

Are Perceptions of Organizational Justice Universal? An Exploration of Measurement Invariance Across Thirteen Cultures

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Abstract Previous research examined whether justice effects are comparable, focusing on quantitative differences in justice effects. This study examines whether justice perceptions are structured similarly or whether they are qualitatively different across working populations from 13 nations. Confirmatory factor analysis and multi-group analysis show that Colquitt's (*J Appl Psychol* 86:386–400, 2001) four-dimensional model of justice works well across these samples. However, factor intercorrelations and reliabilities are found to systematically vary between cultural

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samples. Perceptions of justice are more highly intercorrelated in power distant and collectivistic samples, in line with extensions of the relational model of authority. Score reliabilities were lower in collectivistic settings.

Keywords Organizational justice · Power distance · Collectivism · Equivalence · Invariance · Multi-group factor analysis

Organizational justice research over the last four decades has highlighted the importance of perceptions of justice for work behaviour and motivation in Western societies (Cohen-Charash & Spector, 2001; Colquitt, Conlon, Wesson, Porter, & Ng, 2001). However, the extent to which these findings can be generalized to non-Western work contexts is still under-explored. Justice research provides important insights into work motivation of employees (Erez & Earley, 1993); therefore, it is important to study justice perceptions in more diverse samples to gain a better understanding of employee concerns in our globalized world. Expatriate managers making decisions may assume that employees in non-Western contexts may react in a similar way to their decisions as would employees in their home country; yet, the growing cross-cultural literature has demonstrated that these assumptions are often erroneous (see Gelfand, Erez, & Aycan, 2007; Tsui, Nifadkar, & Ou, 2007). Given the very limited work on perceptions of justice in a wider sample of nations, we present a first examination of the factor structure of a widely used US instrument (Colquitt, 2001), using multi-group confirmatory factor analysis and means-covariance structure analysis (Cheung & Rensvold, 2000; Vandenberg & Lance, 2000) in samples from 13 diverse nations. We also examine whether cultural dimensions from previous research (House, Hanges, Javidan, Dorfman, & Gupta, 2004; Schwartz, 2006) can help us to explain how employees perceive justice events. With a sample of 13 countries, such an analysis by necessity will remain somewhat exploratory and preliminary. However, since we are the first to explore these issues, we believe the findings to be reported merit further empirical attention and by linking cultural dimensions to psychometric indicators; we provide a novel approach to the study of structural invariance in a cross-cultural context.

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Dimensionality of Justice in the US and International Samples

There is now relative consensus in the Western literature that four major dimensions of justice perceptions can be distinguished (Colquitt & Shaw, 2005). The first and oldest dimension is distributive justice which focuses on the distribution of rewards and whether people believe that their outcomes and rewards match their input or investments (Adams, 1965). The second component is procedural justice, which refers to the procedures that determine these outcomes (Thibaut & Walker, 1975). Bies and Moag (1986) introduced the concept of interactional justice. Interactional justice is focused on the treatment of individuals by decision-makers and whether they show respect, sensitivity and explain decisions thoroughly. Subsequently, Greenberg (1993) separated this interactional component into the interactional aspect of procedures, namely the adequacy of providing information (informational justice) and the interpersonal treatment by supervisors when explaining distributive decisions (interpersonal justice).

Colquitt (2001) developed and validated a measure differentiating these four components. There is some evidence now that the four different components of justice relate differently to various outcome measures in the US samples (e.g., Bell, Wiechmann, & Ryan, 2006; Chiaburu & Marinova, 2006; Colquitt, 2001; Colquitt et al., 2001; Judge & Colquitt, 2004; Roch & Shanock, 2006).

Very limited research in non-Western societies has been conducted. Why is it important to examine the factor structure of justice dimensions across different cultures? First, justice perceptions provide an important insight into the motivational states of employees (Colquitt et al., 2001; Erez & Earley, 1993). Many employment surveys today routinely assess general perceptions of justice in Western companies and feedback derived from these assessments influences management decisions. The increasing globalization of the workplace means that managers have to lead teams consisting of employees from many different cultures. Similarly, greater world-wide standardization of HR practices means that subsidiaries in other parts of the world now also apply these employment surveys. If the responses are structured differently in non-Western contexts or for migrants from non-Western countries, then management interventions may waste time, money and resources or even damage employee–management relations (see Erez & Earley, 1993).

Second, recent studies have started to explore differences in justice effects across cultures. There is some evidence that justice effects are not uniform across cultural contexts (Brockner et al., 2001; Farh, Earley, & Lin, 1997; Fischer & Smith, 2006; Lam, Schaubroeck, & Aryee, 2002; for reviews, see Fischer, 2008; Gelfand et al., 2007; Tsui et al., 2007). If there was a different factor structure or items may be comparatively easier or difficult (meaning differences in item intercepts across cultures), then no cross-cultural comparisons can be attempted and previous findings are meaningless (Fontaine, 2005; van de Vijver & Leung, 1997).

Finally and extending the previous point, current research has not addressed the universality of justice perceptions directly. Henrich, Heine, and Norenzayan (2010) pointed out that the majority of research is conducted using Western, educated, industrialized, rich and democratic (WEIRD) samples. These samples come from a

limited geographical range and account for about one-quarter of the world population. Therefore, our insights into the psychology of justice are very limited. More research on non-Western samples is clearly needed. Therefore, we first test whether the four-dimensional structure can be fitted to all samples.

The available data to date provides a mixed picture. To the best of our knowledge, no study exists that has explored all four dimensions included in the Colquitt (2001) questionnaire. Some studies with data from Taiwan (Farh et al., 1997), Hong Kong (Fields, Pang, & Chiu, 2000) and Portugal (Rego, 2002) supported the distinctiveness of distributive, procedural and broad interactional justice components, whereas other studies with samples from France (Igalens & Roussel, 1999), Britain (Fischer & Smith, 2006), Germany (Fischer & Smith, 2006; Pillai, Williams, & Tan, 2001), Hong Kong and India (Pillai et al., 2001) did not.

As a working hypothesis we could propose that employees in all societies can make a basic distinction between these four dimensions. These dimensions refer to distinctions between specific outcomes and procedures that lead to these outcomes as well as social versus structural components of these outcomes and procedures (see Greenberg, 1993). Therefore, justice may be a functional universal (Norenzayan & Heine, 2005, see also Henrich et al., 2010). However, we do not know whether the individual justice elements such as the procedural justice criteria discussed by Leventhal (1980) or the Bies and Moag's (1986) elements of interactional justice are also universal. There is some research suggesting that these criteria may work differently across cultures (Fischer, 2008; Leung & Tong, 2004). Therefore, the individual items that capture these criteria in Colquitt's scale may not work equally well in all samples. Therefore, we are the first to test the factor structure using multi-group confirmatory analysis across a large number of samples (research question 1).

Exploring Differences in Justice Dimensions Across Cultures

Societies differ along a number of cultural dimensions, of which the extent to which people are individualistic or collectivistic (individualism–collectivism: Hofstede, 2001; autonomy vs. embeddedness: Schwartz, 2006) and the extent to which is power is expected to be distributed equally or not (power distance: Hofstede, 2001; egalitarianism vs. hierarchy: Schwartz, 2006) appear particularly important for justice research (see Fischer & Smith, 2003; Lind, Tyler, & Huo, 1997). The relational model of authority (Tyler & Lind, 1992) proposes that individuals care about procedural justice because it provides them with information about inclusion in valued groups (being considered a fully fledged member of one's work group). Lind et al. (1997) were the first to show that in hierarchical societies, individuals pay less attention to procedural justice information. This is because their relative status within the group is determined by the cultural context and therefore the context overrides the need to evaluate justice information to evaluate their standing within the group. To the extent that concerns about hierarchical standing is important, power distance may be an important moderator. In contrast, if the primary is concern with inclusion in the group overall, individualism–collectivism

would also be important. Subsequent research then demonstrated that this context effect is stable (Brockner et al., 2001; Farh et al., 1997; Fischer & Smith, 2006; Lam et al., 2002; for a review, see Fischer, 2008) and also applies to other justice dimensions, including distributive justice (Fischer & Smith, 2004).

These studies have shown that justice perceptions may not be as informative for individuals in some contexts compared to others. Although this does not imply that individuals will not be able to discriminate between the four dimensions, it may have some implications for the factor structure, specifically the factor correlations. The informative value of justice is decreased and, therefore, the motivation of individuals to make such fine-grained differentiations may be reduced (as implied by models of humans as goal oriented information processing agents, De Dreu, Nijstad, & van Knippenberg, 1998; Forgas & George, 2001). Drawing upon these information processing models, it could be expected that justice dimensions may appear more interchangeable and similar in more hierarchical and collectivistic contexts. Therefore, we propose that latent justice factors are more highly intercorrelated in more power distant, hierarchical and collectivistic settings (hypothesis 1).

The Current Study

We are testing the cross-cultural applicability of the four-dimensional scale developed by Colquitt (2001) across samples from 13 different countries. The samples were selected in an effort to maximize variability along the dimensions of power distance/hierarchy and collectivism/embeddedness as measured in two recent multi-national projects (House et al., 2004, Schwartz, 1994, 2006). Schwartz (1994, 2006) measured values in teacher samples from around the world. We have samples covering the whole range of his collectivism equivalent dimension of embeddedness versus autonomy dimension. House et al. (2004) distinguished between practices and values when measuring institutional and ingroup collectivism as well as power distance. Our samples capture the whole range of variability along the ingroup collectivism practices and values and the power distance values. Our samples are somewhat higher in power distance samples because these contexts have been relatively ignored in previous justice research.

Method

Samples

Participants were recruited through personal contacts of the authors, local collaborators and snow-ball sampling. In each location, attempts were made to maximize variability in terms of occupation, organizational status, industry and sector. Surveys were distributed to contact persons within organizations (who often made additional copies) and completed surveys were returned to the contact person or directly to the local investigator via pre-paid envelopes. Surveys were always

Table 1 Demographic information on study samples

	Effective <i>N</i>	Mean age (SD)	%Male	%Managers	%Public sector
Argentina	215	39.11 (10.28)	47.0	18.6	13.0
Brazil	275	35.92 (9.52)	50.5	32.7	33.2
Egypt	75	31.08 (8.59)	44.6	55.2	.0
Indonesia	196	34.98 (9.76)	61.5	56.0	25.2
Lebanon	398	33.21 (9.68)	52.0	53.6	9.1
Malaysia	284	33.55 (7.74)	41.7	70.8	54.2
New Zealand	141	37.91 (10.59)	52.4	37.2	51.5
Philippines	628	35.82 (9.52)	53.5	63.0	5.1
Saudi Arabia	239	32.11 (7.87)	85.7	29.5	10.8
Taiwan	365	32.27 (7.93)	55.2	32.5	69.9
Turkey	148	31.81 (8.40)	53.8	40.4	23.5
United Kingdom	161	45.18 (9.72)	32.8	10.0	100.0
United States of America	145	34.01 (12.19)	48.4	29.2	55.1

completed outside work hours. It was stressed that completion and submission of the questionnaire was entirely voluntary and that answers were treated anonymously. The data collection method did not allow an exact calculation of response rates.

In total, 3,283 completed surveys with no missing information were returned. Data was available from samples in Argentina, Brazil, Egypt, Indonesia, Lebanon, Malaysia, New Zealand, Philippines, Saudi Arabia, Taiwan, Turkey, UK, and US. The sample sizes ranged between 75 in Egypt and 628 in the Philippines. The average sample size was 251.5. Table 1 reports more information about the demographic characteristics of the samples.

Instruments

Organizational Justice

We used the organizational justice measure developed by Colquitt (2001). This scale measures procedural, distributive, interpersonal and informational aspects of organizational justice. It has been developed and validated in the US (Colquitt, 2001; Judge & Colquitt, 2004). Answers were recorded on seven-point likert scales with the labels “(1) Not at all”, “(4) To some extent” and “(7) To a great extent”.

Participants were asked to respond to questions regarding some decision made in their workplace. Seven questions focused on procedural justice which was presented first. An example question is “Have those procedures been free of bias?” Interpersonal justice was measured with four items. The questions were directly related to supervisor/superior actions and an example question is “Has s/he treated you with dignity?” Informational justice focuses on the perceived adequacy of explanations given to respondents by their supervisor/superior and was measured with five items. An example question is “Has s/he explained the procedures leading to a decision thoroughly?” Distributive justice was presented last. Four items

Table 2 Sample score reliabilities (Cronbach's alpha)

	PJ	DJ	IPJ	IFJ	Average alpha
Argentina	.71	.89	.86	.91	.84
Brazil	.82	.92	.86	.89	.87
Egypt	.87	.95	.94	.92	.92
Indonesia	.86	.91	.88	.87	.88
Lebanon	.90	.94	.92	.94	.92
Malaysia	.88	.90	.92	.92	.90
New Zealand	.86	.89	.92	.90	.89
Philippines	.90	.94	.91	.91	.91
Saudi Arabia	.87	.89	.85	.94	.89
Taiwan	.89	.96	.95	.95	.94
Turkey	.88	.92	.89	.91	.90
UK	.90	.92	.96	.94	.93
US	.88	.91	.94	.92	.91

PJ procedural justice, *DJ* distributive justice, *IPJ* interpersonal justice, *IFJ* informational justice

measuring perceptions of the outcomes from decisions that are made in the organization were included. An example question is “Does the outcome of these decisions reflect the effort you have put into your work?”

The English version of the questionnaire (with adaptations to the local language and writing) was used in the US, UK, New Zealand as well as India, Malaysia and the Philippines. The English version was used in these contexts since English is an official language in these countries and is widely spoken in the business community. Arabic and English versions were simultaneously used in Lebanon, Egypt and Saudi Arabia. The English version was translated into Arabic (Saudi Arabia, Egypt, Lebanon), Portuguese (Brazil), Spanish (Argentina), Bahasa Indonesia (Indonesia), Mandarin (Taiwan) and Turkish (Turkey) using a series of translation–backtranslation and committee translation procedures. This combined method is superior to simple translation–backtranslation (Van de Vijver & Hambleton, 1996).

Table 2 displays the reliabilities per sample. As can be seen there, the overall reliabilities are all acceptable and beyond the commonly accepted threshold of .70 (Nunnally, 1978). In fact, the overall reliability across all samples and dimensions is .90, suggesting very good internal consistencies.

Country Level Indicators

We used scores for societal level cultural indicators measuring power distance/hierarchy and collectivism/embeddedness from both the GLOBE project (House et al., 2004) and Schwartz (1994, 2006). House et al. (2004) distinguish between ingroup collectivism (familism), institutional collectivism and power distance societal practices and values. We therefore tested effects for both societal practices and values. Data for all nations is available, except for Lebanon and Saudi Arabia. We therefore used averages for other Arabic samples as estimates for these two

countries. We repeated all analyses excluding these two countries and the patterns were similar.

Data Analysis

We tested whether the four-factor structure fitted in the individual samples fitted in comparison to a standard solution (see Fischer & Fontaine, 2010 for further discussions of options). We chose the US sample as the standard solution (since the questionnaire was developed in the US) and ran a multi-group CFA. We used maximum-likelihood estimation in LISREL 8.52. To evaluate fit, we used a number of fit indices in addition to the Chi-squared statistic which has been shown to have problematic properties (e.g., Bentler, 1990, Bentler & Bonnett, 1980; Bollen, 1989; Mulaik et al., 1989). First, the comparative fit index (CFI, Bentler, 1990) and the Tucker-Lewis Fit index (TLI) or non-normed-fit-index (Bentler & Bonnett, 1980) were used. The TLI has been found to be very robust and relatively sample size independent (Mulaik et al., 1989). Values ranging above .95 have traditionally been seen as indicating an acceptable fit (Hu and Bentler, 1999; Marsh, Balla, & McDonald, 1988). A second set of indices are lack of fit indices. The Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1992) is considered because it punishes less parsimonious models. A value of less than .05 is ideal, values ranging between .06 and .08 are acceptable and values larger than .10 indicate poor fit. Finally, the Standardized Root Mean Square Residual (SRMR) is used since it has been shown to be the most sensitive fit index detecting simple model misspecifications (Hu & Bentler, 1999). Values smaller than .08 are indicating approximate fit.

In line with traditional equivalence/invariance approaches in organizational and cross-cultural research (e.g., Fontaine, 2005; van de Vijver & Leung, 1997; Vandenberg & Lance, 2000), we compare increasingly restricted models. This analysis answers whether the instrument can be used in cross-cultural research and whether scores can be directly compared. The first level tested is configural or structural equivalence (indicating weak factorial invariance, Meredith, 1993). The loading patterns are constrained to be similar across groups. The next step is metric equivalence or measurement unit equivalence, tested by constraining the factor loadings to be identical across cultural groups. The next level is full score or scalar equivalence. Item intercepts are constrained to be identical across groups. Once this level of equivalence has been shown, scores can normally be directly compared across cultural groups. These levels of equivalence are the most important ones to be tested in cross-cultural research (van de Vijver & Leung, 1997; Vandenberg & Lance, 2000).

We used deterioration in model fit between the original four-dimensional model of justice and the hierarchically constrained models as indicators of misfit. Following Cheung and Rensvold (2000) and Little (1997), we used Δ TLI equal or less than .01 as indicating similarly fitting models.

Further Exploration of Cultural Differences

Additional levels of equivalence/invariance can be tested and are of theoretical interest for our purposes. First, invariance of uniqueness is interesting because it relates to reliability estimates of scores. It implies that the unique variance (measurement error) is identical across cultures. In case this assumption is rejected, the scales show different reliabilities across samples. This may be of some importance for practitioners as increased unreliability reduces validity and therefore may explain why justice is less strongly correlated with work variables in some contexts. We will further explore reliability differences (see below).

Finally, invariance of the latent variable variance/covariance matrix can be tested. In this case, the variances and covariances of the latent factors are constrained to be equal across groups. If these constraints do not lead to a substantive deterioration of model fit, intercorrelations between the latent factors are similar. In this case, individuals in all our samples do perceive justice in the same manner, independent of cultural background (Fontaine, 2005). If we have to reject equality of factor intercorrelations, we can proceed and test hypothesis 1. As above, we use the relative fit of each model and reject a model if the deterioration in model fit for $\Delta CFI/TLI$ is larger than .01.

To test our hypothesis 1, we used correlations. First, we averaged the latent correlations across four justice dimensions (see Tables 3, 4). We then correlated this average intercorrelation with the culture-level dimensions. If we found a significant correlation with the averaged factor correlation, we then explored the nature of the correlation by examining the correlations between pairs of latent justice factor correlations and the culture-level dimensions. We chose this strategy as there is a relatively large number of correlations that need to be run and our sample of

Table 3 Latent factor intercorrelations

	PJ × IPJ	PJ × IFJ	IPJ × IFJ	PJ × DJ	IPJ × DJ	IFJ × DJ	Average correlation
Argentina	.66	.73	.77	.36	.21	.11	.47
Brazil	.61	.61	.78	.57	.52	.56	.61
Egypt	.47	.64	.79	.54	.42	.64	.58
Indonesia	.54	.70	.65	.77	.53	.71	.65
Lebanon	.53	.63	.76	.71	.52	.71	.64
Malaysia	.63	.71	.77	.66	.53	.73	.67
New Zealand	.63	.68	.81	.71	.49	.61	.66
Philippines	.58	.66	.83	.73	.63	.73	.69
Saudi Arabia	.52	.61	.69	.62	.57	.66	.61
Taiwan	.64	.67	.81	.62	.56	.58	.65
Turkey	.73	.79	.83	.83	.68	.83	.78
UK	.49	.64	.72	.87	.42	.52	.61
US	.56	.66	.86	.68	.55	.67	.66

PJ procedural justice, *DJ* distributive justice, *IPJ* interpersonal justice, *IFJ* informational justice

Table 4 Correlations of average reliabilities and factor intercorrelations with country-level indicators

	Average alpha	Average factor intercorrelations
Hierarchy (vs. egalitarianism)	.22	.52*
Autonomy (vs. embeddedness)	-.17	.13
Power distance practices	-.34	-.01
Power distance values	.48	.07
Institutional collectivism practices	.34	.47
Ingroup collectivism practices	.03	.23
Institutional collectivism values	-.50*	-.34
Ingroup collectivism values	-.23	.50*

* $p < .05$

countries is relatively small, making family-wise error rates a threat to our analysis. It should be noted that this strategy is more conservative (because it may miss dimension-specific effects that are obscured in the average factor intercorrelation). We used Spearman rank-order correlations due to the non-normality of many country-level indicators and interpret correlations exceeding |.50|, indicating a large effect size.

Results

Testing the Four-Factor Structure (Research Question 1)

We first tested whether the four-dimensional structure fits in all 13 samples equally well. The multi-group analyses tested whether factor patterns, factor loadings, and factor intercepts are invariant or equivalent across cultural groups.

Using the US as reference group, we first tested whether factor loading patterns were similar across groups. This multi-group model fitted reasonably well: $\chi^2(2132) = 6238.56$, RMSEA = .088, TLI = .97, CFI = .97. All items in all samples loaded significantly on the expected factor. On average, each sample contributed about 7.69% to the overall χ^2 , except in the case of the Philippines (15.63). SRMR in each sample was below .08. In the case of the Philippines, the contribution to the χ^2 was relatively large, but the SRMR was the lowest.

Constraining the factor loadings to be identical next, the fit was acceptable: $\chi^2(2324) = 7060.53$, RMSEA = .09, TLI = .97, CFI = .97. The Δ TLI and Δ CFI were both 0, indicating no substantive decrease in fit between models. Only the RMSEA was at the higher end of acceptable fit. Again, the Philippines contributed more to the overall χ^2 than other samples (14.74%).

In the final step, we constrained item intercepts to be equal. The fit was still acceptable: $\chi^2(2564) = 7814.93$, RMSEA = .09, TLI = .97, CFI = .96. The deterioration of fit was only minimal (Δ TLI = 0, Δ CFI = .01). Again, the Filipino sample contributed relatively more to overall sample fit than other samples (13.83%). Levels of SRMR were comparable to the previous model (model B). The

net difference between the two models is less than .001 suggesting that constraining the intercepts did not strongly impact on residuals. Overall, this suggests that factor loadings and variables intercepts are sufficiently similar. This level of scalar or full score equivalence allows comparison of means across cultural groups. To examine the relative contribution of the Filipino sample to the model misfit, we correlated sample size with fit indicators for each sample. Sample size correlated strongly with χ^2 ($\rho = .89, p < .001$) and SRMR ($\rho = -.58, p < .05$). This confirms previous findings of sample size dependence of χ^2 and explains why the large Filipino sample was contributing relatively disproportional to the overall χ^2 . In summary, overall there is strong evidence that the four factors fit well across the 13 cultural samples included in our study.

Additional Invariance Tests

We tested two more models, one in which we constrained the unique variances to be invariant and a second model in which latent factor variances and covariances were constrained. First, the model testing for invariance in measurement error at the item level (unique variances) fitted considerably worse than the previous models: χ^2 (2804) = 17296.36, RMSEA = .14, TLI = .92, CFI = .91. Therefore, the fit was worse than for the previous model constraining only the intercepts (Δ TLI = .05, Δ CFI = .06). Overall, this suggests that reliabilities are different across cultural groups since measurement error is not invariant. We will explore these differences below.

The final model tested latent variable variance–covariance matrix equivalence. The fit of this model was somewhat worse than the fit for the model testing full score equivalence: χ^2 (2684) = 9633.43, RMSEA = .102, TLI = .96, CFI = .96. Although the differences for TLI and CFI were small (.01), RMSEA deteriorated above the threshold of .10. Overall, this indicates that correlations between the latent variables are not strictly equivalent. Since the lower levels of invariance were generally acceptable, this difference cannot simply be explained by measurement artefacts, but suggests some genuine differences in psychological processes. We can therefore proceed with testing our hypothesis 1.

Exploring Differences in Factor Intercorrelations (Hypothesis 1)

Correlating the average correlation across all four justice dimensions with country-level indicators, the correlation with ingroup collectivism values ($\rho = .50, p = .08$) and hierarchy (versus egalitarianism) values ($\rho = .52, p = .06$) had moderate effect sizes. Greater collectivism and hierarchy values were associated with stronger correlations, i.e., is greater similarity in justice perceptions. This supports hypothesis 1. This effect was particularly strong for the procedural justice–informational justice link and ingroup collectivism values ($\rho = .69, p < .05$), the procedural justice–distributive justice link and hierarchy values ($\rho = .61, p < .05$), and interpersonal justice–distributive justice links and hierarchy values ($\rho = .61, p < .05$). Overall, the pattern of results shows support for hypothesis 1.

Exploring Differences in Score Reliabilities

We followed a similar procedure as described for the intercorrelations. We first examined the correlations between the Cronbach alpha coefficients (average of the four alphas per dimension and sample, see Table 2) and the culture-level dimensions. Two effects were significant. The averaged alphas were correlated with institutional collectivism values ($\rho = -.50$, $p = .07$). Greater institutional collectivism values were associated with lower reliabilities for procedural justice ($\rho = -.55$, $p = .05$) and interpersonal justice ($\rho = -.58$, $p < .05$).

Discussion

Our study contributes to the literature in three ways. First, we provide a test of a widely used US scale across a wide range of cultural samples. We are the first to test these dimensions comprehensively in a larger number of non-Western samples, covering samples from all inhabited continents and all major cultural and religious groups in the world. The most important finding of our study is that this measure of justice is applicable across these cultural samples. The good fit for the four-dimensional structure provides broader support for claims that these dimensions are indeed empirically distinct. Employees around the world seem to make the same distinctions.

Second, we found that latent factor score variances and covariances differ across cultures. Our exploration of latent factor intercorrelations shows that in hierarchical and collectivistic settings justice dimensions are somewhat more strongly correlated. This provides support for our speculation that although individuals in all societies have the capacity to differentiate between the four dimensions (see the good fit of the four-dimensional structure in the multi-group analysis), there is less informative value contained in these justice perceptions for individuals in hierarchical and employees may therefore have a somewhat lower motivation to distinguish these latent variables. This fits our extensions of the relational model of authority (Tyler & Lind, 1992) to the perception of justice dimensions. This somewhat greater overlap in justice perceptions may have some practical implications. For example, behaviour of organizational decision-makers and managers is evaluated more holistically by employees in these contexts compared to more egalitarian and individualistic settings, where employees are motivated to make finer differentiations between individual justice components.

Third, we also found that score reliabilities are high, but not identical across cultural groups. The societal context has a significant and important influence on the measurement process. Schmitt and Allik (2005) reported that self-esteem measures showed higher reliability in more individualistic and lower reliability in more power distant settings. Here, we found somewhat similar effects. It is unclear what drives these effects. One reviewer provided an interesting hypothesis. Individuals in collectivistic societies are more concerned with fitting in. Therefore, they should be motivated to avoid extreme answers, which leads to restricted variance in more collectivistic and hierarchical societies (Johnson, Kulesa, Cho, & Shavitt, 2005;

Smith, 2004, 2011; Smith & Fischer, 2008). Variance restriction is one factor that can influence internal consistency measures such as Cronbach's alpha and correlations more generally. In line with this argument, we also found a significant correlation between the overall variance of the justice scores and in-group collectivism values ($\rho = -.64$, $p < .05$). In more collectivistic societies, the variance is more restricted. However, the same restriction of variance argument would imply that intercorrelations between factors are likely to be weaker in collectivistic societies. We found the exact opposite. As a consequence, it is unclear what accounts for these differences. Motivations to fit in collectivistic settings leading to restricted variance may be one factor, but this is inconsistent with other aspects of the data. In short, our study replicates previously noted effects (Schmitt & Allik, 2005), but we cannot offer a plausible explanation for the overall patterns in our data (increased factor correlations but decreased reliability in collectivistic settings). Clearly, we need more research on these effects, especially considering the implications for human resource initiatives because differential score reliabilities will influence confidence intervals and validities (Bollen, 1989). Differential effects of justice dimensions on variables (e.g., in regressions) may be due to differential reliabilities rather than substantive effects. We offered one option for investigating these effects and future work needs to extend our analyses.

Concerning data analysis, the statistical techniques used here are sophisticated but are now widely available in programmes such as LISREL, AMOS, MPlus and EQS. Application of these techniques in cross-cultural settings in conjunction with further data exploration (either using correlations as in our case or multi-level modelling) can be used to address important theoretical questions (see for example Lucas et al., 2008). We strongly recommend greater adoption of these techniques in cross-cultural justice work.

Limitations

We relied on fit indices when evaluating model fit. Judging misfit in multi-group analyses is ambiguous (Cheung & Rensvold, 2000; Vandenberg & Lance, 2000). We used deterioration in the fit indices as indicator of misfit, however, no significance tests (exact tests) are available and researchers have to rely on heuristics such as the Δ TLI equal or less than .01 criterion (Cheung & Rensvold, 2000). Second, it is possible that other items could be relevant for measuring justice across cultures. Issues of domain underrepresentation (Fontaine, 2005) cannot be ruled out through statistical testing. This requires qualitative enquiries in each cultural context to examine whether additional items are important for measuring each dimension of justice in the specific context. A third limitation is that the items are reasonably abstract. It is not clear whether the enactment of procedures such as providing appeal mechanisms or treating employees with dignity and respect entails the same behaviours across cultures (Leung & Tong, 2004; see Fischer, 2008 for a review). To date, there is little information on cultural enactment of these justice principles. This is a serious gap in the literature. Fourth, other principles within each dimension are plausible. The dimension that is best understood in a cross-cultural

context is distributive justice. The scale we used was based on the US research that only included an equity component. However, other principles such equality or need might be important and salient in different cultures. Fischer et al. (2007) developed such a distributive measure incorporating equality and need in addition to equity and reported significant correlations of need and equality, but not equity with both societal values and economic indicators. Future scale development exercise should pay attention to include alternative principles of relevance in non-Western contexts.

Finally, the sampling was based on convenience. Therefore, the samples were not directly matched across cultures. However, we believe this is not an issue. The countries in our study are at different stages of economic and industrial development. Restricting the sampling of participants to specific industries would not capture the diversity of economic activities within each of the countries. For our hypothesis we proposed specific cultural dimensions and we have selected samples so that they represent the whole spectrum of the relevant dimensions as best as possible. Therefore, we were able to test whether these cultural dimensions explain factor intercorrelations and score reliabilities across samples. Previous research has demonstrated that non-matching (e.g., due to industry, occupational and sample differences) is likely to attenuate cultural differences (Fischer & Chalmers, 2008; Fischer & Mansell, 2009; Schmitt, Allik, McCrae, & Benet-Martinez, 2007). Since we found significant effects of cultural dimensions despite the non-matching of industries and occupations, we can be relatively confident in the strength of the cultural effects.

Nevertheless, our study is an important step forward in justice research. We demonstrated that a widely used scale is applicable in different cultural contexts. We provide an example of testing the structure and applicability of the US scales in non-Western settings. The scale shows full score equivalence, allowing researchers to compare scores directly between countries. This is a major achievement and facilitates future work on cross-cultural differences in justice perceptions. However, we also found some systematic differences in factor intercorrelations. These findings point to some consistent, albeit weaker influence of culture on the experience and expression of justice.

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