

Original Research Article

Open Access

A Not-So-Brief Abbreviated Version of the Polish Inventory for Self-Efficacy and Externality in Comparison with the German Version

Julia Miczka*, Michaela Heinecke-Müller

Universität Koblenz, Germany

*Correspondence to: Julia Miczka, Universität Koblenz, Germany; Email: julia-miczka@hotmail.de

Abstract: This study validated the I-SEE-PL-12, a Polish version of the I-SEE-DE-12, measuring multidimensional control beliefs. Confirmatory factor analyses in Polish ($n = 351$) and German ($n = 506$) samples supported a four-factor model over a unidimensional structure. Reliability was acceptable ($\alpha = .752-.843$, $\omega = .762-.844$). Measurement invariance analyses confirmed configural and metric invariance across countries and genders, with partial scalar invariance due to one item. Internality and self-concept of ability correlated positively with positive affect and negatively with negative affect, whereas externality showed the reverse pattern. Age was associated with higher internality and lower externality, reflecting age-related differences rather than developmental change. These results demonstrate that the I-SEE-PL-12 is a valid, reliable, and largely invariant tool suitable for cross-cultural research on control beliefs. Practically, it offers researchers and practitioners a concise, theory-based measure for large-scale psychological surveys and cross-national comparisons, facilitating culturally sensitive assessment of control-related constructs.

Keywords: Control beliefs; Psychometric properties; Polish adaptation; Cross-national validation; Short scale

1. Introduction

Psychological control becomes especially pronounced at times of crisis. When uncertainty is high, people attempt to understand the means to achieve or prevent different outcomes - to see if their actions lead to competence (Fritsche, 2022; Preston & Wegner, 2005). Efforts to regain a sense of agency and avoid feelings of helplessness or powerlessness (Seligman, 1972), and whether their beliefs about outcomes are based on their competence and effort, others, or luck and fortune. Significant research shows that control beliefs, as self-referential thoughts, play a

key role in action, learning, development, adaptation, achievement, well-being, and recovery (Skinner, 1996). This growing interest in investigating those beliefs stimulated the creation of numerous measurement instruments, yet the search for quick and efficient data collection may limit deep understanding of such complex constructs (Credé et al., 2012; Krueger et al., 2013; Ziegler et al., 2014). Thus, researchers use increasingly ultra-brief questionnaires that require minutes to complete, and fit well into large-scale panel studies (DIW Berlin, 2023; Rammstedt & Beierlein, 2014; Specht et al., 2013).



© The Author(s) 2026. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, sharing, adaptation, distribution and reproduction in any medium or format, for any purpose, even commercially, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

While efficiency is an important quality of personality measures, a strong emphasis on brevity to represent control beliefs can jeopardize the construction of a fuller representation of the construct. Importantly, key conceptual components could easily be omitted and lost for the sake of efficiency. In turn, this pattern would encourage a WEIRD centred bias (Henrich et al., 2010; Hofstede Insights, 2022; Triandis, 2001) in which social, religious, and fatalistic views of reality were marginalized or devalued for competing in the manner of self-motivated striving, all of which come with social stigma for those who endorse them (Jakoby & Jacob, 1999). Cross-culturally, social and action psychology literature shows an accumulation of evidence in favor of broader and/or alternative perspectives of human control beliefs beyond a narrow focus on "me, myself, and I" (Fan et al., 2021; Stumpp et al., 2010). Cultural contexts deeply shape how psychological control is understood and enacted (Flammer et al., 1995; Greve et al., 2001; Ji et al., 2000; Jonas et al., 2009; Smith et al., 1995). For example, important others such as professionals, family, or politicians, might be seen as internal objects or parts of the self instead of external agencies (Agroskin & Jonas, 2013; Friesen et al., 2014; Fritsche, 2022; Greenaway et al., 2015; Stollberg et al., 2016; Zaccaro et al., 1995). The same holds for an ultimate source of power, such as God or fate, in which the position of either could be seen as both part of oneself or as distinct from the self, based on the worldview being applied or understood. (Kay et al., 2009, Kay et al., 2010).

Even if it is sometimes retorted that the external control dimensions undermine control beliefs, we should remember that these dimensions are not strange in Western societies. People's belief in their abilities to control chance in a critical future or illusory control is a complex matter (Fast et al., 2009; Langer, 1975; Leung et al., 2012; Whitson & Galinsky, 2008).

In this context, we introduce the I-SEE-PL-12, a contemporary and compact version of Krampen's (1991) Inventory for Self-Efficacy and Externality (I-SEE, known in German as FKK; Greve et al., 2001), as an extension of the already published German version I-SEE DE-12 (Miczka et al., 2024). The original FKK has made a significant contribution to research and psychometrics, very important and similar to the broader measures like the Big Five (Ng

et al., 2006). There is an important theoretical and research legacy leading back to Rotter's (1966) locus-of-control, Bandura's (1977) self-efficacy and action theories from Krampen (1988), where competence and control beliefs are theorized as a system of four generalized expectations that develop someone's sense of agency. These beliefs comprised two internal dimensions, self-concept of ability (S) and internality (I), and two external dimensions, powerful others (P), chance (C). These factors are reliable predictors for a variety of external criteria and relative immunity to the influences of social desirability. Two of the factors can be combined into two secondary factors (fundamentally: Self-Efficacy (SI) self-determined causal expectations and Externality (PC) the expectation that outcomes originate from others or a chance process). This particular level of ingenuity in the structure of factors allows the instrument to be transculturally adaptable - social, religious, and fatalistic perspectives tend to strengthen the cross-cultural validity of the instrument (van Haaften et al., 2004; Kay et al., 2010; Specht et al., 2011).

The current project reinvestigates an original measure using a new reference sample and validation procedures. Although shorter, the original measure has a culture-sensitive way to identify and detect longitudinal development, and resulted in a shorter measure of its Polish format, ready for applied practice. It is important at this stage to acknowledge previous analyses of the I-SEE model, which was published in 2024, using a German primary sample (Miczka et al., 2024).

2. Competence and Control Beliefs: Theoretical Foundations and Current Empirical Evidence

The German Inventory for Self-Efficacy and Externality (I-SEE-DE-12; Miczka et al., 2024) defines these dimensions with four integrity scales that warrant consideration as relatively independent constructs.

At first, externality was conceived as the conceptual inverse of internal control, between which we expected to find negative correlations. Nevertheless, continuing debates over the factor structure (Coombs & Schroeder, 1988; Hui & Triandis, 1983; Huizing, 2015) and empirical findings of moderate intercorrelations (e.g., Kovaleva et al., 2012), prompted more complex evaluations of internality and externality as correlating

but distinct parts, rather than simply opposites along one more continuum.

Past validation studies have shown that the FKK maintains coherent relationships to other instruments measuring control beliefs, self-concept, or other related personality traits (Krampen, 1991). Although correlations with general personality dimensions such as life satisfaction, extraversion, or neuroticism tend to be modest, the associations with action-oriented variables, such as political engagement, health behavior, and developmental cognitions, are notably stronger (Greve et al., 2001). More recently, the FKK's social relevance has been underscored by studies focusing on interpersonal trust and social adaptation (Kanning, 2023). As a measurement instrument, the original FKK has been reliable and valid, demonstrating Cronbach's α values between .70 and .89 across scales, split-half reliabilities between .64 and .82, and test–retest reliabilities from .68 to .87 over three months (Krampen, 1991). Provided evidence, the FKK was a robust and reliable measure in the German cultural context.

Despite these strengths, research on cross-cultural equivalence remained limited until recently. Studies applying the FKK across culturally diverse populations, such as in Germany and Kenya (Heinecke-Müller et al., 2022), confirmed that core dimensions like self-efficacy and internality reflect universal psychological needs for agency and control. Nonetheless, the question of how well the full four-factor structure transfers across cultures has remained open. Recent global trends have further simplified the concept of control beliefs toward a predominantly unidimensional understanding (Décieux et al., 2020; Judge et al., 2003; Luszczynska et al., 2005; Scholz et al., 2002). In contrast, the I-SEE maintains a more differentiated four-factorial approach, which aligns with transcultural models of personality integrating both self-related and relational components (Fan et al., 2021).

Building on these foundations, the I-SEE-DE-12 (Miczka et al., 2024), a condensed German version of the FKK, was developed to retain the richness of the original conceptualization while increasing efficiency for application in survey research. Recent empirical validation studies have confirmed that the I-SEE-DE-12 successfully replicates the original four-factor structure and demonstrates satisfactory internal consistency

(McDonald's ω ranging from .656 to .853) and retest reliability over three months (r_{tt} between .604 and .765). In addition, the shorter instrument maintains meaningful associations with external constructs, such as optimism, resilient coping, and well-being, which provide evidence for convergent validity and discriminant validity. Importantly, measurement invariance tests in the German sample confirmed that the factorial structure of the I-SEE-DE-12 is equivalent across gender groups. Observed correlations between age and control beliefs align with theoretical expectations: older participants tend to report higher internal control beliefs and lower external control beliefs. However, there is a demonstrably weaker relationship between control beliefs and educational attainment compared to other decades, which may reflect sociocultural changes that require further investigation (Miczka et al., 2024).

Given these results, a critical next step is to examine the cross-cultural relevance of the I-SEE-DE-12 in other national contexts. Specifically, this research is examining Poland (a country characterized by a unique historical and sociocultural background regarding control perceptions (Kijowska, 2018)). Ultimately, we are testing the factorial structure, reliability, and validity of the I-SEE-DE-12 in a Polish sample to see if the four-dimensional model of competence and control beliefs can be generalized beyond Germany.

3. Methods

I-SEE-PL-12: Confirmatory Factor Analysis, Reliability, and Construct Validity

Participants and Procedure

Initially, a measurement model was developed and tested using CFA. Weak items were determined and removed if necessary. Once an acceptable fit was determined, construct validity was examined. Convergent and discriminant validity were evaluated using correlations with target variables and comparison to the German version of the I-SEE-DE-12.

The Polish data were collected via an online survey administered between February and March 2025. The survey was open only to panel participants of a professional market research company and could be accessed through a unique invitation link (i.e., restricted access). Participants were recruited countrywide to achieve representativeness with respect

to age, gender, and education. They provided informed consent before completing the questionnaire and were compensated via a point-based incentive system proportional to questionnaire length. The survey items were presented in a fixed order, and all questions were mandatory to ensure complete data. Participants could withdraw from the survey at any time. About 4% of cases were excluded due to missing or inconsistent responses, resulting in a final Polish sample of 351 participants. The German reference sample (n = 1,013)

was obtained from Miczka et al. (2024). The target sample size for the Polish version was determined based on recommendations for structural equation modeling (SEM), which suggest a minimum ratio of 10 participants per estimated parameter or at least 200 participants for stable model estimation. Data collection continued until a sample exceeding these criteria was reached (approximately 350 valid responses), balancing statistical power, model stability, and available research resources (Wolf et al. 2015).

Table 1. Sample structure

(N =351)	Frequency or Mean (SD)	%
Age	43,95 (14,058)	
Gender		
Male	157	44,7
Female	192	54,7
Other	2	0,6
Education level completed^a		
CSE	58	16,5
GCSE	61	17,4
GCE/A-levels	227	6,7
Occupation^b		
Pupil	7	2
Student	14	4
Employee	214	61
Employer	15	4,3
Other	101	28,8

Note. ^aPolish graduation certificates from lower to higher, equivalent to: Certificate of Secondary Education (CSE), or General Certificate of Secondary Education (GCSE), General Certificate of Education Advanced Level (GCE A-levels). ^bIn the university sample, occupations were given at times and often indicated a side job rather than an occupation.

Measures

A dedicated short form of the Inventory of Self-Efficacy and Externality (I-SEE-DE-12; Miczka et al., 2024) was adapted for use in Poland (I-SEE-PL-12). The measure comprises 12 items across four subscales—Self-concept of ability (S), Internality (I), Powerful others (P), and Chance (C), assessed on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Higher scores on S and I indicate stronger internal control beliefs, whereas higher scores on P and C reflect stronger external control beliefs.

Positive and negative affect were measured using the Polish adaptation of the PANAS (Brzozowski, 2010), with 10 positive and 10 negative affect items rated on a 5-point scale (1 = very slightly or not at all, 5 =

extremely). Scale scores were computed as the mean of respective items, with higher values representing greater positive or negative affect.

Translation Procedure

The translation of the I-SEE-DE-12 into Polish followed the ITC (2017) and Beaton et al. (2000) guidelines. The procedure included (1) two independent forward translations by bilingual psychologists, (2) a synthesis and expert review to resolve discrepancies, (3) back-translation by a native German speaker unfamiliar with the original scale, and (4) pretesting on a small Polish sample (n = 30) to ensure clarity and conceptual equivalence. Minor linguistic adjustments were made based on participant feedback before final data collection.

Data Analyses

First, separate confirmatory analyses (CFA) were performed for the German and the Polish samples (see Table 2). Fit indices included RMSEA, SRMR, and CFI. Following Hu and Bentler (1999) and Schermelleh-Engel et al. (2003), model fit was considered good when $RMSEA < .06$, $SRMR < .08$, and $CFI > .95$. Additionally, χ^2 -test statistics and difference tests were reported. Given the relatively large sample sizes, changes in CFI ($\Delta CFI < .01$), RMSEA ($\Delta RMSEA < .015$), and SRMR ($\Delta SRMR < .030$ for metric, $< .015$ for scalar invariance) were prioritized over χ^2 significance (Chen, 2007; Cheung & Rensvold, 2002).

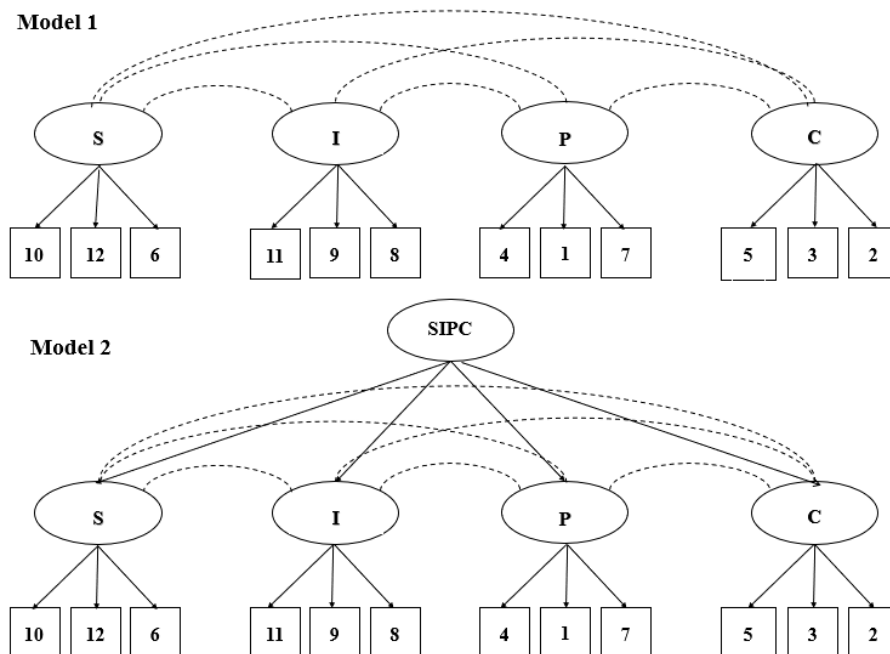
Whenever complete measurement invariance could not be established, partial invariance was examined. Model modification meant releasing equality constraints depending on the order in which modification indices pointed to the highest misfit. According to Vandenberg and Lance (2000; see also Putnick & Bornstein, 2016; Steenkamp & Baumgartner, 1998), a factor can be considered partially invariant if the majority of items in this factor are. All analyses were conducted using Mplus 8.3 (Muthén & Muthén, 1998–2017) with maximum likelihood (ML) estimation. Missing data (<4%) were handled via full information maximum likelihood (FIML). To assess the suitability of ML estimation, univariate and multivariate skewness and kurtosis of all items were inspected and considered

significant at an alpha level of $< .05$. Local model fit indices (e.g., standardized residuals and modification indices) are reported in Table 2. In cases of poor model fit, theoretically justified modifications were implemented and compared to baseline models.

The internal consistency of each subscale was assessed via McDonald's ω (McDonald, 1999) and Cronbach's α , enabling comparison with original FKK benchmarks. All additional statistical analyses were performed in IBM SPSS Statistics 29.0.

Model Specification

Next, group comparisons (German and Polish samples) were calculated to establish increasingly stringent invariance models (Vandenberg & Lance, 2000). To test for configural invariance, a multi-group model without equality constraints was applied (Model 1, followed by an examination of factor loadings across groups. To test the level of metric invariance, factor loadings were constrained to be equal across groups (Model 2). Last, intercepts of the indicators were forced to be equal across groups, as well (Model 3). Figure 1 displays the tested model structures. In the second-order model, the correlations among first-order factors are fully explained by the higher-order factor and were not freely estimated. The correlated four-factor model allowed free covariances among first-order factors. This distinction has been clarified to avoid ambiguity in model interpretation.



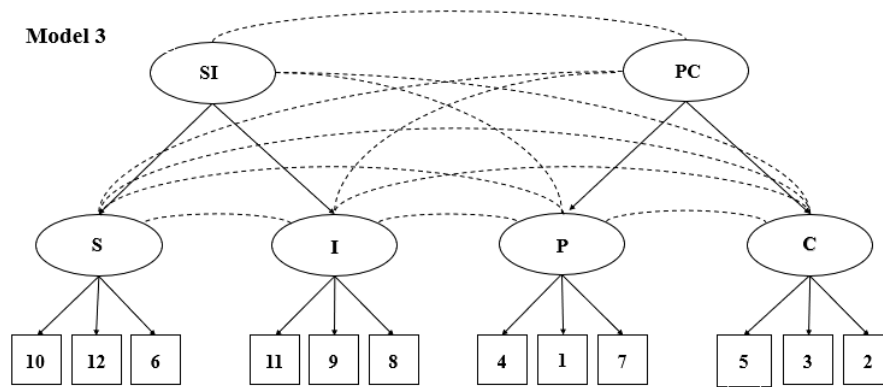


Figure 1 Hypothesized Models for CFA: Competence and Control Beliefs measured using I-SEE-PL-12.

4. Results

Measurement Model I-SEE-PL-12

First, the proposed measurement model was evaluated using 12 selected items a priori from the Polish version of the instrument ($n = 351$). These items were not empirically filtered, but represent the 12-item short form defined by Miczka et al. (2024), corresponding to the four theoretical dimensions of the original FKK. A confirmatory factor analysis (CFA) was conducted using the maximum likelihood (ML) estimator (Satorra & Bentler, 1994) across four primary scales, consistent with the description in the Method section. The fit indices for the correlated four-factor model (Model 1) indicated good model fit (see Table

2). According to the original FKK manual, a single overarching factor (Model 2) may be constructed for large-scale surveys when only one total score is needed. However, Krampen (1991) already considered this single-factor solution outdated, arguing that it fails to capture the construct’s multidimensional nature. Consistent with this, Model 2 showed a significantly poorer fit than Model 1 (Table 2). In contrast, Model 3 followed Krampen’s approach of forming two higher-order factors (SI and PC) based on the primary scales. While Model 3 differed significantly from Model 1, it still demonstrated a good overall fit. Therefore, Model 1 was retained as the final model for subsequent analyses.

Table 2. Confirmatory factor analysis: summary of goodness-of-fit indices from Germany (Miczka et.al. 2024) and Poland

Germany	w^2 (df)	w^2/df	CFI	TLI	SRMR	RMSEA [90% CI]	AIC	BIC
Sample n = 506								
Model 1	104.288***(48)	2.17	.963	.949	.042	.048 [.035–.061]	16,516.901	16,694.416
Model 2	367.842***(53)	6.94	.717	.647	.197	.127 [.117–.137]	17,007.606	17,163.988
Model 3	5.934 (51)	0.12	.961	.950	.044	.048 [.036–.060]	16,518.581	16,683.416
Poland	w^2 (df)	w^2/df	CFI	TLI	SRMR	RMSEA [90% CI]	AIC	BIC
Sample n = 350								
Model 1	126.163***(48)	2.63	.956	.940	.040	.068 [.054–.083]	12,291.985	12,453.938
Model 2	623.350***(53)	11.76	.681	.602	.218	.175 [.163–.488]	12,778.972	12,921.821
Model 3	129.244 (51)	2.534	.956	.943	.041	.066 [.052–.080]	12,288.866	12,439.437

Note: Models: (1) a four-factor first-order model specifying four intercorrelated factors for each I-SEE-DE-12 scale (self-concept of ability, internality, powerful others, chance); (2) a second-order model adding one general second-order factor (competence and control beliefs) to the four first-order factors, with their loadings forced to be equal; (3) a second-order model retracing the hypothesized original model (Greve et al., 2001; Krampen, 1991) with four first-order factors two second-order factors (self-efficacy and externality). The loadings of two of the primary factors were constrained to equal loadings according to the original model. Instead of using marker items, factor variance was fixed to 1.0 in order to define the latent variable metric in each model. The chi-square difference tests for models B and C were carried out in comparison with reference Model A in each sample, using the Satorra-Bentler correction. w^2 = Chi Square value; df = Degrees of Freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; SRMR = Standardized Root-Mean-Square Residual; RMSEA = Root Mean Square Error of Approximation; CI = Confidence Interval; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion. *For Model B of the student sample, the residual variance of item no. 1 was set to zero following the detection of a negative, albeit small, value ($e1 = -.066$; $p = .873$). * $p < .05$; ** $p < .01$; *** $p < .001$.

I-SEE-PL-12 Scale Characteristics

Factor loadings for the multifactorial model were all statistically significant and ranged from .52 to .84, indicating acceptable to strong item-factor relations (see Table 3 for detailed loadings). Internal consistencies were satisfactory: Self-concept of ability (S): $\alpha = .78$, $\omega = .79$; Internality (I): $\alpha = .84$, $\omega = .84$; Powerful Others (P): $\alpha = .75$, $\omega = .76$; Chance (C): $\alpha = .77$, $\omega = .78$. Mean scale values corresponded closely with those of the German validation sample (Krampen, 1991).

Measurement Invariance: German and Polish I-SEE

The single-group CFAs for the German and the Polish sample both showed good model fit, German sample: $\chi^2(48) = 205.721$, $p < .001$, CFI = .962, RMSEA = .057 [.049,.065], SRMR = .041. Polish sample: $\chi^2(48) = 125.163$, $p < .001$, CFI = .956, RMSEA = .068 [.054,.083], SRMR = .040 (the fit indices reported here correspond to those in **Table 3**).

Across both groups, results supported good model fit and configural invariance, indicating that the same factor structure held in both cultural contexts. The metric invariance model—in which factor loadings were constrained to equality—also demonstrated adequate fit, confirming that the strength of the relations between items and their latent factors was comparable in Germany and Poland. When intercepts were additionally constrained (scalar invariance, which requires that groups with the same latent trait level have the same expected item means), model fit declined ($\Delta\text{CFI} > .01$), leading to rejection of full scalar invariance. After releasing equality constraints for one Internality item (I25), the partial scalar invariance model—meaning that most, but not all, item intercepts were equal across groups—achieved an acceptable fit and was retained as the most parsimonious and interpretable solution.

Table 3 - Measurement Invariance – Germany and Poland

Model	χ^2	df	p_1	Compared with	$\Delta\chi^2$	Δdf	p_2	CFI	ΔCFI	RMSEA [90% CI]	SRMR
Germany	205.721	48	< .001					.962		.057 [.049-.065]	.041
Poland	125.028	48	< .001					.957		.068 [.053-.082]	.040
Baseline	331.884	96	< .001					.961		.060 [.053-.067]	.041
Model 1	248.713	48	< .001					.967		.055 [.049-.062]	.038
Model 2	350.591	104	< .001	Model 1	101.878	56	< .001	.959	.008	.059 [.052-.066]	.046
Model 3	454.795	112	< .001	Model 2	104.204	8	< .001	.943	.016	.067 [.061-.073]	.055
Model 3a	410.952	111	< .001	Model 2	67.977	7	< .001	.950	.009	.063 [.057-.070]	.053

Note. Group Germany = 1,013; group Poland = 351. Model 1 = configural invariance (all parameters estimated freely); Model 2 = metric invariance (factor loadings constrained equal); Model 3 = strong invariance (model 2 + intercepts constrained to be equal); Model 3a = partial strong invariance (model 2+ intercepts constrained equal except for I25). χ^2 = Chi Square; df = Degrees of Freedom; p_1 = probability value of model fit; p_2 = probability value obtained in χ^2 -difference test; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root-Mean-Square Residual; CI = Confidence Interval.

Measurement Invariance: Gender in Polish I-SEE

For gender-based invariance within the Polish sample, the female subgroup showed good model fit: $\chi^2(48) = 87.857$, $p < .001$, CFI = .959, RMSEA = .066 [.043,.087], SRMR = .051. The male subgroup initially showed a poorer fit: $\chi^2(48) = 112.618$, $p < .001$, CFI = .925, RMSEA = .093 [.071,.115], SRMR = .056. Modification indices suggested an error covariance between two Internality items (I25, I27). After allowing for this

covariance, the male model improved ($\chi^2(47) = 97.308$, $p < .001$, CFI = .941, RMSEA = .083 [.059,.106], SRMR = .053). Following Byrne (2013), such group-specific residual correlations do not preclude invariance testing.

Configural invariance across men and women was established (**Table 4**). Equality constraints on factor loadings confirmed metric invariance, and additional equality of intercepts indicated scalar invariance, as changes in fit indices remained within acceptable thresholds.

Table 4. Measurement invariance – Men and Women (Polish Sample)

Model	χ^2	df	p_1	Compared with	$\Delta\chi^2$	Δdf	p_2	CFI	ΔCFI	RMSEA [90% CI]	SRMR
Men	112.618	48	< .001					.925		.093 [.071-.115]	.056
Men I25I27	97.308	47	< .001					.941		.083 [.059-.106]	.053

Continuation Table:

Model	χ^2	df	p_1	Compared with	$\Delta \chi^2$	Δdf	p_2	CFI	ΔCFI	RMSEA [90% CI]	SRMR
Women	87.857	48	< .001					.959		.066 [.043-.087]	.051
Baseline	173.393	94	< .001					.957		.070 [.053-.086]	.050
Model 1	125.028	48	< .001					.957		.068 [.053-.082]	.040
Model 2	190.609	102	< .001	Model 1	65.581	54	.134	.952	.005	.071 [.055-.086]	.067
Model 3	208.120	110	< .001	Model 2	17.511	8	.025	.946	.006	.072 [.057-.086]	.071

Note. Group Men = 156; group Women = 192; other sexes summed up to $n < 5$. Model 1 = configural invariance (all parameters estimated freely); Model 2 = metric invariance (factor loadings constrained equal); Model 3 = strong invariance (model 2 + intercepts constrained to be equal). χ^2 = Chi Square; df = Degrees of Freedom; p_1 = probability value of model fit; p_2 = probability value obtained in χ^2 -difference test; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root-Mean-Square Residual; CI = Confidence Interval.

Construct Validity: Convergent and Discriminant Correlations

To assess construct validity, the I-SEE-PL-12 subscales were correlated with external psychological constructs (Table 5). Correlations were calculated using manifest scale scores (mean of item responses) rather than latent factor scores, as recommended for descriptive validation comparisons. Internality and Self-concept of ability correlated positively with

positive affect and negatively with negative affect, whereas Powerful Others and Chance showed the reverse pattern.

Age correlated positively with internality and negatively with externality factors, suggesting that older participants tend to report a stronger sense of internal control. Educational level showed weak associations with externality, consistent with previous research.

Table 5. Correlations of the I-SEE-DE-12 Scales with related constructs (Pearson r), age, and educational level (Spearman ρ)

Scale	Subscale	S	I	P	C	SI	PC
Well-being	Positive affect	.513**	.244**	-.107**	-.143*	.423**	-.147*
	Negative affect	-.264**	-.144**	.233**	.453**	-.233**	.386**
Education		.021	-.067	-.097	-.120*	-.046	-.129*
Age		.177*	.034*	-.147**	-.119*	.079	-.167**

Note: Education results from Poland graduation certificates from lower to higher, equivalent to: Certificate of Secondary Education (CSE), General Certificate of Secondary Education (GCSE), General Certificate of Education Advanced Level (GCE A-levels). * $p < .05$; ** $p < .01$; *** $p < .001$.

5. Discussion

The present study aimed to evaluate the psychometric properties and cross-cultural applicability of the I-SEE-PL-12, a Polish adaptation of the I-SEE-DE-12 (Miczka et al. 2024), which is a brief multidimensional measure of competence and control beliefs as reflected in Krampen’s (1991) original FKK model. Overall, the results provide strong evidence for the structural validity, reliability, and construct validity of the Polish version, and evidence for partial measurement invariance across cultures and genders.

Model Fit and Factor Structure

Confirmatory factor analyses (CFA) revealed that the four-factor correlated model (Model 1) consistently demonstrated good fit in both the

Polish and German samples. This supports the multidimensional conceptualization of control beliefs, which differentiates between internal (self-concept of ability, internality) and external (powerful others, chance) orientations. The superiority of this four-factor correlated model over the second-order Model 2 reinforces prior arguments against overly simplified, unidimensional representations of control constructs (Krampen, 1991; Greve et al., 2001).

Importantly, Model 2 represented a single second-order factor model, in which the four first-order dimensions loaded onto one overarching higher-order construct. This model captured a general control-belief factor but did not fit the data as well as the correlated four-factor model.

Model 3 was specified as a second-order two-factor model, not a bifactor model. In this specification, the four first-order dimensions (S, I, P, C) loaded onto two correlated second-order constructs: *self-efficacy (SI)* and *perceived control by powerful others/chance (PC)*. The term *bifactorial* is therefore not appropriate and has been replaced by the *second-order two-factor model*. This model also yielded an acceptable fit and supports the theoretical assumption that internal and external control orientations can be meaningfully grouped into higher-order factors. Such a representation may be especially useful for applied research contexts that require dimensional reduction while maintaining theoretical coherence. These findings align with the German validation study (Miczka et al., 2024) and confirm that the abbreviated I-SEE-12 structure can be replicated across cultures.

Reliability and Internal Consistency

In the Polish version, internal consistencies (Cronbach's α and McDonald's ω) were acceptable for all four subscales, confirming that the short form yields psychometrically robust and reliable scores. These coefficients were comparable to those of the German sample, supporting the notion that abbreviated yet theoretically guided scales can preserve essential measurement precision (Ziegler et al., 2014).

Measurement Invariance

Measurement invariance testing confirmed configural and metric invariance between the Polish and German samples, indicating that the I-SEE-12 measures the same latent constructs across these cultural contexts. Although full scalar invariance was not achieved, partial scalar invariance was established after freeing the intercept of one Internality item (I25). This suggests that subtle cultural or linguistic nuances may influence how this item is interpreted.

Similarly, within the Polish sample, gender-based analyses supported configural and metric invariance, with marginal evidence for scalar invariance. The lower fit indices in the male subgroup—improved by allowing correlated errors for two semantically similar Internality items—illustrate how small item-level redundancies can produce measurement differences across subgroups. Overall, the results support the robustness of the scale structure while highlighting the importance of refined translation and item design for ensuring conceptual equivalence.

Construct Validity

As expected, correlations between I-SEE-PL-12 scales and external constructs confirmed convergent and discriminant validity. Internality and self-concept of ability were positively related to positive affect and negatively related to negative affect, reflecting established links between internal control beliefs, resilience, and psychological well-being (Bandura, 1977; Skinner, 1996). Conversely, externality dimensions were associated with higher negative affect and lower positive well-being, consistent with theories of learned helplessness and reduced agency (Seligman, 1972).

Age correlated positively with internal control and negatively with external control, supporting theoretical accounts that self-regulatory competence and perceived agency typically increase with life experience (Brandtstädter & Renner, 1990; Ebner et al., 2006). Educational level was only weakly related to externality, which may reflect sociocultural changes that alter the functional meaning of education for control beliefs in contemporary societies (Miczka et al., 2024).

From a theoretical standpoint, the findings contribute to the broader discourse on the universality of control beliefs as a component of self-regulation. The cross-cultural comparability of the I-SEE-12 structure supports the assumption that the internal–external distinction represents a fundamental dimension of perceived control across contexts. At the same time, partial invariance points to culturally specific connotations of control-related language, underscoring the need for more nuanced approaches in cross-cultural psychometrics.

Practically, the validated short form enables efficient assessment of control beliefs in large-scale or cross-national surveys while maintaining conceptual richness. It can thus serve as a diagnostic and comparative tool for examining how control orientations relate to adaptation, motivation, and well-being across populations.

6. Limitations and Future Directions

Despite its strengths, the study has several limitations. Although the Polish sample was population-representative, further replications in diverse cultural contexts are needed to confirm the instrument's generalizability. The short format, while efficient, may

underrepresent specific facets of control—particularly those relevant in collectivist or religiously influenced settings. Future research should explore culturally sensitive extensions or adaptations of the I-SEE to capture such dimensions (Henrich et al., 2010; Fan et al., 2021).

Moreover, although partial scalar invariance supports the scale's overall comparability, item-level differences highlight the importance of conceptual equivalence beyond literal translation. Future psychometric work should therefore combine quantitative invariance testing with qualitative approaches (e.g., cognitive interviews) to ensure semantic and cultural alignment of control-related constructs.

7. Conclusion

To summarize, the I-SEE-PL-12 is a reliable, valid, and consistent tool for measuring control beliefs in the Polish population. It is structurally replicable across national and gender groups, and confirms the relevance of Krampen's four-factor model of a differentiated control to a cross-cultural research program on personality. In general, the I-SEE-PL-12 has some limitations with the scalar invariance, but they are not sufficiently serious in this instance to decrease the overall applicability of the tool. The I-SEE-PL-12 becomes a good resource when you are obtaining survey data where you must balance shortness with formal structure and a formally recognized definition of conceptual validity.

References

- [1] Agroskin, D., & Jonas, E. (2013). Controlling death by defending ingroups – Mediation insights into terror management and control restoration. *Journal of Experimental Social Psychology, 49*(6), 1144–1158.
<https://doi.org/10.1016/j.jesp.2013.05.014>
- [2] Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191–215.
<https://doi.org/10.1037/0033-295X.84.2.191>
- [3] Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine, 25*(24), 3186–3191.
<https://doi.org/10.1097/00007632-200012150-00014>
- [4] Brandtstädter, J., & Renner, G. (1990). Tenacious goal pursuit and flexible goal adjustment: Explication and age-related analysis of assimilative and accommodative strategies of coping. *Psychology and Aging, 5*(1), 58–67.
<https://doi.org/10.1037/0882-7974.5.1.58>
- [5] Byrne, B. (2013). Structural Equation Modeling with Mplus: Basic Concepts, Applications, and Programming. *Multivariate Applications Series*, Routledge.
- [6] Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*(3), 464–504.
<https://doi.org/10.1080/10705510701301834>
- [7] Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233–255.
https://doi.org/10.1207/S15328007SEM0902_5
- [8] Cohen, J. (1988). *Statistical power analysis for the Behavioral Science* (2nd ed.). Erlbaum.
- [9] Coombs, W. N., & Schroeder, H. E. (1988). Generalized locus of control: An analysis of factor analytic data. *Personality and Individual Differences, 9*(1), 79–85.
[https://doi.org/10.1016/0191-8869\(88\)90032-3](https://doi.org/10.1016/0191-8869(88)90032-3)
- [10] Credé, M., Harms, P., Niehorster, S., & Gaye-Valentine, A. (2012). An evaluation of the consequences of using short measures of the Big Five personality traits. *Journal of Personality and Social Psychology, 102*(4), 874–888.
<https://doi.org/10.1037/a0027403>
- [11] Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods, 1*(1), 16–29.
<https://doi.org/10.1037/1082-989X.1.1.16>
- [12] Décieux, J. P., Sischka, P. E., Schumacher, A., & Willems, H. (2020). Psychometrical properties of a French version of the General Self-efficacy Short Scale (ASKU). *Swiss Journal of Psychology, 79*(1), 15–25.
<https://doi.org/10.1024/1421-0185/a000233>
- [13] DIW Berlin [German Institute for Economic Research]. (2023, May 12). *SOEP survey papers*. DIW Berlin.
https://www.diw.de/en/diw_01.c.620272.en/publications/soep_survey_papers.html

- [14] Ebner, N. C., Freund, A. M., & Baltes, P. B. (2006). Developmental changes in personal goal orientation from young to late adulthood: From striving for gains to maintenance and prevention of losses. *Psychology and Aging, 21*(4), 664–678. <https://doi.org/10.1037/0882-7974.21.4.664>
- [15] Fan, W., Li, M., Leong, F., & Zhou, M. (2021). West meets East in a new two-polarities model of personality: self-relatedness structure with independent-interdependent functions. *Frontiers in Psychology, 12*, Article 739900. <https://doi.org/10.3389/fpsyg.2021.739900>
- [16] Fast, N. J., Gruenfeld, D. H., Sivanathan, N., & Galinsky, A. D. (2009). Illusory control: A generative force behind power's far-reaching effects. *Psychological Science, 20*(4), 502–508. <https://doi.org/10.1111/j.1467-9280.2009.02311.x>
- [17] Flammer, A., Ito, T., Lüthi, R., Plaschy, N., Reber, R., Zurbriggen, L., & Sugimine, H. (1995). Coping with control-failure in Japanese and Swiss adolescents. *Swiss Journal of Psychology, 54*(4), 277–288.
- [18] Flammer, A., & Scheuber-Sahli, E. (1995). Selective recall as an intervention to modify control-beliefs in an academic achievement setting. *Swiss Journal of Psychology, 54*(1), 50–56.
- [19] Friesen, J. P., Kay, A. C., Eibach, R. P., & Galinsky, A. D. (2014). Seeking structure in social organization: Compensatory control and the psychological advantages of hierarchy. *Journal of Personality and Social Psychology, 106*(4), 590–609. <https://doi.org/10.1037/a0035620>
- [20] Fritsche, I. (2022). Agency through the We: Group-based control theory. *Current Directions in Psychological Science, 31*(2), 194–201. <https://doi.org/10.1177/09637214211068838>
- [21] Greenaway, K. H., Haslam, S. A., Cruwys, T., Branscombe, N. R., Ysseldyk, R., & Heldreth, C. (2015). From “We” to “Me”: Group identification enhances perceived personal control with consequences for health and well-being. *Journal of Personality and Social Psychology, 109*(1), 53–74. <https://doi.org/10.1037/pspi0000019>
- [22] Greve, W., Anderson, A., & Krampen, G. (2001). Self-efficacy and externality in adolescence: Theoretical conceptions and measurement in New Zealand and German secondary school students. *Identity, 1*(4), 321–344. https://doi.org/10.1207/S1532706XID0104_02
- [23] Heinecke-Müller, M., Quaiser-Pohl, C., Kariuki, P. W., & Arasa, J. N. (2022). Feeling capable in an Ubuntu way: Kenyan comprehensions of control beliefs compared with the German perspective. *Open Psychology, 4*(1), 60–83. <https://doi.org/10.1515/psych-2022-0004>
- [24] Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences, 33*(2–3), 61–83. <https://doi.org/10.1017/S0140525X0999152X>
- [25] Hofstede Insights. (2022). *Country comparison*. <https://www.hofstede-insights.com/country-comparison/>
- [26] Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- [27] Hui, C. H., & Triandis, H. C. (1983). Multistrategy approach to cross-cultural research: The case of locus of control. *Journal of Cross-Cultural Psychology, 14*(1), 65–83. <https://doi.org/10.1177/0022002183014001005>
- [28] Huizinga, R. L. (2015). Who's controlling locus of control? Cross-cultural LOC usage. *International Journal of Leadership Studies, 9*(1), 76–88.
- [29] International Test Commission (ITC). (2017). *The ITC guidelines for translating and adapting tests (Second edition)*. *International Journal of Testing, 18*(2), 101–134. <https://doi.org/10.1080/15305058.2017.1398166>
- [30] Jakoby, N., & Jacob, R. (1999). Messung von internen und externen Kontrollüberzeugungen in allgemeinen Bevölkerungsumfragen [Measuring internal and external control beliefs in general population surveys]. *ZUMA-Nachrichten, 23*(45), 61–71. <https://nbn-resolving.org/urn:nbn:de:0168-ss0ar-208124>
- [31] Ji, L.-J., Peng, K., & Nisbett, R. E. (2000). Culture, control, and perception of relationships in the environment. *Journal of Personality and Social Psychology, 78*(5), 943–955. <https://doi.org/10.1037/0022-3514.78.5.943>

- [32] Jonas, E., Graupmann, V., Kayser, D. N., Zanna, M., Traut- Mattausch, E., & Frey, D. (2009). Culture, self, and the emergence of reactance: Is there a “universal” freedom? *Journal of Experimental Social Psychology*, 45(5), 1068–1080.
<https://doi.org/10.1016/j.jesp.2009.06.005>
- [33] Judge, T. A., Bono, J. E., & Thoresen, C. J. (2003). The Core Self- Evaluations Scale: Development of a measure. *Personnel Psychology*, 56, 303–331.
<https://doi.org/10.1037/t11289-000>
- [34] Kanning, U. P. (2023). *Inventar sozialer Kompetenzen (ISK)* (2nd ed.) [Inventory of social skills]. Hogrefe.
- [35] Kay, A. C., Gaucher, D., McGregor, I., & Nash, K. (2010). Religious belief as compensatory control. *Personality and Social Psychology Review*, 14(1), 37–48.
<https://doi.org/10.1177/1088868309353750>
- [36] Kay, A. C., Whitson, J. A., Gaucher, D., & Galinsky, A. D. (2009). Religious belief as compensatory control. *Current Directions in Psychological Science*, 18(5), 264–268.
<https://doi.org/10.1111/j.1467-8721.2009.01649.x>
- [37] Kijowska, M. (2018). Was ist mit den Polen los?. Porträt einer widersprüchlichen Nation. München:dtv.
- [38] Kovaleva, A., Beierlein, C., Kemper, C. J., & Rammstedt, B. (2012). *Eine Kurzskala zur Messung von Kontrollüberzeugung. Die Skala Internale-Externale-Kontrollüberzeugung-4 (IE-4)* [A short scale for measuring locus of control beliefs: The Internal-External Control Belief Scale]. GESIS Working Papers 2012(19). GESIS.
- [39] Krampen, G. (1988). Toward an action-theoretical model of personality. *European Journal of Personality*, 2(1), 39–55.
<https://doi.org/10.1002/per.2410020104>
- [40] Krampen, G. (1991). *Fragebogen zu Kompetenz- und Kontrollüberzeugungen (FKK)* [Inventory for self-efficacy and exte- rnal- ity]. Hogrefe.
- [41] Krampen, G. (2005). Psychology of control and personality. In W. Greve, K. Rothermund, & D. Wentura (Eds.), *The adaptive self: Personal continuity and intentional self-development* (pp. 97– 115). Hogrefe & Huber Publishers.
- [42] Kruyen, P. M., Emons, W. H. M., & Sijtsma, K. (2013). On the shortcomings of shortened tests: A literature review. *International Journal of Testing*, 13(3), 223–248.
<https://doi.org/10.1080/15305058.2012.703734>
- [43] Langer, E. J. (1975). The illusion of control. *Journal of Personality and Social Psychology*, 32(2), 311–328.
<https://doi.org/10.1037/0022-3514.32.2.311>
- [44] Leung, K., Lam, B. C. P., Bond, M. H., Conway, L. G. III, Gornick, L. J., Amponsah, B., Boehnke, K., Dragolov, G., Burgess, S. M., Golestaneh, M., Busch, H., Hofer, J., Espinosa, A. C. D., Fardis, M., Ismail, R., Kurman, J., Lebedeva, N., Tatarko, A. N., Sam, D. L., .. . Zhou, F. (2012). Developing and evaluating the social axioms survey in eleven countries: Its relationship with the five-factor model of personality. *Journal of Cross-Cultural Psychology*, 43(5), 833–857.
<https://doi.org/10.1177/0022022111416361>
- [45] Luszczynska, A., Scholz, U., & Schwarzer, R. (2005). The General Self-efficacy Scale: Multicultural validation studies. *The Journal of Psychology*, 139(5), 439–457.
<https://doi.org/10.3200/JRLP.139.5.439-457>
- [46] McDonald, R. P. (1999). *Test theory: A unified treatment*. Erlbaum.
<https://doi.org/10.4324/9781410601087>
- [47] Miczka, J., Heinecke-Müller, M., & Boer, D. (2024). *Introducing the I-SEE-DE-12: A not-so-brief abbreviated version of the German Inventory for Self-efficacy and Externality* (Supplementals).
https://osf.io/wsy2a/?view_only=a0ff286ae826448aab88b264603c8cad
- [48] Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus-user’s guide* (8th ed.). Muthén & Muthén.
- [49] Ng, T. W. H., Sorensen, K. L., & Eby, L. T. (2006). Locus of control at work: A meta-analysis. *Journal of Organizational Behavior*, 27(8), 1057–1087.
<https://doi.org/10.1002/job.416>
- [50] Nye, C. D., & Drasgow, F. (2011). Effect size indices for analyses of measurement equivalence: Understanding the practical importance of differences between groups. *Journal of Applied Psychology*, 96(5), 966–980.
<https://doi.org/10.1037/a0022955>
- [51] Putnick, D. L., Bornstein, M.H. (2016). Measurement invariance conventions and reporting: The state of the

- art and future directions for psychological research, *Developmental Review*, Volume 41, 2016, Pages 71–90, <https://doi.org/10.1016/j.dr.2016.06.004>.
- [52] Preston, J., & Wegner, D. M. (2005). Ideal agency: The perception of self as an origin of action. In A. Tesser, J. Wood, & D. Stapel (Eds.), *On building, defending, and regulating the self* (pp. 103–125). Psychology Press.
- [53] Rammstedt, B., & Beierlein, C. (2014). Can't we make it any shorter? The limits of personality assessment and ways to overcome them. *Journal of Individual Differences*, 35(4), 212–220. <https://doi.org/10.1027/1614-0001/a000141>
- [54] Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80(1), 1–28. <https://doi.org/10.1037/h0092976>
- [55] Satorra, A., & Bentler, P. M. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. von Eye & C. C. Clogg (Eds.), *Latent variables analysis: Applications for developmental research* (pp. 399–419). SAGE.
- [56] Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research*, 8(2), 23–74.39.3.127
- [57] Scholz, U., Gutiérrez Dona, B., Sud, S., & Schwarzer, R. (2002). Is general self-efficacy a universal construct? Psychometric findings from 25 countries. *European Journal of Psychological Assessment*, 18(3), 242–251. <https://doi.org/10.1027/1015-5759.18.3.242>
- [58] Seligman, M. E. P. (1972). Learned helplessness. *Annual Review of Medicine*, 23(1), 407–412. <https://doi.org/10.1146/annurev.me.23.020172.002203>
- [59] Skinner, E. A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology*, 71(3), 549–570. <https://doi.org/10.1037/0022-3514.71.3.549>
- [60] Smith, P. B., Trompenaars, F., & Dugan, S. (1995). The Rotter Locus of Control Scale in 43 countries: A test of cultural relativity. *International Journal of Psychology*, 30(3), 377–400. <https://doi.org/10.1080/00207599508246576>
- [61] Specht, J., Egloff, B., & Schmukle, S. C. (2011). The benefits of believing in chance or fate: External locus of control as a protective factor for coping with the death of a spouse. *Social Psychological and Personality Science*, 2(2), 132–137. <https://doi.org/10.1177/1948550610384635>
- [62] Specht, J., Egloff, B., & Schmukle, S. C. (2013). Everything under control? The effects of age, gender, and education on trajectories of perceived control in a nationally representative German sample. *Developmental Psychology*, 49(2), 353–364. <https://doi.org/10.1037/a0028243>
- [63] Steenkamp, J.-B. E. M., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research*, 25(1), 78–90. <https://doi.org/10.1086/209528>
- [64] Stollberg, J., Fritsche, I., Barth, M., & Jugert, P. (2016). Extending control perceptions to the social self: Ingroups serve the restoration of control. In M. Bukowski, I. Fritsche, M. Kofta, & A. Guinote (Eds.), *Coping with lack of control in a social world* (pp. 133–150). Routledge.
- [65] Stumpp, T., Muck, P. M., Hülshager, U. R., Judge, T. A., & Maier, G. W. (2010). Core Self-Evaluations in Germany: Validation of a German measure and its relationships with career success. *Applied Psychology*, 59(4), 674–700. <https://doi.org/10.1111/j.1464-0597.2010.00422.x>
- [66] Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of Personality*, 69(6), 907–924. <https://doi.org/10.1111/1467-6494.696169>
- [67] Vandenberg, R.J., Lance, C.E. (2000) A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods*. 2000;2:4–69. doi: 10.1177/109442810031002.
- [68] Van Haaften, E. H., Zhenrong, Y., & van de Vijver, F. J. R. (2004). Human resilience in a degrading environment: A case study in China. *Asian Journal of Social Psychology*, 7(2), 205–219. <https://doi.org/10.1111/j.1467-839x.2004.00142.x>
- [69] Whitson, J. A., & Galinsky, A. D. (2008). Lacking

control increases illusory pattern perception. *Science*, 322(5898), 115–117.

<https://doi.org/10.1126/science.1159845>

- [70] Wolf EJ, Harrington KM, Clark SL, Miller MW. Sample Size Requirements for Structural Equation Models: An Evaluation of Power, Bias, and Solution Propriety. *Educ Psychol Meas.* 2013 Dec;76(6):913-934. doi: 10.1177/0013164413495237. PMID: 25705052; PMCID: PMC4334479.
- [71] Zaccaro, S. J., Blair, V., Peterson, C., & Zazanis, M. (1995). Collective efficacy. In G. Mason (Ed.), *Self-efficacy, adaptation, and adjustment* (pp. 305–328). Plenum Press.
https://doi.org/10.1007/978-1-4419-6868-5_11
- [72] Ziegler, M., Kemper, C. J., & Kruey, P. (2014). Short scales—Five misunderstandings and ways to overcome them. *Journal of Individual Differences*, 35(4), 185–189.
<https://doi.org/10.1027/1614-0001/a000148>

Acknowledgments

The authors wish to thank Günter Krampen for sharing his wisdom and his friendly support of our work.

Conflict of Interest

The authors report that there are no competing interests

to declare.

Publication Ethics

This study was conducted in accordance with the Declaration of Helsinki principles and received ethical approval from the ethics committee at the University of Koblenz.

Open Science

Open Data: We confirm that there is sufficient information for an independent researcher to reproduce all the reported results with the data and codebook shared (Miczka et al., 2024, 2025). **Open Materials:** We confirm that there is sufficient information for an independent researcher to reproduce all of the reported methodology. Please note that most materials are copyrightprotected (Miczka et al., 2024, 2025). **Open Analytic Code:** We confirm that all the scripts, code, and outputs necessary to reproduce the results are provided (Miczka et al., 2024, 2025). To obtain the data or analyses, please contact us.

Funding

Open access publication enabled by the University of Koblenz.