

## Lesbian, Gay, and Bisexual Identity Scale (LGBIS): Construct Validation, Sensitivity Analyses and other Psychometric Properties

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According to Mohr and Fassinger (2006), identity is seen as both self-identification and collective identification with values, beliefs, traits or behaviours and attachments. Their Lesbian, Gay, and Bisexual (LGB) multidimensional identity model accounts for important variables regarding the constitution of identities. This model not only accesses numerous dimensions of the lives of LGB individuals, but is also based on a body of research that recognizes how LGB difficulties are caused by societal intolerance and marginalization (Mohr & Fassinger, 2000). The Lesbian, Gay, and Bisexual Identity Scale (LGBIS; Kendra & Mohr, 2008) constitutes an operationalization of this multidimensional model, and the aim of this article is to present its construct validity by analysing its factor structure using a sample of Portuguese lesbian, gay and bisexual participants. Results from exploratory and confirmatory factor analyses, as well as from factor invariance analysis across sub-samples are presented. In a general way, the factor structure obtained in this study follows the original proposal of Kendra and Mohr's (2008) LGBIS. Moreover, scale sensitivity analyses are presented in order to check for eventual differences in the factor structure and/or factor intercorrelations regarding participant gender and sexual orientation. These results are then discussed in the light of LGB identity models.

*Keywords: lesbian, gay, bisexual, multidimensional identity models, validation.*

Según Mohr y Fassinger (2006), la identidad es vista como la auto-identificación y la identificación colectiva con valores, creencias, rasgos o comportamientos y apegos. Su modelo multidimensional de identidad de Lesbianas, Gays y Bisexuales (LGB) explica variables importantes con respecto a la constitución de identidades. Este modelo no sólo accede a múltiples dimensiones de la vida de las personas LGB, pero también se basa en un cuerpo de investigación que reconoce que las dificultades de LGB son causadas por la intolerancia social y la marginación (Mohr y Fassinger, 2000). La escala de Identidad de Lesbianas, Gays y Bisexuales (LGBIS; Kendra, y Mohr, 2008) constituye una puesta en marcha de este modelo multidimensional y el objetivo de este artículo es presentar su validez de constructo mediante el análisis de su estructura factorial utilizando una muestra de participantes lesbianas, gays y bisexuales portugueses. Se presentan los resultados de los análisis factoriales exploratorios y confirmatorios, así como los del análisis factorial invariante a través de sub-muestras. De manera general, la estructura factorial obtenida en este estudio sigue la propuesta original del LGBIS de Kendra y Mohr (2008). Además, se presentan los análisis de sensibilidad de la escala con el fin de comprobar posibles diferencias en la estructura de factores y / o en intercorrelaciones en relación con el género y la orientación sexual de los participantes. Estos resultados son discutidos con respecto a los modelos de identidad LGB.

*Palabras clave: lesbiana, homosexual, bisexual, modelos multidimensionales de identidad, validación.*

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Psychological research approaches to homosexual and bisexual identity have shifted dramatically in the last 30 years (e.g. Richardson & Seidman, 2002; Savin-Williams, 2005). The first conceptions about gay/lesbian identity in Psychology were characterised by a pathologizing bias (Clarke, Ellis, Peel, & Riggs, 2010). These studies were later confronted by pioneering research in the area, such as the works by Hooker (1957), Hopkins (1969) and Siegelman (1972) that proved such conceptions to be biased. However, these works were based on a systematic comparison with heterosexuals to prove that gay men and lesbian women were psychologically sane, revealing the heteronormativity of this body of work (Warner, 1993).

It was only later that research on affirmative psychology models describing sexual identities started to develop. The first models (Cass, 1984; Coleman, 1982; Fassinger & Miller, 1996; Troiden, 1979) described the stages a lesbian/gay person had to pass through in order to come out (i.e., to fully assume a lesbian/gay identity). As Clarke et al. (2010) argue, these models construct the lesbian and gay identity formation processes as normative. Coping with the stigma of being gay and lesbian in heterosexist societies is conceptualized as a part of the process of developing a positive and secure identity. These were also the first models to integrate bisexuality (Weinberg, Williams, & Pryor 1994), but construed as an unstable category when compared to categories like gay and lesbian.

The conceptual apparatus of the stage models implies, however, a constancy and stability of identities over time not fully supported by subsequent research (Diamond, 2000; Sophie, 1987), especially in the case of women. Rosario, Schrimshaw, Hunter, and Braun (2006) found evidence of both consistency and change in the sexual identities of lesbian, gay and bisexual youths, suggesting that sexual identity development continues after the adoption of a gay/lesbian sexual identity.

Later models have focused on the multidimensional components of sexual identities instead of proposing fixed stages or phases to describe the development of sexual identities (e.g., Morris, 1997). These proposals also reflect advances in the research concerning sexual identities emphasizing that categories of sexual orientation are not broad enough to encompass the behaviours, cognitions, discourses and emotions individuals experience regarding their sexuality (Diamond, 2000; Diamond & Savin-Williams, 2000; Worthington & Reynolds, 2009).

These studies directly question one-dimensional models of sexual identities or their simple correspondence with the already defined/fixed categories of sexual orientation.

A multidimensional approach, designed to access a range of dimensions in the lives of LGB individuals enables a more holistic conceptualisation of identities. As Kendra and Mohr (2008) explain, both clinical and social psychological theories of social identity have portrayed the management of a stigmatized identity as a complex and multidimensional

process. Stage developmental models may seem too simplistic, since they give rise to what Cohler and Hammack (2007) term the narrative of struggle and success. This *narrative* is presented as individualized and seen in terms of personal achievements (struggle and success). Henceforth, these models may fail to recognize the role and significance that social, economic, cultural or political features might play when it comes to the constitution of our identities. Stage models are built using essentialist assumptions to explain that our identities and sexualities have an inner fundamental nature that either the individual suppresses, denies, recognizes and/or accepts. These frameworks often assume that sexualities and identities are either biologically determined or acquired very early on in life and that they are fixed and unchanging (Clarke et al., 2010). This assumption refutes how identities can be constructed and made real through social norms and interpersonal interactions.

According to Mohr and Fassinger (2006), identity is seen as both self-identification and collective identification with values, beliefs, traits or behaviours and attachments. Their multidimensional model accounts for important variables regarding the constitution of identities, because this process not only accesses numerous dimensions of the lives of LGB individuals, but also underlies a body of theory and research that recognizes how LGB difficulties are due to societal intolerance and marginalization (Mohr & Fassinger, 2000). Expectations about one's own stigmatization or the motivations and efforts to conceal one's sexual orientation or identity (Kendra & Mohr, 2008; Mohr & Fassinger, 2000; Mohr & Daly, 2008) are included in this model. Moreover, this model discusses aspects of identity that are able to emphasize the hostility of both the social climate in general and the cultural norms that characterize sexual orientation as a simple dichotomous concept.

For all these reasons, a multidimensional approach is a better path for striving to access and measure something as complex and multifaceted as identity.

### *The Lesbian, Gay and Bisexual Identity Scale*

The Lesbian, Gay and Bisexual Identity Scale (LGBIS; Kendra & Mohr, 2008) consists of a reworded and revised version of the former Lesbian and Gay Identity Scale (LGIS; Mohr & Fassinger, 2000). The core difference between the two scales is that LGBIS items are worded to be appropriate not only for lesbian women and gay men, but also for bisexual individuals. This multidimensional scale was conceived to assess seven dimensions of lesbian, gay, and bisexual (LGB) identity that have been discussed in the clinical and theoretical literature (Kendra & Mohr, 2008). The first subscale (Identity Dissatisfaction) assesses the degree to which individuals evaluate their LGB sexual orientation. The second subscale measures Identity Uncertainty, confusion and stableness regarding LGB sexual orientations. Stigma sensitivity assesses the degree to which

respondents experience anxious expectations of rejection based on their sexual orientation. The importance of sexual identity and the notions of sexual orientation as a focal point of respondents' lives are accessed through the subscale of Identity Centrality. Difficulties in the identity process are accessed through another subscale. The last two subscales approach other dimensions of identity such as the motivation to conceal one's identity and Identity Superiority.

Based on a multidimensional LGB identity model, the LGBIS (Kendra & Mohr, 2008) moves away from other more rigid models that, for instance, assume identity to be a linear, chronological and unidirectional process. Furthermore, the LGBIS model does not overlook the important role social-historical factors may play within the identity development process (e.g., Clarke et al., 2010). Therefore, LGBIS (Kendra & Mohr, 2008) constitutes an interesting and shrewd instrument for researchers who want to work with LGB identities through empirical measurement.

### *Construct validation, scale sensitivity, and other psychometric properties of the LGBIS*

#### *Overview*

The purpose of the present study is to examine the construct validity of the Lesbian, Gay, and Bisexual Identity Scale (LGBIS; Kendra & Mohr, 2008), analysing its factor structure with a sample of Portuguese lesbian, gay and bisexual participants. In a recent analysis of the Portuguese context, Carneiro and Menezes (2007) emphasized the role of formal advances in Portuguese law and their positive effect on identities. However, a high perception of discrimination and the experience of widespread heterosexism in Portuguese society by the LGB population was also identified in this study. This scale therefore seems very useful as an indicator of LGB identities within a context marked by the discrepancy between formal equality and the daily experiences of discrimination.

The LGBIS structure resulting from the principal components exploratory factor analysis was then submitted to a confirmatory factor analysis, and factor invariance was checked across sub-samples. In addition, scale sensitivity analyses were performed in order to check for eventual differences in the factor structure and/or factor intercorrelations regarding participant gender and sexual orientation.

#### *Method*

##### *Participants*

The study sample was made up of 808 participants (45.2% female); 46.8% were gay men, 25.0% were lesbian women, and 28.2% were bisexuals (164 bisexual females and 64 bisexual males). Average participant age was 28.2 ( $SD = 9.16$ ; 25 participants did not reveal their age). From this main

sample, two sub-samples were randomly extracted with approximately 50% of the cases in each sub-sample. The first sub-sample, where the principal components analyses were run, comprised of 401 participants (46.6% females); 45.6% were gay men; 27.4% were lesbian women; and 26.9% were bisexuals (76 bisexual females and 32 bisexual males). The second sub-sample, where the confirmatory factor analyses were run, included 438 participants (47.7% females); 45% were gay men; 27.6% were lesbian women; and 27.4% were bisexuals (89 bisexual women and 31 bisexual men).

#### *Procedure*

Participants were recruited via e-mail, using LGB associations, schools, universities, political parties, associations and other mailing lists. The questionnaire was run on the Internet and participants were given an Internet address for filling in the LGBIS and other measures including socio-demographic characterization measures, namely their gender, sexual orientation and age. At the beginning of the questionnaire, full anonymity and confidentiality in the data collection process was guaranteed. In the end, participants were provided with a small debriefing text and thanked.

#### *Lesbian, Gay, and Bisexual Identity Scale*

As explained above, the LGBIS is a scale measuring 7 factors and composed of a total of 33 items (Kendra & Mohr, 2008). Items are rated on a 7-point Likert-type scale ranging from 1 = "totally disagree" to 7 = "totally agree". Kendra and Mohr (2008) report a 7 factor structure for the LGBIS, presenting good internal validity indexes: (1) Identity dissatisfaction ( $\alpha = .88$ ), composed of 5 items (e.g., "I wish I were heterosexual"; "I am glad to be an LGB person"); (2) Identity uncertainty ( $\alpha = .91$ ), with 4 items (e.g., "I can't decide whether I am bisexual or homosexual"; "I keep changing my mind about my sexual orientation"); (3) Stigma sensitivity ( $\alpha = .76$ ), containing 7 items (e.g., "I often wonder whether others judge me for my sexual orientation"; "Being an LGB person makes me feel insecure around straight people"); (4) Identity centrality ( $\alpha = .79$ ), made up of 5 items (e.g., "Being an LGB person is a very important aspect of my life"; "My sexual orientation is a significant part of who I am"); (5) Difficult process ( $\alpha = .81$ ), composed by 4 items (e.g., "Admitting to myself that I'm a LGB person has been a very slow process"; "Developing as an LGB person has been a fairly natural process for me"); (6) Concealment motivation ( $\alpha = .77$ ), composed by 5 items (e.g., "My sexual orientation is a very personal and private matter"; "I keep careful control over who knows about my same-sex romantic relationships"); and (7) Identity superiority ( $\alpha = .77$ ), incorporating 3 items (e.g., "I look down on heterosexuals"; "Straight people have boring lives compared with LGB people").

The items were translated into Portuguese before being reverse translated by an English translator. The results of the reverse translation were compared with the original LGBIS items. No major discrepancies between the items were found.

## Results

### *Principal-components analysis and reliability analysis for the total sample*

Following the Kendra and Mohr (2008) procedure, principal-component analyses with *promax* rotation were run for the first sub-sample described above, using the 33 items composing the LGBIS. Previous to the principal components analyses, all items were linearized by square rooting the participant's score in each item. This allowed us to smooth out some skewed distributions in specific items, specifically those more prone to socially desirable answers (e.g., "I am glad to be an LGB person"; "I look down on heterosexuals"). The final solution obtained from these analyses supports the original seven-factor structure proposed by Kendra and Mohr (2008) integrating 28 of the original 33 items ( $KMO = .84$ ). These seven factors were retained through the application of the Kaiser rule (i.e., all factors retained had eigenvalues greater than 1.00).

The items "Coming out to my friends and family has been a very lengthy process", "If you are not careful about who you *come out* to you can get very hurt", "Being an LGB person makes me feel insecure around straight people", and "I will never be able to accept my sexual orientation until all of the people in my life have accepted me", all from the Stigma Sensitivity dimension, loaded highly on several factors and were thus discarded. By the same token, the item "My private sexual behavior is nobody's business" loaded on several factors and was also discarded. Additionally, in the final solution, the item "I'm proud to be part of the LGB community" loaded in the Identity Dissatisfaction dimension instead of its original loading in the Identity Centrality dimension.

This seven-factor solution accounts for 64.39% of the total variance, and loadings of items in their respective dimensions were moderate to high (see table 1). The scale score reliability of the dimensions, as determined by Cronbach's alpha, yielded reasonable-to-good reliabilities (see table 1). Indeed, and regarding its internal consistency, the majority of the items contribute to the good reliability of the dimensions as can be seen from the corrected item-total correlations presented in table 1. This is especially the case for the items in the Identity Superiority dimension. In this dimension, the obtained Cronbach's alpha is low, but all items

show reasonable correlations with the total score (see table 1), which attests to the internal consistency of this dimension.

We also checked for differences in participants mean scores in each LGBIS sub-scale. The ANOVA results demonstrated participants globally evaluate each dimension differently,  $F(6, 2400) = 399.87$ ;  $p < .001$ ,  $\eta^2 = .50$ . Additionally, one-sample t-test showed that in the Concealment Motivation ( $M = 4.49$ ,  $SD = 1.62$ ), Identity Centrality ( $M = 4.31$ ,  $SD = 1.44$ ), and Stigma Sensitivity ( $M = 4.21$ ,  $SD = 1.71$ ) dimensions participant mean scores were all above the mid-point of the scale; and in the Identity Dissatisfaction ( $M = 2.23$ ,  $SD = 1.20$ ), Identity Uncertainty ( $M = 1.65$ ,  $SD = 1.11$ ), Difficult Process ( $M = 3.35$ ,  $SD = 1.61$ ), and Identity Superiority ( $M = 1.71$ ,  $SD = 1.00$ ) participant mean scores were all below the scale's mid-point (all  $p$ 's  $< .01$ ). In this sense, while describing their LGB identity, participants are stressing aspects regarding identity concealment, centrality and stigma sensitivity, while devaluing other aspects such as identity dissatisfaction, uncertainty, and superiority. The LGB dimensions mean and standard deviations by participant gender and sexual orientation are presented in table 2.

### *Confirmatory factor analysis of the LGBIS for the total sample*

We ran confirmatory factor analyses on the factor structure obtained from the principal components analysis, one testing the 7-factor structure of the LGBIS, and another testing invariance in the factor structure across the different groups composing the original sample (sexual orientation groups: gay, lesbian, bisexual; gender groups: males, females). The 7-factors structure was tested through the calculation of fit indexes according to different models: a totally uncorrelated model, a partially correlated model (our hypothesised model), and a model proposing a second-order LGBIS general identity factor<sup>1</sup>. The results of these analyses are presented in table 3 and described below.

In order to test the 7-factor structure of the LGBIS through confirmatory factor analysis, some constraints were imposed so that model identification and required general model specifications were met. Correspondingly, one indicator path loading of the latent factor was set to 1, and all measurement errors were set to 1. By the same token, in the model comprising a second-order factor, the unique variances associated to first-order factors were constrained to 1. Both relative and absolute goodness of fit indexes of the models were obtained: the chi-square fit index ( $\chi^2$ ); the relative chi-square fit index ( $\chi^2/df$ ); goodness-of-fit index (GFI; Jöreskog & Sörbom, 1984); the comparative fit index (CFI; Bentler, 1990); and the root mean square error of approximation (RMSEA; Browne & Cudeck, 1989).

<sup>1</sup> It should be noted that the test of a partially correlated model was preceded by the test of a fully correlated model. The fit indexes were lower than those obtained in the partially correlated model, and some factor intercorrelations did not attain significance.

Table 1

*Principal components factor analysis of the LGBIS (promax rotation), corrected item-total correlation, and internal reliability of the scale's dimensions*

Dimensions and items	Loadings	Corrected Item-total correlation
<b>Identity Dissatisfaction (eigenvalue = 4.96; <math>\alpha</math> = .83, 95%CI = .80-.85):</b>		
1. My life would be more fulfilling if I were heterosexual	.85	.60
2. If it were possible, I would choose to be straight	.85	.74
3. I wish I were heterosexual	.78	.71
4. I believe it is unfair that I am attracted to people of the same sex	.72	.57
5. I am glad to be an LGB person*	.62	.61
6. I'm proud to be part of the LGB community*	.52	.47
<b>Identity Uncertainty (eigenvalue = 3.46; <math>\alpha</math> = .82, 95%CI = .79-.85):</b>		
1. I'm not totally sure what my sexual orientation is	.89	.71
2. I keep changing my mind about my sexual orientation	.83	.64
3. I can't decide whether I am bisexual or homosexual	.79	.63
4. I get very confused when I try to figure out my sexual orientation	.72	.66
<b>Concealment Motivation (eigenvalue = 3.74; <math>\alpha</math> = .81, 95%CI = .78-.84):</b>		
1. I keep careful control over who knows about my same-sex romantic relationships	.80	.72
2. My sexual orientation is a very personal and private matter	.80	.60
3. I prefer to keep my same-sex romantic relationships rather private	.77	.54
4. I think very carefully before coming out to someone	.76	.66
<b>Difficult Process (eigenvalue = 4.54; <math>\alpha</math> = .83, 95%CI = .80-.86):</b>		
1. I have felt comfortable with my sexual identity just about from the start*	.86	.57
2. Admitting to myself that I'm an LGB person has been a very painful process	.81	.74
3. Admitting to myself that I'm an LGB person has been a very slow process	.81	.67
4. Developing as an LGB person has been a fairly natural process for me*	.63	.63
<b>Identity Centrality (eigenvalue = 2.62; <math>\alpha</math> = .70, 95%CI = .65-.75):</b>		
1. My sexual orientation is a central part of my identity	.83	.58
2. My sexual orientation is an insignificant part of who I am*	.76	.43
3. Being an LGB person is a very important aspect of my life	.74	.53
4. To understand who I am as a person you have to know that I'm LGB	.55	.41
<b>Stigma sensitivity (eigenvalue = 3.80; <math>\alpha</math> = .81, 95%CI = .78-.84):</b>		
1. I often wonder whether others judge me for my sexual orientation	.88	.71
2. I think a lot about how my sexual orientation affects the way people see me	.79	.72
3. I can't feel comfortable knowing that others judge me negatively for my sexual orientation	.77	.56
<b>Identity Superiority (eigenvalue = 2.09; <math>\alpha</math> = .62, 95%CI = .55-.68):</b>		
1. I feel that LGB people are superior to heterosexuals	.81	.53
2. I look down on heterosexuals	.79	.45
3. Straight people have boring lives compared with LGB people	.69	.38

Note: \*Reverse-scored items.

Table 2

*LGB dimensions' means and standard deviations by participants' gender and sexual orientation*

	Gender		Sexual orientation		
	Man	Women	Gay Men	Lesbians	Bisexuals
Identity dissatisfaction	2.43 (1.35)	2.00 (0.94)	2.23 (1.28)	1.93 (1.00)	2.40 (1.20)
Identity uncertainty	1.53 (1.00)	1.78 (1.20)	1.33 (0.70)	1.30 (0.64)	2.55 (1.48)
Concealment motivation	4.53 (1.59)	4.44 (1.65)	4.37 (1.54)	4.43 (1.69)	4.75 (1.64)
Difficult process	3.56 (1.69)	3.12 (1.48)	3.50 (1.67)	3.01 (1.43)	3.47 (1.64)
Identity centrality	4.27 (1.39)	4.35 (1.50)	4.27 (1.35)	4.52 (1.49)	4.14 (1.52)
Stigma sensitivity	4.40 (1.68)	4.00 (1.72)	4.38 (1.68)	3.92 (1.78)	4.23 (1.67)
Identity superiority	1.69 (1.04)	1.61 (0.93)	1.64 (1.01)	1.57 (0.84)	1.76 (1.09)

Note: values in parentheses represent standard deviations.

Following exploratory factor analysis, and as expected, the model proposing a partially correlated 7-factor structure of the LGBIS proved the most acceptable model. Indeed, an examination of both absolute and relative fit indexes (GFI, CFI, RMSEA, and  $\chi^2/df$ ) shows that the model kept within the minimum standards normally established in the literature for goodness of fit measures, GFI = .89; CFI = .91; RMSEA = .06 (.06; .07),  $\chi^2/df = 2.30$ . Furthermore, the standardized regression weights of the paths to the latent factor were, on average, moderate to high (ranging from  $\lambda = .39$  to  $\lambda = .89$ ) as were the factor correlations ( $r = .13$  to  $r = .50$ ). A diagrammatic representation of the partially correlated confirmatory model is presented in the appendix (figure 1).

The remaining models either had lower goodness of fit indexes or proved conceptually inadequate. Therefore, the totally uncorrelated model presented itself as the model

with the poorest fit, and in the second-order model two of the first-order factors did not appear significantly correlated with the second-order factor, thus yielding a conceptually inadequate model.

Inspecting the factor intercorrelations, table 4 shows that they are moderate to high. Stronger correlations were found between identity dissatisfaction, identity uncertainty, difficult process, and identity centrality dimensions, and between identity centrality, concealment motivation and difficult process. More moderate correlations were found between concealment motivation and identity dissatisfaction and identity uncertainty. The interpretation of negative correlations between factors is within expectations regarding the contents of the dimensions and hence the more a participant scores on identity centrality, the less he/she scores on identity dissatisfaction, identity uncertainty, concealment motivation, and difficult process.

Table 3

*Summary of fit indices for confirmatory models*

Models	N	df	$\chi^2$	$\chi^2/df$	GFI	CFI	RMSEA (CI)
Partially Correlated	438	336	772.87	2.30	.89	.91	.06 (.05; .06)
Second-order*	438	343	970.11	2.83	.86	.87	.07 (.06; .07)
Uncorrelated	438	350	1374.11	3.93	.80	.79	.08 (.08; .09)

Note: \*In the second-order model, the standardized regression weights of the paths of the second-order latent factor to the first order factors Stigma Sensitivity and Identity Superiority were non-significant.

Table 4

*LGBIS factor intercorrelations (partially correlated confirmatory factor model)*

	1	2	3	4	5	6	7
1. Identity dissatisfaction	—	.047	.39	.50	-.42	ns	ns
2. Identity uncertainty		—	.30	.37	-.26	ns	.13
3. Concealment motivation			—	.40	-.48	ns	ns
4. Difficult process				—	-.50	ns	ns
5. Identity centrality					—	.34	ns
6. Stigma sensitivity						—	.20
7. Identity superiority							—

Note: all  $p$ 's < .05.

### Sensitivity analyses of LGBIS

*Factor invariance analysis.* It might be expected that differences appear when the factor structure of the LGBIS is compared taking into account respondent gender and sexual orientation. It would furthermore be reasonable to accept that, and since the partially correlated model achieved higher fit indexes, differences might emerge in factor intercorrelations when comparing male and female respondents, as well as when comparing lesbian, gay or bisexual respondents.

Apart from demonstrating how LGB identities are construed in different ways, highlighting certain dimensions and stressing specific factor associations, the differences we are expecting to obtain also provide an empirical demonstration of the scale's sensitivity to distinguish between respondents of different sex and sexual orientations. Therefore, factor invariance analyses are presented below as the means adopted for testing the sensitivity of the LGBIS model. It should be noted that these invariance analyses were run using the whole sample, since the previous LGBIS factor structure demonstrations for the two sub-samples dismissed the proposition that the factor structures obtained are idiosyncratic.

Different methods of estimating CFA factorial invariance have been proposed differentiating in their patterns of specific constraints imposed on factorial structures (e.g., Byrne, Shavelson, & Muthèn, 1989; Meredith, 1993; Steenkamp & Baumgartner, 1998). The strategy of invariance analysis used in the present article was adapted from the steps for testing invariance proposed by Steenkamp and Baumgartner (1998), specifically on the tests of configural invariance (or identical factor structure), which requires the same patterns of freed (nonzero) and fixed (zero) factor loadings across groups, and factor variance-covariance invariance, which restricts the

latent variables (factors) covariances and correlations to the same value. Put simply, factor invariance analysis supposes that an unconstrained model, i.e., a model where all path loadings and factor structural covariances are allowed to vary freely between sub-sample groups, is compared to constrained models either imposing that factor path loadings or that path loadings and factor structural covariances are invariant across sub-sample groups. Regarding this last model, we tested the invariance of factor covariances based on the partially correlated model presented above. Normally, a chi-square difference test is used at each step to evaluate the stability of fits of each model (Jöreskog & Sörbom, 1996; Yung & Bentler, 1996), with non-significant chi-square difference tests meaning stable model fits and thus attesting factor invariance. Nonetheless, and taking into account the construct definition and its specificities (cf., Kendra & Mohr, 2008; Mohr & Fassinger, 2000), we expected that in the present scale differences between sub-sample groups factor structural covariances (i.e., factor intercorrelations) would arise, namely between gender or sexual orientation groups, but not regarding path loadings. This means that when comparing sub-groups drawn from the main sample, we expected a similar factor structure for the LGBIS (i.e., path loadings remain invariant), while factor intercorrelation might be different between groups of respondents varying in sexual orientation or their gender. The results of the factor invariance analysis are set out in table 5.

Concerning participant sexual orientation, table 5 highlights significant differences between invariance constraints imposed on steps 1 through 3. These results show that factor loadings and factor structural covariances vary across sexual orientation groups (i.e., all in all, the factor solution initially proposed is rather heterogeneous between

Table 5  
*Invariance analysis across sub-samples – participants' sexual orientation and gender*

Steps	Invariance constraints	<i>df</i>	$\chi^2$	$\Delta df$	$\Delta \chi^2$	GFI	CFI	RMSEA (CI)	ECVI (CI)
Sexual orientation:									
1	Unconstrained	1008	1778.95			.87	.91	.031 (.028; .033)	2.73 (2.59; 2.88)
2	FL invariance	1050	1904.49	42	125.54	.86	.90	.032 (.030; .034)	2.78 (2.64; 2.94)
3	FL, FSC invariance	1076	1968.86	68	189.91	.86	.90	.032 (.030; .034)	2.80 (2.65; 2.96)
Gender:									
1	Unconstrained	672	1493.29			.89	.91	.04 (.036; .042)	2.20 (2.07; 2.34)
2	FL invariance	693	1521.34	21	28.05*	.89	.91	.04 (.036; .041)	2.18 (2.05; 2.33)
3	FL, FSC invariance	706	1553.20	37	39.91*	.89	.91	0.04 (.036; .041)	2.17 (2.03; 2.31)

Notes: CI = Confidence interval; FL = factor loading; FSC = factor structural covariates; \*ns.

these groups of respondents). Nevertheless, the use of the chi-square statistic as the indicator of sub-sample factor invariance is a matter of much debate in the literature, and several authors have recognized a number of problems associated with the use of the chi-square difference test (e.g., Browne & DuToit, 1992; MacCallum, 1995; Marsh & Hocevar, 1985; Maruyama, 1998). An alternative evaluation technique to the chi-square statistic is the inspection of RMSEA fit indexes and their respective confidence intervals (Quintana & Maxwell, 1999). Using this approach, we find the three models to have reasonable and identical RMSEA fits to those obtained in the unconstrained model. Hence, we can put forward as acceptable models those constraining path loadings and factor structural covariances equal across sub-samples of participant sexual orientation. Furthermore, in the remaining fit indexes these models yielded similarly acceptable values. One exception should be made for the model imposing structural covariance similarity (specifically, factor intercorrelations), since some factor intercorrelations did not hold across samples. Correspondingly, and regarding gay participants, intercorrelations between factors of “identity superiority” and “identity uncertainty” did not attain significance. In the case of Lesbian participants, the correlations between “identity superiority” factor and “stigma sensitivity”, and between “identity uncertainty”, “concealment motivation”, “difficult process”, and “identity centrality” did not reach significance. Finally, for bisexual participants, the factor correlations between “identity superiority” and “stigma sensitivity” were statistically non-significant. The remaining correlations were significant as proposed by our initial confirmatory model.

A similar set of results was obtained when considering participant gender. In this case, no differences were observed in the chi-square test comparing the unconstrained model and both the path loadings and the structural covariance constrained models. Thus, we could argue in favour of the invariance of the LGBIS factor structure across participant gender. Nevertheless, and as we described above, in the model imposing equality of factor intercorrelations (i.e., structural covariance invariance) some factor correlations

did not hold across sub-samples. Thus, for male participants the “identity superiority” factor did not correlate with the “uncertain identity” factor. In the case of female participants, all correlations achieved significance.

The results of factor invariance analysis record how the LGBIS factor structure held across the sub-samples of participant gender and sexual orientation, and although the models testing factor structural covariates did not depart from the unconstrained model, at least when regarding their fit indexes, some correlations between factors did not hold across sub-samples. These results argue in favour of LGBIS sensitivity, namely its capability to tap the specificities inherent to participant gender and sexual orientation while expressing their LGB identities.

*Confirmatory analyses with sub-sample groups.* The results of invariance analysis lead to the identification of specificities concerning LGBIS factor intercorrelations dependent upon participant gender and sexual orientation. Similarly, we retested the factor structure obtained with the main sample across five different sub-samples: male, female, gay, lesbian, and bisexual participants, but constrained factor intercorrelations to those yielding significance in the previous invariance analysis. The results of these analytical processes are summarized in table 6.

In general terms, the results of the confirmatory factor analyses ran on different sub-samples return adequate fit indexes for the LGBIS factor structure. To this end, the analyses demonstrate that the original LGBIS factor structure, proposed by Kendra and Mohr (2008), held in every sub-sample. However, these analyses also reveal how factor intercorrelations vary in accordance with participant sexual orientation and gender, attesting to LGBIS sensitivity to different types of respondents. It should also be noted that models regarding lesbian and bisexual participants present lower GFI indexes when compared to the model tested with gay participants. However, they present higher CFI indexes and adequate chi-square ratios thus sustaining their overall quality.

As set out in table 7, and when considering male and female participants, factor intercorrelations differ mainly

**Table 6**  
*Summary of fit indices for the partially correlated confirmatory model – sub-samples*

Models	<i>N</i>	<i>df</i>	$\chi^2$	$\chi^2/df$	GFI	CFI	RMSEA (CI)
Sex:							
Men	443	334	782.37	2.34	.89	.91	.06 (.05; .06)
Women	365	338	699.58	2.07	.88	.91	.05 (.05; .06)
Sexual orientation:							
Gay men	378	336	679.06	2.02	.89	.91	.05 (.05; .06)
Lesbian women	202	342	558.64	1.63	.84	.89	.06 (.05; .06)
Bisexuals	228	337	553.49	1.64	.86	.92	.05 (.05; .06)

Note: \*In the second-order model, the standardized regression weights of the paths of the second-order latent factor to the first order factors Stigma Sensitivity and Identity Superiority were non-significant.



Table 7  
*Factor intercorrelations - sub-samples analyses*

	1	2	3	4	5	6	7
Women <sup>1</sup> :							
1. Identity dissatisfaction	—	.44	.41	.59	.39	ns	ns
2. Identity uncertainty		—	.24	.37	.25	ns	ns
3. Concealment motivation			—	.43	.42	ns	ns
4. Difficult process				—	.47	ns	ns
5. Identity centrality					—	.31	ns
6. Stigma sensitivity						—	ns
7. Identity superiority							—
Men <sup>2</sup> :							
1. Identity dissatisfaction	—	.43	.39	.57	.38	-.11	ns
2. Identity uncertainty		—	.31	.36	.28	ns	ns
3. Concealment motivation			—	.39	.49	ns	ns
4. Difficult process				—	.45	ns	ns
5. Identity centrality					—	.33	.20
6. Stigma sensitivity						—	.28
7. Identity superiority							—
Gay men <sup>3</sup> :							
1. Identity dissatisfaction	—	.35	.36	.53	.41	ns	ns
2. Identity uncertainty		—	.28	.33	.33	ns	ns
3. Concealment motivation			—	.38	.48	ns	ns
4. Difficult process				—	.43	ns	ns
5. Identity centrality					—	.30	.14
6. Stigma sensitivity						—	.25
7. Identity superiority							—
Lesbian women <sup>4</sup> :							
1. Identity dissatisfaction	—		.39	.52	.39	ns	ns
2. Identity uncertainty		—	ns	ns	ns	ns	ns
3. Concealment motivation			—	.35	.41	ns	ns
4. Difficult process				—	.42	ns	ns
5. Identity centrality					—	.36	ns
6. Stigma sensitivity						—	ns
7. Identity superiority							—
Bisexuals <sup>5</sup> :							
1. Identity dissatisfaction	—	.60	.44	.68	.35	ns	ns
2. Identity uncertainty		—	.32	.52	.32	ns	ns
3. Concealment motivation			—	.50	.46	ns	ns
4. Difficult process				—	.51	ns	ns
5. Identity centrality					—	.31	ns
6. Stigma sensitivity						—	.27
7. Identity superiority							—

Notes: <sup>1</sup> All  $p$ 's < .001; <sup>2</sup> All  $p$ 's < .02; <sup>3</sup> All  $p$ 's < .02; <sup>4</sup> All  $p$ 's < .000; <sup>5</sup> All  $p$ 's < .01; ns = non-significant.

in the associations between the “identity superiority” factor and the other LGBIS factors. In fact, male participants show that greater identity superiority is related to higher scores in “identity centrality” and “stigma sensitivity” factors, a pattern that is not present in female participants. By the same token, male participants associate “identity dissatisfaction” to “stigma sensitivity”. The remaining factor intercorrelations were identical in both these two groups of participants.

Turning now to factor intercorrelations regarding participant sexual orientation, we can observe that concealment motivation and identity uncertainty factors appear associated in bisexual and gay participant samples, reflecting how the greater the motivation for participants to conceal their sexual orientation, the greater their uncertainty regarding their own identity. In addition, within these same participants, higher scores on stigma sensitivity were associated with higher identity superiority. The factor intercorrelation matrix presented in table 6 also shows that higher stigma sensitivity was linked to higher identity centrality within gay, lesbian, and bisexual participants.

## Discussion

In this article, we present evidence backing the validity of the construct and other psychometric properties of the LGBIS model (Kendra & Mohr, 2008). The results presented also argue for this scale’s sensitivity to tap into specific dimensions of identity within different groups of individuals, specifically regarding their gender and sexual orientation.

Correspondingly, the confirmatory factor analyses we ran with a sample of Portuguese lesbian, gay and bisexual participants showed that a model proposing a partially correlated 7-factor structure proved to be the most acceptable model. The factor intercorrelations, in general, prove that the identity dissatisfaction factor appeared more strongly associated with the identity uncertainty, concealment motivation, difficult process, and identity centrality factors, showing that respondents tended to be less satisfied with their LGB identity the more uncertain they feel about their sexual orientation, the more they keep their sexual orientation to themselves, the more they have problems admitting to themselves that they are LGB, or even the less they think that their sexual orientation is a central aspect to their identities.

On the other hand, stigma sensitivity appeared strongly correlated to the identity centrality factor, suggesting that respondents revealing sensitivity to the negative judgements of others about their sexual orientation are also those that prioritise their sexual orientation as an important aspect of their identity.

To put it briefly, confirmatory factor analysis fully supported the factor structure proposed by Kendra and Mohr

(2008), but some of the LGBIS items presented in the original version of this scale were dropped. In our sample, the LGBIS showed that participants are associating identity dimensions to construct their LGB identity, while leaving other dimensions more independent within the same process. This gives a more dynamic and realistic view of identity construction processes, showing that the LGBIS is a sensitive instrument responsive to and insightful about complex constructs such as identity.

The issue of LGBIS sensitivity was further explored in the sensitivity analyses presented in this article. In reality, the invariance analyses presented above provide a clear account that the LGBIS model is sensitive to sample variations in terms of participant gender and sexual orientations, since factor intercorrelations did not hold equal significance across these sub-samples. This also contributes towards gathering empirical evidence regarding the LGBIS construct validity. Indeed, our analyses reveal, for example, that men tend to associate identity superiority with other LGBIS dimensions, such as identity centrality and stigma sensitivity, a pattern that did not hold within female respondents. This gives a clear picture concerning the specificities that underlie the female and male respondents regarding their LGB identity.

In a similar vein, our analyses showed that bisexual respondents have similar patterns of factor intercorrelations to gay respondents, but differ from lesbian respondents. In fact, bisexuals and gay respondents seem to associate stigma sensitivity with identity superiority, while lesbian participants do not. Furthermore, gay men and bisexuals seem to associate identity centrality with identity uncertainty, while lesbian participants do not. At the same time, this analysis also showed that the factor structure proposed by Kendra and Mohr (2008) is invariant across these same sub-samples, attesting to the construct validity in respondents with different sexual orientations and gender.

As we stated in the introduction, in Mohr and Fassinger’s (2006) model, identity is seen as both self-identification and collective identification with beliefs, values or traits and behaviours and attachments. Their multidimensional model accesses numerous dimensions of the lives of LGB individuals, as well as of their positioning, but also expectations regarding their own stigmatization or motivations and efforts to conceal their sexual orientation or identity (Kendra & Mohr, 2008; Mohr & Fassinger, 2000; Mohr & Daly, 2008). Moreover, their model discusses aspects of identity that are able to emphasize the hostility of the social climate and of cultural norms characterizing sexual orientation as a simple dichotomous construct.

The results presented in this article go hand-in-hand with this model’s arguments. Indeed, LGBIS not only presented good psychometric properties, which argues for the quality of this measurement’s operationalization regarding its underlying construct, but also proved capable of capturing specific facets to the construct, for example, the understanding

of bisexual identity construction, the specificities of gay and lesbian identities, but also clearer differences between (gay/bisexual) men and (lesbian/bisexual) women. These specificities are clearly sustained by the scale's sensitivity analysis that we set out and commented on above.

To conclude, the results obtained from our sample of LGB respondents lead us to support our argument that Mohr and Fassinger's (2006) multidimensional approach to identity is a priori a good way of measuring something as complex and multifaceted as identity. Thus, we can conclude that the LGBIS model is a sound instrument for researchers working with the measurement and specificities of LGB identities.

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## APPENDIX

## Principal components analysis of LGBIS scale using the whole sample – detailed results

Dimensions and items	F1	F2	F3	F4	F5	F6	F7
<b>F1 Identity Dissatisfaction:</b>							
1. My life would be more fulfilling if I were heterosexual	<b>.85</b>	-.01	-.02	-.12	.12	.04	.07
2. If it were possible, I would choose to be straight	<b>.85</b>	-.02	.01	-.07	-.03	.10	.001
3. I wish I were heterosexual	<b>.78</b>	.02	.08	.003	.007	.05	-.04
4. I believe it is unfair that I am attracted to people of the same sex	<b>.72</b>	.11	.01	.10	.11	-.17	.12
5. I am glad to be an LGB person*	<b>.62</b>	-.02	.01	.13	-.15	-.05	-.13
6. I'm proud to be part of the LGB community*	<b>.52</b>	-.08	.02	.07	-.28	-.11	-.11
<b>F2 Identity Uncertainty:</b>							
1. I'm not totally sure what my sexual orientation is	.002	<b>.89</b>	.05	-.10	-.03	-.03	-.05
4. I keep changing my mind about my sexual orientation	-.04	<b>.83</b>	-.10	.01	-.05	-.02	.09
2. I can't decide whether I am bisexual or homosexual	.02	<b>.79</b>	-.002	-.09	.01	.09	-.04
3. I get very confused when I try to figure out my sexual orientation	.08	<b>.72</b>	.06	.18	.04	.03	-.003
<b>F3 Concealment Motivation:</b>							
1. I keep careful control over who knows about my same-sex romantic relationships	-.002	.04	<b>.80</b>	-.03	-.02	.15	.05
2. My sexual orientation is a very personal and private matter	.06	-.02	<b>.80</b>	-.05	-.08	-.06	-.03
3. I prefer to keep my same-sex romantic relationships rather private	.07	.01	<b>.77</b>	.06	.09	-.22	.81
4. I think very carefully before coming out to someone	-.06	-.05	<b>.76</b>	-.05	.06	.27	-.03
<b>F4 Difficult Process:</b>							
1. I have felt comfortable with my sexual identity just about from the start*	-.23	-.04	-.16	<b>.86</b>	-.05	-.01	.09
2. Admitting to myself that I'm an LGB person has been a very painful process	.03	-.08	-.01	<b>.81</b>	.01	.12	.01
3. Admitting to myself that I'm an LGB person has been a very slow process	-.08	.03	.16	<b>.81</b>	.02	-.01	.05
4. Developing as an LGB person has been a fairly natural process for me*	.14	.02	.01	<b>.63</b>	0.07	.13	-.10
<b>F5 Identity Centrality:</b>							
1. My sexual orientation is a central part of my identity	.09	-.07	.02	.06	<b>.83</b>	-.04	-.02
2. My sexual orientation is an insignificant part of who I am*	-.11	.08	.09	.12	<b>.76</b>	-.16	-.20
3. Being an LGB person is a very important aspect of my life	-.10	-.05	.07	-.07	<b>.74</b>	-.10	.07
4. To understand who I am as a person you have to know that I'm LGB	.22	-.02	-.23	-.16	<b>.55</b>	.23	.09
<b>F6 Stigma sensitivity:</b>							
1. I often wonder whether others judge me for my sexual orientation	-.08	.07	-.08	.12	-.02	<b>.88</b>	-.03
2. I think a lot about how my sexual orientation affects the way people see me	.05	-.04	-.05	.11	.08	<b>.79</b>	.01
3. I can't feel comfortable knowing that others judge me negatively for my sexual orientation	.004	.02	.18	-.07	-.12	<b>.77</b>	-.003
<b>F7 Identity Superiority:</b>							
1. I feel that LGB people are superior to heterosexuals	.04	.05	.004	.05	-.02	-.03	<b>.81</b>
2. I look down on heterosexuals	.03	-.10	.10	.01	-.04	-.01	<b>.79</b>
3. Straight people have boring lives compared with LGB people	-.08	.06	-.02	.05	-.03	.01	<b>.69</b>

Note: all  $p$ 's < .05.

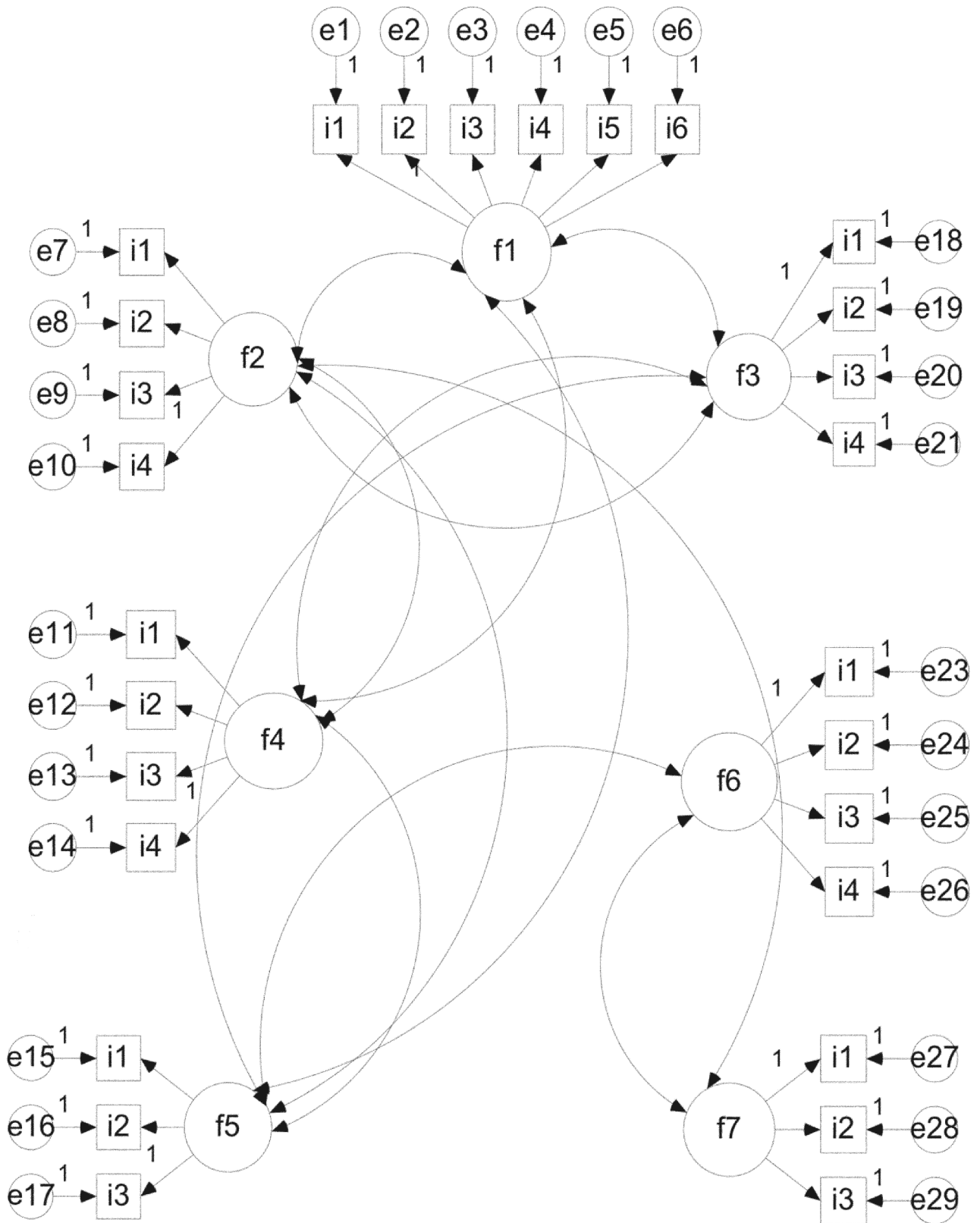


Figure 1. SLGBIS partially correlated confirmatory model.