

Rasch exploratory analysis of the Gender Stereotyped Beliefs and Violent Behavior Scale (GSBVS)

Análisis exploratorio de Rasch de la Escala de Creencias Estereotipadas de Género y Conductas Violentas (ECEGV)

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Abstract

The Gender stereotyped beliefs and violent behaviors scale (GSBVS) is an instrument to assess preconceived ideas about characteristics, roles and behaviors of people based on their gender. The aim of this work was to determine the psychometric properties of the scale using the Rasch model. We used the partial credit parameterization and analyzed the fit to the Rasch model, the residual fit of the items and of the individuals, the functioning of the response thresholds, the differential item functioning (DIF) according to the sample, the reliability, the unidimensionality and the local dependence. For this purpose, a sample of 371 men from the province of Córdoba (Argentina) was made up. Of this total, 67.39% ($n = 248$) had previous complaints of domestic or gender violence and attended the Integral Men's Center of the Ministry of Women's Affairs. The original version of the scale did not show a satisfactory fit, so modifications were made to improve its psychometric properties. As a result, it was found that a version with a smaller number of items and with three response alternatives presented a satisfactory fit and adequate reliability. However, in this version there were items with DIF (uniform and non-uniform) as well as one item with residual values that should be revised. In summary, our study presents the first psychometric results performed on the GSBVS and offers recommendations for future psychometric studies.

Keywords: Measurement, Rasch analysis, Measuring instruments, Gender stereotypes, gender-based violence.

Resumen

La Escala de creencias estereotipadas de género y conductas violentas (ECEGV) es un instrumento para evaluar ideas preconcebidas sobre características, roles y conductas de las personas basados en su género. El objetivo de este trabajo fue determinar las propiedades psicométricas de la escala desde el modelo de Rasch. Se utilizó la parametrización de crédito parcial y se analizó el ajuste al modelo de Rasch, el ajuste residual de los ítems y de las personas, el funcionamiento de los umbrales de respuesta, el funcionamiento diferencial de los ítems (DIF) según la muestra, la fiabilidad, la unidimensionalidad y la dependencia local. Para esto se constituyó una muestra de 371 hombres de la provincia de Córdoba (Argentina). De ese total, el 67.39% ($n = 248$) contaba con denuncias previas por violencia familiar o de género y asistía al Centro Integral de Varones dependiente del Ministerio de la Mujer. La versión original de la escala no mostró un ajuste satisfactorio por lo cual se realizaron modificaciones para mejorar sus propiedades psicométricas. Como resultado se encontró que una versión con una menor cantidad de ítems y con tres alternativas de respuestas presenta un ajuste satisfactorio y una adecuada confiabilidad. Sin embargo, en esta versión se presentaron ítems con DIF (uniforme y no uniforme) como así también un ítem con valores residuales que debería ser revisado. En síntesis, nuestro estudio presenta los primeros resultados psicométricos realizados sobre la ECEGV y ofrece recomendaciones para futuros estudios psicométricos.

Palabras clave: Medición, análisis de Rasch, instrumento de medición, estereotipo sexual, violencia de género.

INTRODUCTION

Violence against women is one of the most widespread human rights violations worldwide, encompassing multiple forms of abuse, including physical, sexual and emotional mistreatment (World Health Organization, 2021). The United Nations (1993) defines this phenomenon as any act of gender-based violence that causes physical, sexual or mental harm or suffering to women, including threats, coercion or arbitrary deprivation of liberty, whether in the public or private sphere. This type of violence manifests itself in family, community and institutional contexts (UN General Assembly, 1993). Among the most extreme manifestations of this violence are femicides, gender-motivated killings of women and girls, which represent the tragic denouement of a cycle of continuous abuse and aggression (Heise & Kotsadam, 2015; UN Women, 2019).

In 2022, 89,000 cases of femicides were recorded worldwide, committed mainly by intimate partners or other family members (United Nations Office on Drugs and Crime [UNODC], 2023). This figure implies that more than 133 women or girls were killed every day by people close to them (UNODC, 2023). Evidence indicates that these acts of violence are mostly perpetrated by men known to the victims, often partners or ex-partners (García-Moreno *et al.*, 2005).

The phenomenon of femicides and gender-based violence reflects profound structural and social inequalities. Recent studies have identified factors such as cultural and social norms that promote the subordination of women, which contribute to the occurrence and normalization of these acts of violence. According to the Center for Gender Studies of the National University of Cajamarca (2020), factors such as religion, gender roles, traditions and machismo have a significant influence on the perpetuation of gender-based violence against women. In addition, impunity and the lack of an adequate response by the authorities reinforce the persistence of these crimes. González (2021) warns that, in some countries, there is considerable resistance to investigating the murders of women as femicides, it being common that, when a violent death of a woman occurs, it is initially claimed that it is a suicide. It is also noted that 97% of acts of violence against women go unpunished, which perpetuates the cycle of violence.

Likewise, femicidal violence comprises a progression of gender-based violent behaviors. According to the Economic Commission for Latin America and the Caribbean (ECLAC, 2021), in 2020 there were numerous cases of femicides or feminicides in the region, which demonstrates the seriousness of the situation and the urgent need for effective measures to address this problem. Impunity and lack of an adequate response by the authorities are factors that reinforce the persistence of these crimes (UN Women, 2019).

The violent actions of an aggressor may be linked to gender stereotyped beliefs, sustained and promoted at social and cultural levels (Gauna *et al.*, 2022). These beliefs imply rigid ideas about appropriate roles and behaviors for men and women, limiting and conditioning the expectations of each gender. Early detection and intervention of these beliefs is crucial to reduce inequality and avoid the consolidation of power roles that subordinate women and girls (Cardenas *et al.*, 2010; Gauna, 2022). The persistence of these stereotypes reinforces a cycle of violence that not only victimizes women, but also hinders their access to justice and protection, increasing impunity for aggressors (Flood & Pease, 2009; Yodanis, 2004).

Gender beliefs play a central role in structuring power relations and perpetuating violence, especially in contexts where social norms reinforce inequality. Scientific evidence has shown that stereotypical conceptions of gender roles not only affect individual perception and behavior, but also act as risk factors in the manifestation of violent behavior (Flood, 2018; Bjørnholt & Rosten, 2020).

One of the most relevant approaches to understanding this link is the Social Learning Model of Violence (Bandura, 1977), which postulates that violence is a behavior learned through observation and imitation of social models. In contexts where male dominance is naturalized, individuals internalize violence as a legitimate strategy for control and conflict resolution (Hearn *et al.*, 2021). Recent research has found that men with sexist beliefs present greater acceptance of gender-based violence, reinforcing the idea that the cultural transmission of patriarchal norms is a key factor in the perpetuation of these dynamics (Flood, 2018).

From the perspective of the Ambivalent Sexism Theory (Glick & Fiske, 1996), it has been identified that both hostile sexism (overtly negative attitudes towards women) and benevolent sexism (paternalistic beliefs that reinforce female subordination) act as mechanisms that justify violence and hinder its recognition. Recent studies have shown that benevolent sexism may be an indirect predictor of violence, as it minimizes its impact and contributes to its social tolerance (Bjørnholt & Rosten, 2020). On the other hand, the Ecological Model of Violence (Heise, 1998) offers a comprehensive framework for analyzing the interaction of individual, relational and structural factors in the manifestation of gender-based violence. This model has been validated in multiple studies that have demonstrated how the combination of rigid gender beliefs, community norms, and ineffective institutional responses contribute to the persistence of violence (Hearn *et al.*, 2021).

Among the risk assessment instruments that consider cognitive factors as predictors of gender violence are the Inventory of Distorted Thoughts about Women and the Use of Violence (IPDMUV, from their Spanish initials) developed in Spain and the Inventory of Ambivalent Sexism (ISA, from Spanish initials) developed in the United States, both of which presented adequate psychometric properties in different studies (Echeburúa & Fernández-Montalvo, 2008; Glick & Fiske, 1996). However, these instruments could be strengthened by incorporating a gender perspective that allows a more integral understanding of violence. In a qualitative study in Argentina, with men reported for gender violence, it was observed that the participants held deeply rooted sociocultural representations that exceed mere cognitive distortions (Gauna *et al.*, 2022). This coincides with theories that propose that in the analysis of gender violence, the mechanisms of justification and minimization of aggressive behaviors are directly related to sexist beliefs that aggressors acquire and reproduce in their sociocultural contexts (Amor *et al.*, 2009).

Despite criticisms of self-reports—such as social desirability bias (Paulhus & Reid, 1991), recall bias (Schwarz, 1999), and lack of self-awareness (Nisbett & Wilson, 1977)—these instruments remain fundamental in risk assessment by providing a direct perspective from the individual on his or her thoughts and behaviors (Paulhus

& Vazire, 2007). In the specific context of gender-based violence, self-reports allow for the identification of patterns of thinking and attitudes that might go unnoticed in traditional assessments (Hegarty *et al.*, 2008), especially in the detection of gender stereotypical beliefs that legitimize violent behaviors (Else-Quest & Hyde, 2016).

In Argentina, the Gender Stereotyped Beliefs and Violent Behavior Scale (GSBVS) (Gauna *et al.*, 2022) was recently developed following a qualitative approach, aimed at designing items that accurately assess the preconceived ideas about characteristics, roles and behaviors attributed to people based on their gender. This scale is based on antecedents such as the IPDMUV, which identifies cognitive biases in men who are violent towards their partners (Fernández-Montalvo & Echeburúa, 2008), and ISA, which addresses sexism as a multidimensional construct with hostile and benevolent beliefs (Cárdenas *et al.*, 2010; Glick & Fiske, 1996). These instruments served as a basis for delimiting and assessing distorted thoughts associated with gender-based violent behavior.

As mentioned, the development of the questionnaire was based on a qualitative approach, where hypotheses emerged and were refined during data collection and analysis. This process included the dynamic interpretation between the facts and the participants' experiences, allowing a subjective approach and the co-construction of knowledge between researchers and participants (Montero & León, 2002). The research identified and organized gender stereotypical beliefs into four main categories: the causes that generate intimate partner and family violence, the classical or traditional conception of the family, the gender role assigned to women in society and the family, and hegemonic thinking.

Among the causes that generate violence, beliefs were identified that attribute this behavior to external factors, such as the consumption of psychoactive substances or mental disorders, as well as ideas that justify the violent actions of men due to provocation by women (Catena *et al.*, 2015; Lorente, 2001; Murphy *et al.*, 2001). Also detected were conceptions that perceive violence as a strategy to manage family conflicts and beliefs about the ability of men to change their behavior by their own free will. In relation

to the classic conception of the family, ideas emerged that restrict violence to the private sphere, attribute to the male the role of absolute head of the household and perpetuate an inherited patriarchal family model (Connel, 2005; R. González & Yanes, 2000; Kinsfogel & Grych, 2004).

Regarding the gender role assigned to women, perceptions were identified that define them as satisfying the needs of others, devalue their capabilities and enhance the idea that they should be overprotected (Moya, 1985; Paz de Corral et al., 2004). Also included were ideas that consider the female partner as personal property (Fernández, 2014). Finally, within hegemonic thinking, expressions of benevolent paternalism, religious beliefs that reinforce traditional roles and the identification of women exclusively as mothers were found (Bonino, 2002; Connel, 2005; Segato, 2010; Beck & Freeman, 2004).

The questions in the questionnaire were organized in a progressive way, from general topics to more specific aspects. For example, statements such as “It is normal and to be expected that in the family conflicts are resolved with some aggressive behavior” were included to introduce the topic, followed by more specific statements such as “Men should provide financially for their children and partners” or “Women are more fragile, delicate and vulnerable than men”. These statements seek to explore the underlying beliefs that reinforce gender stereotypes and contribute to violent gender behavior.

Currently, there are no studies on the psychometric properties of the scale that analyze, for example, the level of difficulty of the items, the fit of the measurement model, the functioning of the response alternatives and the differential functioning of the items. Considering the importance of having evidence of the psychometric properties of the instrument, from robust psychometric approaches, the aim of the present work was to examine the psychometric properties of the Gender Stereotyped Beliefs and Violent Behavior Scale (GSBVS) in a sample of Argentinian men with and without a judicial history of family or gender violence using the Rasch model (Rasch, 1960). The implementation of this instrument could be very useful in instances of violence risk assessment for its prevention and specific intervention.

METHOD

Type

Research design

The present study adopts an instrumental research design, since the psychometric properties of an assessment and diagnostic instrument are analyzed (Montero & León, 2007).

Sample

The sample consisted of 369 men from the province of Cordoba. On the one hand, 32.61% ($n = 121$) had no previous reports of domestic or gender violence, with ages between 21 and 65 years. In this group, age was classified into four categories: 30.6% were between 21 and 31 years old, 28.1% between 32 and 41, 23.1% between 42 and 51 and 18.2% between 52 and 65 years old. On the other hand, 67.39% ($n = 248$) had previous complaints of family or gender violence and attended the Integral Men's Center of the Ministry of Women's Affairs. For this group, individual age data were not available, so it was not possible to calculate the mean or standard deviation. It is important to clarify that the status of ‘judicialized’ was verified through official records of previous complaints. In this way, the social desirability bias that could arise from self-reporting was avoided. In addition, the total sample size and that of each subsample is in line with the recommendations of the specialized literature to obtain stable estimates when using the Rasch model (Chen et al., 2014), guaranteeing the validity of the analysis performed.

Instrument

The Gender Stereotypical Beliefs and Violent Behavior Scale (GSBVS) (Gauna et al., 2022) is an instrument designed to assess gender stereotypical beliefs associated with family and intimate partner violence behaviors. It consists of 32 items, which are answered on a 5-point Likert scale (1= “completely disagree” to 5= “completely agree”). In a first qualitative stage, the authors proposed that the instrument allow for the evaluation of different dimensions of men's perceptions of: gender roles in the family sphere (e.g., Keeping the house clean and tidy is more the responsibility of women, and even more so if they do not have a formal job), expected behaviors of women in situations of violence (e.g., Women

have an essence that leads them to magnify the supposed aggressive behaviors of men), ways of resolving family conflicts (e.g., Couple problems are private and are resolved with the partner or the family, not outside of it), social mandates and expectations about the couple bond (e.g., a woman being unfaithful is not the same as a man being unfaithful), and the gender roles assigned to women (e.g., the most important thing for a woman is to be a mother). Because the development of this instrument is recent, the psychometric evidence available in the literature is limited and so far, no specific studies have been reported that analyze its internal structure validity or reliability. However, in the present study Cronbach's alpha index was .93 suggesting adequate internal consistency for this specific sample.

Procedure

To carry out this study, we proceeded to collect data from the two types of samples: with and without previous complaints of gender-based violence. First, the corresponding authorization was requested from the Ministry of Women's Affairs and the director of the Integral Center for Men in Situations of Violence of the Province of Córdoba, and a document was submitted explaining the purpose of the study and the usefulness and dissemination of the data obtained. After the data collection was approved, the objectives and scope of the study were explained to the participants, and anonymity and data protection were guaranteed. After obtaining the informed consent of each of the participants, they were given the Gender Stereotyped Beliefs and Violent Behavior questionnaire. On the other hand, a google form was prepared and disseminated, requesting the participation of males between 21 and 65 years of age, with the exclusion criterion of not having previous reports of domestic or gender violence. The purpose of the study, the usefulness and dissemination of the data obtained, as well as the objectives and scope of the study, and the guarantee of anonymity and data protection were specified. The administration time of the questionnaire was 30 minutes. In both cases, informed consent forms were provided.

In compliance with the ethical standards for research involving human subjects (APA, 2002), measures were implemented to guarantee respect for human rights, the dignity of the participants and the confidentiality of the data collected. Likewise, strict protocols were

applied to minimize any possible psychological or social risk derived from participation in the research. Participants were provided with clear information on the objectives, scope and possible implications of the study, ensuring their voluntary informed consent, free of coercion. In addition, the possibility of leaving the study at any time without consequences was guaranteed.

For data management, the guidelines of the Personal Data Protection Law 25.326 were strictly followed, implementing secure storage mechanisms and anonymization of responses to protect the identity of the participants. Furthermore, in accordance with the Declaration of Helsinki, strategies were established to mitigate any negative impact of the research, prioritizing the welfare of the participants and ensuring that the results obtained contribute to scientific knowledge without causing harm. Finally, a responsible research approach was adopted, including environmental protection throughout the study, minimizing unnecessary resource use, and promoting sustainable practices in data collection and analysis.

Data analysis

Parameterization of the Rasch Model

Before starting the data analysis, it was determined whether a partial credit parameterization (PCM) or a classification scale parameterization (CSM) was appropriate for the Rasch model. To determine this, the likelihood ratio test was used, which in case it shows significance values $p > .01$, the rating scale parameterization is chosen since the distances among the response categories are estimated to be constant (Tennant & Conaghan, 2007).

Fit to Rasch Model

The chi-square test was used to evaluate the global adjustment of the test and of each of the items. In the particular case of the items, the chi-square test with Bonferroni correction was used. An adequate overall fit is assumed when the chi-square test is not statistically significant ($p > 0.05$). For individual items, adequate fit is considered when the p-value is greater than the Bonferroni adjusted significance level (Cavanagh & Waugh, 2011). Considering that the test of χ^2 may be conditioned by the sample size, the root mean square error of approximation (RMSEA) was calculated to examine the fit and a value less than .05 accepted for samples smaller than

500 cases was considered as an interpretation criterion (Tennant & Pallant, 2012).

Residual adjustment of items and persons

To assess the fit of the items and individuals to the Rasch model, it was considered adequate that the mean (M) of the residuals be close to 0 and the standard deviation (SD) close to 1. In addition, Item Characteristic Curves (ICCs) were used for graphical display and a good fit was considered if the values of the residuals were between ± 2.5 . The values that were not in this range or that were identified as extreme are identified and if necessary, eliminated because abnormal response patterns can influence the fit indices of the model (Tennant & Conaghan, 2007).

Functioning of the response thresholds

The functioning of the response categories was examined. For this purpose, adequate functioning was considered to be evident when item thresholds are ordered. A threshold is the point at which two adjacent categories are equally likely to be selected. Item Characteristic Curves (ICC) allow visualizing this behavior and detecting possible disorders in the thresholds. This analysis is essential to assess the validity of the instrument's response structure and to ensure accurate measurements.

Differential Item Functioning (DIF)

The differential functioning of the item (DIF) was analyzed according to the type of sample (participants with reports of gender-based violence and participants without reports of gender-based violence). Rasch analysis makes it possible to identify whether an item functions differently in different sample subgroups, a phenomenon known as DIF. The DIF can be uniform, when the differences in responses between groups are consistent along the continuum of the trait measured, or non-uniform, when these differences vary according to the level of the latent trait. For detection, the characteristic curves of each item were analyzed and the presence of DIF was statistically confirmed by ANOVA considering a Bonferroni adjustment ($p < .05$). In the case of uniform DIF, it is possible to adapt the item for each group. In contrast, when non-uniform DIF is identified, the elimination of the item is considered the most appropriate option, since its differential behavior compromises the validity of the measurement

(Tennant & Pallant, 2006). In this study, the criterion for eliminating an item with non-uniform DIF was to obtain a significant p-value ($p < .05$) after the Bonferroni adjustment.

Reliability

The People Separation Index (PSI), which ranges from 0 to 1, was used. A PSI of .70 or higher indicates that the instrument can adequately differentiate among levels of the trait in the population studied. The PSI is comparable to Cronbach's alpha when there is no significant missing data or the distribution of scores is not skewed or biased.

Unidimensionality and local dependence

The unidimensionality was assessed by Principal Component Analysis of the residuals, followed by paired t-tests among subgroups of items with opposite residual loadings ($\pm .30$). It was considered unidimensional if less than 5% of individuals showed significant differences (± 1.96) among subgroups (Tennant & Pallant, 2006). Local independence was examined with the residual correlation matrix, considering items with correlations greater than .20 as dependent. These analyses are crucial to validate the structure of the instrument and the quality of the measurements obtained (Andrich *et al.*, 2010).

RESULTS

The likelihood ratio test was found to be significant ($p < 0.001$), so it was decided to use the Partial Credit Model (PCM) as a parameterization.

Initial version

The items of this scale presented $M = 0$ and $SD = 0.40$, while the individuals had $M = -0.48$ and $SD = 0.74$, with a distribution of responses ranging from -4 to +4 logits (see Fig. 1). A significant chi-square was obtained ($X^2 = 423.63$; $gl = 96$; $p < 0.01$; $RMSEA = 0.11$) (Table 1), suggesting a possible poor fit on some items. In the item-by-item analysis (Table 2), items 1, 14, 17, 19, 22 and 26 showed residual values outside the acceptable range (± 2.5). Likewise, items 4, 7 and 24 presented mismatches in both statistics of fit with a significance level of $p = .05$ (Bonferroni adjusted probability level value $p = .0015$). Regarding response thresholds, all items

except item 10 evidenced disordered thresholds, indicating difficulties in the logical progression of response categories.

The residual correlation matrix revealed associations between items 11-18 and between items 30-31. In addition, uniform DIF was identified for items 11, 20, 21 and 22, with items 11 and 22 being favorable for the overall sample, and items 20 and 21 favorable for the judicial sample. Non-

uniform DIF was also observed in item 17. At the individual level, three participants (1%) showed extreme values, while 64 participants (21%) presented residual values outside the acceptable range (± 2.5), suggesting atypical responses. The PSI obtained was .91, reflecting good internal consistency of the instrument. However, the proportion of statistically significant t-tests outside the ± 1.96 range was 8.41%, indicating that there is not enough evidence to assume unidimensionality of the scale.

Table 1

Summary of the fit of the original version and the version with ordered categories

	Residual adjustment of item		Residual adjustment of people		Item-Trait Interaction			PSI	Unidimensionality
	M	SD	M	SD	X ² (df)	p	RMSEA		
Initial	0.60	2.50	-0.20	1.94	423.64 (96)	.000	0.11	.91	8.41
Alternative	0.14	1.29	-0.25	1.46	115.68 (75)	.001	0.04	.88	1 %

Note: M = mean; SD = standard deviation; df = degrees of freedom; PSI = person separation index; per C <5% = proportion of t tests that were significant at the .05 significance level.

Table 2

Location and fit statistics of the items in their original version

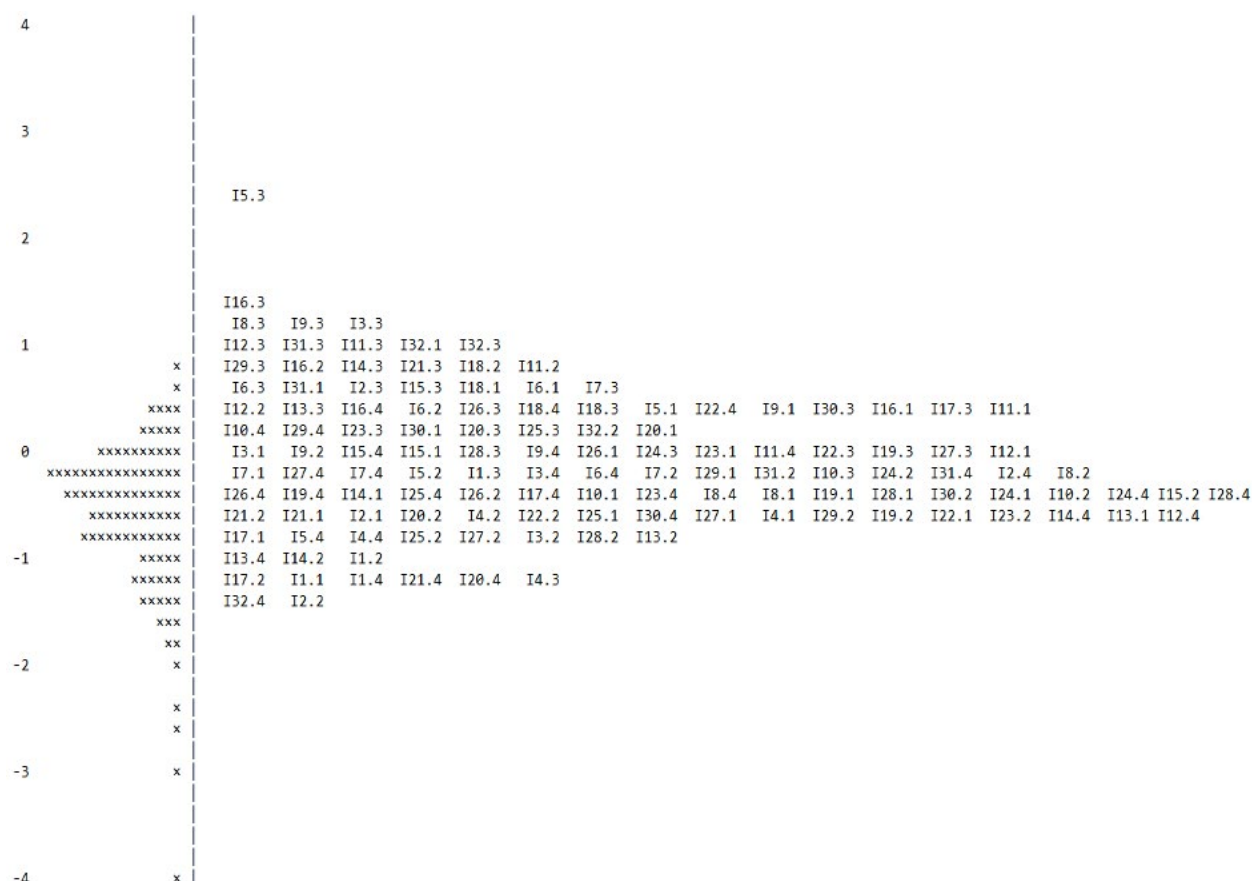
Item	Loc (Logit)	SE	AR	df	x ²	df	Pr
1. The family should always be united, regardless of the problems and conflicts that occur within it.	-0,83	0,05	3,42	287,69	18,61	3	.000
2. Men are more tolerant than women in the resolution of family conflicts.	-0,36	0,05	-1,51	287,69	3,75	3	.289
3. Men are more capable than women to carry out personal and family projects.	0,06	0,05	-1,64	287,69	1,74	3	.627
4. The consumption of alcohol and other substances (drugs, psychiatric medication, etc.) are determinants of violent behavior.	-0,85	0,05	9,28	287,69	111,09	3	.000
5. Men are the ones who should set the rules in the family environment.	0,48	0,06	0,06	287,69	5,37	3	.147
6. Psychological and psychiatric treatment is only for the mentally ill, not for people who have had a marital conflict.	0,60	0,06	0,10	287,69	15,02	3	.001
7. Women possess an essence that leads them to magnify the supposedly aggressive behavior of men.	0,07	0,05	-3,41	287,69	24,00	3	.000
8. Women should cover the affective needs of all the family members.	0,13	0,05	-0,49	287,69	1,62	3	.654

9. Keeping the house clean and in order corresponds more to women, and to a greater extent if they are not formally employed.	0,47	0,06	-2,17	287,69	17,37	3	.000
10. Women tend to be more emotionally unstable than men, generating some conflicts in the bonds.	-0,18	0,05	-0,89	287,69	9,55	3	.022
11. It is normal and to be expected that conflicts in the family will be resolved with some aggressive behavior.	0,81	0,07	-0,25	287,69	5,49	3	.139
12. The violent behavior of the male tends to be a response to a provocation from his partner.	0,38	0,06	-0,93	287,69	15,13	3	.001
13. Couple's problems are private and are solved with the partner or the family, not outside of it.	-0,41	0,05	1,91	287,69	1,38	3	.711
14. The man must be firm in order to maintain family ties and family order.	-0,25	0,05	-3,27	287,69	11,09	3	.011
15. It is necessary to maintain customs of our family of origin in order to sustain the present family.	0,08	0,05	-0,80	287,69	3,87	3	.275
16. To avoid conflicts within the couple, the woman should have similar characteristics to her own mother	0,80	0,07	-1,82	287,69	3,65	3	.302
17. Males make many efforts to sustain the bonds of a couple.	-0,45	0,05	-2,92	287,69	1,55	3	.670
18. In a couple's argument, shouting and insults are normal and to be expected, because they are part of its solution.	0,82	0,07	0,31	287,69	1,28	3	.734
19. The ways of relating in the family should be respected and religious considerations should be taken into account.	-0,29	0,05	3,50	287,69	9,45	3	.023
20. Families should be made up of a man, a woman and children (boys and girls).	-0,25	0,05	1,69	287,69	18,99	3	.000
21. Men must financially support their children and partners.	-0,34	0,05	2,36	287,69	2,76	3	.430
22. Many aggressive behaviors in men are determined by external factors such as lack of money, work, other people's opinions and other causes.	-0,20	0,05	4,25	287,69	27,95	3	.000
23. Women need the care and protection of a man.	-0,14	0,05	-1,39	287,69	22,53	3	.000
24. Men can stop certain aggressive behaviors when they themselves wish to do so.	-0,14	0,05	4,61	287,69	30,03	3	.000
25. When choosing a partner, men should take into account and think about what that woman would be like as a mother.	-0,34	0,05	0,20	287,69	0,32	3	.956
26. If a woman is a bad mother, she is undoubtedly a bad person.	-0,06	0,05	3,48	287,69	7,02	3	.071
27. Women are very much influenced by their friends and family of origin, as opposed to men.	-0,34	0,05	-1,17	287,69	4,06	3	.255
28. Women are more fragile, delicate, and vulnerable than men are.	-0,34	0,05	0,94	287,69	5,61	3	.132

29. Sometimes men react aggressively to women's instability/psychopathology, just to defend themselves.	0,02	0,05	-0,27	287,69	2,56	3	.464
30. When a woman is in a couple, it is up to her to stay with the man she has chosen to continue the bond.	0,02	0,05	0,63	287,69	4,70	3	.195
31. If a woman is or has been in a relationship with a man, she should reciprocate, especially if they spent a long time together.	0,43	0,06	-0,77	287,69	11,77	3	.008
32. It is not the same for a woman to be unfaithful as for a man to be unfaithful.	0,61	0,06	2,28	287,69	8,51	3	.035

Note: Items with residual values greater than ± 2.5 or statistically significant considering a Bonferroni adjustment $p = 0015$ for a $p = .05$ are highlighted in bold. Loc (Logit) = location expressed in logit; SD = standard deviation; RA = residual adjustment; df = degrees of freedom; X^2 = chi-square; Pr = probability.

Figure 1
Item-person map of the 32 items



Note: Item-person map of the 32 items. On the left is the location of the persons on the continuum according to their trait level. The symbol $\times$ represents a group of 3 persons. On the right is the distribution of the items. In the upper part it can be seen that category 3 of item 5 allows the evaluation of the highest trait level and in the lower part category 4 of item 32 and category 2 of item 2 allow the evaluation of the lowest trait level.

Version with ordered categories

On the basis of the results, adjustments were made to the response categories and items. Adjacent categories that showed disorder in their thresholds were collapsed, resulting in a three-category scale with monotonically ordered and increasing transition thresholds. This allowed for optimal functioning of the response categories, consistent with Rasch polytomous scaling. In addition, items 1, 4, 22, 24, and 26 were eliminated due to extreme residual values. In this version only item 7 remained with a residual value greater than -2.5 and a mismatch, according to both adjustment statistics, with a significance level of $p = .05$ (Bonferroni adjusted probability level value $p = .0020$). Items 11 and 31 were also eliminated for presenting local dependence and 24 cases

with extreme residual values were excluded. When evaluating the residual correlation matrix, no items with local dependence were found. Likewise, DIF was identified in items 6, 16 and 18 in favor of the non-judicial sample. Also, non-uniform DIF was observed in item 17.

After the modifications made to this version with the ordered thresholds, the items presented a mean of 0 and a standard deviation (SD) of 0.68, while the persons showed a mean of -0.84 and SD of 1.09 within a sampling distribution of -3.80 to 2.12 logits (see Fig. 2). The model fit improved reaching an RMSEA of 0.04 and the person separation reliability index (PSI) was .88. Finally, a value close to the Per C < 5% criterion was obtained, which supports the assumption of unidimensionality of the model (see Table 1).

Table 3

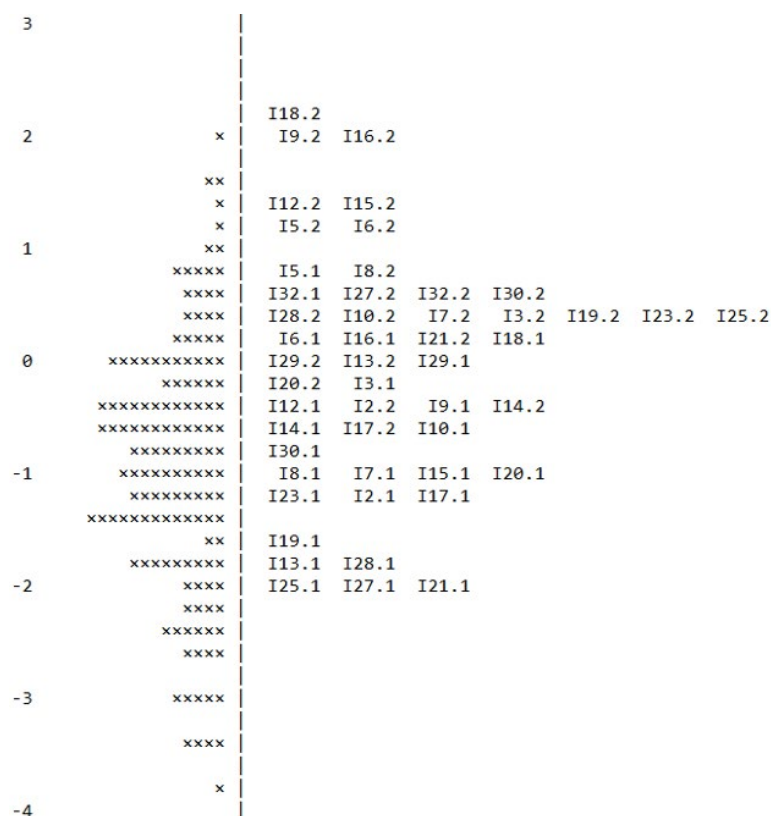
Localización y estadísticos de ajuste de los ítems de la versión con categorías ordenadas

Item	Loc (Logit)	SE	AR	df	χ^2	df	Pr
2. Men are more tolerant than women when it comes to resolving family conflicts.	-0,69	0,09	1,67	264	4,31	3	.230
3. Men are more capable than women in carrying out personal and family projects.	0,21	0,10	-0,25	264	1,19	3	.756
5. Men are the ones who should establish the rules in the family environment.	1,05	0,12	1,67	264	1,08	3	.782
6. Psychological and psychiatric treatment is only for the mentally ill, not for people who have had a marital conflict.	0,82	0,11	-0,09	264	0,89	3	.828
7. Women possess an essence that leads them to magnify the supposedly aggressive behavior of men.	-0,20	0,10	-2,73	264	20,01	3	.000
8. Women should cover the affective needs of the family members.	-0,03	0,10	0,61	264	0,32	3	.957
9. Keeping the house clean and in order corresponds more to women, and to a greater extent if they do not have a formal job.	0,90	0,12	-1,90	264	13,68	3	.003
10. Women tend to be more emotionally unstable than men, generating some conflicts in the bonds.	0,06	0,10	-1,34	264	6,36	3	.096
12. Men's violent behavior tends to be a response to a provocation from their partner.	0,52	0,11	-0,70	264	5,12	3	.163
13. Couple's problems are private and are solved with the partner or the family, not outside of it.	-0,84	0,10	1,67	264	1,78	3	.619

14. The man must be firm in order to maintain family ties and order.	-0,40	0,09	-1,11	264	4,02	3	.260
15. It is necessary to maintain customs of our family of origin in order to sustain the present family.	0,25	0,11	0,37	264	0,74	3	.864
16. To avoid conflicts within the couple, the woman should have similar characteristics to her own mother.	1,18	0,12	-0,06	264	7,12	3	.068
17. Males make many efforts to sustain the bonds of a couple.	-0,83	0,09	0,37	264	1,72	3	.632
18. In a couple's argument, shouting and insults are normal and to be expected, because they are part of its solution.	1,39	0,13	0,61	264	8,67	3	.034
19. The ways of relating in the family should be respected and take into account religious considerations.	-0,52	0,10	2,37	264	13,94	3	.003
20. Families should consist of a man, a woman, and children (boys and girls)	-0,50	0,09	-0,35	264	1,94	3	.585
21. Men should provide financially for their children and partners.	-0,78	0,10	1,72	264	2,38	3	.497
23. Women need the care and protection of a man.	-0,28	0,10	-2,16	264	7,63	3	.054
25. In choosing a partner, men should take into account and think about what that woman would be like as a mother.	-0,67	0,11	0,42	264	2,61	3	.456
27. Women are very much influenced by their friends and family of origin, as opposed to men.	-0,64	0,10	0,01	264	1,93	3	.588
28. Women are more fragile, delicate and vulnerable than men are.	-0,63	0,10	0,15	264	0,93	3	.817
29. Sometimes men react aggressively to women's instability/psychopathology, just to defend themselves.	0,05	0,09	1,52	264	4,93	3	.177
30. When a woman is in a couple, it is up to her to stay with the man she has chosen to continue the bond.	-0,03	0,10	0,47	264	0,64	3	.887
32. It is not the same for a woman to be unfaithful as for a man to be unfaithful.	0,61	0,11	0,53	264	1,76	3	.623

Note. Items with residual values greater than ± 2.5 or statistically significant considering a Bonferroni adjustment $p = .0015$ for a $p = .05$ are highlighted in bold. Loc (Logit) = location expressed in logit; SD = standard deviation; AR = residual adjustment; df = degrees of freedom; X^2 = chi-square; Pr = probability.

Figura 2
 Mapa de ítems- personas de los 25 ítems



Note. Item-person map of the 25 items. On the left is the location of the persons on the continuum according to their trait level. The symbol × represents a group of 3 persons. On the right is the distribution of the items. In the upper part it can be seen that category 2 of item 18 allows to evaluate the highest trait level and in the lower part it can be seen that category 1 of items 21, 25 and 27 allows to evaluate the lowest trait level.

DISCUSSION

Gender-based violence has serious consequences at the individual and social level, which makes it necessary to develop instruments that allow us to reliably assess the risk of these behaviors. One strategy for assessing gender violence is through the evaluation of risk factors associated with its occurrence. In this regard, previous studies indicate that in men machista beliefs are a predictor of violence towards their partners (Flood & Pease, 2009). With the objective of developing tools capable of assessing the risk of gender violence, in the present study the psychometric properties of the Gender Stereotyped Beliefs and Violent Behavior Scale (GSBVS, from their Spanish initials)) were evaluated in men with and without judicial measures for gender violence.

The first analyses of the original version showed that the items did not adequately fit the Rasch model. To solve this, the response categories were collapsed, items were eliminated, especially

those that showed extreme residual values or had local dependence problems. These modifications showed a better fit of the data to the Rasch model, as well as compliance with the assumptions of unidimensionality and local independence. It is worth mentioning that since the scale is still under development, it is feasible to make modifications such as, for example, eliminating items to evaluate its psychometric properties. However, these actions could be controversial when analyzing already established instruments (Shea *et al.*, 2009).

The analysis of response thresholds showed that except for item 10, the rest of the items presented disordered thresholds. After the collapse of the categories, ordered thresholds were obtained, showing a better correspondence between the level of ability of the participants and the response categories. In addition, this adjustment of the response thresholds ensured a monotonic and ascending category transfer, in line with the requirements of Rasch's polytomous scaling (Rasch, 1960). While these modifications at the technical level proved effective, it should be

mentioned that this category reduction could also affect the accuracy in measuring high levels of frequency or severity (Abulela & Khalaf, 2024).

The version with three response alternatives showed compliance with the unidimensionality assumption and the local independence assumption. The verification of these assumptions supports the usefulness of the instrument to assess in a unidimensional way and without residual correlations among the items the latent trait of gender stereotyped beliefs. However, one item was identified with a high residual fit, suggesting a mismatch with respect to what was expected by the Rasch model. Despite this, it was decided to keep this item in the final version due to its conceptual relevance and its contribution to the coverage of the construct. It is recommended that future research analyze its behavior in different samples of prosecuted and non-prosecuted men to determine the stability of this mismatch and its possible impact on the measurement of the latent trait. Additionally, the good fit of the participants' responses to the Rasch model allowed us to accurately place them on the logit continuum, facilitating the interpretation of the levels of the latent trait (Bond & Fox, 2007).

The person separation index (PSI) showed adequate reliability which would indicate that the version with three response alternatives effectively discriminates individuals with different levels of gender stereotyped beliefs (Hagquist et al., 2009). In addition, the person-item mapping showed that the items are concentrated in the middle part of the latent trait, indicating that the instrument items measure moderate levels of stereotyped beliefs. This result suggests that additional items should be developed to assess extreme levels of gender stereotyped beliefs.

When assessing the presence of bias in the items, it was found that three items presented uniform DIF. Specifically, at the same trait level the non-judicial sample presented lower values than the judicial sample, which could be due to the influence of social desirability (Echeburúa et al., 2016; Eckhardt et al., 2012; Gracia et al., 2015) or due to the presence of benevolent rather than hostile sexism style (Agut et al., 2023). Likewise, one item presented non-uniform DIF, which represents 4% of the total number of items. It is worth mentioning that, although the presence

of DIF may indicate that the measurement of the construct varies among groups, the decision to keep these items was based on the consideration that this is an exploratory study. In addition, priority was given to eliminating those items with severe mismatches, and it was decided to keep the items with DIF in order to evaluate their impact in future psychometric studies. This decision will allow, in future research, to examine how the presence of DIF could influence the validity of the scale and whether these items might need additional adjustments.

Despite the contributions made, this study has limitations that should be considered. First, the lack of sociodemographic data in the judicial sample, such as age or educational level, prevented us from assessing whether the instrument's items presented response patterns differentiated according to specific subgroups (e.g., youth vs. adults or low, medium and high socioeconomic levels). This could affect the interpretation of the fairness of the measurement in different population segments. However, since this is an exploratory study, the invariance of measurement was analyzed according to the presence or absence of reports of gender or family violence, which allows a first approach to the evaluation of the DIF in this sample. Even so, it is recommended that future studies incorporate variables such as age and socioeconomic status to further examine potential differences in item functioning. Second, although the assumption of local independence was met, some items had residual correlation values close to the cutoff point, suggesting that item wording should be reviewed to avoid local dependence among items due to similarity in formulation or redundancy in content (Bandalos, 2021). Future studies could address these limitations in several ways. First, it is recommended to broaden the sample of men on trial, including a greater diversity in terms of age and levels of stereotyped beliefs. In addition, it would be beneficial to develop new items to capture extreme levels of the trait, thus improving the instrument's discriminative ability. Regarding the analysis of DIF, it would be pertinent to further investigate the impact of social desirability, given that this factor could influence the validity of the instrument. Finally, it is suggested to explore the use of fewer response options or to introduce category definitions that improve clarity in the selection of responses, thus optimizing the measurement of frequency and severity.

CONCLUSION

This study provides evidence on the psychometric validity of the Gender Stereotyped Beliefs and Violent Behavior Scale (GSBVS) in its version of three response options adjusted by means of the Rasch model. The results indicate that the scale meets the criteria of unidimensionality and local independence, showing an adequate fit to the model and good discriminative ability. However, the concentration of the items at moderate levels of the trait suggests the need to develop additional items to assess extremes of the construct with greater precision. The detection of items with DIF highlights the importance of considering factors such as social desirability and type of sexism when interpreting the results. Also, the lack of sociodemographic data in the judicialized sample limited the analysis of differences by age or educational level, suggesting the need to address these variables in future studies. Despite these limitations, the GSBVS presents itself as a promising tool for assessing gender stereotyped beliefs, which have been identified as a key factor in the prevention of gender-based violence. Finally, it should be noted that continued assessment of the psychometric properties of the scale in diverse populations will strengthen its usefulness and contribute to the development of more effective interventions.

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REFERENCES

- Abulela, M. A. A., & Khalaf, M. A. (2024). Does the Number of Response Categories Impact Validity Evidence in Self-Report Measures? A Scoping Review. *Sage Open*, 14(1). <https://doi.org/10.1177/21582440241230363>
- Agut, S., Martín-Hernández, P., Soto, G., & Arahuete, L. (2023). Understanding the relationships among self-ascribed gender traits, social desirability, and ambivalent sexism. *Curr Psychol*, 42, 25793–25806. <https://doi.org/10.1007/s12144-022-03650-6>
- Amor, P.J., Echeburúa, E. y Loinaz, I. (2009). ¿Se puede establecer una clasificación tipológica de los hombres violentos contra su pareja? *International Journal of Clinical and Health Psychology*, 9(3) 519-539.
- Andrich, D., Sheridan, B. & Luo, G. (2010). Rasch models for measurement: RUMM2030 [Computer software]. Perth: RUMM Laboratory Pty Ltd. <https://www.rummlab.com.au/>
- Bandalos, D. L. (2021). Item Meaning and Order as Causes of Correlated Residuals in Confirmatory Factor Analysis. *Structural Equation Modeling: A Multidisciplinary Journal*, 28(6), 903–913. <https://doi.org/10.1080/10705511.2021.1916395>
- Bond, T. G., & Fox, C. M. (2007). *Applying the Rasch model: Fundamental measurement in the human sciences (2nd ed.)*. London: Lawrence Erlbaum.
- Bjørnholt, M., & Rosten, M. (2020). *Men, masculinities and intimate partner violence*. Routledge.
- Cárdenas, M., Lay, S.-L., González, C., Calderón, C., & Alegría, I. (2010). Ambivalent sexism inventory: adaptation, validation and relationship to psychosocial variables. *Salud & Sociedad*, 1(2), 125–135. <https://doi.org/10.22199/S07187475.2010.0002.00006>
- Cavanagh, R. F., & Waugh, R. F. (Eds.). (2011). *Applications of rasch measurement in learning environments research* (Vol. 2). Rotterdam: Springer Science & Business Media. <https://doi.org/10.1007/978-94-6091-493-5>.

- Centro de Estudios de Género. (2020). *Factores socioculturales que influyen en la violencia de género*. Universidad Nacional de Cajamarca. <https://repositorio.unc.edu.pe/handle/20.500.14074/4945>
- Chen, W. H., Lenderking, W., Jin, Y., Wyrwich, K. W., Gelhorn, H., & Revicki, D. A. (2014). Is Rasch model analysis applicable in small sample size pilot studies for assessing item characteristics? An example using PROMIS pain behavior item bank data. *Quality of life research: an international journal of quality of life aspects of treatment, care and rehabilitation*, 23 (2), 485–493. <https://doi.org/10.1007/s11136-013-0487-5>
- Comisión Económica para América Latina y el Caribe (CEPAL). (2021). *La pandemia en la sombra: Femicidios o feminicidios ocurridos en 2020 en América Latina y el Caribe*. https://www.cepal.org/sites/default/files/news/files/21-00793_folleto_la_pandemia_en_la_sombra_web.pdf
- Echeburúa, E., Amor, P. J., Sarasua, B., Zubizarreta, I., & Holgado-Tello, F. (2016). Inventario de Pensamientos Distorsionados sobre la Mujer y el Uso de la Violencia: revisado (IPDMUV-R): propiedades psicométricas. *Anales de Psicología*, 32(3), 837–846. <https://doi.org/10.6018/analesps.32.3.231901>
- Eckhardt, C. I., Samper, R., Suhr, L., & Holtzworth-Munroe, A. (2012). Implicit attitudes toward violence among male perpetrators of intimate partner violence: A preliminary investigation. *Journal of Interpersonal Violence*, 27(3), 471–491. <https://doi.org/10.1177/0886260511421677>
- Else-Quest, N. M., & Hyde, J. S. (2016). Intersectionality in quantitative psychological research: I. Theoretical and epistemological issues. *Psychology of Women Quarterly*, 40(2), 155–170. <https://doi.org/10.1177/0361684316629797>
- Flood, M., & Pease, B. (2009). Factors influencing attitudes to violence against women. *Trauma, Violence, & Abuse*, 10(2), 125–142. <https://doi.org/10.1177/1524838009334131>
- Flood, M. (2018). *Engaging men and boys in violence prevention*. Palgrave Macmillan.
- García-Moreno, C., Jansen, H. A. F. M., Ellsberg, M., Heise, L., & Watts, C. (2005). WHO multi-country study on women's health and domestic violence against women: Initial results on prevalence, health outcomes and women's responses. World Health Organization. <https://iris.who.int/handle/10665/43309>
- Gauna, M.B., Comba, S., Chilo, J., Homenuc, G., Quiroz, V., Rosa, P., & Alberoni, A. (2022). Inventario de estereotipos de género y ejercicio de violencia en varones denunciados por sus parejas. *Revista Estudios Psicológicos*, 2(3), 22–41. <https://doi.org/10.35622/j.rep.2022.03.002>
- Gauna, M.B. (2022) Aproximaciones teóricas a la valoración de riesgo desde la perspectiva de género en Comba, S. (Ed.) *El trabajo con varones que ejercen violencia desde una perspectiva de género* (v1 pp 167-182) Babel editorial
- Glick, P., & Fiske, S. T. (1996). The Ambivalent Sexism Inventory: Differentiating hostile and benevolent sexism. *Journal of Personality and Social Psychology*, 70(3), 491–512. <https://doi.org/10.1037/0022-3514.70.3.491>
- González, M. (2021). Los impactos de la impunidad en México: Reflexiones desde una perspectiva de género. *Revista Mexicana de Ciencias Políticas y Sociales*, 66(241), 363–392. https://www.scielo.org.mx/scielo.php?pid=S0041-86332021000100363&script=sci_arttext
- Gracia, E., Rodríguez, C. M., & Lila, M. (2015). Preliminary evaluation of an analog procedure to assess acceptability of intimate partner violence against women: the Partner Violence Acceptability Movie Task. *Frontiers in psychology*, 6, 1567. <https://doi.org/10.3389/fpsyg.2015.01567>
- Hearn, J., Ratele, K., Shefer, T., & Rahman Khan, A. (2021). Men, Masculinities, and Peace, Justice, Conflict, and Violence : A Multi-level Overview. In *Routledge Handbook of Feminist Peace Research* (1st ed.).
- Hagquist, C., Bruce, M., & Gustavsson, J. P. (2009). Using the Rasch model in nursing research: an introduction and illustrative example. *International journal of nursing studies*, 46(3), 380–393. <https://doi.org/10.1016/j.ijnurstu.2008.10.007>

- Hegarty, P., & Buechel, C. (2006). Androcentric reporting of gender differences in APA journals: 1965-2004. *Review of General Psychology*, 10(4), 377-389. <https://doi.org/10.1037/1089-2680.10.4.377>
- Heise, L. L., & Kotsadam, A. (2015). Cross-national and multilevel correlates of partner violence: An analysis of data from population-based surveys. *The Lancet Global Health*, 3(6), e332-e340. [https://doi.org/10.1016/S2214-109X\(15\)00013-3](https://doi.org/10.1016/S2214-109X(15)00013-3)
- Jewkes, R. (2018). Intimate partner violence: Causes and prevention. *The Lancet*, 359(9315), 1423-1429. [https://doi.org/10.1016/S0140-6736\(02\)08357-5](https://doi.org/10.1016/S0140-6736(02)08357-5)
- Montero, I., & León, O. (2002). Clasificación y descripción de las metodologías de investigación en Psicología. *International Journal of Clinical and Health Psychology*, 2(3), 503-508. <https://www.redalyc.org/articulo.oa?id=33720308>
- Montero, I., & León, O. G. (2007). A guide for naming research studies in Psychology. *International Journal of Clinical and Health Psychology*, 7(3), 847-862.
- Naciones Unidas (20 de diciembre, 1993) Declaración sobre la eliminación de la violencia contra la mujer. <https://www.ohchr.org/es/instruments-mechanisms/instruments/declaration-elimination-violence-against-women>
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84(3), 231-259. <https://home.csulb.edu/~cwallis/382/readings/482/nisbett%20saying%20more.pdf>
- ONU Mujeres. (2019). *El progreso de las mujeres en el mundo 2019-2020: Familias en un mundo cambiante*. <https://www.unwomen.org/es/digital-library/progress-of-the-worlds-women>
- Paulhus, D. L., & Reid, D. B. (1991). Enhancement and denial in socially desirable responding. *Journal of Personality and Social Psychology*, 60(2), 307-317. <https://doi.org/10.1037/0022-3514.60.2.307>
- Paulhus, D. L., & Vazire, S. (2007). The self-report method. In R. W. Robins, R. C. Fraley, & R. F. Krueger (Eds.), *Handbook of Research Methods in Personality Psychology* (pp. 224-239). The Guilford Press.
- Rasch, G. (1960). Probabilistic models for some intelligence and attainment tests. Copenhagen: Danish Institute for Educational Research.
- Schwarz, N. (1999). Self-reports: How the questions shape the answers. *American Psychologist*, 54(2), 93-105. <https://doi.org/10.1037/0003-066X.54.2.93>
- Shea, T. L., Tennant, A., & Pallant, J. F. (2009). Rasch model analysis of the Depression, Anxiety and Stress Scales (DASS). *BMC Psychiatry*, 9(1). <https://doi.org/10.1186/1471-244x-9-21>
- Tennant, A., & Conaghan, P. G. (2007). The Rasch measurement model in rheumatology: what is it and why use it? When should it be applied, and what should one look for in a Rasch paper?. *Arthritis and rheumatism*, 57(8), 1358-1362. <https://doi.org/10.1002/art.23108>
- Tennant, A., & Pallant, J. F. (2012). The root mean square error of approximation (RMSEA) as a supplementary statistic to determine fit to the Rasch model with large sample sizes. *Rasch Measurement Transactions*, 25, 1348-1349.
- United Nations Office on Drugs and Crime (UNODC). (2023). Global Study on Homicide: Gender-related killing of women and girls. Vienna: UNODC. <https://www.unwomen.org/es/digital-library/publications/2019/06/progress-of-the-worlds-women-2019-2020>
- World Health Organization. (2021). *Violence against women prevalence estimates, 2018*. Geneva: WHO. <https://www.who.int/publications/i/item/9789240022256>
- Yodanis, C. L. (2004). Gender inequality, violence against women, and fear: A cross-national test of the feminist theory of violence against women. *Journal of Interpersonal Violence*, 19(6), 655-675. <https://doi.org/10.1177/0886260504263868>