004, 2013; Eskin et al., 2016b). A principal component analysis with varimax  
298 rotation extracted four factors: 1. Social acceptance (6 items,  $\alpha = .90$ ); 2. Helping a suicidal friend (6  
299 items,  $\alpha = .83$ ); 3. Disapproval of suicidal disclosure (5 items,  $\alpha = .77$ ); and 4. Emotional  
300 involvement (3 items,  $\alpha = .63$ ) that accounted for 60.7% of the total variance. Scale scores were  
301 computed by summing up the items under a factor, divided by the number of items. Thus, scale  
302 scores ranged from 1 to 5, with higher scores indicating higher levels of factor content.

## 303 **2.3 Procedure**

304 The principal investigator (author M. Eskin) selected the questionnaire ensemble and invited  
305 researchers via e-mail to join the study. All participating researchers were university-based,  
306 collecting their dataset at their academic institution. For the Jordan and Palestine study sites, data  
307 were additionally collected at a second university. On the first page of the questionnaire packet,  
308 participants were told that the study was anonymous from the outset and participation entirely  
309 voluntary. Contact information of the respective study-site investigator was provided on the first  
310 survey page, so that participants could get in touch, for asking any study-related questions.

311 All researchers were requested to undertake data collection only after receipt of approval from  
312 relevant institutional review boards. Except for Austria, where such an approval formally was not  
313 necessary, according to the relevant national legal requirements and regulations, approval was  
314 obtained at all study sites. In the UK, data collection was stopped by the ethics committee due to one  
315 member’s concerns over possible distress effects of the suicide-related questions. Only the Jordanian  
316 researchers reported legal sanctions against suicidal behavior. According to the Jordanian Penal  
317 Code, “the person who attempts suicide will be punished by imprisonment from three months to two  
318 years”.

## 319 **2.4 Data-analytic Strategy**

### 320 **2.4.1 Cross-National Measurement Equivalence**

321 In order to ensure that measured scores were comparable between countries and to obtain scores on a  
322 common scale for all countries, the INDCOL, E-ATSS, and E-SRSPS items were subjected to tests  
323 of cross-national measurement equivalence, utilizing methods of multi-group confirmatory factor  
324 analysis. To make these analyses computationally feasible, data from the UK (for which only a  
325 relatively small sample was available) and the USA were merged. Also, for some of the E-ATSS and

326 E-SRSPS subscale analyses, data from China and Japan had to be merged. Mplus 8.2 was used for  
 327 tests of measurement equivalence, treating the items as ordered categorical variables by utilizing the  
 328 WLSMV estimator. This is, in this factor analytic context, comparable to fitting Samejima's (1969)  
 329 graded response model to the data, wherein each item is described by a single discrimination  
 330 parameter (item loading) and  $m - 1$  difficulty parameters for its  $m$  response options (item thresholds)  
 331 (see also Kim and Yoon, 2011).

332 Separately for all scales and subscales, we tested the data for cross-national configural invariance  
 333 (i.e., whether all respective scale or subscale items loaded onto a single latent factor across all  
 334 countries) and full measurement invariance (i.e., whether all loadings and thresholds of items within  
 335 a scale or subscale were the same across all countries). Equivalence of item parameters across  
 336 countries was then relaxed in an iterative procedure, where necessary, to arrive at a final model of  
 337 partial measurement invariance that showed an acceptable data fit. Partial measurement invariance  
 338 indicates that the parameters of some, but not all, items were equal across groups. Partial  
 339 measurement invariance may still allow for meaningful comparisons between groups (see Sass,  
 340 2011); however, comparisons need to be made with caution. Item parameters were freed for single  
 341 countries or set to equivalent values for groups of countries. In this procedure, item loadings and  
 342 thresholds were freed in tandem, because both types of item parameters conjointly define the  
 343 regression curve of the item on the latent trait. For the final models, factor scores were then extracted  
 344 and used in subsequent analysis. All E-ATSS and E-SRSPS subscales were found to be fully  
 345 invariant, except the E-SRSPS subscales Helping a suicidal friend, for which partial invariance was  
 346 observed, and Disapproval of suicidal disclosure, for which one item was removed to first achieve  
 347 configural invariance (see Results). As the results of the multilevel analyses did not critically depend  
 348 on the use of factor scores for the fully invariant scales, results based on scale scores are presented  
 349 for simplicity. For the partially invariant E-SRSPS subscale, factor and scale scores correlated with  $r$   
 350 = .93 ( $p < .001$ ) and the results of the multilevel analyses did not critically depend on the use of  
 351 factor scores. Hence, also in this case results based on scale scores are presented for simplicity.

352 Model fit was assessed with the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the  
 353 standardized root mean square residual (SRMR), utilizing the benchmarks of Hu and Bentler (1999)  
 354 (CFI/TLI: good fit:  $\geq .95$ , acceptable fit:  $\geq .90$ ) and Schermelleh-Engel, Moosbrugger, and Müller  
 355 (2003) (SRMR: good fit:  $< .05$ , acceptable fit:  $< .10$ ). Values of the root mean square error of  
 356 approximation (RMSEA) were not used, as the models were fitted on a large number of groups ( $>$   
 357 10) with only a few indicators (e.g., five items each for individualism and collectivism). In the multi-  
 358 group context, RMSEA values are estimated from the square root of the weighted average of the  
 359 sample-based discrepancies, divided by the average degrees of freedom ( $df$ ) per sample (Steiger,  
 360 1998), not the overall  $df$ . This resulted in the present study in small average  $dfs$  ( $\sim 5$ ), especially in  
 361 the configural invariance analyses. Yet, in models with small  $df$ , RMSEA values are inflated,  
 362 rendering them uninformative for the evaluation of model fit (Kenny et al., 2014). Similarly, we  
 363 report chi-square values of model fit, but do not interpret them with regards to significance as chi-  
 364 square values are inflated in large samples (see Schermelleh-Engel et al., 2003).

365 CFI and TLI compare the fit of the investigated model against a null model, which assumes no latent  
 366 variables and uses the identity matrix as variance-covariance matrix. The CFI compares the chi-  
 367 square to  $df$  differences between the null and the investigated model, whereas the TLI the respective  
 368 chi-square to  $df$  ratios. Under maximum likelihood (ML) estimation, this entails smaller TLI than CFI  
 369 values (which is consistent with the interpretation that the TLI more strongly penalizes model  
 370 complexity than the CFI). However, under WLSMV, the  $df$  are estimated from the data and are not  
 371 determined by the difference in the number of observed to estimated parameters (e.g., Muthén et al.,

1997). Compared to the null model, this led in many of the multi-group analyses of the present study to especially small  $df$  in less restrictive models (e.g., configural invariance models, which estimate large numbers of parameters), and especially large  $df$  in more restrictive models (e.g., full invariance models, which estimate only relatively few parameters). This either (less restrictive models) excessively disadvantaged TLI to CFI values, or (more restrictive models) also CFI to TLI values (a case that cannot similarly arise under ML).

Against this background, model fit was considered acceptable, if at least one of the two goodness-of-fit indices (CFI, TLI) and the SRMR (an absolute badness-of-fit index, which assesses the standardized difference between the observed and predicted correlations) indicated acceptable model fit.

#### 2.4.2 Associations with Suicidal Ideation, Suicide Attempts, and Psychological Distress

In order to account for the clustered nature of the data, multilevel (more precisely, two-level) regression models were then applied to investigate the associations of individualism and collectivism factor scores with suicidal ideation, suicide attempts, and psychological distress (as the level-1 predictors), using country as a cluster variable (i.e., level-2 predictors). This utilization of multilevel models allowed the modeling and testing of regression slopes on the mean level (i.e., averaged across all countries) for statistical significance, and further to investigate the variability of individual regression slopes (and intercepts) across countries. These models were further utilized to examine possible effects (i.e., cross-level interactions) of level-2 predictors (the country level) on the regression slopes and intercepts of the level-1 predictors (the individual level).

Mplus 8.2 was again used for analysis, using numerical integration and robust methods (MLR) for the estimation of standard errors. All models included individualism and collectivism factor scores as level-1 predictors (controlling also for participant sex and age, see below), testing their **linear, but in a second step also their quadratic**, associations with the various outcomes separately for each outcome. **By including quadratic terms, we controlled and tested for the possible non-linearity of the associations of individualism and collectivism with the outcome variables.** Outcomes were modeled as binary variables. Hence, the fitted models were multilevel logistic regression models. For these models, we report unstandardized slope coefficients (on the logit scale). These appear to fit better the present context of multilevel modeling, which directly deals with the variation of slopes and intercepts on this scale. Odds ratios may be obtained from the reported slope parameters by exponentiation.

Model building proceeded in three steps: in the first step, intercepts and slopes on level 1 were modeled as random effects (i.e., they were allowed to vary between countries), estimating the covariance between intercepts and slopes freely from the data. If the variability of an individual slope parameter was not significant ( $p > .05$ ; instead of the Wald test the more powerful likelihood ratio test, comparing models with and without this variance parameter and the covariance, was used here; see Snijders and Bosker, 2012, pp. 98-99), the respective slope parameters were in a second step modeled as fixed effects, in order to arrive at more parsimonious final models. Analyses controlled for participant sex and age by including them as further level-1 predictors in the models. We report on the effects of sex and age in detail, where their effects appeared to be significant ( $p < .05$ ; based on the Wald test). **For the effect tests of individualism and collectivism, sequential Bonferroni corrections were applied (using an overall  $\alpha$  of 5%) to control for the accumulation of type I errors.** The results of these analyses were used to test Hypothesis 1.

415 In a third step, potential cross-level interactions of culture (level 2) with random slopes (level 1),  
416 were investigated for the above models. Countries included in the study were classified into  
417 individualistic and collectivistic categories on the basis of their aggregated country individualism  
418 scores (Hofstede et al., 2010). Accordingly, Austria, Italy, the UK and the USA were grouped as  
419 individualistic countries. Asian and Middle Eastern collectivisms may involve different cultural  
420 patterns. Therefore, two groups of collectivistic cultures were created. China and Japan were grouped  
421 together and termed as Asian collectivistic cultures. Likewise, Jordan, Iran, Palestine, Saudi Arabia,  
422 Tunisia, and Turkey were grouped together and termed as Muslim collectivistic cultures. We created  
423 two level-2 dummy variables to indicate Asian and Muslim collectivistic cultures and used these as  
424 predictors of random slopes and random intercepts (which are of less interest here) on level 1. The  
425 results of these analyses were used to test Hypothesis 2.

### 426 **2.4.3 Associations with Attitudes and Reactions towards Suicide and Suicidality Factors**

427 Multilevel models were used in a similar fashion as in Steps 1 and 2 of the foregoing analyses to  
428 investigate the associations of individualism and collectivism factor scores with the E-ATSS and E-  
429 SRSPS subscale scores. Outcomes were modeled as continuous variables in these analyses. Hence,  
430 fitted models resembled ordinary multilevel linear regression analyses. The results of these analyses  
431 were used to test the Hypotheses 3 and 4.

432 To test Hypothesis 5, we examined the associations of the country-level mean E-ATSS and E-SRSPS  
433 subscale scores with national suicide rates. For this goal, national suicide rate was used as a level-2  
434 variable to predict random intercepts in these subscales in models without any focal level-1  
435 predictors, but controlling for participant sex and age. The respective national suicide rates were  
436 taken from the World Health Organization (2014). Palestine was excluded from this analysis, as no  
437 suicide rate was available for this unit of analysis.

438 Finally, similarly to the third step of analysis of the foregoing analyses, possible cross-level  
439 interactions of national suicide rate with random slopes (and intercepts) for the associations of  
440 individualism and collectivism with the E-ATSS and E-SRSPS subscale scores were investigated in  
441 an exploratory fashion.

## 442 **3 Results**

### 443 **3.1 Cross-National Measurement Equivalence**

444 All scales and subscales exhibited at least acceptable levels (with reference to either CFI and/or TLI  
445 and SRMR values) of configural invariance (see Supplementary Materials); i.e., every scale and  
446 subscale was essentially unidimensional in all investigated countries. Full measurement invariance  
447 could be assumed for the E-ATSS and E-SRSPS subscales (except Helping a suicidal friend) as well.  
448 The individualism and collectivism scales exhibited only partial measurement invariance. The final  
449 partial measurement invariance models for these two scales (and of Helping a suicidal friend) were  
450 obtained by relaxing the equivalence of item parameters between countries or groups of countries in a  
451 stepwise fashion until an acceptable fit was achieved.

452 Means and standard deviations of the individualism and collectivism factor scores of the partial  
453 measurement models in the investigated countries are displayed in Table 1 (standardized across all  
454 countries to yield a grand mean of 0 and a variance of 1; thereby, predictors were also grand-mean-  
455 centered for the subsequent multilevel regression analyses). As can be seen, Muslim countries like  
456 Palestine, Tunisia, and Turkey, but also the USA, had the highest scores in individualism; Italy,

457 Austria, and Japan had the lowest scores. For collectivism, Austria and Iran had the highest scores;  
 458 China, Jordan, and Saudi Arabia had the lowest scores. As only partial measurement invariance was  
 459 achieved, direct comparisons between countries need to be made with caution, however. Across  
 460 countries, individualism and collectivism were weakly interrelated ( $r = .13, p < .001$ ). Within-country  
 461 correlations were particularly high for Saudi Arabia ( $r = .78, p < .001$ ) and Palestine ( $r = .37, p <$   
 462  $.001$ ), but otherwise ranged from  $r = -.13$  (Italy) to  $r = .29$  (Jordan). Excluding Saudi Arabia from the  
 463 further analyses did not substantially alter their results. Hence, the data from Saudi Arabia were  
 464 included in all subsequent analyses.

### 465 3.2 Suicidal Ideation, Suicide Attempts, and Psychological Distress (Hypothesis 1)

466 Descriptive statistics on suicidal ideation, suicide attempts, and psychological distress in the  
 467 investigated countries are provided in Table 1. The results of the multilevel analyses are presented in  
 468 Table 2. Mostly, linear associations of individualism with suicidal ideation and suicide attempts were  
 469 not significant at the mean level (i.e., averaged across all countries); control variables participant sex  
 470 and age did not affect these outcomes, except that suicidal ideation in the last 12 months was more  
 471 likely reported by younger than older individuals ( $p = .048$ ). Higher individualism appeared to be  
 472 linearly associated only with less current suicidal ideation and a lower likelihood of a suicide attempt  
 473 in the last 12 months across all samples. However, there were also quadratic associations of  
 474 individualism with suicidal ideation and suicide attempts. Overall, both lower and higher than  
 475 average individualism scores were associated with a higher likelihood for life-time suicidal ideation,  
 476 suicidal ideation in the last 12 months, and any suicidal ideation. For suicide attempts in all  
 477 investigated periods, individuals low in individualism, compared to individuals with intermediate or  
 478 high scores, also had an overall higher likelihood for reporting an attempt.

479 In contrast, higher collectivism appeared to be linearly associated with less suicidal ideation in the  
 480 last 12 months, current suicidal ideation, and any suicidal ideation; and with a lower likelihood of a  
 481 life-time suicide attempt and any suicide attempt (either life-time or in the last 12 months). For life-  
 482 time suicide attempts there was also a quadratic association with collectivism, such that (in  
 483 combination with the linear effect) individuals low in collectivism, compared to individuals with  
 484 intermediate or high scores, had a higher likelihood to report an attempt. Slopes of the linear, but not  
 485 the quadratic terms, varied somewhat between countries for life-time suicidal ideation and suicidal  
 486 ideation in the last 12 months (see Section 3.3).

487 Controlling for multiple testing (using sequential Bonferroni correction) with regards to the 16 effect  
 488 tests for linear and quadratic associations of individualism and collectivism with suicidal ideation, the  
 489 quadratic association of individualism ( $p < .001$ ) and the linear association of collectivism ( $p = .003$ )  
 490 with suicidal ideation in the past 12 months remained significant (overall  $\alpha = 5\%$ ).

491 Similarly controlling for multiple testing with regards to the respective 12 effect test for suicide  
 492 attempts, all quadratic associations of individualism with life-time suicide attempts ( $p = .003$ ),  
 493 suicide attempts in the last 12 months ( $p < .001$ ), and any suicide attempts ( $p < .001$ ) retained their  
 494 significance (overall  $\alpha = 5\%$ ).

495 Individualism also exhibited a quadratic association with psychological distress (cut-offs 3 and 5),  
 496 such that individuals with either low or high scores had a higher likelihood of crossing the cut-off  
 497 than individuals with intermediate scores. Additionally, there was a negative linear association of  
 498 individualism with psychological distress (cut-off 5), indicating that individuals with high scores  
 499 were somewhat less likely to cross this cut-off than individuals with low scores. Overall, women  
 500 were more likely to report psychological distress for all cut-offs ( $ps \leq .041$ ) than men; also, for the



501 cut-off of 3, younger individuals more likely reported psychological distress than older ones ( $p =$   
 502 .016). Cross-country variability was apparent with regards to the linear associations of individualism  
 503 with psychological distress.

504 Controlling for multiple testing with regards to the 12 effect tests of individualism and collectivism  
 505 with psychological distress, all associations but the quadratic association of individualism with  
 506 psychological distress (cut-off 5) retained their significance (overall  $\alpha = 5\%$ ).

### 507 3.3 Cross-Level Interactions with Culture (Hypothesis 2)

#### 508 3.3.1 Suicidal Ideation and Suicide Attempts

509 The associations of predictors with outcomes on the level 1 varied between cultures. Among  
 510 individualistic cultures, collectivism on average was negatively linearly associated with life-time  
 511 suicidal ideation (Table 3). Thus, controlling for individualism, higher collectivism appeared to be  
 512 protective against suicidal ideation among individualistic cultures, whilst not among Asian and  
 513 Muslim collectivistic cultures.

514 Concerning the linear associations of individualism with suicidal ideation in the last 12 months, the  
 515 mean slopes among Muslim collectivistic cultures were significantly negative, whereas significantly  
 516 positive among Asian collectivistic cultures (Table 3). Combined with the overall quadratic effect of  
 517 individualism, this indicated that in Asian collectivistic cultures specifically individuals high in  
 518 individualism, compared to individuals with low or intermediate scores, had a higher likelihood to  
 519 report suicidal ideation in the last 12 months. In contrast, in Muslim collectivistic cultures,  
 520 specifically individuals low in individualism had a higher likelihood to report suicidal ideation in the  
 521 last 12 months than individuals with intermediate or high scores. Thus, specifically high  
 522 individualism appeared to be a risk factor for suicidal ideation in Asian collectivistic cultures,  
 523 whereas low individualism in Muslim collectivistic cultures.

#### 524 3.3.2 Psychological Distress

525 For a cut-off of 3, the slope of the linear association of individualism with psychological distress was  
 526 significantly positive for individualistic cultures and significantly negative for Muslim collectivistic  
 527 cultures. Combined with the overall quadratic effect of individualism, this indicated that the  
 528 likelihood of reporting psychological distress was elevated for individuals low in individualism  
 529 (compared to individuals with high or intermediate scores) in Muslim collectivistic cultures, but  
 530 elevated for individuals high in individualism in individualistic cultures. A similar trend was apparent  
 531 in Muslim collectivistic cultures for a cut-off of 5.

### 532 3.4 Attitudes and Reactions towards Suicide and Suicidality Factors (Hypotheses 3 and 4)

533 Descriptive statistics on attitudes and social reactions towards suicide and suicidality factors in the  
 534 investigated countries are provided in the Supplementary Materials.

535 In the following, we report only on associations of individualism and collectivism with attitudes  
 536 (Table 4) which were significant after controlling for multiple testing (as above; 24 tests, overall  $\alpha =$   
 537 5%). At the mean level (averaged across all countries), higher collectivism was linearly negatively  
 538 associated with acceptability of suicide and positive with punishment after death and communicating  
 539 psychological problems. Individualism was linearly positively associated with hiding suicidal  
 540 behavior and quadratically with suicide as a sign of mental illness, such that a positive association at  
 541 the low range of individualism scores levelled off for intermediate and high scores (i.e., there was no

542 further increase in the range of intermediate and high scores). Associations were mostly stronger with  
 543 collectivism than with individualism. Regarding the control variables, men overall had higher scores  
 544 than women with regards to acceptability of suicide ( $p < .001$ ) and hiding suicidal behavior ( $p =$   
 545  $.001$ ). Younger participants had higher scores in punishment after death than older participants ( $p <$   
 546  $.001$ ).

547 Concerning reactions to suicidality factors (Table 4; all associations remained significant after  
 548 controlling for multiple testing; 16 tests, overall  $\alpha = 5\%$ ), individualism was at the mean level  
 549 linearly positively associated with social acceptance, helping a suicidal friend, and emotional  
 550 involvement. Its association with disapproval of suicidal disclosure was overall nonlinear (combining  
 551 the linear and quadratic associations), such that a positive association at the low range of  
 552 individualism scores levelled off (i.e., there was no increase) for intermediate and high scores.  
 553 Collectivism was at the mean level linearly positively associated with social acceptance, helping a  
 554 suicidal friend, and emotional involvement. Its nonlinear association with disapproval of suicidal  
 555 disclosure was such that, controlling for individualism, disapproval decreased for both high and low  
 556 scores of collectivism. Regarding the control variables, women had overall higher scores than men in  
 557 social acceptance ( $p < .001$ ), helping a suicidal friend ( $p = .002$ ), and emotional involvement ( $p =$   
 558  $.003$ ). Younger participants had higher scores in disapproval of suicidal disclosure than older  
 559 participants ( $p = .002$ ).

### 560 3.5 Moderating Effects of National Suicide Rate (Hypothesis 5)

561 Suicide rates mostly did not moderate the mean E-ATSS and E-SRSPS subscale scores at the country  
 562 level ( $ps \geq .075$ ). However, moderating effects were observed for punishment after death (slope = -  
 563  $0.100$ ,  $SE = 0.029$ ,  $p < .001$ ), suicide as a sign of mental illness (slope =  $-0.051$ ,  $SE = 0.021$ ,  $p =$   
 564  $.013$ ), and emotional involvement (slope =  $-0.042$ ,  $SE = 0.008$ ,  $p < .001$ ). Mean scores in these scales  
 565 (controlling for participant sex and age) were lower in countries with higher national suicide rates.

### 566 3.6 Cross-Level Interactions with National Suicide Rate (Exploratory Analysis)

567 National suicide rates did not account for any variability in the linear slopes of individualism and  
 568 collectivism for most dependent variables ( $ps \geq .077$ ). However, suicide rates moderated the linear  
 569 association of individualism with disapproval of suicidal disclosure (slope =  $0.005$ ,  $SE = 0.002$ ,  $p =$   
 570  $.013$ ): linear slopes were stronger positive in countries with higher suicide rates (Figure 1A).  
 571 Combined with the overall quadratic association (see Section 3.4), this indicated that increases of  
 572 disapproval with individualism in the lower score range actually reverted for higher score ranges in  
 573 countries with lower suicide rates.

574 Also, suicide rates moderated the linear association of collectivism with communicating  
 575 psychological problems (slope =  $-0.010$ ,  $SE = 0.005$ ,  $p = .047$ ): linear slopes were stronger positive in  
 576 countries with lower suicide rates (Figure 1B).

## 577 4 Discussion

578 Research indicates that the individualism-collectivism dimension provides important sources of  
 579 information for both intersocietal and interindividual similarities and differences. Therefore, the  
 580 present study investigated the associations of individualistic and collectivistic value orientations with  
 581 nonfatal suicidal behavior, attitudes towards suicide and suicidality, and psychological distress in  
 582 student samples from 12 countries by testing five research hypotheses. The findings from these  
 583 yielded interesting features, which may shed light on the relations of individualism-collectivism to

584 suicidal behavior, attitudes towards suicide and suicidal persons, and psychological distress in young  
585 adults enrolled in higher-education institutions.

586 It is noteworthy that while the individualism scores were highest in traditionally collectivistic  
587 countries like Palestine, Tunisia, and Turkey, together with the USA, the lowest individualism scores  
588 were noted in traditionally individualistic countries, such as Austria and Italy, together with Japan.  
589 Whereas Austria and Iran had the highest collectivism scores, China, Jordan and Saudi Arabia had  
590 the lowest collectivism scores. It seems that young adults in individualistic countries seek  
591 communion with others, while their age mates in collectivistic countries seek to assert their  
592 individuality, which is in line with the Arab Spring uprisings in Arab countries (Bellin, 2012) and the  
593 Gezi protests in Istanbul, Turkey (Göle, 2013). Another reason for high individualism scores in  
594 traditionally collectivistic countries might be related to the item content of the utilized scale. Items in  
595 the individualism scale mostly dealt with competition. Due to the limited resources in their countries,  
596 participants might have specifically endorsed competition, which, however, is only one aspect of  
597 individualism, not its whole content. Also, the individualism and collectivism scales exhibited only  
598 partial measurement invariance in the current study. Conclusions thus have to be made with caution.  
599 Fully invariant scales are still needed.

600 The scientific evidence indicates that, compared to people with predominantly collectivistic values,  
601 people with individualistic values report more independent self-concepts and context-independent  
602 cognitive processing styles, and lower relationality and dispositional or internal attributions (Cross et  
603 al., 2011; Kitayama and Uskul, 2011; Kühnen and Oyserman, 2002; Matsumoto et al., 2008;  
604 Oyserman et al., 2002; Oyserman and Lee, 2008). It has previously been argued (Eskin, 2013) that  
605 individuals with individualistic value orientations, when experiencing negative life circumstances,  
606 may feel personal responsibility for the situation and may blame themselves for what happened  
607 which, in turn, may result in feelings of anger, unhappiness, and hopelessness during times of  
608 personal crisis. Such an attribution process may have dire consequences for the individual, when  
609 coupled with insufficient social support. Conversely, when experiencing negative life circumstances,  
610 individuals with high collectivistic value orientations may attribute responsibility to others or to  
611 situations. This, in turn, may well mitigate the impact of anger, unhappiness, and hopelessness, which  
612 are the predominating cognitive-affective states in suicidal developments (Ellis and Rutherford,  
613 2008).

614 Based on research findings related to the differences between individualism and collectivism, our  
615 first hypothesis predicted that individualistic values would be associated with more suicidal behavior  
616 and psychological distress, whereas collectivistic values would be associated with less suicidal  
617 behavior and psychological distress. The results provided mixed support for this prediction. In line  
618 with findings from Eskin (2013) and Scott et al. (2004), collectivism was associated with less life-  
619 time suicidal ideation, but unlike these previous findings, the shape of the associations of  
620 individualism with suicidal ideation within a 12-month period, and of suicide attempts appeared to be  
621 'u'-shaped: Both individuals with high and low, but not intermediate, levels of individualism had a  
622 higher likelihood of suicidal ideation and behavior. Individualism was also associated with a higher  
623 likelihood of psychological distress (linearly with a higher scale cut-off; again u-shaped with a lower  
624 cut-off), controlling for participant sex and age. However, our results demonstrated some variability  
625 in the slopes of individualism and collectivism between countries. Thus, the associations of the two  
626 value orientations to suicidal ideation and psychological distress appear in part to be context-  
627 dependent, rather than being universal.

628 Individuality (agency, differentiation) and relatedness (communion, assimilation) are the two  
629 universal human needs (Bakan, 1966; Brewer, 1991; Guisinger and Blatt, 1994). This duality of  
630 social needs corresponds well to the dichotomy of the individualism-collectivism dimension.  
631 Research shows that national cultures, with their specific value structures, differ from another or  
632 resemble each other with regards to their location on this cultural dimension (Hofstede et al., 2010).  
633 It is possible that some cultures, in line with their location on the individualism-collectivism  
634 dimension, might be better prepared for satisfying one social need over others. For instance, cultures  
635 on the individualistic pole may well be more prepared for gratifying the need for individuality,  
636 whereas those on the collectivistic pole **are** more prepared for gratifying the need for communion or  
637 relatedness. Thus, there is a discrepancy between country (or group) culture and individual need  
638 satisfaction. Previously, Caldwell-Harris and Ayçiçeği (2006) have highlighted this as the  
639 personality-culture clash hypothesis.

640 On this background, our second hypothesis predicted that the prevailing culture (individualistic vs.  
641 collectivistic) in the investigated countries would moderate the associations of individualistic and  
642 collectivistic values with suicidal behavior and psychological distress. Our results yielded support for  
643 this idea. Collectivism on average was significantly negatively associated with life-time suicidal  
644 ideation in individualistic countries, but not in Asian and Muslim countries. In turn, **whereas both**  
645 **individuals high and low in individualism were at risk for suicidal ideation in the last 12 months in**  
646 **individualistic countries, only individuals low in individualism were at risk in Muslim collectivistic**  
647 **countries, and only individuals high in individualism in Asian collectivistic countries. Patterns were**  
648 **somewhat different for psychological distress, where individuals at risk appeared to be again either**  
649 **situated at the low range of individualism (Muslim collectivistic countries), the high range**  
650 **(individualistic countries), or at both ends of the distribution (Asian collectivistic countries).**

651 Individualism signifies independence, freedom, choice, personal responsibility, and competition  
652 (Bryerton, 2016; Waterman, 1981). The suicidal act frequently is seen as personal freedom and  
653 choice (Wexler and Gone, 2012; Wiesenhutter, 1971). Consistent with this view, a majority of  
654 suicidal individuals seem not to seek professional or nonprofessional help (Bruffaerts et al. 2011;  
655 Husky et al., 2009). Concurrently, perceived stigma, embarrassment, and self-reliance preferences are  
656 widely seen as important general barriers to help-seeking behaviors in younger individuals affected  
657 with mental health problems, including suicidality (Clement et al. 2015; Curtis, 2010; Gulliver et al.,  
658 2010). Within such a value matrix, it is reasonable to assume that people with an individualistic  
659 world view will see suicide as personal freedom and choice, and subsequently they will hold higher  
660 levels of acceptance for suicide than those with a collectivistic world view. On these grounds, our  
661 third hypothesis anticipated that individualistic values would be associated with more permissive  
662 attitudes to suicide, whereas collectivistic values with less permissive attitudes. Consistent with prior  
663 related evidence (Eckersley and Dear, 2002; Eskin, 2013; Lenzi et al., 2012; Stack and Kposowa  
664 2008), our results indicate that collectivistic values are uniformly associated with less permissive  
665 attitudes to suicide, whereas individualistic values with a **more** stigmatized view of suicidal behavior.  
666 **Yet, we found that the tendency to view suicide as a sign of mental illness increased only in the low**  
667 **score range of individualism, but not the intermediate and high ranges.** Thus, our third hypothesis  
668 was confirmed.

669 Independence, freedom, and personal responsibility are core values in the concept of individualism,  
670 and persons with individualistic value orientations display context-independent information  
671 processing and dispositional attribution styles, compared to context-dependent and situational  
672 attribution style shown by those with collectivistic value orientations. Further, persons engaging in  
673 suicidal behavior are reluctant to seek help for reasons related to a belief in self-reliance, stigma, and

674 a belief that nobody could help (Dadasev et al., 2016; Freedenthal and Stiffman, 2007). Thus, our  
675 fourth hypothesis predicted collectivistic values would be associated with more socially  
676 accepting/helping attitudes to suicidal persons, whereas individualistic values with less socially  
677 accepting/helping attitudes to suicidal persons. Like the findings from Eskin (2013), the results  
678 obtained from this study produced **some** support for our fourth prediction. Both individualistic and  
679 collectivistic values were significantly associated with socially accepting attitudes to a suicidal peer,  
680 **helping a suicidal friend, and emotional involvement.** These associations were overall stronger for  
681 collectivism than for individualism. **Yet, both individualistic and collectivistic values were also**  
682 **nonlinearly** associated with disapproving attitudes to suicidal disclosure, **but in slightly dissimilar**  
683 **fashions: Disapproving attitudes increased with increasing scores in the low score range of**  
684 **individualism and collectivism, but decreased only in the high score range of collectivism.**

685 Research indicates that individuals in high-suicide-rate countries more strongly approve suicide than  
686 their counterparts in low-suicide-rate countries (Stack and Kposowa, 2008). Also, research indicates  
687 that people with a suicidal past (Reynders et al., 2015) and people from regions with a high suicide  
688 rate (Reynders et al., 2014) have less positive attitudes and lower intentions to help-seeking  
689 behaviors. In similar vein, Crowder and Kemmelmeier (2014) showed that in regions with high  
690 suicide rates people are less likely to seek out psychiatric services for depression. Against this  
691 background, in our fifth hypothesis we tested whether national suicide rates are associated with  
692 attitudes towards suicide and suicidal persons in the countries investigated. The results revealed that  
693 participants in countries with higher suicide rates believed less that persons engaging in suicidal  
694 behavior would be punished after death and that suicide is a sign of mental illness; however, they  
695 also displayed less emotionally engaging reactions towards a suicidal peer than their counterparts.  
696 These results dovetail with insights from prior related comparative research (Eskin et al., 2011,  
697 2014).

698 It is interesting to note that national suicide rates **also moderated the linear** associations of  
699 individualism with **disapproval of suicidal disclosure and of collectivism with communicating**  
700 **psychological problems.** Thus, the association of individualistic values with disapproval was more  
701 linear in countries with higher suicide rates, whereas more quadratic in countries with lower suicide  
702 rates. This implies that in countries with higher suicide rates only lower individualism was actually  
703 associated with less disapproval, whereas in countries with lower suicide rates both lower and higher  
704 individualism was associated with less disapproval of disclosure. Positive linear associations of  
705 collectivism with communicating psychological problems were stronger in countries with lower  
706 suicide rates. This might be indicative of the relative ease of activating the informal social support  
707 **systems in these countries, which is in line with** research demonstrating the protective functions of  
708 social support against suicidal behavior (Šedivý et al., 2017).

709 As an aside, the current results suggest that the E-ATSS and E-SRSPS subscales are readily  
710 applicable in cross-cultural research, as their items appeared to exhibit full measurement invariance  
711 in the herein investigated countries. This is further evidence of the good psychometric properties of  
712 these two scales (see also Nader et al., 2012). Reported means and standard deviations of the E-  
713 ATSS and E-SRSPS subscales in the herein investigated countries may be used as reference in future  
714 cross-cultural suicide research.

#### 715 **4.1 Limitations**

716 Although our results provide a variety of clues for a possibly causal involvement of individualism in  
717 self-reported suicidal behavior and psychological distress, for several reasons caution should be

718 exercised when generalizing from the current findings. First, the national samples in this study were  
719 convenience samples. Therefore, they might neither be fully representative of their countries nor their  
720 countries' general population. Also, information on the numbers of students who were asked, but  
721 refused to participate was not collected and is thus not available. Random sampling techniques  
722 should be employed in future research to overcome possible problems of sampling bias. Second, the  
723 measurement of individualism with five items and collectivism with five items might be inadequate  
724 for sampling the entirety of these constructs' components. To better understand this issue, future  
725 research may benefit from using measures of self-construal. Also, horizontal and vertical facets of  
726 individualism and collectivism were conflated, and the scales did not include any reverse-coded  
727 items. This could have introduced response bias. Further, acquiescence bias, which tends to be  
728 stronger as a function of collectivism, arguably could have led to the overestimation of associations  
729 with collectivism, and the underestimation of associations with individualism. Third, the INDCOL  
730 scale was not administered in the home language at all study sites. The English INDCOL was used in  
731 Jordan, Palestine, Saudi Arabia, and Tunisia. Note that Palestine and Tunisia, together with Turkey  
732 and the USA, had the highest scores on individualism. There is evidence indicating that language  
733 itself might function as a prime (Oyserman and Lee, 2008). Thus, high individualism scores  
734 observed in Palestinian and Tunisian samples might be due to such effects, rather than truly reflecting  
735 the cultural orientation. Fourth, the cross-sectional study design does not allow for causal  
736 interpretations. To infer causality, prospective and longitudinal research designs are needed.

#### 737 4.2 Conclusion

738 In this study, we tested whether individualistic and collectivistic values are related to self-reported  
739 suicidal behavior, attitudes and psychological distress in a 12-nation sample of young adults. Our  
740 findings confirm and extend some findings from previous research.

741 The answer to the question we posed in the title is that universally both high and low individualism  
742 may be associated with suicide attempts. With regards suicidal ideation the answer depends on the  
743 cultural background. According to the current findings, higher individualism appears to be protective  
744 against suicidal ideation in Muslim collectivistic cultures, but seems a risk factor for suicidal ideation  
745 among Asian collectivistic cultures; both high and low individualism appears a risk factor in  
746 individualistic countries. At the same time, higher collectivism appears to protect against suicidal  
747 ideation among individualistic cultures, but not among Asian and Muslim collectivistic cultures. It is  
748 possible that individualistic values have a personally liberating and protective effect in some Muslim  
749 countries, where social pressure to conform is high. In other countries, where there is a generally  
750 lower level of social cohesion and/or less pressure to conform (Western individualistic and Asian  
751 collectivistic countries), higher individualism might further drive people at risk into isolation. Higher  
752 collectivism might be protective, when coupled with social support. Further, the findings from this  
753 study yielded interesting results concerning the attitudes towards suicide and suicidal persons.  
754 Collectivism may promote the communication of psychological problems, whereas hiding suicidal  
755 behavior is positively associated with individualism. Acceptability of suicide is negatively associated  
756 with collectivism, while both individualism and collectivism at the mean level are positively  
757 associated with social acceptance of a suicidal peer and emotional involvement. Individualism and  
758 collectivism are associated with disapproval of suicidal disclosure in a complex way, and  
759 associations also differ dependent on national suicide rate.

760 In this research, we adopted the view that, in their modest dosages, individualistic and collectivistic  
761 values correspond to individuality and relatedness, which in turn correspond to the two universal  
762 social human needs. The results suggest that, indeed, only intermediate levels of individualism may

763 be considered protective against suicide attempts. If gratified at an optimum level, both value  
764 orientations could benefit people in many ways. For instance, collectivistic values may foster sharing,  
765 helping, and reciprocity, which in turn increase social cohesion and social support. Individualistic  
766 values, on the other hand, may help people get to know themselves better and to determine individual  
767 goals, based on what they may think that will make them happier. In contrast, overly individualistic  
768 or collectivistic values may shatter such possible benefits of these two fundamental value  
769 orientations.

## 770 **5 Conflict of Interest**

771 The authors declare that the research was conducted in the absence of any commercial or financial  
772 relationships that could be construed as a potential conflict of interest.

## 773 **6 Author Contributions**

774 ME designed the study, organized the database, contributed to the statistical analysis, and wrote the  
775 first draft of the manuscript. UST performed the statistical analysis and wrote sections of the  
776 manuscript. All authors contributed to subsequent manuscript revisions, and read and approved the  
777 submitted version.

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978 **Table 1.** Descriptive statistics of individualism and collectivism factor scores, suicidal ideation, suicide attempts, and GHQ-12 scores per  
 979 county.

Country	n	% Women	Age M (SD)	Individualism M (SD)	Collectivism M (SD)	Suicidal ideation			Suicide attempt		GHQ-12 score		
						Life-time	Last 12 months	Current	Life-time	Last 12 months	≥ 3	≥ 4	≥ 5
Austria	627	55%	22.81 (3.37)	-0.30 (0.65)	1.17 (0.74)	48%	16%	6%	3%	<1%	38%	29%	22%
China	651	52%	21.47 (2.12)	0.11 (0.84)	-0.95 (0.73)	22%	7%	2%	4%	1%	35%	28%	21%
Iran	1000	60%	22.43 (3.93)	0.15 (1.07)	0.61 (0.77)	30%	15%	6%	5%	4%	45%	37%	30%
Italy	471	52%	23.29 (3.31)	-1.26 (0.98)	0.01 (0.75)	19%	4%	2%	3%	<1%	43%	29%	23%
Japan	246	33%	20.98 (2.21)	-0.24 (0.62)	-0.41 (0.68)	26%	10%	1%	3%	<1%	65%	55%	48%
Jordan	436	59%	21.10 (1.66)	-0.09 (1.03)	-0.79 (0.76)	22%	18%	14%	16%	15%	54%	47%	40%
Palestine	358	60%	20.83 (2.49)	0.37 (1.04)	-0.16 (0.80)	22%	16%	6%	12%	6%	69%	57%	47%
Saudi Arabia	413	30%	24.98 (3.50)	-0.06 (1.11)	-0.64 (0.92)	18%	10%	11%	10%	9%	79%	70%	61%
Tunisia	484	77%	21.47 (1.90)	0.67 (0.69)	0.20 (0.72)	21%	9%	3%	5%	1%	64%	52%	43%
Turkey	497	63%	20.57 (1.82)	0.28 (0.62)	0.02 (0.78)	24%	9%	3%	9%	2%	60%	49%	40%
UK	150	69%	26.93 (8.02)	0.06 (0.67)	-0.13 (0.74)	39%	15%	3%	7%	3%	NA	NA	NA
USA	239	51%	19.93 (3.89)	0.29 (0.71)	-0.23 (0.70)	31%	10%	<1%	3%	0%	32%	25%	14%

981 **Table 2.** Associations of individualism and collectivism with suicidal ideation, suicide attempts, and psychological distress.

Outcome variables	Slope coefficients		Random-effects variance estimates		
	Individualism	Collectivism	Intercept	Slope Individualism	Slope Collectivism
<b>Suicidal ideation</b>					
Life-time	-0.016 (0.049) 0.072 (0.032)*	-0.136 (0.071) 0.022 (0.046)	0.212 (0.118)	--	0.041 (0.017)*
Last 12 months	-0.009 (0.098) 0.084 (0.020)***	-0.241 (0.082)** 0.045 (0.036)	0.263 (0.101)**	0.083 (0.035)*	--
Current	-0.273 (0.126)* 0.031 (0.043)	-0.251 (0.122)* 0.033 (0.044)	0.804 (0.289)**	--	--
Any	-0.008 (0.047) 0.070 (0.030)*	-0.149 (0.060)* -0.002 (0.034)	0.450 (0.279)	--	--
<b>Suicide attempt</b>					
Life-time	-0.207 (0.146) 0.092 (0.031)**	-0.216 (0.105)* 0.058 (0.029)*	0.381 (0.164)*	--	--
Last 12 months	-0.295 (0.129)* 0.156 (0.040)***	-0.340 (0.195) -0.032 (0.051)	2.073 (0.858)*	--	--
Any	-0.238 (0.126) 0.125 (0.021)***	-0.226 (0.097)* 0.007 (0.042)	0.543 (0.221)*	--	--
<b>Psychological distress</b>					
GHQ-12 $\geq 3$	-0.053 (0.049) 0.087 (0.031)**	0.014 (0.069) 0.023 (0.048)	0.445 (0.149)**	0.038 (0.016)*	--
GHQ-12 $\geq 4$	-0.116 (0.062) 0.062 (0.034)	-0.046 (0.068) 0.046 (0.048)	0.404 (0.128)	--	--
GHQ-12 $\geq 5$	-0.120 (0.028)*** 0.091 (0.038)*	0.020 (0.059) 0.026 (0.037)	0.471 (0.165)**	0.063 (0.022)**	--

982 *Note.* Numbers are parameter estimates (standard errors in parentheses). Slope coefficients for linear terms are presented in the first line, and  
 983 for quadratic terms in the second line for each outcome. Slopes were modeled as random effects, where respective variance estimates are  
 984 provided, and as fixed effects otherwise. Displayed significance levels are based on Wald tests for slope coefficients, and likelihood ratio  
 985 tests for random-effects variance estimates (confidence intervals for the variance estimates may not reliably reproduce the significance of  
 986 these more powerful tests). Participant sex and age (not shown) were used as level-1 control variables for all outcomes, see main text for  
 987 further details. \* $p < .05$ , \*\* $p < .01$ .

988 **Table 3.** Mean slopes of individualism and collectivism in the investigated cultures.

Outcome variable: Predictor	Culture			Simple contrasts
	(1) Individualistic	(2) Asian collectivistic	(3) Muslim collectivistic	
<b>Suicidal ideation</b>				
Life-time: Collectivism	-0.305 (0.031)***	0.113 (0.106)	-0.106 (0.118)	2 > 1
Last 12 months: Individualism	0.241 (0.123)	0.457 (0.088)***	-0.225 (0.094)*	1,2 > 3
<b>Psychological distress</b>				
GHQ-12 ≥ 3: Individualism	0.157 (0.039)***	-0.014 (0.057)	-0.148 (0.047)**	1 > 2 > 3
GHQ-12 ≥ 5: Individualism	0.085 (0.088)	-0.021 (0.052)	-0.140 (0.059)*	1,2 > 3

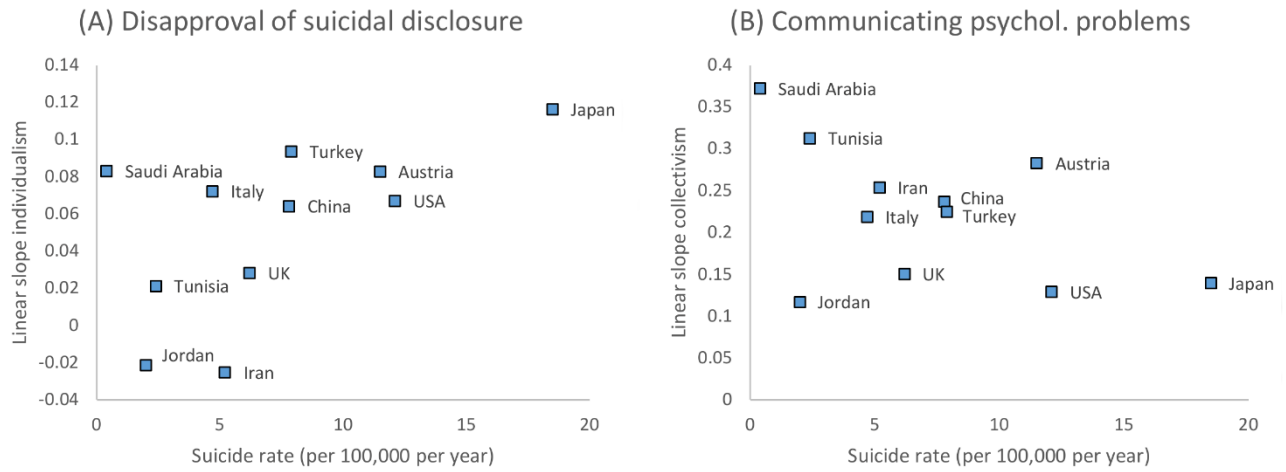
989 *Note.* Individualistic cultures = Austria, Italy, UK, USA; Asian collectivistic cultures = China, Japan; Muslim collectivistic cultures = Iran,  
 990 Jordan, Palestine, Saudi Arabia, Tunisia, Turkey. Numbers are parameter estimates (standard errors in parentheses). ‘Simple contrasts’ lists  
 991 significant differences ( $p < .05$ ) in the mean slopes between cultures. \*\* $p < .01$ , \*\*\* $p < .001$ .



992 **Table 4.** Associations of individualism and collectivism with attitudes and reactions towards suicide and suicidality factors.

Outcome variables	Slope coefficients		Random-effects variance estimates		
	Individualism	Collectivism	Intercept	Slope Individualism	Slope Collectivism
Attitudes towards suicide factors					
Acceptability of suicide	0.031 (0.035)	-0.166 (0.016)***	0.138 (0.051)**	0.011 (0.004)***	--
	0.018 (0.012)	0.013 (0.010)			
Punishment after death	0.058 (0.045)	0.093 (0.036)**	0.737 (0.089)***	--	0.020 (0.007)***
	-0.028 (0.020)	-0.049 (0.022)*			
Suicide as a sign of mental illness	0.057 (0.039)	0.087 (0.051)	0.194 (0.046)***	--	0.027 (0.009)***
	-0.043 (0.012)***	-0.019 (0.015)			
Communicating psychological problems	0.048 (0.023)*	0.230 (0.026)***	0.043 (0.010)***	--	0.007 (0.004)***
	-0.029 (0.017)	-0.056 (0.024)*			
Hiding suicidal behavior	0.088 (0.033)**	-0.043 (0.047)	0.159 (0.037)***	0.007 (0.002)***	--
	-0.001 (0.024)	-0.039 (0.027)			
Open reporting and discussion of suicide	0.045 (0.019)*	0.070 (0.027)*	0.161 (0.068)*	--	--
	-0.029 (0.022)	0.012 (0.014)			
Reactions to suicidality factors					
Social acceptance	0.103 (0.024)***	0.218 (0.024)***	0.045 (0.015)**	0.006 (0.002)***	--
	-0.030 (0.016)	-0.019 (0.012)			
Helping a suicidal friend	0.081 (0.021)***	0.191 (0.019)***	0.022 (0.009)*	--	--
	-0.033 (0.021)	-0.023 (0.015)			
Disapproval of suicidal disclosure	0.049 (0.016)**	-0.014 (0.024)	0.100 (0.028)***	0.002 (0.001)**	--
	-0.030 (0.008)***	-0.036 (0.012)**			
Emotional involvement	0.094 (0.020)***	0.115 (0.025)***	0.176 (0.048)***	--	--
	-0.022 (0.015)	-0.018 (0.016)			

993 *Note.* Numbers are parameter estimates (standard errors in parentheses). Slopes were modeled as random effects, where respective variance  
 994 estimates are provided, and as fixed effects otherwise. Displayed significance levels are based on Wald tests for slope coefficients, and  
 995 likelihood ratio tests for random-effects variance estimates (confidence intervals for the variance estimates may not reliably reproduce the  
 996 significance of these more powerful tests). Participant sex and age (not shown) were used as level-1 control variables for all outcomes, see  
 997 main text for further details. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .



998  
 999 **Figure 1.** Slope coefficients (on the ordinate) by national suicide rate (on the abscissa) of (A)  
 1000 individualism for disapproval of suicidal disclosure and (B) collectivism for communicating  
 1001 psychological problems.

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Figure 1.TIFF

