ISSN online 1688-4221

Ciencias Psicológicas January-June 2025; 19(1), e-4074
DOI: 10.22235/cp.v19i1.4074

Cognitive rigidity and theatrical improvisation practice time as predictors of empathy dimensions

Rigidez cognitiva y tiempo de práctica de improvisación teatral como predictores de las dimensiones de la empatía

Rigidez cognitiva e tempo de prática de improvisação teatral como preditores das dimensões de empatia

Gianfranco Baldeon[1]
Agustín Espinosa[1]

[1] Pontificia Universidad Católica del Perú

Received: 05/20/2024
Accepted: 04/22/2025

Correspondence:
Gianfranco Baldeon
baldeon.g@pucp.edu.pe

How to cite:
Baldeon, G., & Espinosa, A. (2025). Cognitive rigidity and theatrical improvisation practice time as predictors of empathy dimensions. *Ciencias Psicológicas*, *19*(1), e-4074. https://doi.org/10.22235/cp.v19i1.4074

Data Availability:
The dataset supporting the results of this study is available in the OSF repository: https://osf.io/u2rzk/

Funding: Completed with financial support from the Program to Support the Development of Undergraduate Theses (PADET) of the Pontificia Universidad Católica del Perú.

Abstract: A possible relationship between theatrical improvisation practice and empathy has been suggested from some qualitative studies. The aim of this study was to analyze the statistical contribution of theatrical improvisation practice time and cognitive rigidity on empathy using the Affect-Cognition model within a statistical framework. The participants were 204 young and adult residents of Lima, of which 51 % practiced theatrical improvisation and 49 % were women. Non-probabilistic sampling and path analysis were used. The results indicate that the variables investigated can be integrated in a statistical model with a good fit, where the practice of improvisation contributes directly to Fantasy and indirectly to Perspective Taking, mediated by Rigidity. The results provide evidence in favor of the application of the Affect-Cognition model in the Latin American context and are compared with qualitative studies of improvisation and empathy. Practical implications on the role of theatrical improvisation and theoretical implications on the prediction of empathy are analyzed.
Keywords: theatrical improvisation; cognitive rigidity; empathy; affect-cognition model

Resumen: Se ha sugerido una posible relación entre práctica de improvisación teatral y empatía a partir de algunos estudios cualitativos. El objetivo de este trabajo fue analizar la contribución estadística del tiempo de práctica de improvisación teatral y rigidez cognitiva sobre la empatía, desde el modelo del afecto a la cognición de la empatía en un modelo estadístico. Los participantes fueron 204 jóvenes y adultos residentes de Lima, de los cuales el 51 % practicaba la improvisación teatral y el 49 % eran mujeres. Se usó un muestreo no probabilístico y un análisis de senderos. Los resultados indican que las variables investigadas pueden integrarse en un modelo estadístico y de buen ajuste, donde la práctica de improvisación contribuye directamente en las dimensiones de fantasía e indirectamente en toma de perspectiva, mediado por la rigidez. Los resultados aportan evidencia a favor de la aplicación del modelo del afecto a la cognición en el contexto latinoamericano y son comparados con los estudios cualitativos de improvisación y empatía. Las implicancias prácticas sobre el rol de la improvisación teatral y las implicancias teóricas sobre la predicción de las dimensiones de la empatía son analizadas.
Palabras clave: improvisación teatral; rigidez cognitiva; empatía; modelo del afecto a la cognición

Resumo: Uma possível relação entre a prática de improvisação teatral e a empatia foi sugerida a partir de alguns estudos qualitativos. O objetivo deste estudo foi analisar a contribuição estatística do tempo de prática de improvisação teatral e da rigidez cognitiva sobre a empatia, a partir do modelo do afeto à cognição da empatia, em um modelo estatístico. Os participantes foram 204 jovens e adultos residentes em Lima, dos quais 51 % praticavam a improvisação teatral e 49 % eram mulheres. Foram utilizadas uma amostragem não probabilística e uma análise de caminhos. Os resultados indicam que as variáveis investigadas podem ser integradas em um modelo estatístico com um bom ajuste, no qual a prática da improvisação contribui diretamente para as dimensões de fantasia e indiretamente para a tomada de perspectiva, mediada pela rigidez. Os resultados fornecem evidências a favor da aplicação do modelo do afeto à cognição no contexto latino-americano e são comparados com estudos qualitativos de improvisação e empatia. São analisadas as implicações práticas sobre o papel da improvisação teatral e as implicações teóricas sobre a predição das dimensões da empatia.
Palavras-chave: improvisação teatral; rigidez cognitiva; empatia; modelo do afeto à cognição

Introduction

Empathy from Davis's Multidimensional Model

According to Fernández-Pinto et al. (2008), two main approaches have been identified in the history of empathy research: the cognitive versus affective perspective, and the integrative approach viewing empathy as both cognition and emotion. The first approach is characterized by various conceptualizations that emphasize either the cognitive or the affective dimension of empathy; in contrast, the second approach encompasses conceptualizations that integrate both dimensions. From this integrative standpoint, Davis (1980) proposed that empathy consists of a set of cognitive and emotional reactions in an observer who perceives another's experiences. He further described empathy as a complex, multidimensional construct comprising four components: perspective-taking, defined as the tendency to adopt others' viewpoints; fantasy, reflecting the inclination to identify with fictional characters in books, films, or theatrical works; empathic concern, which involves feeling compassion, care, and warmth in response to others' negative experiences; and personal distress, referring to the propensity to feel discomfort or anxiety at others' suffering. The first two components are considered cognitive, while the latter two belong to the affective domain. Although subsequent integrative conceptualizations share Davis's vision, they sometimes include additional dimensions or frame empathy as a dynamic process. For example, Decety and Jackson (2004) incorporate mental flexibility and emotion regulation into their model.

To measure these four facets, Davis (1983) developed the Interpersonal Reactivity Index (IRI), which has become one of the most widely used scales in empathy research (Fernández-Pinto et al., 2008; Israelashvili & Karniol, 2018). One methodological trend has been to compute an overall empathy score by averaging two or more IRI subscales. For instance, some studies examining prejudice and empathy have averaged all four components—perspective-taking, empathic concern, fantasy, and personal distress—to yield a single empathy measure (Álvarez-Castillo et al., 2018; Bäckström & Björklund, 2007), whereas others have averaged only the cognitive subscales (Díaz-Lázaro et al., 2014; Díaz-Lázaro & Toro-Alfonso, 2013; McFarland, 2010; Nicol & Rounding, 2013). However, this approach poses three main problems: first, by combining cognitive and affective components, it obscures the independent contributions of each dimension to other variables; second, by selectively omitting fantasy and/or personal distress from certain composites, it nullifies the specific relevance of those factors; and third, by collapsing all subscales into one score, it prevents any analysis of the interrelations among the distinct components of empathy (Israelashvili & Karniol, 2018).

Empathy from the Affect-to-Cognition Model

Israelashvili and Karniol (2018) noted that it remains unclear whether affective factors precede cognitive ones in empathy, as empirical findings have been inconsistent. To address this, they tested two statistical models based on Davis (1980) multidimensional framework. Their results provided stronger support for a model in which affective components influence cognitive ones, leading them to propose the Affect-to-Cognition Model of Empathy. In this model, empathic concern and personal distress independently predict perspective-taking and fantasy. They argue that empathic concern and personal distress arise when one perceives another's difficulty: concern fosters perspective-taking, whereas distress inhibits it (Israelashvili & Karniol, 2018).

A key theoretical contribution of the Affect-to-Cognition Model is that it establishes both conceptual and empirical links among the empathy components, thereby enhancing the precision of related research and interventions. Methodologically, the model restores the complete and independent use of all four IRI subscales, preserving empathy's multidimensional conceptualization instead of collapsing them into a single aggregate score.

However, despite using multiple samples, the Affect-to-Cognition Model has only been empirically tested by Israelashvili and Karniol (2018). Nonetheless, the model aligns with neuroscientific research showing that affective components of empathy develop earlier than cognitive ones and constitute the initial subjective experience of empathy (Decety & Holvoet, 2021; Lamm et al., 2007). Another limitation is that the predictive relationship between affective components and fantasy remains conceptually ambiguous. Although not consistently supported across Israelashvili and Karniol's three samples, this link merits further theorizing to bolster the model's coherence.

It is possible that personal distress triggers the activation of fantasy as a means of regulating stress or anxiety in response to another's difficult situation (Shiota & Nomura, 2022). This interpretation is consistent with research showing that imagination or fantasy can be employed as a coping mechanism under conditions of stress or uncertainty (Rubinstein et al., 2021; Rubinstein et al., 2023).

Likewise, empathic concern may enhance fantasy or identification with others to better understand their emotions and thus reduce one's own discomfort. This is consistent with research linking fantasy to emotion recognition (Bukach et al., 2018; Namba et al., 2021) and correlating empathic concern with emotional recognition (Israelashvili et al., 2020).

Thus, although both personal distress and empathic concern may positively predict fantasy, the underlying motivations differ—emotion regulation versus emotional comprehension—with empathic concern typically exerting a stronger effect (β = .38 to .50) than personal distress (β = .15 to .22) (Israelashvili & Karniol, 2018). Personal distress may exert a weaker influence on fantasy because individuals can also mitigate distress by avoiding the stressor (Israelashvili & Karniol, 2018). Additionally, personal distress and empathic concern often correlate positively, as both arise from emotional reactions to similar situations (Davis, 1983; Israelashvili & Karniol, 2018; Israelashvili et al., 2020).

Cognitive Rigidity: A Direct Predictor of Empathy

In order to develop interventions to promote empathy, some studies have identified its predictors (Guilera et al., 2019; Song & Shi, 2017). However, few research studies have examined predictors of empathy considering the affect-to-cognition model of empathy due to its relative novelty (Israelashvili & Karniol, 2018; Israelashvili et al., 2020). While personality research has pinpointed predictors for each empathy facet, these predictors have not been integrated into a unified statistical framework. Openness to experience is particularly relevant, as it influences all empathy facets—especially perspective-taking and personal distress—showing greater stability and effect size in this regard (Guilera et al., 2019; Melchers et al., 2016; Song & Shi, 2017).

Cognitive rigidity, which integrates openness to experience and other individual differences, is defined as a cognitive style and capacity marked by a heightened need to resolve uncertainty, complexity, and ambiguity, and a preference for certainty, structure, order, and closure; with openness to experience being a negative expression of rigidity (Jost et al., 2009; Jost et al., 2003; Rottenbacher, 2012a). Cognitive rigidity may negatively impact perspective taking by reducing or inhibiting openness to others' thoughts and emotions in complex or uncertain contexts, thereby undermining cognitive needs for certainty and order. This view is corroborated by evidence that openness to experience predicts perspective taking (Di Fabio & Kenny, 2021; Levin et al., 2016; Song & Shi, 2017) and aligns with Decety and Jackson (2004), theory that empathic understanding requires mental flexibility.

Cognitive rigidity's contribution to personal distress may be explained by viewing personal distress as a manifestation of rigidity in interpersonal contexts. The distress that arises in response to others' crises likely reflects the perception of those situations as uncertain and unpredictable stimuli - that rigid individuals seek to avoid or minimize (Davis, 1980; Rottenbacher, 2012a). This interpretation is consistent with prior evidence showing that openness to experience -a low cognitive rigidity indicator- negatively predicts personal distress (Song & Shi, 2017).

Theatrical Improvisation Practice: Direct and Indirect Predictor of Empathy

Certain interventions impact not only cognitive rigidity but also empathy facets. Meta-analytic reviews indicate that mindfulness and theater training enhance empathy (Hu et al., 2022; Lewandowska & Węziak-Białowolska, 2022). Theater practice is especially pertinent, as it affects both cognitive and affective empathy facets as well as related social and communication skills (Schmidt et al., 2021). Theatrical Improvisation, in particular, is defined as a theater technique—practiced individually or in groups—entailing the spontaneous creation of scenarios, narratives, or performances based on ongoing agreements among improvisers, collaborators, and/or audience (Argentino, 2013).

Regarding the influence of improvisation practice on cognitive rigidity, in two experiments with samples of university students it was found that this practice decreased the levels of two expressions of cognitive rigidity, which is explained by the comfortable encounters with uncertainty or ambiguity, in addition to the demand for cognitive flexibility that continuous improvisation practice implies (Baldeon & Espinosa, 2024; Felsman et al., 2020; Felsman et al., 2023; Hainselin et al., 2018; Lewis, 2012; Lewis & Lovatt, 2013). If personal distress reflects rigidity, improvisation should likewise reduce distress. Indeed, quantitative studies report that improvisation lowers anxiety levels (Felsman et al., 2019; Felsman et al., 2023). Complementarily, from a qualitative approach, perceptions that improvisation reduces stress and even personal distress have been reported (Stewart, 2016; Zelenski et al., 2020).

Regarding the contribution of improvisation practice on perspective taking, although there is no quantitative evidence of this correlation or prediction, from a qualitative approach, there have been reports of perceptions of perspective taking learning and higher levels of empathy in Peruvian adolescents (Bachani, 2020) and U.S. undergraduates (Stewart, 2016) who practiced improvisational theatre, which is explained by perceptions of greater listening, consideration and understanding of other people after practicing improvisation. Furthermore, two core improvisation principles—active listening and unconditional acceptance—are proposed to foster perspective-taking skills by promoting emotion recognition and acceptance (Cai et al., 2019; Davis, 1980; Shivarajan & Andrews, 2021).

Finally, although no studies have directly examined improvisation's effect on the fantasy subscale, it is possible that regular identification with fictional characters enhances fantasy levels. This hypothesis is supported by findings of significant fantasy differences between general populations and those practicing role-play techniques (Rivers et al., 2016; Schmidt et al., 2021). Notably, existing improvisation research has focused on practice effects rather than cumulative practice, underscoring the need to examine practice time.

The importance of researching empathy and its associated factors

Historically, conflicts have persisted worldwide. As of February 2024, over 240,000 deaths have been attributed to armed conflicts in Gaza and Ukraine (Khatib et al., 2024; The Lancet, 2023). Promoting a culture of peace to prevent violent conflict and resolve disputes through dialogue is therefore imperative (United Nations Educational, Scientific and Cultural Organization, 2002). Empathy plays a crucial role in both personal and social transformation toward peace (de Rivera et al., 2011). However, global challenges—such as the COVID-19 pandemic and financial crises—have heightened anxiety and stress, potentially diminishing empathy (Arceneaux, 2017; Nair et al., 2024; Nitschke & Bartz, 2023). Investigating strategies to counteract these effects and foster empathy -and, by extension, peace- is thus paramount.

In Peru, discrimination remains a persistent conflict. National surveys report that one in three Peruvians has experienced discrimination, 53 % perceive their compatriots as racist, and 63 % of LGBTI individuals report discrimination (Instituto Nacional de Estadística e Informática (2017, 2019; Ministerio de Cultura, 2018). Prejudice is a key explanatory factor (Agadullina et al., 2022; Pauwels & Williamson, 2022).

McFarland (2010) identified empathy as one of the three major predictors of generalized prejudice, although subsequent findings have been mixed (Álvarez-Castillo et al., 2018; Bäckström & Björklund, 2007; Díaz-Lázaro & Toro-Alfonso, 2013; Nicol & Rounding, 2013). Interventions aimed at promoting empathy have also been reported to reduce prejudice (Matera et al., 2021; Miklikowska, 2018; Olivier et al., 2019; Suarez et al., 2024; Vezzali et al., 2015) , but prejudice is also shaped by political conservatism, socioeconomic context, historical factors and other variables (Esponisa et al., 2007; Jost et al., 2003; Sidanius et al., 2004). Given empathy's role in prejudice reduction, further research into enhancing empathy is warranted.

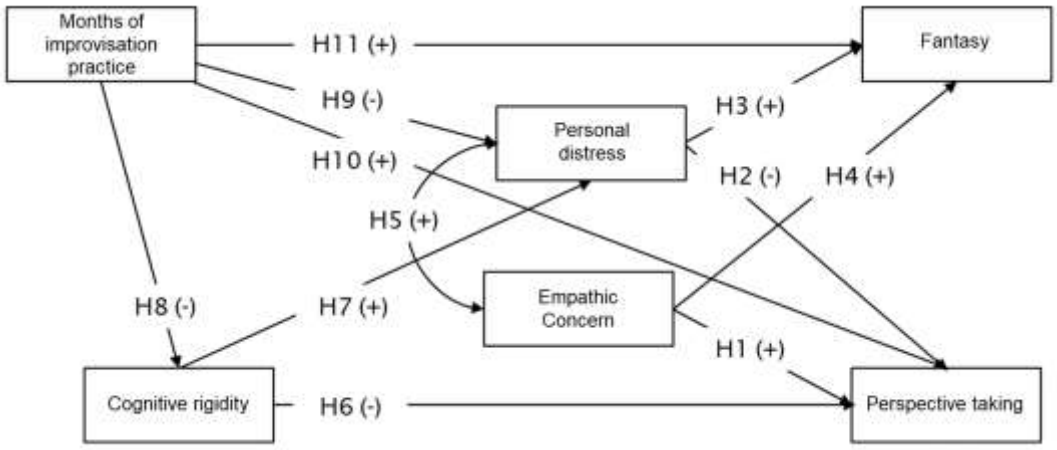
Beyond conflict prevention, empathy contributes to health promotion. It directly predicts mental health in young samples (Chung et al., 2021; Li et al., 2024; Niu et al., 2023; Wang et al., 2023), and indirectly predicts subjective well-being, positive relationships, and social adjustment through its influence on prosocial behavior (Chen, 2023; Fu et al., 2022; Pang et al., 2022). Thus, investigating empathy and its associated factors is crucial due to its individual and societal impact.

Objective of the study

The objective of this study was to analyze the statistical contribution of months of theatre improvisation practice and cognitive rigidity on empathy from the affect -to-cognition model of empathy using an integrated statistical model. The hypotheses stated are shown in Figure 1.

Figure 1

Hypothesised model



Note. H: Hypothesis; (+) = direct relationship; (-) = indirect relationship.

Method

Design

The present study employed a non-experimental, cross-sectional, correlational-predictive design. Although two groups of participants were included, they were not randomly assigned as would be required in an experimental design. Instead, this approach allowed examination of the relationships outlined in the theoretical framework at a single point in time (Hernández et al., 2010).

Participants

Non-probabilistic convenience sampling was used. The sample consisted of 204 Peruvian young people and adults. The participants were selected according to their belonging to two groups: one group of practitioners of theatre improvisation in the last 6 months (Group does practice improvisation) and another group of non-practitioners (Group does not practice improvisation). Improvisers were recruited through instructors at ten improvisation schools, whereas non-practitioners were contacted at universities and workplaces. The total sample size provided the minimum statistical power required for path analysis (Kline, 2011). Sociodemographic characteristics of the sample are presented in Table 1.

Table 1

Socio-demographic data of the sample

	Total sample	Group does practice improvisation	Group does not practice improvisation
Sex			
Women	101	52	49
Men	103	53	50
Age			
M	24	26.22	22.80
SD	5.22	4.88	5.00
Careers			
Social sciences	130	68	62
Natural sciences and engineering	40	16	24
Arts	34	21	13
Months of improvisation practice			
M	15.40	28.90	1.07
SD	26.67	31.58	3.50

Measures

Sociodemographic Questionnaire. Information was collected on age, sex, professional career, theatre improvisation practice in the last 6 months and improvisation practice time over the life span.

Interpersonal Reactivity Index (IRI; Davis, 1983). Empathy was assessed using the Peruvian adaptation of IRI (Acasiete, 2015). The 28-item scale uses a 5-point response format (1 = *Does not describe me well*; 5 = *Describes me very well*). Adequate reliability coefficients were found for the dimensions studied: perspective taking α = .75, empathic concern α = .73, personal distress α = .73 and fantasy α = .70.

Integrated and reduced cognitive rigidity questionnaire. A survey was developed that integrated several items from instruments used in previous studies to assess cognitive rigidity in a more reduced form (Baldeon, 2020; Rottenbacher, 2012a, 2012b). It is composed of 20 items whose response option is a 6-point Likert scale (1= *Strongly disagree* and 6= *Strongly agree*). The overall score has a good level of reliability (α = .88).

Data collection procedure

Data were collected individually and in person between March and June 2019. Participants completed the printed questionnaires in approximately 15 minutes on average.

Half of the participants were contacted with the collaboration of teachers from 10 theatre improvisation schools and the other half were contacted at universities and workplaces in Lima. The ethical standards of the Pontifical Catholic University of Peru were followed, based on the Helsinki ethical guidelines for research involving human subjects. In addition, the ethical considerations of the Psychology Ethics Committee 2019 were followed and a declaration of commitment to the ethical principles of the Research Ethics Committee of the Pontificia Universidad Católica del Perú was signed. All participants received informed consent.

Data Analysis

The data were processed and analyzed with the statistical software R Studio and the Lavaan package (version 0.5-23.1097). Reliability, Pearson's correlation and path analyses were performed, using the Maximum Likelihood estimator because the variables studied showed a normal distribution (Kline, 2011; Li, 2016). Model fit was evaluated against the following criteria: $\chi^2/df < 2$; Bentler-Bonett Comparative Fit Index (CFI) > .95; Incremental Fit Index (IFI) > .95; Steiger-Lind Root Mean Square Error of Approximation (RMSEA) < .08 and Standardized root mean square residual (SRMR) < .08 (Kline, 2011).

Results

Table 2 shows the mean, standard deviation and normality test statistics for each of the variables studied.

Table 2

Normality tests of variables studied in total sample

Variable	*M*	*SD*	Kolmogorov - Smirnov	Asymmetry	Kurtosis
Cognitive rigidity	3.06	0.77	.20*	0.24	-0.26
Perspective taking	3.63	0.65	.01	-0.42	0.88
Empathic concern	3.81	0.68	.00	-0.60	0.66
Personal distress	2.70	0.70	.09	-0.02	0.23
Fantasy	3.52	0.71	.01	-0.25	-0.23
Months of theatre improvisation practice	15. 40	26.67	.00	2.50	6.35

*p > .05

Table 3 displays the intercorrelations among the study variables. To address the research objective, the correlation matrix was extracted and the hypothesized model (Figure 1) was tested using path analysis.

Table 3

*Correlation matrix (*N *= 204)*

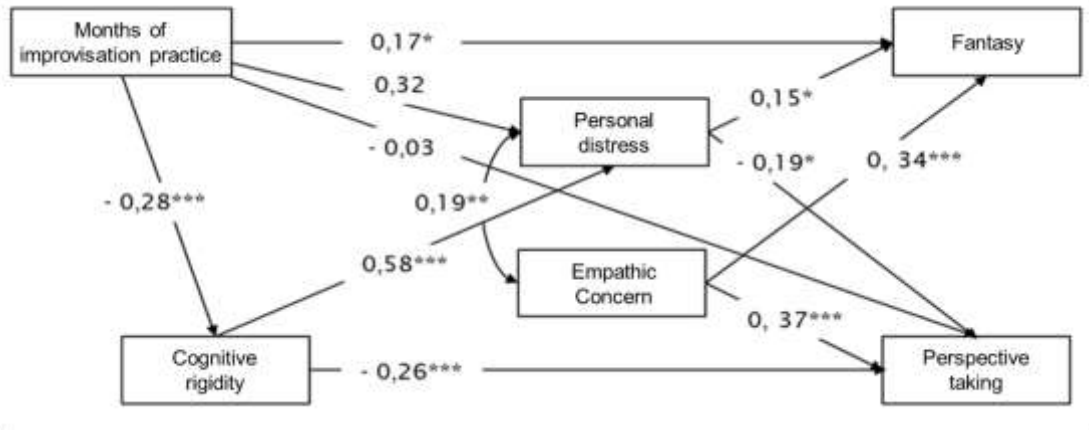
		1	2	3	4	5
1	Cognitive rigidity					
2	Perspective taking	-.36**				
3	Fantasy	.02	.15*			
4	Personal distress	.57**	-.28**	.18**		
5	Empathic concern	-.01	.35**	.37**	.15*	
6	Months of theatre improvisation practice	-.30**	.05	.22**	-.17*	-.07

*p < .05; **p < .01

Thus, the model obtained a good fit (χ^2/df = 0, 473; CFI = 1.000; IFI = 1.010; RMSEA = .000 [IC90 % = .000 - .073]; SRMR = .020 (Kline, 2011). Hypothesized relationships and estimated coefficients are displayed in Figure 2. Most hypotheses were supported, with the exception of H9 (months of improvisation practice → personal distress) and H10 (months of improvisation practice → perspective-taking). Subsequently, an alternative model was tested excluding the unfulfilled hypotheses. The model had a good fit (χ^2/df = 0, 416; CFI = 1.000; IFI = 1.017; RMSEA = .00 [IC90 % = .00 - .047]; SRMR = .021) (Kline, 2011).

Figure 2

Hypothesized model analyzed



*p < .05; **p < .01; ***p < .001

Discussion

The objective of this study was to analyses the statistical contribution of theatre improvisation practice and cognitive rigidity on empathy using the Affect-to-Cognition model using an integrated statistical model. The results indicate that the proposed theoretical model has good fit rates and demonstrates an indirect contribution of months of theatre improvisation practice on empathy mediated by cognitive rigidity. Furthermore, most of the hypotheses of the model have been fulfilled, with the exception of H9 and H10. The alternative model shows a slight improvement of the fit indices if we exclude the relationships of the unmet hypotheses.

Affect-to-Cognition Model of Empathy in the Latin American Context

First, hypotheses 1 through 5—concerning the interrelations among perspective-taking, fantasy, empathic concern, and personal distress posited by the Affect-to-Cognition Model—were confirmed, indicating that this framework can be generalized to the Latin American context while preserving its core structure (Israelashvili & Karniol, 2018).

According to the results, personal distress contributes negatively to perspective taking variability, but positively to fantasy. While this is consistent with the study by Israelashvili and Karniol (2018), it is not fully clarified in that study. Therefore, the present research suggests that it is possible that personal distress increases fantasy as a form of escape from the situation that produces distress, regulating one's own emotions, while empathic concern drives fantasy to facilitate the emotional understanding of other people (Bukach et al., 2018; Israelashvili et al., 2020; Namba et al., 2021; Shiota & Nomura, 2022). This conceptual refinement advances the theoretical precision of the Affect-to-Cognition Model by delineating distinct functional roles for its affective predictors.

Second, these findings carry practical implications for empathy training. Interventions aiming to enhance empathy should incorporate activities that (a) mitigate the detrimental effects of personal distress through targeted emotion-regulation strategies and (b) cultivate empathic concern, given its stronger statistical contribution to cognitive facets of empathy. This dual focus aligns with evidence linking emotion regulation and empathic concern to reduced prejudice (Bobba & Crocetti, 2022; Burns et al., 2016; Levin et al., 2016; Makwana et al., 2021).

Cognitive Rigidity from a Multidimensional Perspective

Third, hypotheses 6 and 7 concerning cognitive rigidity were supported: cognitive rigidity negatively predicted perspective taking and positively predicted personal distress, consistent with prior research (Di Fabio & Kenny, 2021; Levin et al., 2016; Rottenbacher, 2012a; Song & Shi, 2017). Particularly, the finding of the contribution of cognitive rigidity on personal distress contributes to the scarce line of research on cognitive rigidity (Rottenbacher, 2012a). Moreover, this result indicates that cognitive rigidity is not a purely cognitive concept as it also influences affective reactions such as personal distress. Thus, it is possible that emotional uncertainty, an affective dimension of cognitive

rigidity, has a stronger association with personal distress than other dimensions; similarly, perspective taking may have a stronger correlation with more cognitive dimensions of cognitive rigidity, such as openness to experience (Jost et al., 2003; Rottenbacher, 2012a; Song & Shi, 2017).

Fourth, conceptualizing cognitive rigidity as a multidimensional construct suggests potential interactions with other affective predictors of empathy. Empirical evidence indicates that specific facets of cognitive rigidity influence emotional self-regulation (Alghamdi et al., 2017; Kumar & Tankha, 2023), which in turn impact in empathy (Makwana et al., 2021; Zirenko & Krasavtseva, 2021). These findings support the inclusion of cognitive rigidity within broader Affect-to-Cognition models of empathy prediction.

Fifth, the contribution of cognitive rigidity in the variability of empathy has practical implications as interventions designed to increase empathy and reduce prejudice could include techniques to decrease cognitive rigidity (Hillen et al., 2017), as it has been found to have a direct influence on prejudice (Sassenberg et al., 2022; Sekerdej et al., 2018).

Direct and Indirect Contributions of Improvisation Practice

Sixth, although people who practice theater improvisation may be characterized by lower cognitive rigidity before practicing it, the results of the study and the experiments of Felsman et al. (2020; 2023) indicate that the time spent practicing theater improvisation contributes negatively to cognitive rigidity, decreasing its levels. Thus, hypothesis 8 is corroborated. Also, consistent with reported differences between people in general and those who practice theater and role-playing (Rivers et al., 2016; Schmidt et al., 2021), months of improvisation practice directly and positively predict fantasy; that is, identification with fictional characters by interacting with them through improvised and fictional stories (Argentino, 2013). Thus, hypothesis 11 is confirmed. These findings suggest that improvisation practice time contributes significantly in individual cognitive variables.

Seventh, contrary to what was expected in hypothesis 9, the time spent practicing improvisation has no predictive relationship with personal distress, which can be attributed to the greater influence of this practice on cognitive reactions compared to affective ones. Although the experiments of Felsman et al. (2020; 2023) report that improvisation practice reduces tolerance to uncertainty, an expression of cognitive rigidity, it is possible that a more detailed analysis of the cognitive, emotional, and behavioral dimensions of rigidity will confirm this conjecture. Furthermore, although cognitive rigidity has a predictive relationship with personal distress with a large effect size (.58), personal distress also receives statistical contribution from other variables not contemplated in the study, on which improvisation practice may not have any contribution, even if the practice is performed over a period of months.

Similarly, Hypothesis 10 was not supported: practice duration did not predict perspective-taking, a result at odds with qualitative reports of enhanced perspective-taking following improvisation training (Bachani, 2020; Stewart, 2016). This can be attributed to the insufficiency of improvisation practice to train a complex, multi-causal reaction such as perspective taking. Although theatrical improvisation practice contributes to the variability of cognitive rigidity (Felsman et al., 2020; Felsman et al., 2023) and consequently contributes to greater openness to the thoughts and feelings of others in complex situations, skills such as recognition, clarification, regulation and understanding of emotions, as well as compassion, are required for perspective taking. (Davis, 1980, 1983; Israelashvili et al., 2020; Makwana et al., 2021; Shiota & Nomura, 2022). Although theatre improvisation training can cover emotion management, the approach tends to be reduced, intuitive and ephemeral because the aim of theatre improvisation is to create improvised stories without necessarily delving into the stories, their fictional characters or emotions (Argentino, 2013; Baldeon, 2020).

Eighth, nevertheless, the indirect contribution of improvisation practice on empathy through cognitive rigidity has practical implications as exercises that are used to train improvisation can be used and targeted to develop empathy, complemented by training in other relevant skills such as emotion management. In addition, such exercises can be combined with techniques like exposure to counter-stereotypical exemplars, one of the most effective interventions for reducing prejudice according to a review of 30 studies (FitzGerald et al., 2019). For instance, requiring participants to embody or interact with counter-stereotypical characters within a playful, accepting framework may bolster empathic responses while preserving the spontaneity that defines theatrical improvisation (Argentino, 2013; Felsman et al., 2023).

Conclusions, Limitations, and Future Directions

The study concludes that improvisation practice time contributes directly to fantasy variability and indirectly to perspective taking and personal distress, mediated by cognitive rigidity. Furthermore, it is concluded that the affect-to-cognition model of empathy is applicable to the Latin American context and the relationships of affective factors and fantasy may be associated with emotion management. Additionally, it is specified that the practice of theatrical improvisation can be a tool that increases the effectiveness of interventions aimed at increasing empathy, if it is complemented with strategies to manage emotions and uncertainty.

Limitations include the non-experimental cross-sectional design, which precludes causal inferences, and the absence of controls for demographic variables such as age and gender (Hernández et al., 2010; Israelashvili & Karniol, 2018). Additionally, the study did not differentiate among cognitive, emotional, and behavioral dimensions of cognitive rigidity nor include other potentially relevant affective predictors.

Experimental and longitudinal designs should be employed to clarify predictive pathways and to disaggregate the effects of improvisation practice on cognitive, emotional, and behavioral dimensions of cognitive rigidity. In particular, randomized controlled studies comparing an improvisation-only condition with one that integrates structured emotion-regulation components and counter-stereotypical exposure would allow isolation of each intervention element's specific contribution. Incorporating the *Test de Empatía Cognitiva y Afectiva (TECA)* (López-Pérez et al., 2008) would enable separate measurement of perspective adoption and emotional comprehension, thereby facilitating more specific analyses of how these components influence distinct empathy facets.

Moreover, the use of probabilistic sampling and pre- and post-intervention assessments will enhance the external validity of findings and support evidence-based policy recommendations. Longitudinal follow-up studies are also needed to assess the durability of cognitive rigidity and empathy changes after discontinuation of improv practice. Comparative investigations that contrast improvisation with other theatrical techniques—such as scripted role-play or classical acting exercises—would further elucidate which theatrical elements most effectively foster cognitive flexibility and empathic responding. Finally, theoretical extensions of the Affect-to-Cognition model should incorporate additional predictors, including uncertainty tolerance and emotion regulation, and examine their capacity to predict specific forms of prejudice or discriminatory behavior.

Referencias

Acasiete, K. (2015). *Empatía y razonamiento moral prosocial en estudiantes de psicología de una universidad privada de Lima* [Degree thesis]. Universidad Ricardo Palma. https://hdl.handle.net/20.500.14138/860

Agadullina, E., Lovakov, A., Balezina, M., & Gulevich, O. A. (2022). Ambivalent sexism and violence toward women: A meta-analysis. *European Journal of Social Psychology*, *52*(5-6), 819-859. https://doi.org/10.1002/ejsp.2855

Alghamdi, N. G., Aslam, M., & Khan, K. (2017). Personality traits as predictor of emotional intelligence among the university teachers as advisors. *Education Research International*, *2017*, 1-6. https://doi.org/10.1155/2017/9282565

Álvarez-Castillo, J. L., Fernández-Caminero, G., & González-González, H. (2018). Is empathy one of the big three? Identifying its role in a dual-process model of ideology and blatant and subtle prejudice. *PLoS ONE, 13*(4), e0195470. https://doi.org/10.1371/journal.pone.0195470

Arceneaux, K. (2017). Anxiety reduces empathy toward outgroup members but not ingroup members. *Journal of Experimental Political Science*, *4*(1), 68-80. https://doi.org/10.1017/XPS.2017.12

Argentino, O. (2013). *Del salto al vuelo: Manual de Impro*. Improtour.

Bachani, J. (2020). *La improvisación teatral como herramienta para el desarrollo de empatía en adolescentes* [Master thesis]. Pontificia Universidad Católica del Perú. http://hdl.handle.net/20.500.12404/17120

Bäckström, M., & Björklund, F. (2007). Structural modeling of generalized prejudice. *Journal of Individual Differences*, *28*, 10-17. https://doi.org/10.1027/1614-0001.28.1.10

Baldeon, G. (2020). *Correlatos psicológicos del sexismo ambivalente en personas que practican y no practican improvisación teatral en una muestra de Lima Metropolitana* [Degree thesis]. Pontificia Universidad Católica del Perú. http://hdl.handle.net/20.500.12404/19177

Baldeon, G., & Espinosa, A. (2024). *Modelo predictivo del sexismo ambivalente en personas que practican y no practican improvisación teatral* [Unpublished manuscript].

Bobba, B., & Crocetti, E. (2022). "I feel you!": The role of empathic competences in reducing ethnic prejudice among adolescents. *Journal of Youth and Adolescence*, *51*(10), 1970-1982. https://doi.org/10.1007/s10964-022-01650-0

Bukach, C., Nguyen, R., Rinnen, T., Munezero, P., Kade, P., & Deutsch, A. (2018). I can read you like a book: expression recognition is positively correlated with the fantasy empathy subscale. *Journal of Vision*, *18*(10), 935. https://doi.org/10.1167/18.10.935

Burns, M. D., Parker, L. R. M., & Monteith, M. J. (2016). Self-regulation strategies for combatting prejudice. In C. G. Sibley & F. K. Barlow (Eds.), *The Cambridge Handbook of the Psychology of Prejudice* (pp. 500-518). Cambridge University Press. https://doi.org/10.1017/9781316161579.022

Cai, F., Ruhotina, M., Bowler, M., Howard, E., Has, P., Frishman, G. N., & Wohlrab, K. (2019). Can I get a suggestion? Medical improv as a tool for empathy training in obstetrics and gynecology residents. *Journal of Graduate Medical Education*, *11*(5), 597-600. https://doi.org/10.4300/JGME-D-19-00185.1

Chen, Y. (2023). Pro-sociality and happiness across national cultures: A hierarchical linear model. *Current Psychology*, *43*(4), 3381-3394. https://doi.org/10.1007/S12144-023-04608-Y

Chung, Y. W., Im, S., & Kim, J. E. (2021). Can empathy help individuals and society? Through the lens of volunteering and mental health. *Healthcare*, *9*(11), 1406. https://doi.org/10.3390/HEALTHCARE9111406

Davis, M. (1980). A multidimensional approach to individual differences in empathy. *Journal of Personality and Social Psychology*, *10*(5), 85-105.

Davis, M. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology*, *44*(1), 113-126. https://doi.org/10.1037//0022-3514.44.1.113

de Rivera, J., Huici, C., Gómez, Á., Morales, J., & Bustillos, A. (2011). El papel de la empatía en la reducción del conflicto y la mejora de las relaciones entre grupos. In D. Páez, C. Martín Beristain, J. L. González, N. Basabe, & J. de Rivera (Eds.), *Superando la violencia colectiva y construyendo una cultura de paz* (pp. 587-606). Fundamentos.

Decety, J., & Holvoet, C. (2021). The emergence of empathy: A developmental neuroscience perspective. *Developmental Review*, *62*, 100999. https://doi.org/10.1016/J.DR.2021.100999

Decety, J., & Jackson, P. L. (2004). The functional architecture of human empathy. *Behavioral and Cognitive Neuroscience Reviews*, *3*(2), 71-100. https://doi.org/10.1177/1534582304267187

Di Fabio, A., & Kenny, M. E. (2021). Connectedness to nature, personality traits and empathy from a sustainability perspective. *Current Psychology*, *40*(3), 1095-1106. https://doi.org/10.1007/s12144-018-0031-4

Díaz-Lázaro, C. M., & Toro-Alfonso, J. (2013). La contribución estadística del autoritarismo, la dominancia social, la empatía, y el materialismo a la varianza del prejuicio intergrupal en Puerto Rico. *Revista Puertorriqueña de Psicología*, *25*(1), 118-137.

Díaz-Lázaro, C. M., Castañeiras, C., Ledesma, R. D., Verdinelli, S., & Rand, A. (2014). Right-wing authoritarianism, social dominance orientation, empathy, and materialistic value orientation as predictors of intergroup prejudice in Argentina. *Salud & Sociedad*, *5*(3), 282-297. https://doi.org/10.22199/s07187475.2014.0003.00004

Espinosa, A., Calderón-Prada, A., Burga, G., & Güímac, J. (2007). Estereotipos, prejuicios y exclusión social en un país multiétnico: el caso peruano. *Revista de Psicología, 25*(2), 295-338. https://doi.org/10.18800/psico.200702.007

Felsman, P., Gunawardena, S., & Seifert, C. M. (2020). Improv experience promotes divergent thinking, uncertainty tolerance, and affective well-being. *Thinking Skills and Creativity*, *35*, 1-14. https://doi.org/10.1016/j.tsc.2020.100632

Felsman, P., Seifert, C. M., & Himle, J. A. (2019). The use of improvisational theater training to reduce social anxiety in adolescents. *The Arts in Psychotherapy*, *63*, 111-117. https://doi.org/10.1016/j.aip.2018.12.001

Felsman, P., Seifert, C. M., Sinco, B., & Himle, J. A. (2023). Reducing social anxiety and intolerance of uncertainty in adolescents with improvisational theater. *The Arts in Psychotherapy*, *82*, 101985. https://doi.org/10.1016/j.aip.2022.101985

Fernández-Pinto, I., López-Pérez, B., & Márquez, M. (2008). Empatía: Medidas, teorías y aplicaciones en revisión. *Anales de Psicología, 24*(2), 284-298.

FitzGerald, C., Martin, A., Berner, D., & Hurst, S. (2019). Interventions designed to reduce implicit prejudices and implicit stereotypes in real world contexts: a systematic review. *BMC Psychology*, *7*(1), 29. https://doi.org/10.1186/s40359-019-0299-7

Fu, W., Wang, C., Chai, H., & Xue, R. (2022). Examining the relationship of empathy, social support, and prosocial behavior of adolescents in China: a structural equation modeling approach. *Humanities and Social Sciences Communications*, *9*(1), 1-8. https://doi.org/10.1057/s41599-022-01296-0

Guilera, T., Batalla, I., Forné, C., & Soler-González, J. (2019). Empathy and big five personality model in medical students and its relationship to gender and specialty preference: a cross-sectional study. *BMC Medical Education*, *19*(1), 57. https://doi.org/10.1186/s12909-019-1485-2

Hainselin, M., Aubry, A., & Bourdin, B. (2018). Improving teenagers' divergent thinking with improvisational theater. *Frontiers in Psychology*, *9*, 1-9. https://doi.org/10.3389/fpsyg.2018.01759

Hernández, R., Fernández, C., & Baptista, M. del P. (2010). *Metodología de la Investigación*. McGraw-Hill.

Hillen, M. A., Gutheil, C. M., Strout, T. D., Smets, E. M. A., & Han, P. K. J. (2017). Tolerance of uncertainty: Conceptual analysis, integrative model, and implications for healthcare. *Social Science & Medicine*, *180*, 62-75. https://doi.org/10.1016/j.socscimed.2017.03.024

Hu, Z., Wen, Y., Wang, Y., Lin, Y., Shi, J., Yu, Z., Lin, Y., & Wang, Y. (2022). Effectiveness of mindfulness-based interventions on empathy: A meta-analysis. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.992575

Instituto Nacional de Estadística e Informática. (2017). *Primera Encuesta Virtual para Personas LGBTI*. *Principales resultados*. https://www.inei.gob.pe/media/MenuRecursivo/boletines/lgbti.pdf

Instituto Nacional de Estadística e Informática. (2019). *Encuesta Nacional Sobre Relaciones Sociales ENARES 2019. Principales resultados*. https://www.inei.gob.pe/media/MenuRecursivo/boletines/presentacion_enares_2019.pdf

Israelashvili, J., & Karniol, R. (2018). Testing alternative models of dispositional empathy: The Affect-to-Cognition (ACM) versus the Cognition-to-Affect (CAM) model. *Personality and Individual Differences*, *121*, 161-169. https://doi.org/10.1016/j.paid.2017.09.036

Israelashvili, J., Sauter, D., & Fischer, A. (2020). Two facets of affective empathy: concern and distress have opposite relationships to emotion recognition. *Cognition and Emotion*, *34*(6), 1112-1122. https://doi.org/10.1080/02699931.2020.1724893

Jost, J. T., Federico, C. M., & Napier, J. L. (2009). Political Ideology: Its structure, functions, and elective affinities. *Annual Review of Psychology*, *60*, 307-337. https://doi.org/10.1146/annurev.psych.60.110707.163600

Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin*, *129*(3), 339-375. https://doi.org/10.1037/0033-2909.129.3.339

Khatib, R., McKee, M., & Yusuf, S. (2024). Counting the dead in Gaza: difficult but essential. *The Lancet*, *404*(10449), 237-238. https://doi.org/10.1016/S0140-6736(24)01169-3

Kline, R. (2011). *Principles and practice of structural equation modeling* (3rd ed.). The Guilford Press.

Kumar, V. V., & Tankha, G. (2023). Association between the big five and trait emotional intelligence among college students. *Psychology Research and Behavior Management*, *16*, 915-925. https://doi.org/10.2147/PRBM.S400058

Lamm, C., Batson, C. D., & Decety, J. (2007). The Neural Substrate of Human Empathy. *Journal of Cognitive Neuroscience*, *19*(1), 42-58. https://doi.org/10.1162/JOCN.2007.19.1.42

Levin, M. E., Luoma, J. B., Vilardaga, R., Lillis, J., Nobles, R., & Hayes, S. C. (2016). Examining the role of psychological inflexibility, perspective taking, and empathic concern in generalized prejudice. *Journal of Applied Social Psychology*, *46*, 180-191. https://doi.org/10.1111/jasp.12355

Lewandowska, K., & Węziak-Białowolska, D. (2022). The impact of theatre on social competencies: a meta-analytic evaluation. *Arts & Health*, 1-32. https://doi.org/10.1080/17533015.2022.2130947

Lewis, C. (2012). *The relationship between improvisation and cognition* [Doctoral dissertation]. University of Hertfordshire. https://uhra.herts.ac.uk/handle/2299/8890

Lewis, C., & Lovatt, P. J. (2013). Breaking away from set patterns of thinking: Improvisation and divergent thinking. *Thinking Skills and Creativity*, *9*, 46-58. https://doi.org/10.1016/j.tsc.2013.03.001

Li, C.-H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior Research Methods*, *48*(3), 936-949. https://doi.org/10.3758/s13428-015-0619-7

Li, Y., Qiu, R., Liu, D., Cheng, C., & Zhu, X. (2024). The impact of empathy on the mental health of healthcare workers via social support: a moderated mediation model. *Current Psychology*, *43*(48), 36858-36866. https://doi.org/10.1007/S12144-024-07037-7/METRICS

López-Pérez, B., Férnandez-Pinto, I., & Abad Garcia, F. J. (2008). *TECA. Test de empatía cognitiva y afectiva*. TEA.

Makwana, A. P., Dhont, K., García-Sancho, E., & Fernández-Berrocal, P. (2021). Are emotionally intelligent people less prejudiced? The importance of emotion management skills for outgroup attitudes. *Journal of Applied Social Psychology*, *51*(8), 779-792. https://doi.org/10.1111/jasp.12798

Matera, C., Nerini, A., Di Gesto, C., Policardo, G. R., Maratia, F., Dalla Verde, S., Sica, I., Paradisi, M., Ferraresi, L., Pontvik, D. K., Lamuraglia, M., Marchese, F., Sbrillo, M., & Brown, R. (2021). Put yourself in my wheelchair: Perspective-taking can reduce prejudice toward people with disabilities and other stigmatized groups. *Journal of Applied Social Psychology*, *51*(3), 273-285. https://doi.org/10.1111/JASP.12734

McFarland, S. (2010). Authoritarianism, social dominance, and other roots of generalized prejudice. *Political Psychology*, *31*(3), 453-477. https://doi.org/10.1111/j.1467-9221.2010.00765.x

Melchers, M. C., Li, M., Haas, B. W., Reuter, M., Bischoff, L., & Montag, C. (2016). Similar personality patterns are associated with empathy in four different countries. *Frontiers in Psychology*, *7*. https://doi.org/10.3389/fpsyg.2016.00290

Miklikowska, M. (2018). Empathy trumps prejudice: The longitudinal relation between empathy and anti-immigrant attitudes in adolescence. *Developmental Psychology*, *54*(4), 703-717. https://doi.org/10.1037/dev0000474

Ministerio de Cultura. (2018). *I encuesta nacional "Percepciones y actitudes sobre diversidad cultural y discriminación étnico-racial" Principales resultados 2018.* https://centroderecursos.cultura.pe/sites/default/files/rb/pdf/primeros-resultados-encuestra-discriminacion.pdf

Nair, T. K., Waslin, S. M., Rodrigues, G. A., Datta, S., Moore, M. T., & Brumariu, L. E. (2024). A meta-analytic review of the relations between anxiety and empathy. *Journal of Anxiety Disorders*, *101*, 102795. https://doi.org/10.1016/J.JANXDIS.2023.102795

Namba, S., Kabir, R. S., Matsuda, K., Noguchi, Y., Kambara, K., Kobayashi, R., Shigematsu, J., Miyatani, M., & Nakao, T. (2021). Fantasy component of interpersonal reactivity is associated with empathic accuracy: findings from behavioral experiments with implications for applied settings. *Reading Psychology*, *42*(7), 788-806. https://doi.org/10.1080/02702711.2021.1939823

Nicol, A. A. M., & Rounding, K. (2013). Alienation and empathy as mediators of the relation between social dominance orientation, right-wing authoritarianism and expressions of racism and sexism. *Personality and Individual Differences*, *55*(3), 294-299. https://doi.org/10.1016/j.paid.2013.03.009

Nitschke, J. P., & Bartz, J. A. (2023). The association between acute stress & empathy: A systematic literature review. *Neuroscience & Biobehavioral Reviews*, *144*, 105003. https://doi.org/10.1016/J.NEUBIOREV.2022.105003

Niu, J., Jin, C., & Meng, L. (2023). The structural relations of self-control, empathy, interpersonal trust, friendship quality, and mental well-being among adolescents: A cross-national comparative study in China and Canada. *Humanities and Social Sciences Communications, 10*(1), 1-11. https://doi.org/10.1057/s41599-023-02468-2

Olivier, L., Sterkenburg, P., & Rensburg, E. Van. (2019). The effect of a serious game on empathy and prejudice of psychology students towards persons with disabilities. *African Journal of Disability*, *8*, 328. https://doi.org/10.4102/AJOD.V8I0.328

Pang, Y. L., Song, C., & Ma, C. (2022). Effect of different types of empathy on prosocial behavior: gratitude as mediator. *Frontiers in Psychology*, *13*, 768827. https://doi.org/10.3389/FPSYG.2022.768827/BIBTEX

Pauwels, L. J. R., & Williamson, H. (2022). Explaining prejudicial attitudes and bias-motivated aggression in Belgium: a comparison of individual-level theoretical models. *European Journal on Criminal Policy and Research*. https://doi.org/10.1007/s10610-022-09529-3

Rivers, A., Wickramasekera, I. E., Pekala, R. J., & Rivers, J. A. (2016). Empathic features and absorption in fantasy role-playing. *American Journal of Clinical Hypnosis*, *58*(3), 286-294. https://doi.org/10.1080/00029157.2015.1103696

Rottenbacher, J. M. (2012a). Conservadurismo político y rigidez cognitiva en una muestra de estudiantes y egresados universitarios de la ciudad de Lima. *Avances En Psicología Latinoamericana*, *30*(2), 257-271.

Rottenbacher, J. M. (2012b). Relaciones entre el sexismo ambivalente, el conservadurismo político y la rigidez cognitiva en una muestra de habitantes de la ciudad de Lima. *Psicología Desde El Caribe*, *29*(2), 229-256.

Rubinstein, D., Lahad, M., Leykin, D., & Aharonson-Daniel, L. (2021). Development and validation of fantastic reality ability measurement (FRAME) to measure use of imagination in response to stress and trauma. *Journal of Creativity in Mental Health*, *16*(4), 412-427. https://doi.org/10.1080/15401383.2020.1789017

Rubinstein, D., O'Rourke, N., & Lahad, M. (2023). Using imagination in response to stress and uncertainty in the time of COVID-19: further validation of the fantastic reality ability measurement (FRAME) scale. *Frontiers in Psychology*, *14*. https://doi.org/10.3389/fpsyg.2023.1115233

Sassenberg, K., Winter, K., Becker, D., Ditrich, L., Scholl, A., & Moskowitz, G. B. (2022). Flexibility mindsets: Reducing biases that result from spontaneous processing. *European Review of Social Psychology*, *33*(1), 171-213. https://doi.org/10.1080/10463283.2021.1959124

Schmidt, I., Rutanen, T., Luciani, R. S., & Jola, C. (2021). Feeling for the other with ease: prospective actors show high levels of emotion recognition and report above average empathic concern, but do not experience strong distress. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.543846

Sekerdej, M., Kossowska, M., & Czernatowicz-Kukuczka, A. (2018). Uncertainty and prejudice: The role of religiosity in shaping group attitudes. *European Journal of Social Psychology*, *48*(2), O91-O102. https://doi.org/10.1002/ejsp.2298

Shiota, S., & Nomura, M. (2022). Role of fantasy in emotional clarity and emotional regulation in empathy: A preliminary study. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.912165

Shivarajan, S., & Andrews, R. (2021). Using improvisation to develop emotional intelligence. *Management Teaching Review*, *6*(2), 152-163. https://doi.org/10.1177/2379298119882339

Sidanius, J., Pratto, F., Van Laar, C., & Levin, S. (2004). Social dominance theory: Its agenda and method social dominance theory: Its agenda and method. *Political Psychology*, *25*(6), 845-880. https://doi.org/10.1111/j.1467-9221.2004.00401.x

Song, Y., & Shi, M. (2017). Associations between empathy and big five personality traits among Chinese undergraduate medical students. *PLOS ONE*, *12*(2), e0171665. https://doi.org/10.1371/journal.pone.0171665

Stewart, C. (2016). *Effects of Improv Comedy on College Students* [Doctoral dissertation]. Illinois State University. http://doi.org/10.30707/ETD2016.Stewart.C

Suarez, V. D., Najdowski, A. C., Persicke, A., & Tarbox, J. (2024). A laboratory evaluation of the effects of empathy training on racial bias. *The Psychological Record 2024 74:3*, *74*(3), 271-289. https://doi.org/10.1007/S40732-024-00606-Z

The Lancet. (2023). Russia's invasion of Ukraine: an attack on health. *The Lancet*, *401*(10377), 617. https://doi.org/10.1016/S0140-6736(23)00387-2

United Nations Educational, Scientific and Cultural Organization. (2002). *UNESCO: mainstreaming the culture of peace*. https://unesdoc.unesco.org/ark:/48223/pf0000126398

Vezzali, L., Stathi, S., Giovannini, D., Capozza, D., & Trifiletti, E. (2015). The greatest magic of Harry Potter: Reducing prejudice. *Journal of Applied Social Psychology*, *45*(2), 105-121. https://doi.org/10.1111/JASP.12279

Wang, Q., Zhi, K., Yu, B., & Cheng, J. (2023). Social trust and subjective well-being of first-generation college students in China: the multiple mediation effects of self-compassion and social empathy. *Frontiers in Psychology*, *14*, 1091193. https://doi.org/10.3389/FPSYG.2023.1091193/BIBTEX

Zelenski, A. B., Saldivar, N., Park, L. S., Schoenleber, V., Osman, F., & Kraemer, S. (2020). Interprofessional improv: Using theater techniques to teach health professions students empathy in teams. *Academic Medicine*, *95*(8), 1210-1214. https://doi.org/10.1097/ACM.0000000000003420

Zirenko, M. S., & Krasavtseva, Y. V. (2021). Tolerance of uncertainty and emotional intelligence as predictors of Empathy. European *Proceedings of Social and Behavioural Sciences*, *119*, 662-668. https://doi.org/10.15405/epsbs.2021.12.02.80

Authors' contribution (CRediT Taxonomy): 1. Conceptualization; 2. Data curation; 3. Formal Analysis; 4. Funding acquisition; 5. Investigation; 6. Methodology; 7. Project administration; 8. Resources; 9. Software; 10. Supervision; 11. Validation; 12. Visualization; 13. Writing: original draft; 14. Writing: review & editing.

G. B. has contributed in 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13; A. P. in 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13.

Scientific editor in charge: Dra. Cecilia Cracco.