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BEYOND TRADITIONAL SCALES: DEVELOPING A SELF-CALIBRATING MEASURE OF HOMONEGATIVITY

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ABSTRACT
The article presents the development and validation of a novel measure of homonegativity based on a self-calibrating scoring method. Unlike traditional Likert-type scales, this approach applies Multiple Correspondence Analysis (MCA) to derive optimal quantifications for categorical responses, allowing the data themselves to determine the numerical weights of response options.
Starting from an initial pool of eight items, the instrument was administered to a large Italian sample (N = 2,088 adults). After data screening and selection procedures, a refined dataset was analyzed using Correspondence analysis. The results supported a strong unidimensional structure, as evidenced by the dominance of the first eigenvalue and the presence of a clear Guttman-like pattern, indicating that a single latent dimension captures most of the variance. SEM models were used to confirm the unidimensional nature of the scale (Cronbach's alpha = .78). Correlations with Adorno's authoritarianism scale, as well as comparisons across religion, education, interest in the research and sexual orientation provided support for construct validity.
Overall, the study demonstrates that the self-calibrating method offers a flexible and data-driven alternative to traditional scoring procedures, improving measurement precision while maintaining conceptual coherence. The resulting scale provides a robust tool for assessing homonegativity and may be extended to other domains involving ordinal or categorical psychological data.
Keywords: Optimal scaling, scale development, self-calibrating scores, attitudes, LGBTQ+ population, homonegativity, data-driven scoring

BRIEF INTRODUCTION TO HOMOPHOBIA

The term *homophobia*, introduced by George Weinberg in 1972, refers to fear, aversion, or prejudice toward homosexual individuals (Weinberg, 1972). Homophobia is not limited to individual attitudes; it is also embedded in cultural stigma, institutional barriers, and structural discrimination affecting sexual minorities (Herek, 2004).
Early interpretations conceptualized homophobia primarily as a specific phobia; however, subsequent research has framed it as a multidimensional construct encompassing emotional, cognitive, and behavioral components (Herek, 1991). Various perspectives have defined it as an irrational fear (MacDonald et al., 1972), a personality disposition (Smith, 1971), a social value system (O'Donohue & Caselles, 1993), or a broader cultural phenomenon (Reiter, 1991). More recent frameworks distinguish among ideological, societal, and individual levels of homophobia, emphasizing how negative attitudes are internalized and expressed through stereotypes, prejudice, and discrimination (Herek, 2006).
Several related constructs—such as heterosexism, homonegativity, and anti-gay bias—capture the multifaceted nature of prejudice toward sexual minorities (Sears & Williams, 1997). These concepts highlight both structural and interpersonal forms of discrimination that shape legal rights, social interactions, and psychological well-being (Dovidio et al., 2010).
The terminology used in this field reflects important conceptual distinctions. *Homophobia*, originally referring to an irrational fear of homosexuality, is now commonly used to denote prejudice, hostility, or discrimination toward gay and lesbian individuals. Such attitudes may be expressed through derogatory language, social exclusion, or support for discriminatory policies. *Homonegativity* refers to more subtle forms of negative attitudes, including discomfort in interpersonal interactions, mild social distancing, or passive endorsement of restrictive norms. *Heterosexism* describes a belief system that positions heterosexuality as normative and inherently superior, often assuming heterosexuality as the default orientation. Finally, *sexual prejudice* represents a broader construct encompassing negative attitudes toward individuals based on their sexual orientation, including gay, lesbian, bisexual, and other sexual minority groups.

Impact of homonegativity on modern society

Lingiardi and Nardelli (2024) investigates the impact of homonegativity on individuals and society. Tausch (2024) examines the relationship between homonegativity, restrictive gender norms, and violence, focusing on strategies to promote social tolerance. Pachankis and Bränström (2023) **e**xplore how structural homophobia develops within societal systems and its ecological impacts on minority stress. To conclude this cursory update of research on homonegativity and its impact on society we can cite results from the meta-analysis by Lattanner et al., (2025) which revealed that structural stigma is positively and significantly correlated with adverse health outcomes among LGBTQ+ individuals (effect size = 0.05) . These results highlight the persistent impact of systemic discrimination on mental, physical, and social well-being.

Measuring Homophobia

The *Systematic Review of Instruments Measuring Homophobia and Related Constructs* by Angelo Costa, Denise Bandeira, and Henrique Caetano Nardi (2013) highlights that homophobia has been conceptualized in multiple ways—including as a personality trait, an explicit attitude, and a broader cultural phenomenon—and emphasize the need for valid and reliable instruments to assess anti-LGBTQ+ prejudice (Costa et al., 2013).

The *Attitudes Toward Lesbians and Gay Men Scale* (ATLG), developed by Gregory M. Herek (1988), captures cognitive, affective, and behavioral components and has demonstrated strong reliability and validity across multiple studies. The *Modern Homonegativity Scale* (MHS; Morrison & Morrison 2002), was designed to assess subtle and contemporary forms of prejudice. The *Homophobia Scale* (HS), developed by Lester W. Wright Jr. and Daniel J. Potoczniak (2005), was validated on diverse samples and assesses cognitive, affective, and behavioral dimensions of homophobia. More recently, Guo, Fang, and Wen, (2023) proposed the *Two-Factor Attitudes Toward Homosexuality Scale* (TAHS), which distinguishes between explicit prejudice toward homosexuality and a general preference for heterosexuality, offering a more nuanced representation of these attitudes (see also Godø, 2024 for a review on attitudes).

These instruments employ Likert-type response formats, enabling researchers to assess the intensity and variability of homonegative attitudes.

Limitations of Likert-Type Scales

Although Likert-type scales are widely used due to their simplicity and ease of administration, several methodological limitations have been well documented. First, responses may be influenced by systematic response styles, such as acquiescence (the tendency to agree regardless of item content) and central tendency bias, both of which can reduce measurement precision (Van Vaerenbergh & Thomas, 2013). Second, respondents may interpret response categories (e.g., *agree* or *strongly agree*) with varying subjective intensities, thereby limiting comparability across individuals.

Third, Likert-type formats reduce complex attitudes to a single ordered continuum, potentially obscuring the multidimensional nature of respondents' evaluations (DeCastellarnau, 2018). Finally, conventional scoring procedures assume equal intervals between response categories, despite the fundamentally ordinal nature of Likert responses. This assumption may introduce distortions when such data are analyzed using statistical techniques that require interval-level measurement (Bürkner & Vuorre, 2019, Rye & Goldszmidt, 2025).

An Alternative Scoring Approach

Traditional Likert scoring assigns fixed numerical values (e.g., 1–5) to response categories. An alternative approach derives category scores empirically from the data rather than imposing them a priori. In psychology, this perspective is often associated with Louis Guttman and is closely related to correspondence analysis and homogeneity analysis.

Conceptually, this approach resembles a form of categorical factor analysis, in which numerical weights are estimated for each response category by extracting a latent dimension from the data. Each category is assigned a quantification value based on its position along this dimension, and individual scores are computed as functions of the selected response categories. The resulting score can be interpreted as the respondent's position on the underlying latent trait, analogous to factor scores in conventional factor analysis.

When applied to unidimensional scales, this technique may yield improvements in score reliability, but such gains are often limited, which helps explain why the method has not been widely adopted in psychological test development. Every five to ten years, one can observe the re-emergence of scientific articles in which optimal scaling techniques are applied to Likert-type scales or, more broadly, to rating scales involving ordered magnitudes such as frequency, time, or agreement. These contributions appear periodically across different fields, suggesting a persistent—though not continuous—interest in improving the quantification of ordinal responses beyond conventional scoring methods. Notable examples include the application of optimal scaling to consumer sentiment measures (Didow et al., 1983), the development of health risk perception scores in environmental research (Marcon et al., 2015) the psychometric calibration of screening instruments for substance use (Bastiani et al., 2013), or the evaluation of the reflux symptoms (Nacci et al., 2020). Together, these studies illustrate how optimal scaling has been repeatedly revisited as a flexible and potentially more informative approach to handling ordinal data in measurement contexts.

The multiple-choice format

A different approach concerns the multiple-choice format used for achievement tests: with such instruments, testing and scoring are relatively straightforward because responses are typically dichotomous (correct vs.

incorrect). In contrast, attitude measurement presents greater challenges, as response options carry qualitatively different meanings and cannot be classified as objectively correct. By estimating empirical weights through correspondence analysis, this approach addresses the heterogeneity of response categories and derives scores directly from the observed response structure.

Despite its theoretical and methodological potential, this approach has been only rarely applied in psychological measurement, with a notable recent example reported by Flebus et al. (2021).

The present study aims to develop and validate a questionnaire designed to assess social homophobia using a self-calibrating scoring procedure. Specifically, the study examines whether a multiple-choice item format, combined with data-driven category quantification, can measure a psychological construct with reliability and validity comparable to those obtained using traditional Likert-type scales.

INSTRUMENTS AND METHODS

Measures

To develop a pool of multiple-choice items, the following guideline was adopted: each item included at least one response option strongly favorable toward gay and lesbian individuals and at least one strongly unfavorable option. The decision to use five response alternatives was pragmatic rather than theoretically driven. Item content was informed by the existing literature and further refined with input from the psychotherapist Antonella Montano, author of three widely disseminated Italian books on psychotherapy with gay and lesbian clients (Montano, 1997, 2000; Montano & Rubbino, 2021).

The multiple-choice format allows for the systematic comparison of different scenarios, emotional reactions, causal attributions, and behavioral tendencies. Previous research has shown that specific emotions—particularly disgust toward gay men—are strongly associated with broader homonegative attitudes (Herek, 1986, 1988, 1993). Accordingly, one item (Item N1; see Table 1) was designed to capture the primary emotional response elicited by homosexual individuals.

Gender-role beliefs have also been identified as significant predictors of attitudes toward homosexuality. A study by Raiz et al. (2006) found that college students endorsing more traditional gender roles expressed lower levels of support for gay men's and lesbian women's rights (see also Kite & Whitley, 1996; Items N2 and N3).

Another approach to assessing attitudes involves examining beliefs about what children should be taught regarding homosexuality (Item N4). For instance, responses may range from presenting gay and lesbian individuals as normal and healthy to portraying homosexuality as undesirable or morally wrong (Herek, 2000).

Attitudes toward same-sex parenting were assessed through an item on child adoption (Item N5). Response options range from perceiving homosexual individuals as unfit parents to viewing them as equally capable of providing loving and supportive environments as heterosexual parents (Herek et al., 2009; Gates, 2015; Herek, 2006).

Perceptions of homosexuality were further explored through an item asking participants to evaluate common media portrayals (Item N6). Participants were invited to consider whether representations of homosexual individuals—often characterized by loneliness, limited family relationships, or social difficulties—are accurate or distorted (Gross, 2001).

Attitudes toward "coming out" were examined by exploring the motives attributed to disclosure (Item N7). Some respondents may view coming out as a natural and authentic expression of identity, whereas others may interpret it as attention-seeking or exhibitionistic behavior (Savin-Williams, 2001).

Finally, one item addresses the interpretation of homosexual content in heterosexual individuals' dreams (Item N8), which may be understood as indicative of latent sexual orientation, as a normal psychological phenomenon, or as a random occurrence without particular significance (Loewald, 2000).

Other Measures

Social homophobia questionnaire. A novel questionnaire assessing social homophobia was included. Developed within a bifactor framework comprising one general factor and seven specific ("satellite") factors, this instrument measures homophobia using a traditional Likert-type format (Authors, in preparation). Internal consistency was satisfactory (Cronbach's $\alpha = .83$).

Authoritarianism. Authoritarianism was assessed using a scale derived from the work of Theodor W. Adorno. This construct is theoretically linked to prejudicial attitudes toward minority groups, including sexual minorities (Adorno et al., 1950; Altemeyer, 1996; Whitley, 1999). The 11-item scale showed acceptable reliability (Cronbach's $\alpha = .75$).

Sexual orientation. Sexual orientation was assessed using a single item based on the Alfred Kinsey scale (Kinsey et al., 1948), ranging from 1 (exclusively heterosexual) to 7 (exclusively homosexual). To accommodate participants who might not identify within this continuum, additional options such as "prefer not to answer" and "no preference" were included.

Sociodemographic variables. Additional sociodemographic information (age, gender, education, religiosity, occupation, region of origin, and location of administration) was collected using single-item measures.

Sample

Participants were recruited across multiple regions of Italy through convenience sampling, including personal contacts and anonymous administration in public settings (e.g., trains, medical offices, and hospital waiting rooms). A small number of questionnaires were administered by psychology students as part of their master's thesis projects. To enhance confidentiality, envelopes were introduced following participant feedback for the submission and collection of completed questionnaires.

The final sample consisted of 2,088 participants. Age (n = 2,037) ranged from 16 to 101 years (M = 33.99, SD = 13.03; median = 30). Gender (n = 2,040) was 45.0% male and 55.0% female. Most participants were unmarried (56.6%), followed by married (32.0%) and other statuses (11.4%) (n = 2,064).

Regarding religiosity (n = 2,064), 31.2% identified as practicing, 40.9% as non-practicing, 12.3% as non-believers, and 15.6% as other. Occupational status (n = 2,062) was heterogeneous, with students (24.4%) and employees (20.5%) representing the largest groups. Educational attainment (n = 2,059) was relatively high (high school: 51.9%; university: 28.1%).

Interest in the research (n = 2,055) was generally high, with 57.2% reporting strong interest. Questionnaires were primarily completed at home (36.1%) or on trains (23.0%) (n = 2,062). Participants were drawn from all Italian regions (n = 2,034), with higher representation from Latium (26.4%), Marche (14.5%), Sicily (12.5%), and Emilia-Romagna (12.0%). The use of envelopes was reported by 46.4% of participants (N = 2,088), and data collection was predominantly conducted by a single interviewer (74.4%).

Data Analysis

A total of 2,322 protocols were collected, of which 2,088 were retained following data screening procedures. The final sample was randomly split into two subsamples to assess the stability of the results.

A categorical principal component analysis (CATPCA; SPSS optimal scaling) was conducted on the eight initial items. Item discrimination was evaluated using the discrimination index (squared component loadings), leading to the exclusion of Item 6 due to insufficient discriminatory power. The analysis was then repeated on both subsamples to verify the robustness of the solution.

Category quantifications derived from the CATPCA on the full sample were used to recode the seven retained items. A composite score was computed based on the first extracted dimension and labeled *Homonegativity*. A second dimension was also retained, and individual scores on the first two dimensions were plotted to explore potential Guttman-like structures (Guttman, 1950).

The recoded items were subsequently subjected to an exploratory factor analysis (EFA) using an unrotated solution to examine the underlying structure.

Scores were transformed to approximate a normal (Gaussian) distribution prior to further analyses. A structural equation model (SEM) was estimated to evaluate model fit in the total sample. Further, a multi-group confirmatory factor analysis was conducted across four sexual orientation groups

Concurrent validity was assessed through correlations with a 67-item homophobia scale based on a bifactor model (Authors, in preparation). Construct validity was examined via correlations with Authoritarianism.

Associations with education, religiosity, interest in the topic, and sexual orientation were tested using analysis of variance (ANOVA), with effect sizes reported as eta squared (η^2). Post hoc comparisons were conducted using the Student–Newman–Keuls (SNK) procedure. Analyses were restricted to exclusively heterosexual participants, except for those involving sexual orientation.

RESULTS

A correspondence analysis was conducted on the seven retained items, yielding the category quantifications and discrimination indices reported in Table 1. Internal consistency was satisfactory (Cronbach's $\alpha = .782$; McDonald's $\omega = .794$). Based on the first extracted dimension, a composite score was computed and labeled *Homonegativity*.

The dominance of the first dimension was evaluated by examining the ratio between the first and second eigenvalues of the correlation matrix. A substantially larger first eigenvalue indicates an essentially unidimensional structure (Jolliffe, 2002; Greenacre, 1984; Nishisato, 1980). In the present study, the observed ratio (3.556) supports the presence of a single dominant factor.

The quadratic component of the scores is illustrated in Figure 2 by the parabolic pattern. The very high R^2 obtained when predicting the second dimension as a squared function of the first provides additional evidence of unidimensionality, consistent with the Guttman effect.

Individual scores were then computed, with higher values indicating greater homonegativity (Figure 3). To regularize distributional properties, the scores were transformed to approximate a normal (Gaussian) distribution while preserving their ordinal relationships (Figure 4).

A one-factor structural equation model showed excellent fit to the data, $\chi^2(14) = 69.94$, $p < .001$, CFI = .982, TLI = .973, RMSEA = .044, 90% CI [.034, .054].

Concurrent validity was supported by a strong correlation with a 67-item homophobia scale based on a bifactor model ($r = .80$). Construct validity was further supported by a moderate correlation with Authoritarianism ($r = .43$).

Among exclusively heterosexual participants, religiosity showed a small but significant effect ($\eta^2 = .03$), with practicing believers reporting higher homonegativity (M = 0.32) compared to non-believers and non-

practicing individuals (M = −0.14, −0.13, and 0.05). Education also showed a modest effect (η^2 = .02), with a gradient from lower homonegativity among participants with higher education (M = −0.07 and 0.08) to higher levels among those with lower educational attainment (M = 0.53).
Interest in the results showed a larger effect (η^2 = .11), with a clear monotonic trend: higher interest was associated with lower homonegativity (very interested, M = −0.24 , fairly interested and −0.07), whereas low interest corresponded to higher scores (a little interested M = 0.47 not interested at all and 1.03).
Sexual orientation was analyzed in the full sample (η^2 = .08). Participants identifying as mostly homosexual (N=175) or almost exclusively heterosexual (N=226) reported the lowest homonegativity (M = −0.54 and −0.52), followed by exclusively heterosexual individuals (M = 0.10, N=1584), while those selecting other orientations showed the highest scores (M = 0.73, N=72). The configural model showed good fit, $\chi^2(56)$ = 110.94, RMSEA = .044, CFI = .979, TLI = .969, indicating a consistent one-factor structure across groups. However, metric invariance was not supported, $\Delta\chi^2(18) = 83.47$, $p < .001$, nor was scalar invariance, $\Delta\chi^2(18)$ = 87.66, $p < .001$. These results indicate that, although the same latent construct is present across groups, both factor loadings and item intercepts vary, suggesting differences in measurement parameters in addition to latent means.

DISCUSSION

The primary aim of this study was not to introduce an additional measurement scale, but to demonstrate that a self-calibrating scoring approach can achieve levels of reliability and validity comparable to those obtained with traditional Likert-type instruments.
The results support the feasibility of constructing an attitude measure based on empirically derived category weights. The items—comprising heterogeneous scenarios involving emotional reactions, expectations, and evaluative judgments—were quantified directly from the response structure, without relying on predefined scoring schemes.
From a structural perspective, the findings indicate that the data can be effectively represented along a single latent dimension. The dominance of the first eigenvalue suggests that most of the variance is captured by a primary component, with subsequent dimensions contributing only marginally. This pattern is commonly interpreted as evidence of essential unidimensionality and supports the interpretation of the scale as measuring a coherent underlying construct of homonegativity.
Importantly, the proposed approach addresses several limitations of traditional Likert-type scales. By deriving category weights empirically, it avoids the assumption of equal intervals between response options and allows for a more flexible representation of the latent construct. This may be particularly advantageous when measuring complex and socially sensitive attitudes, where response categories are not interpreted uniformly across individuals.
Several limitations should be acknowledged. The use of a convenience sample limits the generalizability of the findings. In addition, measurement invariance across sexual orientation groups was not supported, suggesting that the scale may function differently across subpopulations. Future research should further investigate these aspects and replicate the findings in more diverse samples.
The distribution of total scores showed a triangular shape closely approximating a Gaussian distribution.
Previous studies have consistently shown that higher levels of religiosity are associated with more negative attitudes toward homosexuality (Herek, 2000; Adamczyk & Pitt, 2009; Whitley, 2009). Similarly, the inverse relationship between educational attainment and prejudice is well established in the social sciences, with higher education generally linked to more tolerant attitudes toward sexual minorities (Herek, 1987; Andersen & Fetner, 2008; Whitley, 2009). The present results indicate that the scale successfully captures these expected sociodemographic gradients.
The pattern observed for sexual orientation was also theoretically coherent. Previous research consistently shows that heterosexual individuals tend to report higher levels of sexual prejudice than sexual minority individuals, who generally express more accepting attitudes toward homosexuality (Herek, 2000; Herek & McLemore, 2013; Morrison & Morrison, 2002). In the present data, individuals with non-exclusive heterosexual orientations showed the lowest homonegativity scores, whereas exclusively heterosexual respondents displayed higher levels of the construct measured by the scale.
The particularly high scores observed among respondents selecting “other” orientations may reflect the heterogeneity of this group, which often includes individuals experiencing ambiguity or uncertainty regarding sexual identity categories. Previous research suggests that such responses may sometimes be associated with ambivalence or defensive attitudes toward homosexuality (Herek, 2000).
Participants’ interest in sexuality-related research was examined as an additional indicator of construct validity. Individuals reporting greater interest in the present study tended to show lower homonegativity scores. This pattern is consistent with prior findings indicating that exposure to diversity-related content and engagement in critical reflection on sexuality are associated with more positive attitudes toward sexual minorities (Hillman & Martin, 2002; Herek, 2000). More broadly, openness to new information and opportunities for contact with sexual minorities have been linked to reduced sexual prejudice (Herek & McLemore, 2013; Smith et al., 2009).

Although strict measurement invariance was not supported, this finding does not undermine the primary objectives of the present study. The scale was explicitly designed to assess social homonegativity—that is, attitudes directed toward sexual minorities at the interpersonal and societal level rather than internalized processes. Accordingly, the items were formulated primarily from the perspective of individuals external to the target group. From this standpoint, it is not unexpected that the measurement model functions differently among respondents who do not identify as exclusively heterosexual. For these individuals, the items may carry partially different psychological meanings, potentially involving elements of identity, self-reflection, or internalized experience. Therefore, the lack of full invariance across sexual orientation groups likely reflects substantive differences in construct interpretation rather than a limitation of the measurement instrument itself.

Future Applications

The proposed measurement approach offers considerable potential for future research. As illustrated in the present study, the method is highly flexible, as item stimuli can take multiple forms, including images, symbols, sounds, or video-based scenarios. This versatility makes it particularly suitable for assessing complex and context-dependent constructs that may not be adequately captured by traditional verbal Likert-type items. Moreover, the self-calibrating scoring procedure may be extended to other domains of psychological assessment, especially in areas where response categories are difficult to order a priori or where subjective interpretation plays a central role. Despite these advantages, practical applications of this approach remain relatively limited in the current literature, highlighting the need for further empirical studies to evaluate its robustness and generalizability across different constructs and populations.

STRENGTHS AND LIMITATIONS

Strengths

The proposed method enables the comparison of qualitatively distinct response alternatives within each item, a feature that is difficult to achieve using traditional Likert-type formats. This structure allows respondents to position themselves among contrasting scenarios rather than along a predefined agreement continuum. In addition, the approach is inherently flexible and can accommodate nonverbal stimuli—such as images, sounds, or videos—although this possibility was not explored in the present study.

The method appears particularly well suited for the assessment of complex attitudinal constructs, as it allows the integration of affective, cognitive, and evaluative components within a single item. Furthermore, the relatively large sample size and the broad geographic representation across Italian regions provide a solid basis for the robustness of the findings.

Limitations

Despite its advantages, the proposed approach presents several limitations. First, scale construction is more demanding than in traditional Likert formats, particularly with respect to item design. If one or more response alternatives within an item do not function adequately, the entire item—and the thematic domain it represents—may need to be discarded, complicating the refinement process.

Second, it is difficult to anticipate how intermediate response options will function relative to extreme categories. For this reason, a team-based approach to item development is recommended, as collective evaluation can help ensure that response alternatives represent coherent and meaningful positions along the latent dimension.

Introducing a New Term

The method adopted in the present study is based on correspondence analysis (CA), a class of data-analytic techniques developed in the mid-twentieth century and widely used across multiple disciplines (Torgerson, 1958; Nishisato, 1980; Benzécri, 1982; Greenacre, 1984; Young, 1981). Over time, similar approaches have been described using different terminologies, including optimal scaling, reciprocal averaging, dual scaling, and Hayashi's quantification theory (Guttman, 1950; Gifi, 1990; Linting, Meulman, Groenen, & van der Kooij, 2007). Despite its broad methodological relevance, this family of techniques has only rarely been applied to the construction of psychological measurement instruments.

In principle, these methods can also be applied to standard Likert-type scales, potentially improving score reliability by estimating category weights empirically. However, in most practical applications, such improvements are modest, which has limited their diffusion in psychometric practice.

The term *optimal scoring* presupposes the existence of a non-optimal scoring system, typically defined a priori based on the assumption of equal distances between response categories (e.g., 1, 2, 3…). The new approach, by contrast, dispenses with such assumptions: it does not impose predefined distances, but instead estimates them directly from the data, allowing the empirical structure of responses to determine the quantification of categories. More specifically, provisional scores are estimated based on the mean scores of respondents selecting each response option, and these estimates are iteratively refined until convergence. This procedure closely follows the iterative algorithms developed within the Gifi system (Gifi, 1990).

For this reason, we propose the term *self-calibrating scoring method* to describe this approach. The term reflects the fact that both category weights and individual scores are derived through an internal, data-driven calibration process.

Importantly, in the present application, the method is explicitly oriented toward the identification of **one** single underlying latent dimension, corresponding to the target psychological construct. This distinguishes it from broader applications of correspondence analysis, which is basically **multidimensional**. Accordingly, the self-calibrating scoring method can be understood as a specific psychometric implementation of optimal scaling techniques applied to multiple-choice instruments designed to measure just **one** pre-defined construct.

CONCLUSION

The present study introduced and empirically tested a measurement approach based on data-driven quantification of response alternatives in multiple-choice items (Greenacre, 2007; Gifi, 1990; Meulman et al., 2004). The results indicate that this approach can yield psychometrically sound measures of attitudes. The *Homonegativity* scale demonstrated satisfactory internal consistency and provided evidence of both convergent and construct validity through its associations with authoritarianism, religiosity, education, and sexual orientation. These patterns were consistent with well-established findings in the literature on sexual prejudice (Herek, 2000; Herek & McLemore, 2013; Whitley, 2009).

More broadly, the study highlights the potential of empirically calibrated response alternatives for the construction of attitudinal measures. Multiple-choice formats allow the comparison of qualitatively distinct emotional, cognitive, and evaluative positions within a single item, offering a richer and potentially more flexible representation of attitudes than traditional agree–disagree formats (DeVellis, 2017).

Although further research is needed to examine the generalizability of this approach across different constructs and populations, the present findings suggest that attitudinal measurement can be grounded in empirically derived category quantifications rather than predefined ordinal scoring schemes.

TABLE 1 **Discrimination index and weight for each item (N=2088)**

	Frequency	Weight	Percentile
n1 Homosexuals evoke in me		**0,558**	
5 Sympathy	373	-0,719	23,69
1 Curiosity	540	-0,415	38,45
3 Indifference	985	0,092	58,16
4 Anger	33	2,086	91,76
2 Disgust	152	2,186	93,45
n2 Girls who dress and behave in a masculine way are people who		**0,218**	
2 Fall within the norm	519	-0,441	35,76
4 Are in search of practicality	784	-0,216	44,16
1 Hate their femininity	405	0,333	61,11
3 Simply follow fashion	223	0,362	63,75
5 Want to replace men	140	1,318	81,84
n3 Boys who have effeminate behaviors are people who		**0,530**	
1 Simply express a way of being (outside of male standards)	1172	-0,44	37,62
4 Are more sensitive and delicate	524	-0,085	51,4
2 Frequent predominantly feminine environments	100	0,779	75,98
5 Lack virility	199	1,586	88,35
3 Manifest their weakness	86	1,916	90,59
n4 Children should be taught that		**0,573**	
3 Being homosexual is normal and healthy	56	-0,695	23,93
2 Homosexuals are people like everyone else	1549	-0,363	40,83
5 Homosexuality does not concern children	256	0,642	75,17

1 They should not have contact with homosexuals because they might be negatively influenced	183	1,944	91,33
4 Homosexuality is a sin	36	2,164	92,83
n5 The adoption of children by homosexual couples is		**0,294**	
4 Appropriate if homosexual parents provide care, love, and attention to the children	344	-0,802	19,69
2 Appropriate if homosexual parents are intelligent and balanced	219	-0,638	26,96
5 Something we still don't know much about	382	-0,445	36,18
1 Inappropriate because children need parents of different sexes	1109	0,45	67,56
3 Inappropriate because homosexuals are sick people	29	3,045	96,62
n7 People who openly declare their homosexuality		**0,435**	
4 Do so because it is not right to hide	961	-0,372	39,32
5 Do so spontaneously	492	-0,034	49,66
2 Do so to feel accepted	482	0,283	60,84
3 Do so for exhibitionism	107	1,424	85,13
1 Do so to scandalize	34	2,575	93,97
n8 Regarding dreams about sexuality, you think		**0,421**	
1 That it is normal, even for heterosexuals, to have dreams with homosexual content	565	-0,715	23,84
5 That it can rarely happen even to a heterosexual person to have dreams with homosexual content	747	-0,139	49,01
4 That dreams have nothing to do with reality	481	0,326	64,17
3 If a person has dreams with homosexual content, it means they have some issue with their sexual identity	246	0,953	77,69
2 If a person has dreams with homosexual content, it means they are homosexual	42	2,804	95,81
Note: Responses are ordered according to their quantifications, not their printed order (first column). The discrimination index is reported on the same line as each question.			

FIGURE 1 **Scree test**

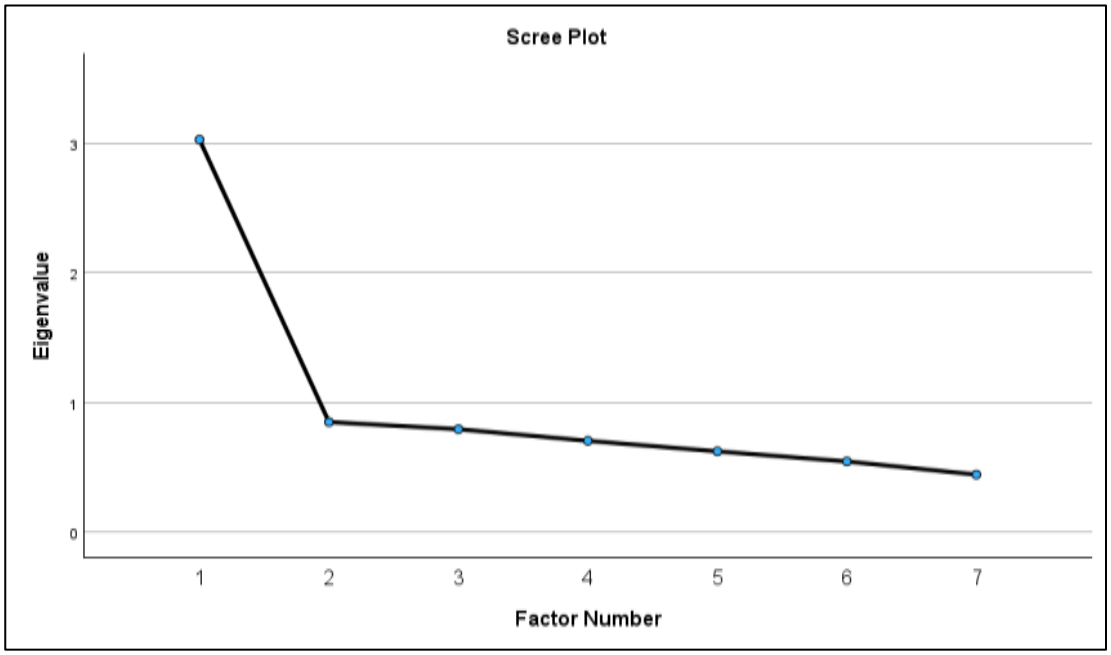


FIGURE 2 **Quadratic component of the score and Guttman effect**

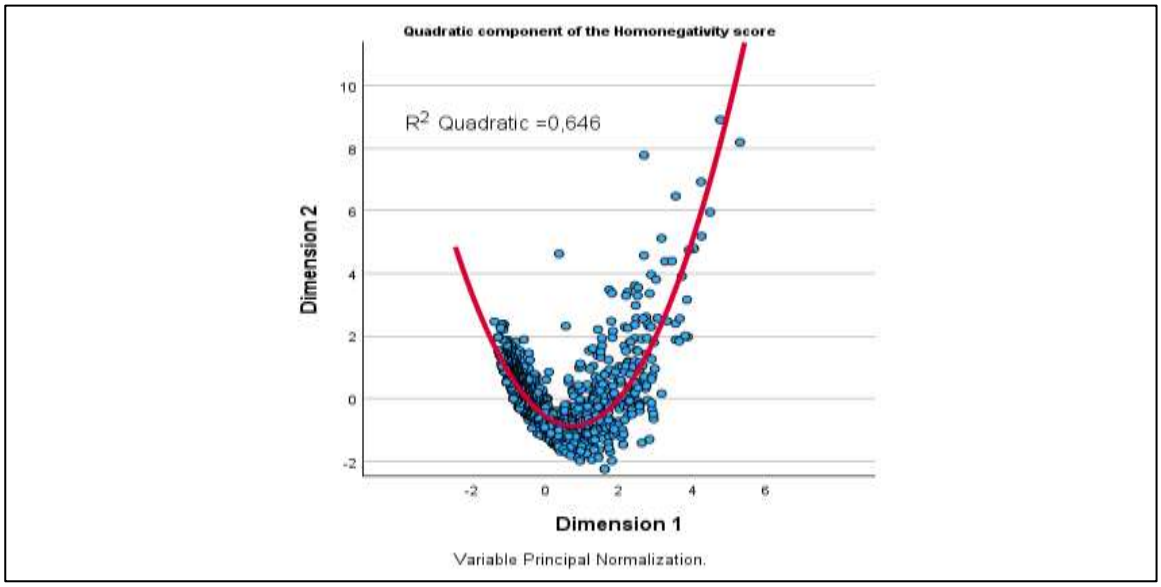


FIGURE 3 **Frequency distribution**

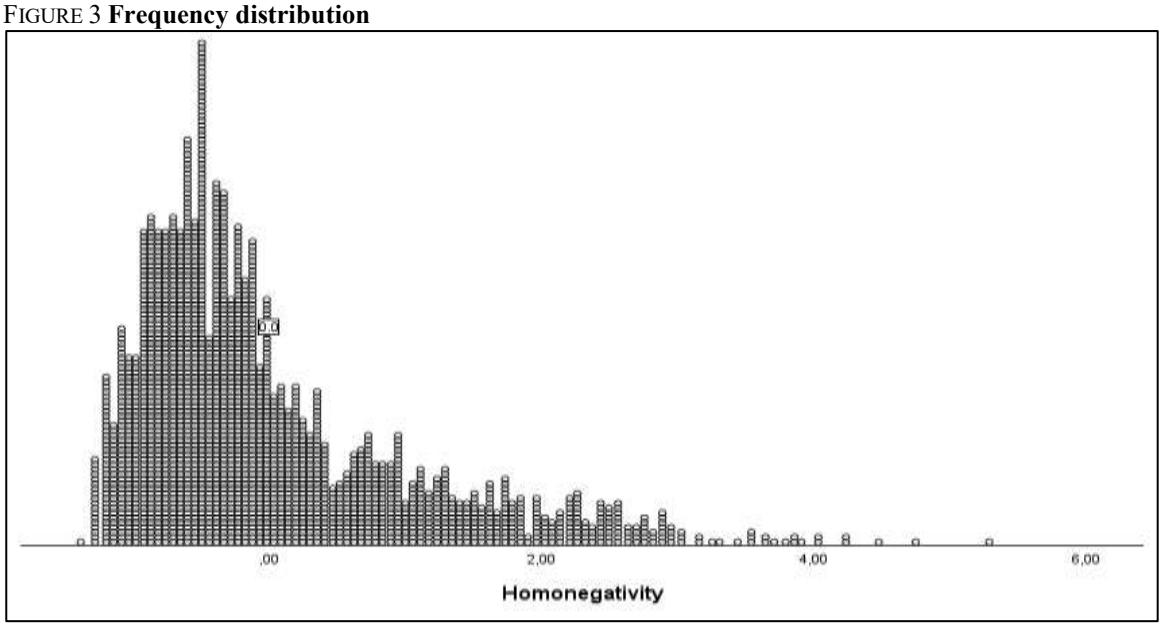
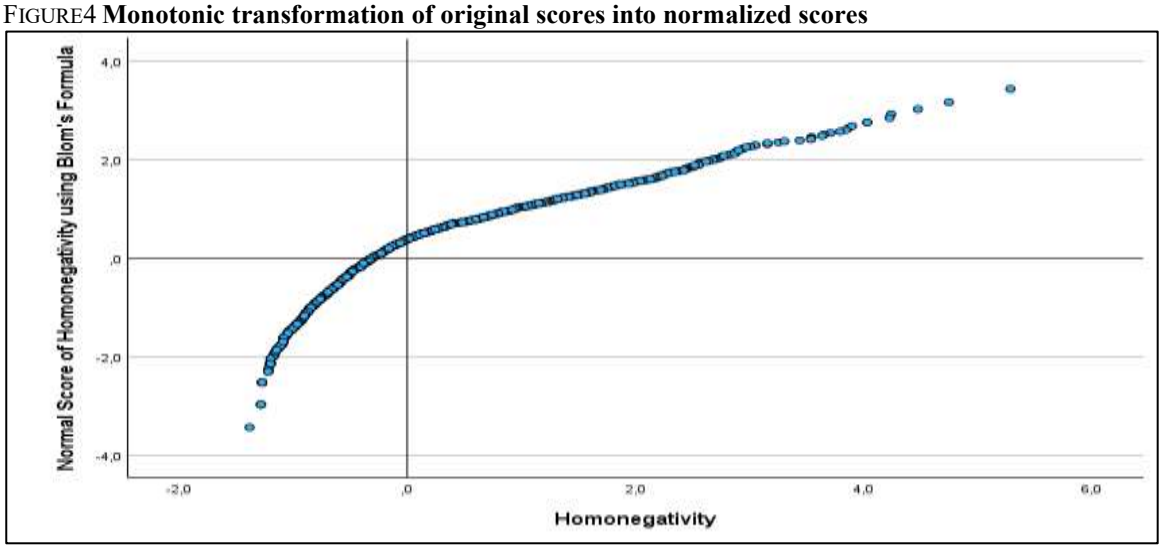


FIGURE4 **Monotonic transformation of original scores into normalized scores**



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