Factor Structure and Psychometric Properties of the Italian Version of the Homosexuality Scale of the Trueblood Sexual Attitudes Questionnaire

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Abstract

The aim of the present study was to translate the Homosexuality scale of the Trueblood Sexual Attitudes Questionnaire in Italian language, and assess its factor structure and psychometric properties in Italian psychology students. The questionnaire was originally developed and validated in U.S. college students, and later in Turkish social work students, showing high internal consistency. It measures attitudes towards several sexual practices and behaviours, regarding self and others. Particularly, the Homosexuality scale measures attitudes towards different sexual and romantic practices with people of the same sex. 199 Italian psychology students participated to the study, and were administered the Italian translation of the scale. We applied Exploratory Factor Analysis and Confirmatory Factor Analysis. Results showed that the scale has high internal consistency, and that the original two-factor model accounting for attitudes towards self and others fits the data well. Implications for education and assessment in student populations are discussed.

Keywords: Attitudes, Homosexuality, Gay, Lesbian, Sexual Practices, Behaviours, Students, Psychology, Psychometrics.

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Attitudes towards gay, lesbian, and bisexual sexual behaviours vary in different cultures, determining the way individuals evaluate what is appropriate and inappropriate about self and others' sexual orientation and practice (Murray, 2000).

Recent studies show that conservative attitudes towards gay, lesbian, and bisexual sexual behaviours are deeply-rooted and widespread in the Italian society (Fino & Aiello, 2014; Giunti & Fioravanti, 2017; Pelullo, Di Giuseppe, & Angelillo, 2013), and research highlighted that lesbian and gay people represent a stigmatised sexual minority in the Italian context (Giunti & Fioravanti, 2017, p. 16).

In this regard, differences between Italy and other European countries exist. A study on discrimination in Europe showed that Italy had one of the highest level of discrimination on grounds of sexual orientation across E.U. member states, with 63% of Italians respondents reporting that such type of discrimination is widespread (European Commission, 2012). Recently, the Italian law has recognised civil unions between same-sex individuals (ANSA, 2016). However, same-sex marriage and adoption by same-sex couple are not allowed, despite several European countries have legally recognised them.

Results from research conducted in Italian populations show that religiosity and conservative orientation are significant predictors of negative attitudes towards sexual and romantic practices with people of the same sex (Hichy, Gerges, Platania, & Santisi, 2015). These results are consistent with previous literature (Averett, Strong-Blakeney, Nalavany, & Ryan, 2011; Baiocco, Nardelli, Pezzuti, & Lingiardi, 2013; Brumbaugh, Sanchez, Nock, & Wright, 2008; Hollekim, Slaatten, & Anderssen, 2012; Olson, Cadge, & Harrison, 2006). Particularly, a study conducted in Italy by Lingiardi, Falanga, and D'Augelli (2005)

identified being political and religious conservative, as well as not knowing gay and lesbian people personally, as determinants of homophobia in an Italian sample.

Recent studies highlight the importance of analysing attitudes towards sexual practices and behaviours in educational settings, with findings showing that students are likely to hold conservative attitudes towards gay, lesbian, and bisexual practices (Chonody, Kavanagh, & Woodford, 2016; Moreno, Herazo, Oviedo, & Campo-Arias, 2015; Rowniak, 2016). Duyan & Duyan (2005) investigated the relation between lack of social contact with gay and lesbian people and liberal vs. conservative attitudes towards different sexual and romantic practices with people of the same sex, in a sample of Turkish social work students. Attitudes were measured by means of the Trueblood Sexual Attitudes Questionnaire (TSAQ) (Trueblood, Hannon, & Hall, 1998; Hannon, Hall, Gonzez, & Cacciapaglia, 1999). They found that lack of social contact with gay and lesbian people determined more stereotypic attitudes, supporting traditional gender values. The authors concluded that "Turkish students who hold more traditional gender-role attitudes also hold more negative attitudes toward homosexuality" (p. 704).

Despite the dramatic implications of assessing liberal vs. conservative attitudes towards different romantic and sexual practices with people of the same sex in student populations, there is a lack of reliable psychometric tools in the Italian context.

The Trueblood Sexual Attitudes Questionnaire (TSAQ) (Trueblood et al., 1998) is a questionnaire that was developed to measure changes in students' attitudes towards common topics related to sexual behaviour, as covered in human sexuality courses (Hannon et al., 2011). The questionnaire is named after one of its authors (Trueblood). Its psychometric properties and factor structure were tested by Hannon et al. (1999) in a sample of college students from Northern California, U.S.A., showing high internal consistency. The TSAQ is

listed in the GASP Measures Database of the American Psychological Association (Hannon, Hall, Gonzalez & Cacciapaglia, 2011).

The questionnaire is divided into five scales, measuring attitudes towards Autoeroticism, Commercial Sex, Heterosexuality, Homosexuality, and Variation In Sex, respectively. Each scale is divided in two different sub-scales, measuring attitudes towards sexual behaviours that are considered acceptable for oneself (Self) and for the others (Other), respectively. Regarding the Homosexuality scale, higher scores indicate more liberal attitudes towards gay, lesbian, and bisexual behaviours and practices, and lower scores indicate more conservative attitudes. Each of the two sub-scales (Self, Other) is composed of 8 items. Particularly, students are asked to rate the extent to which they would consider acceptable, for themselves and for the others, respectively, different sexual and romantic practices with people of the same sex.

The psychometric properties and the factor structures of the TSAQ were also investigated in a sample of Turkish social work students (Duyan & Duyan, 2005), showing very good internal consistency. Regarding the total scales, they were .92 for self, and .95 for others. Regarding the Homosexuality scale, internal consistency was .81 for self, and .94 for others. Petroski, Spears, Dempsey, and Kapalka (2007) employed the TSAQ in a study investigating the relationship between attachment style, attitudes towards sexuality, and risky sexual behaviour. Pettijohn and Dunlap (2010) administered the TSAQ to a sample of U.S. undergraduates attending a human sexual behaviour course, to investigate attitudes towards sexuality. Results showed that after completing the course, the students had higher tolerance towards others' sexual practices and more positive sexual attitudes. The authors commented that the TSAQ is useful in measuring attitudes towards sexuality in an educational setting, with important implications in terms of enhancement of tolerance as a key factor to

combating homophobia. More recently, the TSAQ has been utilised to investigate Turkish nursing students' attitudes towards sexuality (Özbaş, Gürhan, & Duyan, 2016).

The aim of the present study was to translate the Homosexuality scale of the TSAQ in Italian, to investigate its psychometric properties and factor structure in a sample of Italian psychology students, and to explore differences in gender, age, and sexual orientation.

Method

Participants

In January 2015, 304 undergraduate and postgraduate psychology students attending the Faculty of Medicine and Psychology of Sapienza University of Rome were contacted in classroom settings during regular class meetings, and they were asked to participate voluntarily in the study. 199 students accepted to participate and completed the procedure (65.46% response rate). All participants provided written informed consent prior to any study procedure.

Procedure

Questionnaires were administered in classroom settings during regular class meetings. They were given no special inducement to participate in the study, and there was no penalty for refusing to participate. They were told that the purpose of the survey was to obtain information about their attitudes towards sex for self and others. They were assured anonymity and asked to answer the questionnaire honestly.

Measures

All students were administered the Italian version of the TSAQ Homosexuality scale. The scale was translated from English into Italian by one the authors, and the adequacy of the translation to the English version was assessed independently through a back-translation by a native speaker professional translator. Furthermore, we asked two Italian–English bilingual colleagues to provide critical suggestions about the translation, checking for consistency of

grammar and understanding. This process allowed us to resolve differences between the English and Italian version. The original English and Italian versions of the scale are provided in Appendix. The participants completed all the measures, providing information on gender, age, and sexual orientation.

Statistical Analyses

The factor structure and psychometric properties of the scale were assessed by means of Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).

EFA was utilised to explore the factor structure underlying the Italian version of the scale. EFA was performed by means of the Principal Axis Factoring (PAF) method with Promax rotation, relying on the theoretical assumption that the latent factors of attitudes towards self and others could be correlated. The factors to retain in the final solution were extracted on the basis of results from the following tests: (1) the Bartlett's test of sphericity, assuming that the correlation matrix is an identity matrix; (2) the Kaiser–Meyer–Olkin test (KMO), measuring sampling adequacy; (2) eigenvalues greater than 1; factor loadings greater than .55 (Tabachnick & Fidell, 2013).

CFA aimed at validating the factor structure obtained from the EFA (Bollen, 1989). Goodness-of-fit was evaluated by means of χ^2, Goodness-of-fit Index (GFI), Comparative Fit Index (CFI), and the root mean square error of approximation (RMSEA). The χ^2 test indicates the difference between observed and expected covariance matrices, with values closer to zero indicating a better fit. The GFI is a measure of fit between the hypothesized model and the observed covariance matrix, with values ranging from 0 to 1 (a value of .90 or larger is considered to indicate acceptable model fit). The CFI analyses the model fit by examining the discrepancy between the data and the hypothesized model, with values ranging from 0 to 1 (a value of .95 or larger is considered to indicate acceptable model fit). The RMSEA analyses the discrepancy between the hypothesized model and the covariance matrix, when the

parameters are optimally chosen. The RMSEA ranges from 0 to 1, with a value of .06 or smaller indicating acceptable model fit. Therefore, we expected a well-fitting model to perform as follows: ratio of χ^2 to degrees of freedom < 3, GFI > .90, CFI > .95, and RMSEA < .06 (Brown, 2006).

Cronbach's alpha was used to investigate the internal consistency of the scale. We used Pearson's correlation to analyse inter-correlations between sub-scales, independent sample t-test to investigate differences in gender and age groups, and Kruskal-Wallis test to investigate differences in sexual orientation. CFA was applied with the use of IBM AMOS 22. All other analyses were carried out using IBM SPSS Statistics 22.0.

Results

Descriptive statistics

The sample was comprised of 33% males (N = 65) and 67% females (N = 134). There were 43.2% (N = 86) undergraduate students and 56.8% (N = 113) postgraduate students. As regard sexual orientation, 88.9% (N = 177) of the students reported that they were heterosexuals, 7.5% (N = 15) reported that they were gay or lesbian, and 3.5% (N = 7) reported that they were bisexual. We considered two groups of participants regarding age: (1) Students aged 18-25 and (2) students aged 26-33. No differences were found between age and gender ($\chi_{(1)} = .56$; p = .45). Significant differences were found in sexual orientation (p. < 002), as there were less lesbian women (3.0%) than gay men (16.9%), and more heterosexual women (94.0%) than heterosexual men (78.5%). There were also less bisexual women (3.0%) than bisexual men (4.6%). Descriptive statistics are shown in Table 1.

[Table 1: Here]

Reliability

High values of Cronbach's alpha were found for Self ($\alpha = .94$), Other ($\alpha = .96$), and the total scale (.93), indicating very good internal consistency. We found that no item

substantially increased the value of alpha if removed, both at the total scale and sub-scales levels.

Exploratory Factor Analysis (EFA)

EFA with Promax rotation was applied to the correlation matrix. The Kaiser's Meyer Olkin measure of sampling adequacy (KMO = .93) was greater than the minimum value of .6, and the Bartlett's test of sphericity resulted significant ($p < .001$), suggesting the factorability of the correlation matrix and indicating that the theoretical assumptions were met. A two-factor solution was extracted, in line with theoretical assumptions, accounting for 76.73% of variance. All 16 items showed communalities greater than .45, and factor loadings greater than .55. Factor I (Other) accounted for 50.85% of variance (eigenvalue = 8.14), Factor II (Self) accounted for 25.89% of variance (eigenvalue = 4.14). Factor loadings and communalities are shown in Table 2.

[Table 2: Here]

Confirmatory Factor Analysis (CFA)

Two CFA models were tested on the covariance matrix, by means of Maximum Likelihood method. The first model was a one-factor model, in which all the 16 variables loaded on one factor. This model produced fit indices as follows: $\chi^2_{(104)} = 1559.98$ ($p < .001$); GFI = .375; CFI = .590; RMSEA = .266. These values were inadequate, suggesting to reject the hypothesis of good fit. The second model was a two-factor model. Items loaded on the two factors extracted from the EFA and factors were inter-correlated. This second model produced fit indices as follows: $\chi^2_{(103)} = 289.564$ ($p = .000$); GFI = .828; CFI = .947; RMSEA = .096. Modification indices computed on the fixed parameters highlighted that a model with freely estimated error covariances between pairs of indicators would produce a decrease in Chi-Square and improvement of fit. Error covariances are defined as "zero-order relationships freely estimated between pairs of indicators" (Brown, 2006, p. 40). Therefore,

we tested a model in which the following error covariances were freely estimated: Cov(e2; e3), Cov(e2; e7), Cov(e3; e4), Cov(e3; e7), Cov(e3; e8), Cov(e7; e8), Cov(e9; e13), Cov(e10; e11), Cov(e10; e14), Cov(e11; e12), Cov(e13; e15), Cov(e15; e16). The model produced fit indices as follows: $\chi^2_{(91)} = 111.24$ ($p = .074$); GFI = .933; CFI = .994; RMSEA = .034. This model showed good fit to the data, and it was appropriate to represent the relations between the observed variables and the factors. All standardized estimates were >.60. Fit indices are shown in Table 3. Standardized estimates are shown in Figure 1.

[Table 3: Here]

[Figure 1: Here]

Inter-Correlations

The two sub-scales and the total scale were computed by adding up the scores of the items comprised within each factor, and the scores of all the items, respectively. The Pearson's correlation coefficient indicated strong inter-correlations regarding the overall score with Self and Other, respectively, with both values exceeding .70 and being statistical significant ($p < .01$), and a moderate correlation regarding Self with Other, with the value exceeding .30 and being statistically significant ($p < .01$) (Table 4).

[Table 4: Here]

Differences in gender, age, and sexual orientation

Results from independent-samples t-test showed no gender differences between males and females, for the overall score ($t_{(197)} = -.27$, $p = .786$), Self ($t_{(197)} = .77$, $p = .442$), and Other ($t_{(197)} = -1.73$, $p = .085$).

Before analysing differences in sexual orientation, we tested the assumption of homogeneity of variances between the groups (gay and lesbian, bisexual, and heterosexual students) by means of Levene's test. Results showed that the assumption was violated for the overall scale ($F_{(2)} = 8.79$, $p < .001$), Self ($F_{(2)} = 10.76$, $p < .001$), and Other ($F_{(2)} = 3.97$, $p <$

.030). Therefore, we decided to proceed with a non-parametric test, and we explored differences in sexual orientation by means of the Kruskal-Wallis test. Results showed that there was a statistically significant difference in overall scores ($\chi^2_{(2)} = 39.60$; $p < .001$), with a mean rank score of 184.30 for gay and lesbian students, 91.27 for heterosexual students, and 140.00 for bisexual students. There was also a statistically significant difference in Self ($\chi^2_{(2)} = 44.69$; $p < .001$), with a mean rank score of 185.57 for gay and lesbian students, 90.53 for heterosexual students, and 156.14 for bisexual students. There was no statistically significant difference in Other ($\chi^2_{(2)} = 2.00$; $p = .368$).

Regarding age, results from independent-samples t-test showed no differences between students aged 18-25 and students aged 26-33 in overall scores ($t_{(197)} = .05$, $p = .959$), Self ($t_{(197)} = .79$, $p = .430$), and Other ($t_{(197)} = -1.1$, $p = .279$).

Discussion

The aim of the present study was to translate the Homosexuality scale of the TSAQ in Italian, to investigate its psychometric properties and factor structure in a sample of Italian psychology students. The Homosexuality scale measures attitudes towards gay, lesbian, and bisexual practices and behaviours, related to self and others, respectively. Higher scores indicate more liberal attitudes towards romantic and sexual practices with individuals of the same sex, and lower scores indicated more conservative attitudes. Results from the EFA and CFA showed that a two-factor model in which a series of error covariances between indicators were freely estimated, fits the data well. We also found high correlations of overall scores with Self and Other, respectively, and a moderate correlation of Self with Other. These results highlight that the scale represents an internally consistent measure of attitudes towards gay, lesbian, and bisexual practices and behaviours, related to self and others. As reported in previous research (Pettijohn & Dunlap, 2010), these attitudes are important to understand students' tolerance towards sexual diversity, enabling to target intervention to enhance

positive sexual attitudes and combat homophobia and prejudice. Although previous research employing the scale in student samples concluded that those "who hold more traditional gender-role attitudes also hold more negative attitudes toward homosexuality" (Duyan & Duyan, p. 704), these conclusions need to be verified by testing correlations with other measures assessing negative attitudes towards sexual and romantic practices with people of the same sex.

We found statistically significant differences in sexual orientation. In fact, gay and lesbian students showed more liberal attitudes in Self than bisexual, and heterosexual students, respectively. Moreover, gay and lesbian students showed more liberal attitudes at the overall scale than heterosexual and bisexual students, respectively. Although it is reasonable to expect gay and lesbian students to endorse more liberal attitudes regarding self, it is not clear why bisexual students showed more conservative attitudes compared to heterosexual students at the overall scale. Further empirical investigation of sexual orientation differences with Italian wider samples is required to better understand differences in Self, Other, and overall scores.

This study has limitations. First, because the sample was limited to psychology students, it is not recommended to generalize results to the wider Italian university student population. Future research will need to test the validity of these results to representative student and community populations. Second, the sample does not represent the entire Italian psychology student population, and students were recruited from a unique faculty. Future research would benefit from testing the Italian version of the TSAQ Homosexuality scale on a more representative sample of the national psychology student population. Third, the sample was not representative in terms of sexual orientation, suggesting the need for future research to employ representative samples. Fourth, the study relied on sensitive information which may have limited honest responses. Some may over-report socially desirable attitudes

or under-report socially undesirable attitudes. Fifth, the study did not assess the discriminant and concurrent validity of the scale. Future research should assess validity of the scale by exploring correlations between Self, Other, and overall scores, and other validated measures of attitudes towards different sexual and romantic practices with people of the same sex. Moreover, further research is required to examine possible correlations between lower scores at the TSAQ Homosexuality scale and other validated measures of negative attitudes, discrimination towards such practices, and homophobia.

In conclusion, we verified that the Italian version of the Homosexuality scale of the TSAQ has good psychometric properties and high internal consistency. These results will provide Italian researchers, educators, community operators, and psychologists with a reliable scale to assess students' attitudes towards different sexual and romantic practices with people of the same sex. We expect these results to further contribute to improve the assessment of such attitudes in the Italian context, with implications in terms of education and prevention. Particularly, the use of the scale in educational settings will allow educators and practitioners to evaluate the impact of targeted sex educational programmes on tolerance and sexual attitudes.

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Table 1. Descriptive statistics

Characteristics	Females (N = 134)	Males (N = 65)
Age (years)	23.47 ± 2.88[a]	22.75 ± 3.08[a]
Sexual orientation (%)		
Gay and Lesbian	3.0	16.9
Bisexual	3.0	4.6
Heterosexual	94.0	78.5

[a]Values shown as mean ± SD.

Table 2. Factor loadings, communalities, and Cronbach's Alpha

Item	Self	Other	Communalities
1	.817		.643
2	.768		.600
3	.724		.559
4	.630		.513
5	.948		.870
6	.928		.837
7	.910		.816
8	.831		.687
9		.638	.490
10		.814	.656
11		.890	.773
12		.908	.816
13		.963	.920
14		.927	.869
15		.956	.895
16		.922	.857
%	50.85	25.89	
α	.943	.962	

% = percentage of explained variance; α = Cronbach's Alpha (N = 199)

Table 3. Goodness-of-fit Statistics

Model	$\chi^2_{(df)}$	p	χ^2/df	CFI	GFI	RMSEA
One-factor	$1559.984_{(104)}$	.000	15.000	.375	.590	.266
Two-factor	$111.24_{(93)}$	.074	1.222	.994	.933	.034

Table 4. Correlation matrix among the overall score, Self, and Other (N = 199)

	Total	Self	Other
Total	1	.890**	.729**
Self	.890**	1	.337**
Other	.729**	.337**	1

** p <.01

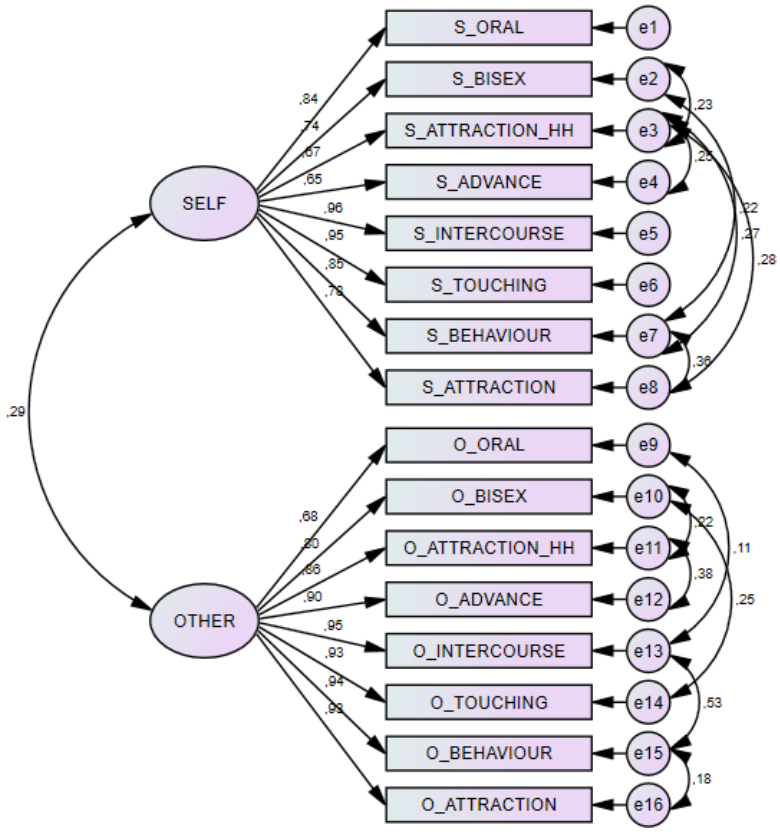

Figure 1. Two-factor model.

Appendix
Italian adaptation of the TSAQ Homosexuality Scale

Per favore, risponda alle seguenti affermazioni sulle attitudini riguardo il suo comportamento sessuale inserendo un numero compreso tra 1 (completamente in disaccordo) e 9 (completamente d'accordo) che meglio rappresenti come si sente in merito ad ogni affermazione *[Please answer the following questions about your attitudes toward your personal sexual behavior by writing the number between 1 (I completely disagree) and 9 (I completely agree) that best represents how you feel in response to each question.]*

	Italian	English	1	2	3	4	5	6	7	8	9
Item 1	Avrei un rapporto orale con un/una partner dello stesso sesso	I would engage in oral genital sexual stimulation with a partner of the same sex.									
Item 2	È accettabile per me essere coinvolto in comportamenti bisessuali	It is acceptable for me to engage in bisexuality									
Item 3	È accettabile per me essere attratto da individui dello stesso sesso così come da individui del sesso opposto	It is acceptable for me to be attracted to members of the same sex as well as members of the opposite sex									
Item 4	Sarebbe accettabile se un individuo del mio stesso sesso mi facesse delle avances.	It would be acceptable to me if a member of my own sex made an advance toward me									
Item 5	Avrei rapporti sessuali con un/una partner dello stesso sesso	I would engage in sexual intercourse with a partner of the same sex									
Item 6	Avrei uno scambio di reciproca stimolazione tattile con un/una partner dello stesso sesso.	I would engage in mutual touching with a partner of the same sex									
Item 7	È accettabile per me essere coinvolto in comportamenti omosessuali	It is acceptable for me to engage in homosexuality									
Item 8	Considero accettabile per me essere attratto/a da persone dello stesso sesso	I consider it acceptable for me to be attracted to members of the same sex									
Item 9	È accettabile che un'altra persona sia coinvolta in rapporti orali con un/una partner dello stesso sesso	It is acceptable for another person to engage in oral genital sexual stimulation with a partner of the same sex									
Item 10	È accettabile che un'altra persona sia attratta da persone dello stesso sesso così come del sesso opposto	It is acceptable for another person to be attracted to members of the same sex as well as the opposite sex									
Item 11	È accettabile che altre persone trovino piacevole ricevere avances da qualcuno del loro stesso sesso	It is acceptable if other people find it acceptable when someone of their same sex makes an advance toward them									

Item 12	È accettabile che un'altra persona abbia rapporti sessuali con un/una partner dello stesso sesso	It is acceptable for another person to engage in sexual intercourse with a partner of the same sex									
Item 13	È accettabile che altre persone aver rapporti omosessuali	It is acceptable for other people to engage in homosexual activity									
Item 14	È accettabile che altre persone siano attratte da individui dello stesso sesso	It is acceptable if other people are attracted to members of the same sex									
Item 15	È accettabile che un'altra persona possa avere uno scambio di reciproca stimolazione (toccarsi reciprocamente) con un/una partner dello stesso sesso	It is acceptable for another person to engage in mutual touching with a partner of the same sex									
Item 16	È accettabile che le altre persone abbiano comportamenti bisessuali	It is acceptable for other people to engage in bisexuality									

Scoring

To calculate the raw subscale scores, add values of items that belong to each subscale as follows:

SELF (Self): 1, 2, 3, 4, 5, 6, 7, 8
OTHER (Other): 9, 10, 11, 12, 13, 14, 15, 16
TOTAL (Overall Score): Self + Other