Validation of the Body Appreciation Scale-2 in Cisgender, Heterosexual and Sexual and Gender Minority Adolescents and Sexuality-Related Correlates

Abstract

Body dissatisfaction has received considerable scientific attention, while research about positive body image has been neglected, particularly among adolescents. The aims of the present study were to examine (1) the factor structure of the Body Appreciation Scale-2 (BAS-2) in a large sample of cisgender, heterosexual and sexual and gender minority adolescents, (2) measurement invariance across language, gender and sexual orientation-based groups, (3) convergent validity with sexuality-related outcomes and (4) one-year temporal stability. Results of a confirmatory analysis among 2419 adolescents (M_{age}=14.6 years, *SD*=0.62; 52.6% girls) corroborated the proposed one-dimensional factor structure of the scale. The BAS-2 demonstrated adequate reliability and one-year temporal stability. The scale was partially invariant across gender and fully invariant across language and cisgender heterosexual and sexual and gender minority adolescents. Boys (cis and trans) had higher levels of body appreciation than girls (cis and trans), while no significant differences were observed between heterosexual and sexual minority adolescents. The BAS-2 correlated positively with sexual satisfaction and sexual body-esteem as well as negatively with sexual distress. Our findings support the validity and reliability of the BAS-2 in French and English for measuring body appreciation in adolescents.

Keywords: Adolescents; Body Appreciation Scale-2 (BAS-2); French; Gender minority; Sexual minority; Validation

1. Introduction

Although there are a growing number of measures to assess body dissatisfaction among adults, few exist to capture body image in a positive way, and even fewer are validated among adolescents. Validated measures are essential for progress in theoretical conceptualizations and clinical practice, especially since adolescence is a critical period in the development of both negative and positive body image (Littleton & Ollendick, 2003; Voelker et al., 2015). Moreover, cisgender girls and sexual and/or gender minority (SGM) adolescents have increased risk for body image concerns (Diemer et al., 2015; He et al., 2020). Therefore, the aims of the present study were to examine 1) the psychometric properties of the Body Appreciation Scale (BAS-2; Tylka & Wood-Barcalow, 2015) in a large, SGM sample of young adolescents, 2) whether the BAS-2 functions the same way in language-, gender- and sexual orientation-based subgroups, and 3) test its temporal stability.

1.1. Assessment of Body Appreciation

Positive body image is a unique construct that is not necessarily the opposite of negative body image (Tiggemann & McCourt, 2013). Factors that contribute to a positive body image could be different from those associated with negative body image (Striegel-Moore & Cachelin, 1999). One of the most studied aspects of positive body image is body appreciation, which can be defined as the acceptance, respect, and favorable opinion of one's body. It also refers to the idea of engaging in health-promoting behaviors and rejecting the body ideals featured in the media as the only standards of beauty (Tylka & Wood-Barcalow, 2015).

The Body Appreciation Scale (BAS; Avalos et al., 2005) was the first self-report measure developed to explicitly assess one's positive attitudes towards one's body. The BAS is a 13-item scale, with very good psychometric properties (e.g., Alexias et al., 2016; Avalos et al., 2005; Swami et al., 2015; Tylka, 2013). The original BAS has important limitations, such as a lack of

alignment with advances in body appreciation conceptualization and research as well as the two different versions of the scale that women and men need to complete due to different wording.

Tylka and Wood-Barcalow (2015) developed the Body-Appreciation Scale-2 (BAS-2) to circumvent these limitations, which is the revised version of the BAS and consists of 10 gender-neutral items. As for the original BAS, the BAS-2 showed a unidimensional factor structure, assessed by both exploratory (EFA) and confirmatory factor analyses (CFA) in mostly White US community and college samples (Kling et al., 2019; Tylka & Wood-Barcalow, 2015). Several validation studies of the BAS-2 have shown that the scale has adequate internal consistency (α = .86 to .96; e.g., Aimé et al., 2020; Atari, 2016; Kling et al., 2019; Razmus & Razmus, 2017; Swami et al., 2016), as well as a high temporal stability over a three-week period (Tylka & Wood-Barcalow, 2015). As for validity, body appreciation was positively associated with appearance evaluation, self-esteem, proactive coping, life satisfaction, well-being, body pride, and intuitive eating (e.g., Alcaraz- Ibáñez et al., 2017; Lemoine et al., 2018; Pálmarsdóttir & Karlsdóttir, 2016) and negatively associated with body dissatisfaction, eating disorder symptoms, social physique anxiety, and body-related shame (e.g., Alcaraz- Ibáñez et al., 2017; Casale et al., 2021; Razmus & Razmus, 2017).

The BAS-2 has also been validated among adolescent populations in Argentina (Spanish; Góngora et al., 2020), Brazil (Brazilian Portuguese; Alcaraz- Ibáñez et al., 2017), Colombia (Spanish; Góngora et al., 2020), Denmark (Danish; Lemoine et al., 2018), Mexico (Spanish; Escoto Ponce de León et al., 2021; Góngora et al., 2020), Portugal (Portuguese; Lemoine et al., 2018) and Sweden (Swedish; Lemoine et al., 2018). In those studies, adolescents' ages ranged from 11 to 20 (Alcaraz- Ibáñez et al., 2017; Escoto Ponce de León et al., 2021; Góngora et al., 2020; Lemoine et al., 2018). As some participants were slightly older than the established adolescence period (10-19 years; World Health Organization, s.d., or 12-17 years in North

America; Centers for Disease Control and Prevention, 2021), it may have conflated adolescence and adulthood (Góngora et al., 2020), without considering the developmental changes occurring while adolescents' transition into emerging adulthood (Arnett, 2007). Only two of these studies examined temporal stability, showing a high short-term temporal stability over a two-week period (Alcaraz- Ibáñez et al., 2017) and three-week period (Escoto Ponce de León et al., 2021). Moreover, Kertechian and Swami (2017) validated a French version of the BAS-2 among 652 university students aged 17 to 51 years old. Unfortunately, there was no information about temporal stability and convergent validity, and the sample was extremely homogenous (i.e., one university from France). Likewise, the BAS-2 was originally developed in English, but has not been validated among English-speaking adolescents. Lastly, there are no empirical reports on the psychometric properties of the BAS-2 among adolescents involving comparisons between cisgender heterosexual (cis/het) and SGM subgroups therein.

1.2. Body Appreciation in Adolescents, and Gender and Sexual Orientation-Based Differences

Adolescence is an important period of cognitive, physical, and social development (Sanders, 2013). It is during this period that adolescents are quite vulnerable to body dissatisfaction and body distortion as they are at their peak during this developmental stage (Littleton & Ollendick, 2003). This emphasizes the importance of utilizing strengths, like body appreciation, that may provide a buffer against the effects of negative body image (Fenton et al., 2010). However, although adolescents experience several changes in their bodies during puberty, relatively little attention has been paid to the examination of body appreciation in this population, especially adolescent boys. In the small number of published studies to date, body appreciation was correlated positively with self-esteem and adaptive coping and negatively with eating disorder symptoms in a sample of Spanish 312 adolescents aged 12 to 20 years (Jáuregui-Lobera

& Bolaños-Ríos, 2011). Furthermore, in an Australian adolescent sample of 400 girls aged 12 to 16 years old, body appreciation was positively associated with perceived body acceptance by others and intuitive eating (Andrew et al., 2015). Nevertheless, more research is needed on boys' and gender minority adolescents' body appreciation.

In terms of gender comparisons in adults, some studies have found no gender differences in body appreciation (assessed with the BAS-2; e.g., Meneses et al., 2019; Swami, Garcia et al., 2017) while others have shown that men had higher body appreciation than women (e.g., Aimé et al., 2020; Atari, 2016; Casale et al., 2021) in different countries. As for adolescents, boys reported higher body appreciation than girls (Lemoine et al., 2018; Góngora et al., 2020) in different countries (e.g., Sweden and Argentine). Further, a study among 298 predominantly White girls aged between 12 and 16 years suggested that body appreciation increased significantly over a period of one year (Andrew et al., 2016). One of the potential reasons for discrepancies between the reported findings might be that measurement invariance tests were not conducted in most studies before examining gender differences (Millsap, 2011).

Only a handful of studies examined gender-based measurement invariance regarding the BAS-2. It is essential to test the measurement invariance of scales to conclude with confidence whether observed differences in different groups of adolescents' (e.g., boys vs. girls) body appreciation are meaningful and not derived from measurement biases or errors (Millsap, 2011). Measurement invariance up to the scalar level (i.e., examination of whether participants use the items' response scale in the same way) was established in different populations such as French university students (Kertechian & Swami, 2017) and adults in Italy (Casale et al., 2021). Moreover, partial gender invariance was demonstrated, for example, in a sample of Romanian university students (Swami, Tudorel et al., 2017). As for adolescents, measurement invariance up to the scalar level was established in Portuguese, Swedish (Lemoine et al., 2018), Mexican,

Argentinean, and Colombian (Góngora et al., 2020) adolescents aged between 12-20 years old. However, only partial gender invariance was found in Brazilian, Danish and Mexican adolescents aged between 12-19 years old, as the results suggested that the intercepts were not fully invariant across boys and girls and thus mean differences in gender-based groups could not be examined (Escoto Ponce de León et al., 2021; Lemoine et al., 2018). Importantly, these studies did not examine all levels of measurement invariance (e.g., residual invariance was not examined, which could provide information on whether the construct is assessed with the same precision in the examined groups). These findings suggest that body appreciation may differ between genders, and testing measurement invariance before any gender-based comparisons is an essential step to reduce potential biases in the findings deriving from measurement issues (Swami & Barron, 2019).

Although sexual identity might be intertwined with body image (Udall-Weiner, 2009), no study has examined measurement invariance for different sexual orientations among adolescents. The psychometric properties of the BAS-2 were validated in a sample of 223 mostly White sexual minority adults. Nevertheless, they did not validate the BAS-2 among gender minorities and could not investigate between-group differences among sexual minority participants due to sample size limitations (Soulliard & Vander Wal, 2019). For mostly White adolescent boys and men, studies have shown that gay and bisexual boys may be more likely to have a negative body image (Calzo et al., 2018) and lower levels of body appreciations (Alleva et al., 2018) than heterosexual men. The media can pressure SGM men to achieve certain standards of body image, such as fit and muscular bodies, more than heterosexual men (Jankowski et al., 2014).

As for adolescent girls and women, research has shown greater variability in the results. Some studies indicate that predominantly White SGM girls and women tend to have greater body satisfaction (Polimeni et al., 2009) and body appreciation (Ramseyer Winter et al., 2015) than

their heterosexual peers since the lesbian community places less emphasis on physical appearance (Morrison et al., 2004). Other studies suggest that lesbian and bisexual women might have similar (Koff et al., 2010; Moreno-Domínguez et al., 2019) or worse (Calzo et al., 2018; Meneguzzo et al., 2018) levels of body dissatisfaction as heterosexual women. A study among mostly White, cisgender women who identified as a sexual minority or heterosexual demonstrated that the BAS-2's invariance was supported among heterosexual and sexual minority women. Moreover, sexual minority and heterosexual cisgender women did not significantly differ in BAS-2 scores (Soulliard & Vander Wal, 2022). Women, regardless of their sexual orientation, are judged by their appearance and are exposed to cultural messages about ideal physical appearance and beauty standards (Wolf, 1991).

1.3. Correlates of Body Appreciation

A key correlate that showed significant associations with body appreciation is sexual well-being (Gillen & Markey, 2018). Sexual well-being may include several different elements, but sexual satisfaction and the absence of sexual distress are two integral aspects (Merwin & Rosen, 2019). Both body image and sexual well-being represent feelings, thoughts, and behaviors relevant to the body (Gillen & Markey, 2018). Findings suggest that predominantly White women with better body image tend to have better sexual well-being (e.g., Pujols et al., 2010; Wiederman, 2012). Nevertheless, sexual well-being is poorly documented in adolescents, especially among those who identity as SGM, despite the existence of a large gap between their well-being and those of cis/het adolescents (Mustanski, 2015). Sexual satisfaction can be defined as the subjective assessment of the positive and negative elements related to one's sexual life (Lawrance & Byers, 1998) and is positively associated with body appreciation among mostly White women (Grower & Ward, 2018; Satinsky et al., 2012). According to objectification theory, sexual objectification, which sees women as being treated as sexual objects, is related to the

internalization of the thin-ideal standards of beauty. It also can predispose women to monitor their body image and become more body dissatisfied (Fredrickson & Roberts, 1997; Moreno-Domínguez et al., 2019). Or, when an individual is connected and attentive to their bodies (i.e., body appreciation), it may serve as a protective factor against negative thoughts about their appearance and body during sexual activities (van den Brink, 2017) and facilitate positive sexual experiences that lead to greater sexual satisfaction (Leinarts, 2021).

Finally, sexual distress corresponds to the negative emotions (e.g., worry, frustration, and anxiety) that an individual may feel about their sexuality (Meston & Derogatis, 2002; Rosen et al., 2000) and is associated negatively with body appreciation in mostly White women (Robbins & Reissing, 2018a, Robbins & Reissing, 2018b). When an individual monitor their body and has negative thoughts about their non-correspondence with thin-ideal standards of beauty, for example, it may result in higher sexual distress as sexual activity is an experience during which the body is completely exposed to the "other's gaze". Besides, these studies were conducted in adult women, which limits our knowledge of adolescents and, in particular, boys and SGM adolescents.

Moreover, sexual body-esteem, a component of sexual subjectivity (Zimmer-Gembeck & French, 2016), refers to an individual's positive feelings towards their body (Zimmer-Gembeck et al., 2011). Specifically, this concept refers to the understanding and self-esteem related to sexuality and appearance (Horne & Zimmer-Gembeck, 2006). If a person objectifies their sexual body and self, they can allow others to judge their right to feel sexually attractive and desirable, which would affect their sexual pleasure (Horne & Zimmer-Gembeck, 2006). Although no study has examined the associations between body appreciation and sexual body-esteem, it may be important as the body is highly exposed to another individual during a sexual activity, which can affect someone's sexual pleasure by the way the person feels about their body (Woertman & van

den Brink, 2012). Thus, body appreciation in general may play an important role in individuals' sexual body-esteem.

1.4. The Current Study

Addressing the limitations of previous studies, the objective of this study was to validate the BAS-2 in a large sample of cis/het and SGM adolescents. First, using confirmatory factorial analysis, we examined the factor structure of the scale and we expected that the BAS-2 items would fit a unidimensional factor structure, as all previous studies examining the BAS-2's factor structure showed that the single-factor model fit the data well (e.g., Kling et al., 2019; Tylka & Wood-Barcalow, 2015). Second, we conducted measurement invariance tests to examine whether the BAS-2 functions the same way across language (i.e., French and English), gender (i.e., cis and trans boys, cis and trans girls and gender minority adolescents) and sexual orientation-based (exclusively heterosexual and sexual minority) groups. We hypothesized that the French and English scales would be similar given that both versions were used in Canada. Concerning gender, we hypothesized that girls would report lower body appreciation scores than boys, consistent with most previous reports in adolescents. As for sexual orientation, we examined measurement invariance in an exploratory manner due to the lack of literature on the subject. Third, in terms of convergent validity, we hypothesized that the BAS-2 would be negatively correlated with sexual distress and positively correlated with sexual satisfaction as well as sexual body-esteem. Lastly, we conducted test-retest reliability analyses, providing information on the one-year temporal stability of the BAS-2.

2. Method

2.1. Participants

The sample included 2419 adolescents (M_{age}=14.6 years, *SD*=0.62) at Time 1 and 1645 adolescents (M_{age}=15.5 years, *SD*=0.6) at Time 2. Detailed sociodemographic information is

presented in Table 1. To simplify the analysis, groups were created based on adolescents' reported gender identity and sexual orientation: boys (n=1133) vs girls (n=1272) vs gender minority (n=14); exclusively heterosexual (n=2001) vs sexual minority individuals (n=381). For the gender group, adolescents who reported their gender identity being "boy" or "girl" were categorized as boys or girls (cis and trans boys vs cis and trans girls). As for the "indigenous or other cultural gender minority identity (e.g., 2-spirit)," the "Non-binary, gender fluid or something else (e.g., genderqueer)," and the "other" groups, they were merged into the gender minority group. For sexual orientation, adolescents who responded "heterosexual" were coded into the exclusively heterosexual group. Adolescents who identified as "bisexual," "gay/lesbian/homosexual," "queer," "pansexual," "asexual," "heteroflexible," "homoflexible," "none of these categories," and "questioning" groups were merged into the sexual minority group.

2.2. Procedure

This study is part of a larger Canadian ongoing longitudinal study on adolescents' sexual health. Data collection took place between November 2018 and May 2020 for the first wave (Time 1), and one year later for the second wave (Time 2), between November 2019 and March 2021. Participants were recruited through their high schools from large metropolitan and rural areas. Furthermore, French and English schools presenting different socioeconomic and cultural backgrounds were approached to ensure sample diversity. Of 50 schools approached, 23 accepted, 16 did not respond to our emails or calls, and 11 refused to participate in the study. The different refusals were often related to the presence of other ongoing research projects within the school as well as the high workload of teachers. For the completion of the online self-report questionnaires, two trained research assistants visited each class, and presented the aims of the study. Participants provided informed consent before completing the surveys, which took

approximately 45 minutes to complete via the platform *Qualtrics Research Suite*[1], on electronic tablets provided by our team. At Time 1, 2904 responded to the overall survey but only 2419 participants responded to the 10 items of the Body Appreciation Scale-2. Moreover, 238 participants responded to the English version of the BAS-2 and 2181 to the French version. Lastly, 1036 adolescents at Time 1 and 689 adolescents at Time 2 reported being sexually active.

A part of the data collection for Time 2 took place during the COVID-19 pandemic. During the school closures in the spring of 2020 (March to June 2020), given our usual in-class procedure could not be used, students completed the measures via the same online survey at home instead of in class. We modified the surveys to include contact information (i.e., phone number and email address) of a research assistant that could help if participants had questions or problems. As for confidentiality, no personal information (e.g., name or email address) was associated with their questionnaire responses. Between September 2020 and March 2021, all high schools participating in the study agreed to our usual in-class data collection, which used exactly the same procedure as that of Time 1.

In both Time 1 and Time 2 data collection waves, three simple attention-testing questions were distributed within the surveys to test whether participants were attentive while answering the questionnaires. If they failed two out of three of these questions, their data was not used for the analyses as it was considered invalid (Thomas & Clifford, 2017). At the end of the completion, a $10 gift card from a store was given along with a list of community and institutional psychological support resources. Ethical approval was granted by the ethics

[1] In Québec, adolescents can provide their own informed consent from age 14. Not relying on parental consent can ensure the safety of students involved in the study, and can prevent sampling biases that may distort the results.

committees of the two related universities and school boards, and the study was carried out under the Declaration of Helsinki.

2.3. Measures

The English and French versions of the measures were used. When they were not available in French, they were translated by our laboratory using the "back-translation" method of Vallerand (1989). Gender identity status, sexual orientation and sexual body-esteem were answered by all participants. Only adolescents who had previously stated having been sexually active with a partner (i.e., had consensually exchanged manual or oral stimulation, and/or had penetrative sexual activity) responded to the sexual well-being measures (i.e., sexual satisfaction and sexual distress). Lastly, gender identity status, sexual orientation, body appreciation, sexual satisfaction and sexual distress were measured at Time 1 and Time 2 while sexual body-esteem was only measured at Time 2.

2.3.1. Cultural identities

Cultural identity (i.e., ethnicities) was assessed using one question about which culture the participants identified the most: "What culture do you identity most with?" (answers options: *French Canadian, English Canadian, American, Western European, Eastern European, African, Asian, Aboriginal/First Nations, Middle Eastern, Latin/South American, Greek/Italian, Pakistani/Hindu, Caribbean, Others*).

2.3.2. Gender identity status and sexual orientation

Gender was assessed using one question about gender identity (Bauer et al., 2017): "What gender or gender identity do you identify with?" (answers options: *men, women, indigenous or other cultural gender minority identity (e.g., two-spirit), non-binary, gender fluid or something else (e.g., genderqueer), other*). Participants also reported their sexual orientation answering the following question (Weinrich, 2014): "People describe their sexual orientation in different ways.

Which expression best describes your current sexual orientation? If no expression describes you, check "None of the above" and write the answer that describes you personally." (answer options: *heterosexual, gay/lesbian, heteroflexible, homoflexible, bisexual, asexual, pansexual, queer, I do not know yet or I am currently questioning my sexual orientation, none of the above, I don't want to answer).* Participants who chose the option *None of the above* had the possibility to write how they describe personally their sexual orientation.

2.3.3. Body appreciation

The Body Appreciation Scale-2 measures a positive version of body image called body appreciation (Tylka & Wood-Barcalow, 2015). Participants responded to 10 items (e.g., "I feel love for my body") on a five-point scale ranging from 1 (*Never*) to 5 (*Always*). The possible scores range from one to five, with a higher score indicating higher body appreciation. Reliability (e.g., test-retest and internal consistency) and the construct, criterion-related, incremental, and discriminant validity were supported in the original validation study (Tylka & Wood-Barcalow, 2015). The French version from France was used in the present study (Kertechian & Swami, 2017).

2.3.4. Sexual satisfaction

The *Global Measure of Sexual Satisfaction* (Bois et al., 2016; Lawrance & Byers, 1998) was used to assess sexual satisfaction, which provides a global assessment of satisfaction with participants' overall sexual relationship. This scale has also been used in samples of adolescents previously (e.g., Blunt-Vinti et al., 2016). This questionnaire includes five items whether participants' sexual relationship with their partner is good (7) versus bad (0), pleasant (7) versus unpleasant (0), positive (7) versus negative (0), satisfying (7) versus unsatisfying (0), and valuable (7) versus worthless (0). Greater scores indicate greater sexual satisfaction. This scale was initially developed and validated with adults in English (Lawrance & Byers, 1998).

2.3.5. Sexual distress

The short, adapted version of the Female Sexual Distress Scale (FSDS; Bois et al., 2016; Derogatis et al., 2002; Pâquet et al., 2018) was used to measure sexual distress among all genders with three items (e.g., "How often did you feel distressed about your sex life?") on a five-point scale from 0 (*Never*) to 4 (*Always*)[2]. This scale was initially developed and validated with adults in English (Derogatis et al., 2002).

2.3.6. Sexual body-esteem

This concept was measured by the sexual body-esteem factor of the Female Sexual Subjectivity Inventory (FSSI; Horne & Zimmer-Gembeck, 2006) for girls and the Male Sexual Subjectivity Inventory (MSSI; Zimmer-Gembeck & French, 2016) for boys. As no gender minority version was available, non-binary and gender minority individuals responded to the version according to their sex assigned at birth. The 5 items for the girls and 4 items for the boys of the factor sexual body-esteem assessed the understanding and esteem related to sexuality and appearance. Both questionnaires include a response scale with five-point scales from *Strongly disagree* (1) to *Strongly agree* (5; e.g., "I worry that I am not sexually desirable to others"). A higher score indicates higher sexual body-esteem. The FSSI and MSSI have been developed in studies with adolescents and young adults in English (Horne & Zimmer-Gembeck, 2006; Zimmer-Gembeck & French, 2016).

2.4. Statistical analysis

[2] Confirmatory factor analysis (CFA) was conducted with the three items of the Sexual Distress Scale using the robust maximum likelihood (MLR) estimator to further examine the factor structure and construct validity of the scale. According to the results of the CFA, the one-factor model had an excellent fit to the data in Time 1 (CFI = 1.00, TLI = 1.00, RMSEA= 0.00 [90%CI 0.00-0.00]) and Time 2 (CFI = 1.00, TLI = 1.00, RMSEA = 0.00 [90%CI .00-.00), and the three items had acceptable standardized factor loadings in both Time 1 (ranging between 0.72 to 0.94) and in Time 2 (ranging between .68 to .74) on the latent factor of sexual distress.

Descriptive statistics and correlations were computed in SPSS 26, while M*plus* 8 was used to conduct statistical analyses. Missing data ranged between 0-18% in the present study (i.e., Time 1 and Time 2 data included). Following previous guidelines (e.g., Newman, 2014), we calculated total scores for the used scales even when item-level missing data was present. Confirmatory factor analysis (CFA) was conducted to examine the structural validity of the BAS-2 at Time 1 using the robust maximum likelihood (MLR) estimation. Commonly used goodness-of-fit indices were used to examine the acceptability of the models (Browne & Cudeck, 1993; Hu & Bentler, 1999; Schermelleh-Engel et al., 2003): Comparative Fit Index (CFI; ≥ .90 acceptable; ≥ .95 good; ; Bentler, 1990), Tucker–Lewis index (TLI; ≥ .90 acceptable; ≥ .95 good; Tucker & Lewis, 1973), and Root-Mean-Square Error of Approximation (RMSEA; ≤ .08 adequate; ≤ .06 good) with its 90% confidence interval.

To ensure that language-based, gender-based, and sexual orientation-based comparisons are meaningful and reduce the possibility of measurement biases (e.g., invalid comparisons between groups; Bőthe et al., 2018; Meredith, 1993; Millsap, 2011; Tóth-Király et al., 2017; Vandenberg & Lance, 2000), we conducted measurement invariance testing, using participants' language (French vs English), gender (cis and trans boys vs. cis and trans girls) and sexual identity (exclusively heterosexual vs sexual minority individuals) as grouping variables. Given the small sample size in the gender minority group, we could not compare their group to the boys' and girls' groups statistically. However, we provided descriptive statistics for them (see Table 4). In each analysis, we tested and compared six levels of invariance with increasingly constrained parameters: configural (i.e., factor loadings and thresholds were freely estimated), metric (i.e., factor loadings were set to be equal), scalar (i.e., factor loadings and thresholds were set to be equal), residual (i.e., factor loadings, thresholds, and residual variances were constrained to be equal), latent variance (i.e., factor loadings, thresholds, uniqueness, and latent variances

were constrained to be equal), and latent mean (i.e., factor loadings, thresholds, residual variances, latent variances, and latent means were constrained to be equal) invariance. Importantly, the first four levels examine measurement invariance in a narrower sense (e.g., the presence of potential measurement differences or biases, while the last two levels examine measurement invariance in broader sense (i.e., structural invariance, such as the presence of group-based differences on the level of variance and means). Testing the last two steps of invariance is optional. Yet, it can provide information about differences in (latent) levels of body appreciation between the groups of adolescents (Milfont & Fischer, 2010; Vandenberg & Lance, 2000). When comparing groups' latent means, latent mean differences were expressed in SD units using the variance model and are accompanied by tests of statistical significance. In cases when models were not fully invariant, we tested partial measurement invariance (i.e., models in which a subset of parameters are allowed to vary across the groups, such as relaxing an equality constraint on one item's residual variance), allowing appropriate cross-group comparisons (Milfont et al, 2010). We also computed and reported chi-square tests and changes in chi-square values for the sake of completeness. However, we did not use them for model comparisons or selections, given the several shortcomings of chi-square tests (e.g., chi-square tests are sensitive to sample size, resulting in the potential rejection of adequate models; e.g., Chen, 2007, Marsh et al., 2005). Cronbach's alpha and McDonald's omega were calculated to assess the reliability of the BAS-2 (McDonald, 1970; Nunnally, 1978). To corroborate the reliability of the BAS-2 we conducted a one-year test-retest. A total of 2001 participants agreed to participate at T2, but 356 students' T1 and T2 data could not be matched (either as a result of failing the attention testing questions or non-matching IDs). This resulted in a final sample of 1645 participants at T2. We assessed associations with theoretically relevant correlates (i.e., sexual satisfaction, sexual distress, and sexual body-esteem) to examine the validity of the BAS-2.

3. Results

3.1. Descriptive Statistics, Construct Validity, and Reliability

Means, standard deviations, skewness, kurtosis, Cronbach's alphas, and McDonald's omegas of all scales were calculated for Time 1 (Table 2) and Time 2 (Table 3). Likewise, descriptive statistics (i.e., means, standard deviations, skewness, and kurtosis) were calculated for each item of the BAS-2 (Table 5).

Based on the results of the CFA (Table 6), the hypothesized unidimensional model fit the data well. The CFI indicated an excellent fit to the data (CFI = .95) and the TLI indicated an acceptable fit (TLI = .94). As for the RMSEA, it indicated an acceptable fit (RMSEA = .80 [90% CI .074 to .086]). As presented in Table 6, all items loaded significantly on the latent factor ($p <$ .005) and factor loadings were above .50, which is the minimum required factor loading for adequate contribution of items on a latent factor (Tabachnick & Fidell, 2007). The BAS-2 also demonstrated excellent reliability ($\alpha = .93$; $\omega = .93$) and adequate one-year temporal stability ($r =$ .70, $p < .001$) in the sample.

3.2. Measurement Invariance across Language, Gender and Sexual Orientation

Measurement invariance testing was conducted to examine the factor structure of the BAS-2 across the French vs English versions of the scale to ensure that any future language-based comparisons are meaningful (Table 6). For each group, the baseline models were estimated, and the parameters were gradually constrained. Fit indices suggested that configural, metric, scalar, residual, latent variance and latent mean invariance were achieved (i.e., $\Delta CFI \leq .010$; $\Delta TLI \leq .010$; and $\Delta RMSEA \leq .015$). These results indicate language-related invariance on the level of latent means, suggesting that the BAS-2 appears to function the same way in both languages and no significant latent mean differences are present.

Measurement invariance testing was conducted to examine the factor structure of the BAS-2 across two subgroups (cis and trans boys vs cis and trans girls) and ensure that gender-based comparisons are meaningful and not derived from measurement biases (Table 6). For each group, the baseline models were estimated and the parameters were gradually constrained. Fit indices suggested that configural and metric invariance was achieved (i.e., $\Delta CFI \leq .010$; $\Delta TLI \leq .010$; and $\Delta RMSEA \leq .015$). For scalar invariance, the change in CFI was higher than the recommended threshold value, yet the changes in TLI and RMSEA were acceptable. Therefore, we relaxed the equality constraint on the intercept of item 10, based on the examination of modifications indices. However, after the modification, even if the changes in TLI and RMSEA were acceptable, the change in CFI was still higher than the recommended threshold value. Thus, we relaxed the equality constraint on the intercept of item 6 as well, resulting in partial scalar invariance. For residual invariance, the changes in TLI and RMSEA were acceptable. However, the change in CFI was higher than the recommended threshold value. Hence, we relaxed the equality constraint on the residual of item 6 and achieved a model of partial residual invariance with adequate changes in the fit indices. Latent variance invariance was also achieved, but not latent mean invariance. This suggests the presence of latent mean differences between cis and trans boys and cis and trans girls. For the purpose of model identification, when cis and trans boys' latent means differences were constrained to zero, cis and trans girls' latent means proved to be substantially lower (-0.76 SD, $p < .001$).

Measurement invariance testing was also conducted to examine the factor structure of the BAS-2 across exclusively heterosexual vs sexual minority adolescents to ensure that sexual orientation-based comparisons are meaningful (Table 6). For each group, the baseline models were estimated, and the parameters were gradually constrained. Fit indices suggested that configural, metric, scalar, residual, latent variance and latent mean invariance were achieved (i.e.,

$\Delta CFI \leq .010$; $\Delta TLI \leq .010$; and $\Delta RMSEA \leq .015$). These results indicate sexual orientation-related invariance on the level of latent means, suggesting that the BAS-2 appears to function the same way in both groups and no significant latent mean differences are present.

3.3. Convergent validity

Correlations between body appreciation and measures of sexuality-related variables (i.e., sexual satisfaction, sexual distress, and sexual body-esteem) were examined to assess convergent validity. At Time 1 (Table 2), moderate, negative correlations were observed between body appreciation with sexual distress. A moderate, positive association was observed between body appreciation and sexual satisfaction. At Time 2 (Table 3), a moderate, negative correlation was found between body appreciation and sexual distress. Furthermore, body appreciation was moderately and positively associated with sexual satisfaction and strongly and positively associated with sexual body-esteem. These associations were similar in boys and girls (Tables S1 and S4, online supplementary material), in heterosexual and sexual minority adolescents (Tables S2 and S5, online supplementary material) at Time 1 and Time 2, and in French and English-speaking adolescents (Tables S3 and S6, online supplementary material) as well.

4. Discussion

The development of body image is critical during adolescence (Voelker et al., 2015; Littleton & Ollendick, 2003), yet there is a paucity of studies examining body appreciation and changes in body appreciation in minority samples of adolescents, presumably due to the lack of well-validated scales in this population. The present study examined the psychometric properties of the BAS-2 in a large, SGM sample of adolescents and whether the BAS-2 functioned the same way in language-, gender-, and sexual orientation-based groups, which received limited attention in the past. The BAS-2's one-dimensional factor structure was corroborated, and results of the measurement invariance tests indicated that the scale was partially invariant across gender and

fully invariant across languages as well as heterosexual and SGM adolescents. Moreover, we examined body appreciation's associations with theoretically relevant correlates, and demonstrated its one-year temporal stability, providing further evidence concerning the BAS-2's validity and reliability, respectively.

4.1. Construct Validity and Reliability of the BAS-2 in Adolescents

Consistent with results from previous studies examining the factor structure of the BAS-2 among adults (e.g., Alleva et al., 2016; Swami, Tudorel et al., 2017; Tylka & Wood-Barcalow, 2015) and adolescent populations (Alcaraz- Ibáñez et al., 2017; Escoto Ponce de León et al., 2021; Góngora et al., 2020; Lemoine et al., 2018) of different cultures, our results showed that all BAS-2 items loaded on a single factor, supporting that all items assess the same underlying construct – body appreciation. In addition, the 10 items showed an excellent internal consistency, which is consistent with previous literature among adolescents (Alcaraz- Ibáñez et al., 2017; Escoto Ponce de León et al., 2021; Góngora et al., 2020; Lemoine et al., 2018). Also, the BAS-2 demonstrated a strong temporal stability over a one-year period. As only two studies among adolescents examined temporal stability over a brief, two or three-week period (Alcaraz- Ibáñez et al., 2017; Escoto Ponce de León et al., 2021), our findings provide a novel insight into adolescents' long-term body appreciation stability. Nevertheless, body image may change and fluctuate among this population (e.g., Bucchianeri et al., 2013; Kvalem et al., 2019), more than in adults (e.g., Frisén et al., 2015; von Soest et al., 2016); thus, future studies are needed to examine changes in adolescents' body appreciation over several years.

4.2. Language, Gender and Sexual Orientation-Based Differences in Body Appreciation

Adding to previous findings in the field and testing residual, latent variance and latent mean invariance, which was absent from the literature, we assessed the BAS-2's measurement invariance across language (e.g., French and English), gender, and sexual orientation. Results

suggest that the scale works similarly in French and English. Therefore, the scores on the BAS-2 can be compared between these two languages.

Our findings suggest that the scale functions similarly in cis and trans boys and cis and trans girls. However, items 6 (i.e., *I feel love for my body*) and 10 (i.e., *I feel like I am beautiful even if I am different from media images of attractive people [e.g., models, actresses/actors])* were not completely invariant between cis and trans boys and cis and trans girls. Therefore, in line with other studies examining measurement invariance of the BAS-2 in adolescent samples (e.g., Alcaraz-Ibáñez et al., 2017, Escoto Ponce de León et al., 2021, Lemoine et al., 2018), we relaxed the mentioned items' constraints purely due to statistical reasons (i.e., based on the modification indices). These results could be partly explained by the conceptualization of the BAS-2, which may be more appropriate for women as they are socialized to be more attentive to their feelings (Chaplin & Aldao, 2013) and be more sensitive to the ideals of thinness and beauty conveyed by the media (Seidah et al., 2004). Regarding item 10, the participants' different perspectives of beauty could be explained by whose celebrity bodies are described as "attractive". In different cultures, for example, being slender or heavier for a woman are preferred (Swami et al., 2010). Also, previous studies in adolescents (Alcaraz- Ibáñez et al., 2017; Escoto Ponce de León et al., 2021; Góngora et al., 2020; Lemoine et al., 2018) only examined configural, metric, and scalar invariance in boys and girls, with mixed results. Some studies found scalar invariance between the two genders (Góngora et al., 2020; Lemoine et al., 2018) and others reported partial invariance (Alcaraz- Ibáñez et al., 2017; Escoto Ponce de León et al., 2021; Lemoine et al., 2018). However, previous studies did not examine all levels of measurement invariance (e.g., residual invariances in the invariance of residual variances is also met in addition to configural, metric, and scalar invariance) – an important gap filled by the present study.

Furthermore, results suggested that boys had better body appreciation than girls, which is

consistent with previous literature among adolescents of different countries (e.g., Lemoine et al., 2018; Góngora et al., 2020). Adolescent boys may appreciate and be more satisfied with their bodies than girls (e.g., Bucchianeri et al., 2013; He et al., 2020), which may be linked to puberty as it brings changes in their body that are closer to society's male ideal, such as increased muscle mass (Seidah et al., 2004). Appearance ideals tend to be more flexible for heterosexual boys, which might also explain their greater body appreciation (Alleva et al., 2018; Swami et al., 2008).

Past studies among adolescents have not tested measurement invariance between cis/het and SGM adolescents. Measurement invariance tests are essential prerequisite steps before conducting any group comparisons. They can allow the BAS-2 to be used reliably in future adolescent studies, as the differences in BAS-2 scores may be attributed to actual differences between sexual orientation-based groups, and not measurement biases. Our results showed that the BAS-2 is fully invariant between heterosexual and sexual minority adolescents, and no differences were present between heterosexual and SGM adolescents. In sum, the BAS-2 functions similarly in the two groups and they reported similar body appreciation scores. However, it is possible that no sexual orientation-based differences are present when we consider sexual orientation alone, but differences may exist when gender and sexual orientation are examined together (e.g., Bőthe et al., 2018). For example, gay adolescents and men might have a lower body image than heterosexual adolescents and men (Alleva et al., 2018; Calzo et al., 2018). However, we were not able to examine this possibility in the present study as the sample size in the gender and sexual minority sub-sample were small for measurement invariance testing using both gender and sexual orientation together as grouping variable. Therefore, further studies are needed to examine gender and sexual orientation-based measurement invariance and comparisons simultaneously.

4.3. Associations Between Body Appreciation and Sexuality-Related Constructs

Body appreciation was positively associated with sexual satisfaction. This result is consistent with the findings of previous studies among mostly White adult women, whose higher levels of body appreciation were associated with greater sexual satisfaction (Grower & Ward, 2018; Satinsky et al., 2012). According to objectification theory (Fredrickson & Roberts, 1997), when a person devotes energy to thinking about how their body appears to the partner during sexual activity, rather than focusing on the experience itself, sexual satisfaction could be compromised. Thereby, when adolescents show higher levels of body appreciation, they may be more likely to spend more energy on their sexual experience, which could result in greater sexual satisfaction.

In line with findings of previous studies among predominantly White adults (Robbins & Reissing, 2018a, Robbins & Reissing, 2018b), body appreciation was negatively associated with sexual distress. Experiencing lower self-esteem, feeling less sexually desirable, and considering oneself to be an inadequate sexual partner (Ayling & Ussher, 2008; Pazmany et al., 2013a; Pazmany et al., 2013b) may result in higher distress regarding one's body and sexuality (Pazmany et al., 2013a). However, most of the studies examining this association were conducted among mostly White adult women experiencing genital pain. Our finding concerning the negative association between adolescents' body appreciation and sexual distress provides a novel insight into their sexuality.

In addition, body appreciation was positively associated with sexual-body-esteem. Thus, individuals with higher levels of body appreciation and sexual body-esteem could stay connected to and tuned in with their bodies during sexual activity as they perceived pleasure from and in the body (Tolman, 2002). Indeed, if a person objectifies or depreciates their body and sexual self, they may allow others to judge their right to feel sexually attractive and desirable, which would affect their sexual pleasure (Horne & Zimmer-Gembeck, 2006). Yet, these theoretically relevant

associations were not examined in previous studies. Future studies are needed to explore the associations between body appreciation and sexual body-esteem as well as sexual subjectivity.

4.4. Practical Implications

Focusing on the concept of body appreciation could be a potential point of intervention to help prevent negative body image, self-objectification, or even eating disorder symptoms (Tylka & Augustus-Horvarth, 2011; Tylka & Wood-Barcalow, 2015). Given the strong psychometric properties of the BAS-2 in adolescents found in the present study, it might be incorporated to assess the efficacy of body appreciation promotion interventions in adolescents (e.g., the Healthy Body Image Intervention in Sweden – Sundgot-Borgen et al., 2019, or the Body Project in the United States – Shaw & Stice, 2016). Within a psychosocial intervention context, the BAS-2 could be used with adolescents who might have body image disturbances as a way to introduce positive body image, and to show how one's body can be accepted and appreciated (Tylka & Wood-Barcalow, 2015). Lastly, an individual's relationship to their bodies could affect their sexuality negatively. Given this, it would be relevant to help adolescents appreciate their bodies in order to improve their sexual satisfaction and reduce their sexual distress. Interventions targeting body appreciation could be helpful in fostering a more pleasurable and satisfying sex life (van den Brink, 2017), especially since adolescence is a cornerstone for sexual well-being in adulthood (Reese, 2019).

4.5. Strengths, Limitations, and Future Directions

This study examined the psychometric properties of the BAS-2 in a minority sample of adolescents. The age of participants (i.e., 14-15 years) and the large sample are strengths of the study, as other validations (e.g., Góngora et al., 2020) of the BAS-2 among adolescents included participants who were older than the established adolescence period (10-19 years; World Health Organization, s.d.). Likewise, this study included an often-neglected population in body image

research, SGM adolescents, despite previous studies suggesting that body image varies according to sexual orientation (Alleva et al., 2018; Calzo et al., 2018).

Nevertheless, this study has some limitations. Furthermore, the analyses concerning the sexual well-being variables were conducted solely with the sub-sample of sexually active youth, and given the age of our sample, these sexually active 14-15-year old's may not necessarily be representative of all sexually active youth. The measure for sexual distress demonstrated slightly lower internal consistency than the suggested threshold in the present study. This may derive from the fact that the scale assesses a wide range of feelings in relation to sexual distress with a relatively low number of items (Cortina, 1993). Therefore, further studies are needed to examine the scale's psychometric properties in future studies among adolescents. Finally, it is important to note that the number of gender minority adolescents was low in the present sample, such that measurement invariance between the three gender categories could not be examined. Future studies on body appreciation should include and oversample gender minority individuals, including those from the transgender and genderqueer community. Similarly, differences in body appreciation may vary between sexual minority subcultures (Soulliard & Vander Wal, 2019). Future studies on body appreciation should investigate between-group differences among sexual minority participants, as lesbian, gay, and bisexual individuals may differ in their body appreciation. Moreover, future studies should examine the intersecting roles of race/ethnicity in body appreciation. Others correlates, such as eating behaviors (e.g., disordered eating, intuitive eating) and mental/physical health, should also be examined to assess convergent validity of the BAS-2. It would also be interesting to examine the psychometric proprieties of the BAS-2 in clinical subsamples, for example among adolescents presenting with eating disorders.

4.6. Conclusions

Answering the call for more work on positive body image (Gillen & Markey, 2018; Smolak & Cash, 2011) and addressing the paucity of rigorously validated assessment tools for body appreciation in minority samples of adolescents (Soulliard & Vander Wal, 2019), the present study examined the psychometric properties of the French and English version of the BAS-2. Our findings suggest that the BAS-2 is a valid and reliable scale to measure positive body image among cis/het and SGM adolescents. This study also demonstrated that the measure has strong psychometric properties in terms of temporal stability, and the validity of the BAS-2 was supported by its associations with theoretically relevant constructs, such as sexual well-being. Overall, the BAS-2 is a short, psychometrically sound, and accessible assessment tool that can adequately evaluate body appreciation in research and community settings as well.

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Table 1

Detailed sociodemographic characteristics of the sample in Time 1 and Time 2

Characteristics	Total sample (*N*=2412-2419 [%]) T1	Total sample (*N*=1641-1645 [%]) T2
Age	14.6 (*SD*=0.62)	15.5 (*SD*=0.6)
Sex assigned at birth		
Male	1129 [46.7]	724 [44.0]
Female	1290 [53.3]	921 [56.0]
Gender		
Masculine/man	1133 [46.8]	726 [44.2]
Feminine/woman	1272 [52.6]	905 [55.0]
Non-binary, gender fluid or something else	7 [0.3]	12 [0.7]
Indigenous or other cultural gender minority identity	1 [0.1]	0 [0.0]
Other	6 [0.2]	1 [0.1]
Trans status		
No, I am not a trans person	2390 [98.8]	1620 [98.5]
Yes, I am a trans man	3 [0.1]	1 [0.1]
Yes, I am a trans woman	1 [0.0]	0 [0.0]
Yes, I am a non-binary trans	0 [0.0]	4 [0.2]
I am questioning my gender identity	15 [0.6]	12 [0.7]
I don’t know what it is	10 [0.4]	8 [0.5]
Sexual orientation		
Heterosexual	2001 [82.7]	1367 [83.1]
Questioning their sexual orientation	123 [5.1]	87 [5.3]
Gay or lesbian	22 [0.9]	19 [1.2]
Heteroflexible	24 [1.0]	23 [1.4]
Homoflexible	1 [0.0]	3 [0.2]
Bisexual	92 [3.8]	60 [3.6]
Queer	6 [0.2]	9 [0.5]
Pansexual	24 [1.0]	28 [1.7]
Asexual	5 [0.2]	4 [0.2]
None of these categories	84 [3.5]	27 [1.6]
I don’t want to answer	34 [1.4]	14 [0.9]
Cultural identities		
French Canadian	1652 [68.3]	1082 [65.9]
English Canadian	321 [13.3]	212 [12.9]
American	17 [0.7]	5 [0.3]
Western European	37 [1.5]	28 [1.7]

Eastern European	16 [0.7]	19 [1.2]
African	55 [2.3]	47 [2.9]
Asian	44 [1.8]	75 [2.6]
Aboriginal/First Nations	36 [1.5]	25 [1.5]
Middle Eastern	55 [2.3]	46 [2.8]
Latin/ South American	39 [1.6]	35 [2.1]
Greek/Italian	25 [1.0]	11 [0.7]
Pakistani/Hindu	5 [0.2]	4 [0.2]
Caribbean	55 [2.3]	43 [2.6]
Other	60 [2.5]	11 [0.7]

Note. The final sample for Time 1 is 2419 and 1645 for Time 2. However, some participants did not respond to every sociodemographic question resulting in missing values for these specific questions. Therefore, for complete transparency, we reported ranges for sample sizes for Time 1 and Time 2 in the present table.

Table 2

Descriptive statistics, reliability indices, and correlations between body appreciation and sexuality-related variables in Time 1

Variables	Skewness (*SE*)	Kurtosis (*SE*)	Range	*M* (*SD*)	α	ω	1	2	3
1. Body appreciation	-0.77 (0.05)	0.16 (0.10)	1-5	3.92 (0.79)	.93	.93	—		
2. Sexual satisfaction[1]	-1.41 (0.08)	2.06 (0.16)	1-7	5.70 (1.33)	.92	.93	.14**	—	
3. Sexual distress[1]	1.68 (0.08)	3.32 (0.15)	0-4	0.54 (0.66)	.66	.69	-.29**	-.15**	—

Note. [1.] Only sexually active adolescents completed the sexuality-related variables. *SE* = standard error; *M* = mean; *SD* = standard deviation; α = Cronbach's alpha; ω = McDonald's omega. *$p < .05$. ** $p < .01$.

Table 3

Descriptive statistics, reliability indices, and correlations between body appreciation, and sexuality-related variables in Time 2

Variables	Skewness (*SE*)	Kurtosis (*SE*)	Range	*M* (*SD*)	α	ω	1	2	3	4	5
1. Body appreciation	-0.74 (0.06)	0.25 (0.12)	1-5	3.90 (0.79)	.94	.94	—				
2. Sexual satisfaction[1]	-1.44 (0.09)	2.54 (0.19)	1-7	5.75 (1.26)	.91	.92	.17**	—			
3. Sexual distress[1]	0.90 (0.09)	0.13 (0.19)	0-4	0.78 (0.77)	.76	.77	-.26**	-.23**	—		
4. Sexual body-esteem – Boys[1]	-0.09 (0.09)	-0.26 (0.19)	1-5	3.24 (0.48)	.69	.70	.31**	.15**	-.22**	—	
5. Sexual body-esteem – Girls[1]	-0.16 (0.08)	0.07 (0.16)	1-5	3.04 (0.70)	.70	.75	.56**	.20**	-.20**	N/A	—

Note. [1.] Only sexually active adolescents completed the sexuality-related variables. *SE* = standard error; *M* = mean; *SD* = standard deviation; α = Cronbach's alpha; ω = McDonald's omega. *$p < .05$. ** $p < .01$.

Table 4

Descriptive Statistics of Participants' body appreciation and sexuality-related variables at Time 1 and Time 2 Data Collections by Gender

		Boys (n_{T1} = 491-1133; n_{T2} = 304-726)		Girls (n_{T1} = 484-1272; n_{T2} = 358-905)		Gender minority individuals (n_{T1} = 5-14; n_{T2} = 4-13)	
	Range	Time 1 *M* (*SD*)	Time 2 *M* (*SD*)	Time 1 *M* (*SD*)	Time 2 *M* (*SD*)	Time 1 *M* (*SD*)	Time 2 *M* (*SD*)
1.Body Appreciation	1-5	4.17 (.70)	4.23 (0.67)	3.71 (0.80)	3.65 (0.78)	3.24 (1.08)	3.36 (1.04)
2. Sexual satisfaction[1]	1-7	5.76 (1.29)	5.82 (1.24)	5.65 (1.36)	5.71 (1.28)	4.69 (1.65)	4.55 (0.66)
3. Sexual distress[1]	0-4	0.43 (0.60)	0.63 (0.68)	.64 (0.70)	0.89 (0.81)	0.79 (0.67)	1.00 (1.18)
4. Sexual body-esteem – Boys[1]	1-5	N/A	3.24 (0.48)	N/A	N/A	N/A	N/A
5. Sexual body-esteem – Girls[1]	1-5	N/A	N/A	N/A	3.04 (0.70)	N/A	N/A

Note. [1.] Only sexually active adolescents completed the sexuality-related variables. *M* = mean, *SD* = standard deviation. N/A = Non-applicable.

Table 5

Standardized Factor Loadings, Reliability Indices, and Descriptive Statistics of the Body Appreciation Scale-2 (BAS-2) in Time 1

Items	Factor Loadings	Range	Mean (*SD*)	Skewness (*SE*)	Kurtosis (*SE*)	α	ω
1. Je respecte mon corps. / I respect my body.	.65	1-5	4.42 (0.82)	-1.45 (0.05)	1.91 (0.10)	–	–
2. Je me sens bien à propos de mon corps. / I feel good about my body.	.86	1-5	3.90 (1.04)	-0.77 (0.05)	-0.03 (0.10)	–	–
3. Je sens que mon corps présente au moins certaines bonnes qualités. / I feel that my body has at least some good qualities.	79	1-5	4.07 (0.97)	-0.83 (0.05)	0.04 (0.10)	–	–
4. J'adopte une attitude positive envers mon corps. / I take a positive attitude towards my body.	.88	1-5	3.96 (1.01)	-0.84 (0.05)	0.13 (0.10)	–	–
5. Je suis attentive/attentive aux besoins de mon corps. / I am attentive to my body's needs.	.52	1-5	4.19 (0.86)	-0.92 (0.05)	0.43 (0.10)	–	–
6. Je ressens de l'amour pour mon corps. / I feel love for my body.	.69	1-5	3.38 (1.27)	-0.38 (0.05)	-0.87 (0.10)	–	–
7. J'apprécie les caractéristiques différentes et uniques de mon corps. / I appreciate the different and unique characteristics of my body.	.78	1-5	3.76 (1.05)	-0.58 (0.05)	-0.34 (0.10)	–	–
8. Mes comportements révèlent mon attitude positive envers mon corps (par exemple, je garde ma tête haute et je souris). / My behavior reveals my positive attitude toward my body; for example, I hold my head high and smile.	.65	1-5	3.79 (1.00)	-0.64 (0.05)	-0.13 (0.10)	–	–
9. Je suis confortable dans mon corps. / I am comfortable in my body.	85	1-5	3.97 (1.05)	-0.88 (0.05)	0.07 (0.10)	–	–
10. Je sens que je suis beau/belle même si je suis différent(e) des images de beauté véhiculées dans les médias (par exemple: mannequins, actrices/acteurs). / I feel like I am beautiful even if I am different from media images of attractive people (e.g., models, actresses/actors).	.75	1-5	3.74 (1.09)	-0.66 (0.05)	-0.26 (0.10)	–	–
BAS-2 Total score	–	1-5	3.89 (0.81)	-0.75 (0.06)	0.20 (0.11)	.93	.93
BAS-2 Total score – Boys	–	1-5	4.23 (0.67)	-1.06 (0.09)	1.46 (0.18)	.90	.90
BAS-2 Total score – Girls	–	1-5	3.65 (0.78)	-0.60 (0.08)	0.03 (0.16)	.93	.94
BAS-2 Total score – Non-binary individuals	–	1-5	3.36 (1.04)	0.30 (0.62)	-1.51 (1.19)	.94	.94

BAS-2 Total score – Heterosexual individuals	–	1-5	3.98 (0.74)	-0.75 (0.07)	0.37 (0.13)	.92	.93
BAS-2 Total score – Sexual minority individuals	–	1-5	3.49 (0.89)	-0.39 (0.15)	-0.44 (0.30)	.93	.93
BAS-2 Total score – English-speaking individuals	–	1-5	3.80 (0.88)	-0.60 (0.16)	-0.29 (0.31)	.94	.95
BAS-2 Total score – French-speaking individuals	–	1-5	3.94 (0.78)	-0.79 (0.05)	0.21 (0.10)	.92	.93

Note. All factor loadings are standardized. Loadings are statistically significant at $p < .001$. *SD* = standard deviation; *SE* = standard error; α = Cronbach's alpha; ω = McDonald's omega.

Table 6

Confirmatory Factor Analyses (CFA) and Tests of Measurement Invariance on the Body-Appreciation Scale-2

Model	χ^2 (df)	CFI	TLI	RMSEA	90% CI	Comparison	$\Delta\chi^2$ (df)	ΔCFI	ΔTLI	ΔRMSEA
One-factor CFA	578.958* (35)	.949	.935	.080	.074-.086	—	—	—	—	—
Language-based Invariance (n_{French} = 2181; $n_{English}$ = 238)										
M1. Configural	660.212* (70)	.946	.930	.083	.078-.089	—	—	—	—	—
M2. Metric	670.069* (79)	.946	.938	.079	.073-.084	M2-M1	5.417 (9)	.000	.008	-.004
M3. Scalar	756.372* (88)	.939	.937	.079	.074-.084	M3-M2	87.318* (9)	-.007	-.001	.000
M4. Residual	751.437* (98)	.940	.945	.074	.069-.079	M4-M3	18.620* (10)	.001	.008	-.005
M5. Latent variance	759.142* (99)	.939	.945	.074	.069-.079	M5-M4	7.736* (1)	-.001	.000	.000
M6. Latent means	766.254* (100)	.939	.945	.074	.069-.079	**M6-M5**	7.066* (1)	.000	.000	.000
Gender-based Invariance (n_{boys} = 1133; n_{girls} = 1272)										
M1. Configural	569.396* (70)	.948	.933	.079	.073-.085	—	—	—	—	—
M2. Metric	627.186* (79)	.946	.938	.076	.070-.082	M2-M1	26.73* (9)	-.002	+.005	-.003
M3. Scalar	789.855* (88)	.930	.928	.082	.077-.087	M3-M2	169.49* (9)	-.016	-.010	+.006
M3a. Scalar partial[a]	755.454* (87)	.934	.932	.08	.075-.085	M3a-M2	-55.46* (-1)	-.012	-.006	+.004
M3b. Scalar partial[b]	725.302* (86)	.937	.934	.079	.073-.084	M3b-M2	-40.11* (-1)	-.009	-.004	+.003
M4. Residual	945.697* (96)	.919	.925	.084	.079-.089	M4-M3	159.08* (10)	-.018	-.009	+.005
M4a. Residual partial[c]	763.701* (95)	.934	.938	.077	.072-.082	M4a-M3	-114.23* (-1)	-.003	+.004	-.002
M5. Latent variance	**787.957* (96)**	**.932**	**.936**	**.077**	**.072-.082**	**M5-M4**	**23.49* (1)**	**-.002**	**-.003**	**+.000**
M6. Latent means	1103.711* (97)	.910	.916	.089	.084-.094	M6-M5	268.50* (1)	-.022	-.020	+.012
Sexual Orientation-based Invariance ($n_{heterosexual}$ = 2001; $n_{sexual\ minority\ participants}$= 381)										
M1. Configural	605.414* (70)	.951	.937	.080	.074-.086	—	—	—	—	—
M2. Metric	640.798* (79)	.948	.941	.077	.072-.083	M2-M1	22.07* (9)	-.003	+.004	-.003
M3. Scalar	680.482* (88)	.946	.944	.075	.070-.081	M3-M2	33.85* (9)	-.002	+.003	-.002
M4. Residual	704.539* (98)	.944	.949	.072	.067-.077	M4-M3	34.95* (10)	-.002	+.005	-.003
M5. Latent variance	709.883* (99)	.944	.949	.072	.067-.077	M5-M4	4.45* (1)	.000	.000	.000
M6. Latent means	**749.289* (100)**	**.940**	**.946**	**.074**	**.069-.079**	**M6-M5**	**44.37* (1)**	**-.004**	**-.003**	**+.002**

Note. χ^2 = Chi-square; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; 90% CI = 90% confidence interval of the RMSEA; ΔCFI = change in CFI value compared to the preceding model; ΔTLI = change in the TLI value compared to the preceding model; ΔRMSEA = change in the RMSEA value compared to the

preceding model. [a] = The intercept of item 10 was freed; [b] = The intercepts of item 10 and 6 were freed; [c] = The residual variance of item 6 were freed; Bold letters indicate the final levels of invariance that were achieved. *$p < .05$.