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Measurement invariance of the Belief in a Zero-Sum Game scale across 36 countries

Joanna Różycka-Tran[1], Paweł Jurek[1], Michał Olech[2], Jarosław Piotrowski[3], and Magdalena Żemojtel-Piotrowska[4]

[1]Institute of Psychology, University of Gdansk, Poland
[2]Implicit Explicit Training & Consulting, Warsaw, Poland
[3]University of Social Sciences and Humanities, Poznan, Poland
[4]University of Cardinal Stefan Wyszynski, Warsaw, Poland

In this paper, we examined the psychometric properties of cross-cultural validation and replicability (i.e. measurement invariance) of the Belief in a Zero-Sum Game (BZSG) scale, measuring antagonistic belief about interpersonal relations over scarce resources. The factorial structure of the BZSG scale was investigated in student samples from 36 countries ($N = 9907$), using separate confirmatory factor analyses (CFAs) for each country. The cross-cultural validation of the scale was based on multigroup confirmatory factor analyses (MGCFA). The results confirmed that the scale had a one-factor structure in all countries, in which configural and metric invariance between countries was confirmed. As a zero-sum belief about social relations perceived as antagonistic, BZSG is an important factor related to, for example, social and international relations, attitudes toward immigrants, or well-being. The paper proposes different uses of the BZSG scale for cross-cultural studies in different fields of psychology: social, political, or economic.

Keywords: Belief in a zero-sum game scale; Cross-cultural studies; Measurement invariance.

In social psychology many kinds of beliefs may be found, for example, the belief that the social world is a dangerous and threatening place, a competitive jungle characterised by a ruthless, amoral struggle for resources and power; versus the belief that the social world is a safe, secure, and stable place in which almost all people are fundamentally good, a place of cooperative harmony in which people care for, help, and share with each other.

Especially beliefs about social relations are crucial for social functioning, because they influence cooperation or competition between people (e.g., Bar-Tal, 2000). Based on the classic literature (e.g., Rummel, 1976), generally, two opposing directions of social relations can be defined as solidarity (describing similar intentions and orientation toward helping each other to achieve mutual goals) and antagonistic interaction characterised as the belief that improving one's interest entails frustrating others. Nowadays, for example, Parks, Joireman, and Van Lange (2013), the cooperative and antagonistic behaviour of citizens is also identified as the main axis of social interactions.

In this article, we would like to focus on the antagonistic aspect of social interactions, that is, the belief about the negative relationship between people that need the same resources. In many studies, it was found that beliefs about the antagonistic nature of social relations are strong predictors of intergroup disagreements over interdependent goals and interests, and especially, the zero-sum aspects of competition over scarce resources can lead to intractable conflict between contending people or groups (Bar-Tal, 2000). Some claim that antagonistic thinking might even be a legacy of human nature shaped by evolutionary psychological adaptation that facilitated successful resources competition (e.g., Pinker, 2002).

In our study, we focus on a general belief about the antagonistic nature of social relations, shared by people in a society or culture and based on the implicit assumption that a finite amount of goods exists in the world, in

Correspondence should be addressed to Joanna Różycka-Tran, Institute of Psychology, University of Gdansk, Bazynskiego 4, 80-309 Gdansk, Poland. E-mail: psyjrt@ug.edu.pl.

JRT conceived and designed the study. PJ, MO and JRT analysed and interpreted the data. JRT, MZP and JP have gathered data. JRT and PJ have written the paper. Comments were given by PJ and MZP.

which one person's winning makes others the losers, and vice versa—a relatively permanent conviction that social relations are like a zero-sum game, which can be measured using the Belief in a Zero-Sum Game (BZSG) scale (Różycka-Tran, Boski, & Wojciszke, 2015, p. 526). More specifically, such a belief provides a worldview based on the assumption that the fight over limited resources is crucial for social functioning, which influences the individual and in/outgroup social interactions. In other words, such a belief influences how individuals perceive their relationships in situations where their interests are interdependent and engage in win–lose social exchanges over limited resources. People who share this conviction believe that success is possible only at the expense of other people's failures.

Former studies conducted on several samples showed that BZSG affects not only cognition and emotions (e.g., negative vision of the social world, delegitimization of social systems, antagonistic perception of interests, interpersonal distrust between people, pessimism, anxiety, and a tendency to rumination, entitlement attitudes); but also behavioural tendencies (e.g., interpersonal conflicts, cooperation avoidance, withdrawing from social exchange) (Różycka & Wojciszke, 2010). Furthermore, it was found that BZSG is related with: a negative but not positive reciprocity norm, an external locus of control, belief in the injustice of the social world, belief in a dangerous world, belief in the world as a jungle and national authoritarianism, also feeling oneself to be a loser in social exchange (Różycka, 2012).

The most recent studies showed that the BZSG correlates positively with all facets that define neuroticism: the level of free-floating anxiety; the tendency to experience anger and related states such as frustration and bitterness; the tendency to experience feelings of guilt, sadness, despondency, loneliness, and social anxiety; and general susceptibility to stress. Furthermore, the results confirmed that the BZSG correlates negatively with openness to new experiences, intellectual curiosity, readiness to re-examine one's own values and those of authority figures, preference for the company of others, and belief in the sincerity and good intentions of others. Such findings confirmed the results from previous studies that the BZSG is the conviction of people with a personal tendency toward anger and hostility.

It was also confirmed that BZSG predicts some psychological outcomes: one of the recently discovered consequences of BZSG is a negative attitude toward war refugees and immigrants: if citizens perceive losing their own resources as immigrants gain, anti-refugee and anti-immigration attitudes arise. Furthermore, BZSG was shown to be an important factor for predicting work behaviours (Adamska, Jurek, & Różycka-Tran, 2015) and subjective life satisfaction (Różycka-Tran et al., 2015). In the samples taken from 37 countries, it was found that BZSG is associated with some other cultural dimensions and microeconomic indexes (Różycka-Tran et al., 2015).

In the current paper, we examine the psychometric properties, cross-cultural validation, and replicability of the Belief in a Zero-Sum Game (BZSG) scale, which is a tool designed to measure antagonistic beliefs about social relations over scarce resources. We analyse the measurement invariance of the scale, based on previously gathered and newly collected data.

Belief in a Zero-Sum Game scale

To measure the belief that life is conceived as a zero-sum game, the BZSG scale was developed (Różycka-Tran et al., 2015), which consists of eight items reflecting belief about antagonistic competition over scarce resources. This scale was first used in a study on a Polish national sample ($N = 1133$), and psychometric properties of the BZSG scale have already been described (Różycka & Wojciszke, 2010). Moreover, several experimental and correlational studies were performed on different samples, which found that BZSG correlates with a host of judgmental and behavioural variables.

To test whether BZSG is a universal phenomenon and holds across different countries, we decided to test BZSG in a large pancultural project of 37 nations (Różycka-Tran et al., 2015). In the first step, in addition to the Polish validation studies, cultural interviews with adults and students were conducted in Vietnam, Tibet, and Nepal (Różycka, 2012), about the beliefs and principles that guide their interactions with others (social relationships and social groups). In addition, we explored both the English and non-English language psychological literature on beliefs. Through numerous interviews, we concluded that zero-sum beliefs exist in Asian cultures the same as universal values (e.g., Różycka-Tran, Truong, Cieciuch, & Schwartz, 2017), despite the fact that Asian cultures are very different from European cultures. In the next step, national versions of the scale were created by bilingual individuals working in psychology or at university using the back translation procedure with the English version as the basis for all translations. Finally, the BZSG scale was translated into 20 languages: Armenian, Bulgarian, Chinese, Czech, Estonian, Flemish, French, Georgian, German, Hungarian, Japanese, Polish, Romanian, Serbian, Slovakian, Portuguese, Spanish, Russian, Ukrainian and Vietnamese.

In the case of data gathered in many countries, the equivalence of the scale should be tested. There are two basic means to indicate cross-cultural replicability of the scale: testing measurement invariance and analysing the pattern of correlations with external variables across countries (e.g., Milfont & Fisher, 2010). Previous research on the BZSG scale showed that the pattern of correlations between the BZSG scale scores and a

range of external variables was similar across 37 countries. It was found that at the individual level (within countries) the BZSG strongly negatively correlated with interpersonal trust, satisfaction with social exchange, and self-esteem, whereas at the cultural level (between countries) the BZSG showed some relations with different cultural dimensions (e.g., societal cynicism, collectivism, in-group favouritism) and a variety of external objective macrosocial, political and economic indices such as the gross domestic product, human development index or democracy index (Różycka-Tran et al., 2015); thus providing some evidence for the cross-cultural validity of the given construct.

Although some studies have already been conducted, measurement invariance has not yet been tested. The study reported in this article extends the earlier work of Różycka-Tran et al. (2015) in validating the factorial structure of the BZSG scale, and is the first to assess between-country equivalence of the BZSG scale using new data from additional countries all over the world.

EXAMINATION OF MEASUREMENT INVARIANCE

The main aim of this study was to investigate the measurement invariance of the eight-item BZSG scale, in samples from various countries. We hypothesized that all items of the scale have a similar meaning and structure in all tested countries, which would imply that the scale is valid and suitable for making multilevel modelling analyses in the future.

We focused on measurement invariance, as it indicates whether the scale is used in a comparable manner across countries and whether the meaning of a construct is the same. There are three basic levels of measurement invariance: configural invariance indicates that the construct (as measured by a scale) is stable and replicable in different cultural contexts; metric invariance allows for comparisons between predictors and correlates of construct across compared groups; scalar invariance indicates that comparisons in latent means across countries are possible (Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014).

We assessed the cross-cultural validity of the scale through multigroup confirmatory factor analyses (MGCFA) and invariance analyses on data from 36 countries around the world. The factorial structure of the scale was assessed via separate confirmatory factor analyses (CFAs) for each country. To assess the goodness of fit model, the following criteria are usually used: RMSEA and SRMR smaller than .08 and CFI larger than .90 (e.g., Brown, 2015). However, the investigation by Kenny, Kaniskan, and McCoach (2015) showed that the RMSEA too often falsely indicates a poor fitting model with small *df*, especially those with small sample sizes. According to these findings, we decided to use a more liberal RMSEA criterion (RMSEA < .10), which is also in line with the suggestion of MacCallum, Browne, and Sugawara (1996) who consider RMSEA between .08 and .10 to indicate mediocre fit. Because of non-normal indicators, we used the MLM estimator with robust standard errors and χ^2 to estimate CFA parameters (e.g., Brown, 2015).

Next, we assessed the measurement invariance of the eight-item version of the BZSG scale across countries. Usually, the three above-mentioned levels of measurement invariance are recognised in MGCFA, which are defined by parameters that are constrained to be equal across samples (e.g., Milfont & Fisher, 2010). Accepting the hypothesis of configural invariance provides evidence that the same number of latent variables with the same pattern of factor loadings underlie a set of indicators. Metric (weak) invariance requires that factor loadings are equal across the groups; and scalar (strong) invariance requires that factor loadings and all intercepts are equal across the groups (see Beaujean, 2014; Milfont & Fisher, 2010).[1]

To compute MGCFA we used an R environment (R Development Core Team, 2012) and the R packages *lavaan* (Rosseel, 2012), *semTools* and *semPlot* (Hirschfeld & von Brachel, 2014). Usually, investigating measurement invariance begins by testing a scale across samples for configural invariance, using the same criteria as in the case of CFAs for each group separately. Typically, to identify a metric and scalar measurement invariance, cut-off criteria suggested by Chen (2007) are used; and changes in the comparative fit index (ΔCFI) equal to or greater than .01 and a change in the root mean square error of approximation (ΔRMSEA) greater than or equal to .015 as evidence of non-invariance. However, as Rutkowski and Svetina (2014) argue, most research on measurement invariance concerned a two-population case. In their research, they found that relative fit indices (ΔCFI and ΔRMSEA) are dependent on the number of groups. They suggest that a more liberal criterion of around .02 (for ΔCFI) and .03 (for ΔRMSEA) should be adopted in studies with more than 20 countries (Rutkowski & Svetina, 2014).

METHOD

Participants and procedure

Data were collected from 36 countries at two time points independently. The first wave ($N = 4752$, 36% men)

[1] It is also possible to assess partial invariance, which is sufficient to allow for group comparisons; partial invariance is established when the parameters of at least two indicators per construct are equal across groups (Byrne, Shavelson, & Muthén, 1989).

TABLE 1
Items of BZSG scale and factor loadings in pooled international samples of 36 countries

Item	*M*	*SD*	*Factor loading*
1. Successes of some people are usually failures of others	3.69	1.71	.60
2. If someone gets richer it means that someone else gets poorer	3.56	1.71	.79
3. Life is so devised that when somebody gains, others have to loose	3.60	1.70	.81
4. In most situations interests of different people are inconsistent	4.36	1.47	.41
5. Life is like a tennis game—a person wins only when others lose	3.27	1.67	.74
6. When some people are getting poorer it means that other people are getting richer	3.52	1.63	.78
7. When someone does much for others he or she loses	2.82	1.54	.44
8. The wealth of a few is acquired at the expense of many	3.95	1.68	.60

Note: $N = 9907$.

consisted of student samples from 27 countries. The mean age of students in the first wave was 21.18 years ($SD = 4.76$), most of them studying social sciences or business.[2] The second wave ($N = 5160$, 37% men) consisted of student samples from 25 countries with a mean age of 21.66 years ($SD = 5.10$); the distribution of academic affiliations was similar to that for the first wave. Sixteen of the countries contributed independent samples in both waves (Belgium, Brazil, Bulgaria, China, the Czech Republic, the United Kingdom, Hungary, India, Japan, Poland, Portugal, Russia, Serbia, Slovakia, South Africa, and Spain).

Measures

Antagonistic belief about interpersonal relations over scarce resources was measured by the one-dimensional BZSG scale (Różycka-Tran et al., 2015), which consists of eight items (e.g., "Life is so devised that when somebody gains, others have to lose," "The wealth of a few is acquired at the expense of many"; see Table 1). Participants in the first wave responded to items using a 7-point scale (from 1 = *strongly disagree* to 7 = *strongly agree*) whereas those in the second wave used a 6-point Likert scale because of other scales implemented in the project (from 1 = *strongly disagree* to 6 = *strongly agree*). Linear equations were used to transform 6-point scale scores into 7-point scale scores (Colman, Norris, & Preston, 1997). We tested scalar (strong) invariance of both versions of the scale after linear transforming, where results ($\Delta CFI < .01$ and $\Delta RMSEA < .015$; cut-off criteria see Chen, 2007) supported our decision about combining the data. Estimates of reliability derived from the measurement model are presented in the results section.

RESULTS

In the first step, we tested for goodness-of-fit for the one-factor BZSG structure based on the pooled covariance matrix. We ignored any between-group variability across culture in testing for the validity of factorial structure. Table 1 presents basic descriptive statistics with means and factor loadings in pooled international samples ($N = 9907$), of all items of the BZSG scale. The one-factor model was well fitted to data, $\chi^2 = 337.01$ ($p < .01$), CFI = .98, RMSEA = .05 (CI .05–.06), SRMR = .03. Alternatively, the 6-item model (without poorly loading item 4 and item 7) and the bifactor model (item 4 and item 7 as beyond the main factor) were considered. In both cases, worse fit indices were reported.

In the next step, we calculated basic statistics (mean, standard deviations, and Cronbach's alphas) and we conducted CFAs for each country separately. We tested the applicability of the pooled-within structure to the 36 countries.

As can be seen in Table 2, in the case of all 36 countries, a one-factor model of the BZSG showed good fit according to CFI and SRMR. In addition, the Cronbach's alpha indicators point to good reliability (in the case of the small samples and scale with fewer than 10 items, α larger than .70 are considered of good internal consistency; Cortina, 1993). Although the CFI and SRMR supported the fit of the model to the data, the RMSEA was less clearly supportive. A large number of RMSEA confidence intervals exceeded the liberal cut-off point of .10. In evaluating these results, it is important to take into account the low complexity of the tested model: the BZSG scale measures one factor and consists of a small number of items. Kenny et al. (2015) state that RMSEA, which is the most used to evaluate model data fits, should not be used in small *df* models. With reference to these findings, we have decided to use CFI and SRMR in evaluating model fit in each country.

In the last step, we conducted a three-level measurement equivalence test. Table 3 presents the global fit coefficients for the three levels of measurement invariance: configural, metric, and scalar. First, we established that the full eight-item version of the scale displayed configural invariance and metric invariance across all the

[2]This set of data has already been published (Różycka-Tran et al., 2015).

TABLE 2
Global fit measures for the single sample CFAs ($df = 20$), mean scores, standard deviations, and Cronbach's alphas of BZSG scale in 36 countries

Country	*N*	χ^2	*CFI*	*RMSEA*	*SRMR*	*Cronbach's alpha*	*M (SD)*
Azerbaijan	117	26.9	.98	.05 [.00–.09]	.04	.89	3.66 (1.17)
Belgium	478	115.3	.92	.10 [.09–.11]	.05	.83	3.29 (1.03)
Brazil	324	66.6	.91	.08 [.07–.11]	.05	.77	3.22 (1.03)
Bulgaria	301	50.0	.96	.07 [.05–.09]	.05	.86	3.48 (1.18)
China	467	60.9	.95	.07 [.05–.08]	.04	.82	4.07 (1.03)
Colombia	140	40.2	.95	.08 [.05–.12]	.05	.89	3.32 (1.27)
Czech	345	75.0	.93	.09 [.07–.11]	.06	.82	2.89 (.87)
Dominican	100	22.3	.97	.03 [.00–.09]	.06	.69	4.13 (1.02)
Estonia	303	44.3	.97	.06 [.04–.08]	.04	.90	3.42 (1.12)
Finland	102	30.7	.94	.07 [.01–.12]	.06	.80	3.37 (.83)
Georgia	100	34.6	.89	.09 [.04–.13]	.08	.70	3.99 (.97)
Germany	296	81.1	.90	.10 [.08–.12]	.06	.80	3.31 (.96)
Honduras	108	30.7	.92	.07 [.02–.11]	.08	.73	3.89 (1.15)
Hungary	311	80.2	.92	.10 [.08–.12]	.05	.84	3.29 (1.07)
India	304	48.4	.96	.07 [.05–.09]	.05	.82	4.14 (1.22)
Indonesia	200	42.5	.97	.08 [.05–.10]	.04	.88	3.53 (1.26)
Israel	125	37.3	.93	.08 [.04–.12]	.05	.89	2.93 (1.05)
Japan	413	63.3	.95	.07 [.06–.09]	.04	.84	3.78 (1.11)
Latvia	161	49.4	.97	.10 [.07–.12]	.03	.95	4.24 (1.26)
Panama	176	52.8	.91	.10 [.07–.12]	.06	.85	3.51 (1.25)
Philippines	108	35.8	.92	.09 [.04–.13]	.06	.80	3.88 (.97)
Poland	448	79.4	.96	.08 [.07–.10]	.04	.90	3.29 (1.15)
Portugal	264	58.8	.95	.09 [.07–.11]	.05	.87	3.42 (1.15)
Puerto Rico	299	80.8	.91	.10 [.08–.12]	.06	.84	3.56 (1.29)
Romania	207	60.8	.95	.10 [.08–.12]	.04	.90	3.83 (1.32)
Russia	397	63.9	.96	.07 [.06–.09]	.05	.86	3.15 (1.04)
Serbia	400	37.7	.98	.05 [.03–.07]	.03	.86	3.82 (1.25)
Singapore	108	20.2	.99	.01 [.00–.08]	.05	.84	3.99 (.91)
Slovakia	386	71.7	.94	.08 [.07–.10]	.05	.83	3.48 (.94)
South Africa	369	31.5	.99	.04 [.01–.06]	.03	.85	3.72 (1.18)
South Korea	211	43.9	.97	.08 [.05–.10]	.04	.89	3.93 (1.03)
Spain	330	75.2	.94	.09 [.07–.11]	.05	.85	3.92 (1.17)
Taiwan	298	39.2	.96	.06 [.03–.08]	.04	.80	4.34 (.95)
Ukraine	301	41.9	.94	.06 [.04–.08]	.05	.76	4.16 (1.02)
United Kingdom	466	97.3	.94	.09 [.08–.11]	.05	.87	3.55 (1.05)
USA	444	99.1	.95	.09 [.08–.11]	.05	.87	3.30 (1.06)

TABLE 3
Global fit measures in measurement invariance tests for 8-items version of the BZSG scale

	χ^2	*df*	*CFI*	*RMSEA*	*SRMR*	Δ*CFI*
Configural invariance (equal form)	2025.9	720	.95	.08	.04	-
Metric (weak) invariance (equal factor loadings)	2773.8	965	.93	.08	.08	.02
Scalar (strong) invariance (equal indicator intercepts)	5931.0	1210	.81	.12	.12	.14

Notes: 36 countries.

countries, according to the cut-off criteria suggested by Rutkowski and Svetina (2014) (ΔCFI "around .02" and ΔRMSEA "around .03"). Results support the conclusion about the metric invariance of the BZSG scale across all 36 countries.

Additionally, we tested for partial metric invariance with the more restricted cut-off criteria: that is, ΔCFI should be lower than .02 to support measurement equivalence. We chose to release the two items (items 4 and 7) that had the lowest factor loadings. With these assumptions, the results ($\chi^2 = 3298.8$, $df = 895$, CFI = .94, RMSEA = .08, SRMR = .06; ΔCFI < .01) support the conclusion about the partial metric invariance of the BZSG scale across all 36 countries.

DISCUSSION

Previous research on the BZSG scale showed that the pattern of correlations between BZSG scores and a

range of external variables was similar across different countries ($N = 6138$), thus providing some evidence for the cross-cultural validity of the given construct (Różycka-Tran et al., 2015). In this paper, we show that the BZSG scale displays configural and metric invariance across an additional wide range of countries ($N = 9907$), which is sufficient to allow comparison of correlates and predictors of BZSG scale scores in different countries, also made in multilevel analyses.

This cross-cultural study has also confirmed that the eight-item BZSG scale has a one-factor structure in 36 countries, considering a relatively large number of groups and varied sample sizes within each group (see Rutkowski & Svetina, 2014). According to CFA results of separate analyses for each country, the CFI and SRMR supported the fit of the one-factor model of the BZSG. The results of the research carried out by Kenny et al. (2015) should be taken into account in analysing results of the RMSEA that are clearly less supportive for a good fit of the one-factor model in a large number of countries; however Kenny et al. (2015) argue that the RMSEA should not be computed for low *df* models.

However, we cannot compare raw scores of BZSG between countries and therefore create a world rank of less or more antagonistic cultures due to lack of scalar invariance. Although MGCFA confirmed that the BZSG scale is equivalent across countries (implying that the instrument measures the same concept and in the same way), lack of scalar (strong) invariance suggests that the scale was used differently across various subgroups of respondents (Davidov et al., 2014). However, lack of scalar invariance seems not to be a case of translations, as the national versions of the BZSG scale were developed using the back translation procedure, with the participation of local university teachers who also commented on the applicability of items to their culture; nor caused by response styles (Smithson & Shou, 2016). The case seems to be rather methodological, as it has consistently proved difficult to demonstrate higher levels of metric or scalar equivalence in cross-cultural studies (e.g., Cieciuch, Davidov, Oberski, & Algesheimer, 2015). In multicultural studies, when the number of countries is large (e.g., >10), the multigroup approach is difficult to apply (Byrne & van de Vijver, 2014; Feskens & Hox, 2011). The problem in this situation is that in multigroup modelling for each country, unique parameter values are estimated, generating a very large matrix.

This is why some researchers postulate testing big samples for multilevel equivalence, that is, conducting the test of isomorphism. For example, Byrne and van de Vijver (2014) claim that the multilevel equivalence procedure should be preceded by multigroup equivalence testing; i.e., the equivalence at individual and country-level assumes that a concept measured on an individual level is equivalent across all countries. So, as a next step we plan to indicate cross-level isomorphism (i.e., while individuals have their own beliefs about social relations, the beliefs that are shared by citizens are identifiable at the group level of analysis).

Although our study is limited by its reliance on student samples, the aim was only to confirm the reliability and validity of the BZSG scale in different countries. In this case, the homogeneous student samples are ideal for cross-country comparisons. We believe that this study is a contribution to the literature because, to date, little attention has been paid to issues of comparability, and invariance is too often assumed but not tested.

This study indicates that a scale measuring BZSG could be successfully used by researchers in a wide range of countries and their results could be to some extent compared and integrated. As a BZSG seems to be present in very different cultural settings (Adamska et al., 2015; Różycka-Tran et al., 2015), it is possible to examine the nomological network of the scale in cross-cultural data and to integrate the knowledge about sources, correlates, and outcomes of BZSG from different countries across the cultures. Therefore, BZSG could be further examined in other domains, like conflict resolutions or formulating expectations toward others in different cultural settings.

In future research, we plan to investigate how cultural settings shape the levels of zero-sum beliefs. For example, Foster (1965) noticed that members of "peasant" societies had a tendency to view their world in zero-sum terms: "peasants view their social, economic, and natural universes—their total environment—as one in which all of the desired things in life such as land, wealth, health, friendship and love, manliness and honor, respect and status, power and influence, security and safety, *exist in finite quantity* and *are always in short supply*" (Foster, 1965, p. 296). As BZSG seems to have serious and negative consequences (like lower well-being, or higher levels of prejudice), it is important to know which cultural factors could be responsible for the dissemination of such a belief in a population. Also, it would be interesting to identify how cultural factors influence the relationship between BZSG and outcome variables. For instance, it is possible that antagonistic beliefs are more adaptive in scarce resources conditions, so that its negative relation to subjective well-being is weaker in less affluent countries in comparison to more affluent ones. Because zero-sum beliefs are associated with greater outgroup bias and in-group favouritism (Wilkins, Wellman, Babbitt, Toosie, & Schad, 2015) or group membership bias (Smithson, Sopeña, & Platow, 2015), society would benefit from identifying strategies that contribute to a more cooperative approach to intergroup relations in which zero-sum beliefs, and their negative consequences, are minimised.

The BZSG scale appears to be useful for measuring antagonistic beliefs about interpersonal relations in different countries. The BZSG scale also seems to be a practical

tool for diagnosing the level of antagonism in a given country for outsiders. Social beliefs as cultural descriptors guide the behaviour of individuals in a culture, where a lack of accurate knowledge about them may, therefore, interfere with adaptation to a culture; for example, a lack of knowledge of social beliefs is negatively related to the sociocultural adaptation of immigrants (Kurman & Ronen-Eilon, 2004). In other words, individuals or groups that are less aware of given beliefs in the host country, or are wrong in their assumptions, have more difficulties in sociocultural adaptation compared to people who have a better understanding of the prevalent social convictions. Further work indicating conditions and consequences of holding antagonistic beliefs is very important, as it influences international cooperation. A valid, reliable method of measuring zero-sum belief about the social world, perhaps a given version of the BZSG scale, would be very useful in such investigations.

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