The Developmental Theory of Embodiment: Quantitative Measurement of Facilitative and Adverse Experiences in the Social Environment

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1. Introduction

Sociocultural models of factors that shape the development of body image and eating disorders have been a focus of study for the past five decades (e.g., Dunkley, Wertheim, & Paxton, 2001; Garner & Garfinkel, 1978; Stice, Shaw, & Nemeroff, 1998; Thompson & Stice, 2001; Tylka, 2011a). Such explorations inform both prevention programs and therapy (e.g., Tylka & Piran, 2019). Anchored in three qualitative studies with cisgender girls and women, the developmental theory of embodiment (DTE) is a sociocultural theory that delineates both facilitative and adverse experiences in the social environment that shape the quality of the experiences of living in the body, (Piran, 2017; Piran & Teall, 2012). The current study comprises a quantitative component of a sequential mixed-method research program on embodiment, whereby new quantitative measures that assess facilitative and adverse experiences in the social environment were developed based on qualitative inquiries. As described by Creswell, Klassen, Plano Clark, and Clegg Smith (2011), the development of such measures allows to "generalize, test, or confirm qualitative findings" (p. 18). The Introduction describes the DTE, its research program, and the present study.

1.1. The Developmental Theory of Embodiment

The DTE is a research-based theory of facilitative and adverse experiences in the social environment that shape the experience of embodiment. The experience of embodiment is a construct that captures the quality of the experiences of living in the body, all the way from positive to negative embodiment, addressing body connection and comfort, agency and functionality, attuned self care, bodily desires, and freedom from objectification (Piran, 2016; Piran et al., 2020). The experience of embodiment construct is related other constructs that assess body image (Tylka & Piran, 2019). In particular, a fully structured psychometric measure of the experience of embodiment, the Experience of Embodiment Scale (EES), correlates strongly with other measures that assess individuals' experiences of living in their bodies, positively with body esteem (r=.77) and body responsiveness (r=.73) (Piran et al., 2020), as well as with body appreciation (r=.82) (Campagna, 2021), and negatively with objectified body consciousness (r=-.55) and alexithymia (r=-.55) (Piran et al., 2020).

The DTE outlines 13 core constructs of social experiences that shape the experience of embodiment, with each of these constructs ranging from facilitative social experiences, which we also term protective factors, to adverse social experiences, which we also term risk factors (Piran, 2017). Further, the DTE describes shifts along these continuous constructs of social experiences during individuals' life spans with concomitant changes in the experience of embodiment (Piran, 2017). For example, the core construct of engagement in physical activities ranges all the way from ample social opportunities, support, and rewards to engaging joyfully in physical activities to insurmountable barriers, involving discouragement, penalizing, and a complete lack of opportunities for such engagement. A middle level of this construct that we commonly find among adolescent girls involves newly enforced (around grade 6) femininity-related pressures to cease physical activities in the schoolyard while, concurrently, continuing to take part in paid physical activities outside of school; this middle level position applies mostly to girls whose families have funds, access to transportation, and

care givers who are available to support such paid activities (Piran, 2017). Safety, another example a core construct of social experiences that shape embodiment, similarly ranges all the way from

facilitative social conditions of safety and support to the respectful ownership of the body to exposure to a range of physical and sexual violations and neglect. A middle level of this construct that we commonly find in women involves social relationships and contexts that provide such safety intertwined with concurrent contexts that disrupt the experience of safety. A woman that has experienced sexual assault and is in the process of healing may seek and have access to safer relationships in the private sphere, though she may continue to be exposed to some level of sexual harassment in the public sphere (Piran, 2017). While we term facilitative social conditions protective factors, and adverse social conditions risk factors, the presence of exclusively facilitative (protective) conditions and of exclusively adverse (risk) conditions, represents opposite poles on a continuum on each of the 13 constructs of social experiences that shape embodiment.

The DTE suggests that the constructs of social experiences that shape embodiment take place in different domains of experiences, namely: the physical domain involving experiences in the physical environment, the mental domain involving learned and internalized social constructions, and the social power and relational connections domain addressing experiences of social power and relational connections with others and with communities (Piran, 2017). These constructs of social experiences in each of the three social domains of experiences, derived through the qualitative analyses of studies with cisgender girls and women and originally delineated in Piran (2017), are presented in the left column of Table 1 for the physical domain, Table 2 for the mental domain, and Table 3 for the social power and relational connections domain.

In the physical domain, the DTE identifies 4 key constructs (and additional constructs subsumed under these key constructs) that shape embodiment (Table 1, left column). The first key construct, entitled body ownership, refers to respectful versus violated ownership of the body and is expressed through two constructs: physical safety and body disciplining (referring to forced bodily practices, such as being pressured to go on a diet). The second construct, physical engagement, addressing freedom versus restriction in engaging with the physical environment, is also expressed through two constructs: physical activities and freedom of movement in the public sphere. Third, the construct of care-of-body refers to social conditions that facilitate, or that act as barriers, to engaging in practices that involve attuned body

care (e.g., attuned nutrition, rest). The fourth construct, bodily desires, refers to social conditions that sanction, support, and facilitate attuned and joyful responses to desires, both appetite and sexuality.

In the mental domain, the DTE highlights a critical stance towards constraining social discourses, developed through exposure to social environments that support such a critical stance or social environments that are free of such constraints (Table 2; left column). Such a critical stance contributes to positive embodiment by countering commonly learned and internalized adverse or limiting social constructions (Piran, 2017). Constraining social constructions exist in relation to all dimensions of social locations, e.g., gender, ethnicity/race, sexual orientation, social class (Hill Collins, 2000; Piran, 2017). We exemplify these constructions, by describing two constraining clusters of discourses identified in the qualitative analyses in relation to femininity, 'woman's body as a deficient object', reflecting appearance-related expectations that women inhabit their bodies as objectified and deficient sites, and 'woman as docile', reflecting comportment-related expectations, such as that women act demurely, prioritize others over self, and be sexual objects but not own sexual desire assertively.

In the social power and relational connections domain, the DTE identifies four constructs as shaping the experience of embodiment (Table 3: left column). First, the construct of freedom from prejudice and harassment refers to accessing (vs. facing barriers to) social resources as well as having freedom from (versus exposure to) body-based prejudice and harassment. The second construct, appearance-based social power, reflects freedom from (vs. reliance on) appearance for attaining social power. The third construct, empowering relational connections, describes having access to (vs. absence of) relational connections that are validating and empowering, especially with individuals with whom one shares important characteristics or values, leading to shared embodied pride and agency. The fourth factor, membership in equitable communities, addresses having (vs. lacking) the experience of being part of at least one social system where equity in relation to gender, social/racial heritage, or other social dimensions, is practiced.

As a sociocultural theory, the DTE also addresses intersectionality and the co-occurrence of

facilitative and adverse experiences along the different DTE-delineated social factors. First, all the DTE-delineated social factors that shape embodiment (e.g., safety) are impacted by intersecting dimensions of social location (e.g., gender, age, racial/ethnic heritage, social class, sexual orientation, gender identity, physical health and ability)(Piran, 2017). A second key finding of the qualitative research program is that both facilitative and disruptive factors within and across domains tend to co-occur (Piran, 2017). For example, within the context of societal prejudicial treatment, disenfranchised individuals are also exposed to adverse social constructions and to greater physical violations.

Several sociocultural theories of body image and eating disorders have been developed and studied to date and the DTE should be considered in relation to these theories. First, the most widely cited and studied sociocultural theory, the tripartite influence model, suggests that the internalization of social pressures by family, peers, and the media to adhere to idealized appearance standards (e.g., thinness or thinness and toned look for women, and muscularity for men) adversely disrupts body esteem and eating patterns (e.g., Shroff & Thompson, 2006; Tylka, 2011b). Second, objectification theory (Fredrickson & Roberts, 1997) has been applied to the field of body image and eating disorders, proposing that the internalization of the objectified gaze by girls and women leads to self-surveillance and body shame (e.g., Calogero, 2004; Buchanan, Fischer, Tokar, & Yoder, 2008). Third, stigma, a theoretical construct that denotes both a recognition of difference and devaluation in social interactions (Dovidio, Major, & Crocker, 2000), has also been applied to the fields of body esteem and disordered eating. In line with this theory, weight-based stigma, discrimination, and harassment in different life domains are related to poor self-esteem, depression, and disordered eating patterns (e.g., Puhl, Andreyeva, & Bronwell, 2008; Bucchianeri, Eisenberg, Wall, Piran, 2014). Fourth, body acceptance by others is an additional theoretical lens addressing the protective impact of a social environment whereby individuals perceive body acceptance from important others in their lives (Tylka, 2011a). Body acceptance by others correlates positively with body appreciation among both women and men (e.g., Tylka & Homan, 2015).

The DTE differs from the described theories in several ways. First, while these different socio-

cultural models tend to focus on a singular type of social factor (e.g., appearance-related pressures, objectification, stigma, acceptance) in shaping body image and eating disorders, the DTE aims to capture a multitude of experiences in the social environment, represented by the 13 constructs of social experiences outlined above (Piran, 2017). Uniquely, the theory includes a description of both facilitative (protective) and adverse (risk) social experiences on each of the 13 constructs of social experiences. The theory further examines the ways different dimensions of social location (e.g., age, social class, ethnocultural heritage) affect its facilitative and adverse social conditions (Piran, 2017). In addition, the theory is anchored in a large-scale qualitative research program among girls, younger and older women of different ethno-cultural/racial heritages, socioeconomic backgrounds, sexual orientations, and rural or urban sites of residence; however, all girls and women who volunteered to participate in the studies were cisgender, save for one participant who identified as a "lesbian woman slightly transgender".

1.2 DTE Research program and the Present Inquiry

The research program on embodiment (Piran & Teall, 2017) has adhered to a sequential qualitative-quantitative design, whereby quantitative inquiries follow theoretically driven qualitative inquiries, with the goal of expanding the understanding of the emergent phenomena and enhancing the generalizability of knowledge transfer of the findings (Creswell et al., 2011). In terms of its qualitative component, the research program on embodiment has included four qualitative studies to date: a participatory research school project with girls and boys, which led to a rudimentary theoretical formulation (Piran, 2001), and three studies which led to the emergence of the fully elaborated DTE (Piran, 2017): a 5-year prospective interview study with girls throughout adolescence, and life history studies with younger and older women (Piran, 2016; 2017). In these three qualitative studies participants were asked about their experiences of living in their bodies and about the social experiences that shaped the way they lived in their bodies.

Quantitative components of a mixed-method research program allow for the testing of theories or hypotheses, examining relationships among variables, as well as replicating and generalizing qualitative

findings (Creswell et al., 2011). While we have conducted two previous quantitative studies (Piran & Cormier,

2005; Piran & Thompson, 2008) as a follow up to a participatory action research in a school and to initial theoretical constructions (Piran, 2001), we were also aware that existing quantitative measures did not capture the richness of the emergent qualitative findings delineated by the DTE. A particular qualitative-quantitative sequential design involves the development of new quantitative instruments based on qualitative explorations that are then used to test emergent theories (Creswell et al., 2011). In line with this approach to sequential mixed-method design, quantitative components of the embodiment research program involved, first, the development of new measures anchored in qualitative interviews, and second, the testing of the DTE using these measures.

The present study describes the development and initial psychometric testing of the fully structured Physical Freedom Scale (PFS), Mental Freedom Scale (MFS), and Social Power and Relational Connection Scale (SPRCS) that aim to assess facilitative and adverse conditions in the social environment. We expected that fully structured scales could be developed from the rich qualitative narratives in the physical, mental, and social power domains that would have good psychometric qualities, and, hence, could be used in research about social factors that shape embodiment. Further, as described above, the qualitative analyses led to the emergence of core constructs of facilitative and adverse experiences within each of the three domains that were associated with the experience of embodiment. We hypothesized that factor analyses of the three newly developed quantitative scales would provide cross-method validation of the emergent qualitative constructs, reflecting the merging of qualitative and quantitative data (Creswell et al., 2011). In particular, we expected to find the following quantitative factors in the physical domain: safety, body disciplining, physical activities, freedom of movement in the public sphere, care of body, and bodily desires. In the mental domain we expected to find a factor reflecting a critical stance towards constraining social discourses, and two femininity-related factors: one related to appearance and the second to comportment. In the social power and relational connections domain we expected to find the following factors: prejudice and harassment,

appearance-based social power, empowering relational connections, and membership in equitable communities.

2.0 Item development and Pilot Study

The first phase of the quantitative inquiries involved the generation of scale items that could capture the broad range of social experiences that participants in the qualitative studies described in the physical, mental, and social power and relational connections domains. This phase also included a pilot quantitative study of the derived Physical Freedom Scale (PFS), Mental Freedom Scale (MFS), and Social Power and Relational Connections Scale (SPRCS). The pilot study focused on examining participants' responses to the items with the goals of item deletion and revision, as well as an initial study of internal reliabilities.

Our goal was to construct scales that were anchored in qualitative narratives of girls and women about social experiences that shaped the way they were living in their bodies. For this purpose, we used narratives that were collected in a large scale qualitative research program dedicated to study such experiences: 30 life history interviews with 11 young women (2001-2006), a 6-year prospective study of repeated 3-4 interviews with 27 girls over 5 year (girls were 9-14 years old during the first interview and interviews were conducted in years 1, 2, 4, and 5) (2006-2012), and 54 interviews with 31 women ages 50-68 (2011-2016). It was important for us to finalize the items of the scales once we analyzed narratives from all three studies. All core constructs and most descriptive themes from all three studies overlapped, as described in detail in Piran (2017). However, since our goal was to develop scales of social experiences intended for completion by adult women, we used narratives from the qualitative files of the two life history studies with adult women in determining the wording of each item. In line with the development of the EES (Piran et al., 2017), members of the qualitative/quantitative embodiment research project derived, during weekly research meetings, scale items from descriptive themes extracted during the constructivist grounded theory analyses of qualitative narratives (Charmaz, 2006). The descriptive themes are the lower-level themes extracted from the data, and therefore precede the process of focused coding, which involves the synthesizing of higher-level categories (Charmaz, 2006). The research team included 6-8 women doctoral

students in clinical psychology, all conducting research and clinical work in the areas of body- and self-experiences in relation to varied cultural contexts. The narratives under each descriptive coding were examined to look at the most common narratives utilized by participants to describe their experiences, leading to the construction of one, two or three items. The construction of more than one item for the same descriptive theme took place when the team was not sure about which scale item would resonate most with participants' experiences and when potential scale items within a descriptive code seemed to have a slightly different meaning. Descriptive themes that included narratives from fewer than 3 participants in each of the two research studies with adult women were not utilized to form scale items, as we wanted to tap into common experiences to which most participants could relate.

The life history qualitative approach to interviewing aims to examine the intersection between individuals' experiences and their social contexts throughout their life span, ranging from earliest memories to the time of the interview (Cole & Knowles, 2001). Life history interviews, therefore, as well as the prospective interviews with girls, allowed us to construct items that were relevant to childhood, adolescence, and adulthood. The interviews with girls also enhanced our understanding of social experiences during childhood and adolescence. Based on the qualitative files, the initial versions of the PFS, MFS, and SPRCS included mostly items that were common to all three life stages as well as items that addressed social experiences that were specific to one or two of the three life stages. For example, the adolescent phase included items regarding social experiences in relation to the onset of menstruation and other pubertal processes. The adolescent and adult phases included items regarding social experiences related to dating and sexual activities that were not part of the childhood version. The initial PFS included 47 items for childhood, 68 for adolescence and 56 for adulthood. The initial MFS included 36 items for childhood, 44 for adolescence, and 37 for adulthood. The SPRCS included 70 items for childhood, 100 for adolescence, and 93 for adulthood. Each item of the PFS, MFS, and SPRCS is rated along a 5-point scale (1 = *Strongly Disagree*, 2 = *Somewhat Disagree*, 3 = *Neither Agree nor Disagree*, 4 = *Somewhat Agree*, 5 = *Strongly Agree*). Negative items on the scales are reverse scored, such that higher scores reflect more positive experiences in the three domains of experiences in the

social environment. Further, respondents are asked to provide responses about how they have felt during childhood (0-12 years), adolescence (13-17 years), and currently in adulthood (18 years and older). Mean scores for the PFS, MFS, and SPRCS scales are calculated separately for each developmental phase by adding scores on all items and dividing by the number of items.

In the pilot study of the PFS, MFS, and SPRCS participants were invited to complete the scale, as well as to make comments in an open-ended space provided after each item about the clarity and relevance of the item to their own lives, or to make any other comments. A similar comments section was included at the end of the scale as well. Ninety two (92) women, recruited in the downtown area of a large urban center in Canada, ages 19-55 (M = 32.51, SD = 9.7), participated in the study. They described their ethnic identity as African Canadian (2.2%), Asian (9.9%), Latin/Hispanic (2.2%), Indigenous (3.3%), White (72.5%), or other (9.9%). Most participants (58.7%) were students at the time of the study, and 27.2% of the sample were employed full time. Parental education was used as a proxy of participants' social class background (Erola, Jalonen, & Lehti, 2016). Paternal university education, 38.5%, was higher than the Canadian population-based percentage of 28.4% among adults (Statistics Canada, 2017). Maternal university education rate was similar to the Canadian average.

Ethics approval was obtained from the University of Toronto Ethics Committee. Recruitment took place through paper advertisements in the downtown core of an urban center that were placed in coffee shops, libraries, stores, and university bulletin boards. These ads invited women to participate in a study that aimed at the development of a scale about the way women live in their bodies (the scale included all three scales). Interested participants received study packages in-person or by mail. No compensation was offered for participation in the study.

The important task for this phase was item deletion and revision. While we sought to capture the breadth of social experiences addressed in qualitative narratives, we aimed to derive quantitative measures that would not be too lengthy to use in research studies. Initial analysis revealed that Cronbach's alpha reliability coefficients for all scales ranged between .84 and .94. We decided about item deletion, revision, or retention on a case-by-case basis. Items were excluded if they: (a) had a high rate of missing data (>6%); (b) showed little variation in response tendencies (about 75% of responses were within the range of 2 Likert scale ratings); (c) had negative comments about their clarity or style (4 negative comments or more about a particular item); (d) were too close in content with other items, while showing a similar response pattern to these other items (as was the case often with items derived

from the same descriptive theme); (e) showed very low item-total correlation ($r < .15$); and (f) internal consistency estimates for total scale were equivalent or changed negligibly (< .005) by removing the item. We also made small stylistic revisions to a few items. Altogether, following the process of deletion, the scales included 37 items on the PFS, 34 on the MFS, and 37 on the SPRCS. These items are identical for all three phases such that there is only one version of the scales and participants respond, for each item, on their relevant experiences during childhood, adolescence, and adulthood. The only exception is that on the PFS, three items about engagement in sexual practices (e.g., "In my sexual experiences I have felt that my wishes have been considered and respected" are marked such that participants are guided not to respond to them in relation to childhood. Following this initial item development stage, we conducted three studies aimed at the psychometric study of the PFS, MFS, and SPRCS. The first study involved a study of factor structure, internal reliabilities, and validity. The second study involved a confirmatory study of the factor structure, and the third study aimed to examine test re-test reliabilities of the three scales.

3.0 Study 1: Internal consistency and construct validity

Study 1 aimed to finalize item selection of the PFS, MFS, and SPRCS, as well as assess their internal consistency. It also aimed to assess construct validity through factor analyses and convergent and incremental validity of specific factors of the PFS, MFS, and SPRCS through examining the strength of their correlations with theoretically related measures, as well as their ability to predict the experience of embodiment above and beyond the variance accounted for by the theoretically related measures. We expected that factor analyses of the PFS, MFS, and SPRCS will yield quantitative factors that correspond with qualitatively derived constructs of protective and risk factors in the social environment explicated by the DTE (Piran, 2017) and delineated in the left columns of Tables 1-3 for PFS, MFS, and SPRCS, respectively. To establish convergent validity, we chose to focus on examining the convergent validity of specific factors of the PFS, MFS, and SPRCS that have received extensive research support and for which we could find theoretically similar measures; due to limitations on the total time required

by participants to complete the full battery of tests, we could include only a few such measures. Since the PFS includes a safety (vs. violations) factor and body safety and violations have been widely researched in relation to embodiment, body image, and disordered eating (e.g., Calogero, Tylka, & Siegel, 2019; Smolak & Murnen, 2002), we expected that the PFS and, in particular, this safety factor will be most strongly and negatively correlated with measures of sexual harassment and sexual and physical violations. While the PFS includes a factor that assesses social support and opportunities to engage in physical activities, and there is extensive literature about the degree of, motivation for, and joy related to engagement in attuned physical activities and embodiment and body image (e.g., Alleva et al., 2020; Calogero, Tylka, Hartman, McGilley, & Pedroty-Stump, 2019; Greenleaf & Hauff, 2019), we could not find a measure that assessed a similar construct of social support and social opportunities for engagement in physical activities. Since the MFS addresses social conditions that either support (or suppress) a critical and assertive voice and resistance to constraining social discourses regarding femininity, we expected that the MFS would be most strongly and negatively correlated with measures that assess the internalization of femininity-related discourses regarding appearance and comportment. Extensive research exists documenting the relationship of internalized appearance expectations on embodiment, body image and eating disorders (e.g., Shroff & Thompson, 2006; Thompson et al., 2004; Tylka & Calogero, 2019) and a body of literature on the internalization of femininity stereotypes and embodiment, body image, and eating disorders (Murnen & Smolak, 2009; Murnen & Smolak, 2019). We therefore expected that the MFS and, in particular, the factors of support (or suppress) of a critical and assertive voice and of resistance (or collusion) to constraining social discourses regarding femininity, will be most strongly and negatively correlated with measures of femininity-related internalized appearance and comportment expectations. Similarly, since the SPRCS includes a factor that addresses either protection from (vs. exposure to) prejudicial treatment along gender and other dimensions of social location, and exposure to harassment and stigma has been extensively researched in relation to embodiment, body image, and disordered eating (e.g., Bucchianeri et al., 2014; Puhl, Andreyeva, & Bronwell, 2008), we expected that the SPRCS, and the prejudice and harassment factor,

will be most strongly and negatively correlated with measures of exposure to daily discrimination in relation to a range of social locations and to gender harassment.

3.1 Method

3.1.1. Participants and procedure. The study included 412 cisgender women (*M*age = 24.32; *SD* = 7.21) who were recruited from the downtown area of an urban center in university- and community-based settings in Canada. Participants, ages 18-45, described their ethnic identity as African Canadians (6.3%), Asian (41.8%), Latin/Hispanic (2.9%), Indigenous (0.2%), White (38.9%), or Other (9.7%). Most participants (94.4%) did not report on a significant health issue during the time of the study. Participants described their sexual orientation as bisexual (4%), heterosexual (89.2%), lesbian/gay (3.5%), or other (3.3%). Most participants had at least some university or college education (70.1%). Parental education was used as a proxy to assess social class background (Erola, Jalonen, & Lehti, 2016). Parental university education rates were somewhat higher than the Canadian population-based percentage; among fathers, 42.7% had university education, and among mothers, 39.6%, compared with a national average of 28.2% found in a 2016 Canada-wide census (Statistics Canada, 2017).

Ethics approval was obtained from the University of Toronto Ethics Committee. Study advertisements invited participants to take part in a study that aimed at the development of scales about the way women live in their bodies; this scale included four components, experience of embodiment, physical freedom, mental freedom, and social power and relational connections. Recruitment took place in the downtown area, which includes both university and community settings, through ads in local libraries, stores, community centers, restaurants, as well as posters in publicly available websites (e.g., Kijiji, Craigslist, Facebook) and a university listserv. Interested participants had the option of completing the study on paper or online. Those who completed the study package were offered compensation through a $10 check or an iPad prize entry. Forty-four (44) women who completed the package online were excluded due to concerns regarding very quick completion time (i.e., < 10 minutes) or questionable response patterns (i.e., selecting the same response for all items, only choosing one or two response options throughout).

3.1.2. Measures. Measures included the PFS, MFS, and SPRCS. Since these measures are anchored in qualitative narratives about social experiences that shape embodiment and that led to the emergence of the DTE, these measures are referred to in this paper as 'DTE-derived measures' of social experiences. Measures also included other measures of experiences in the social environment, referred to in this paper as 'alternative measures' of social experiences, utilized to assess convergent validity.

3.1.2.1. The PFS, MFS, and SPRC: DTE-derived measures of social experiences.

All items on the PFS, MFS, and SPRCS relate to experiences in the social environment, and are derived from qualitative narratives by women who participated with interviews about experiences in the social environment that shaped the way they had lived in their bodies (Piran, 2017). Participants provide, for each item on these scales, a rating of their experiences during childhood, adolescence, and adulthood using the following instruction, "Please provide responses for your experiences during childhood (0-12 years), adolescence (13-17 years), and your current experiences in adulthood (18 years and older)." In this paper we include the statistical results on the adult phase, specifically the PFSa, and MFSa, and SPRCSa. The most important reason for this decision is that, according to the DTE, the

protective (and risk) factors in the social environment that are most relevant to the experience of embodiment are those that operate in the current social environment. As the theory suggests, "Most women engage in body journeys that aim to shift, and even counteract, [prior] adverse body-anchored experiences… [P]articular social processes in adulthood, such as validating and empowering relational connections, support their movement toward positive embodiment" (Piran, 2017, p.203). Towards the goal of testing the DTE utilizing quantitative measures, we therefore decided to focus on social experiences reported as taking place in adulthood.

Items on the PFSa, MFSa, and SPRCSa are rated along a 5-point scale from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*) and negative items on the scale are reverse-scored. A mean score is obtained by summing the scores for the items and dividing the total by the number of items such that higher scores on the scales reflect more positive experiences in the social environment.

3.1.2.1.1. *PFSa.* The PFS covers a broad range of physical experiences that take place in the social environment. The PFSa, the adult form of this scale, addresses current experiences during adulthood and has 25 items (see first paragraph of section 3.1.3. Statistical analyses for criteria utilized in the final deletion of items). Items include experiences such as engaging in varied physical activities (e.g., "I have had the opportunity to engage in physical activities that have helped me feel confident in my physical abilities") and experiencing physical and sexual safety or violations (e.g., "Events in my life have made me feel scared in my body") (see Table 1 for a complete list of items). Higher scores on the PFSa reflect more positive physical experiences.

3.1.2.1.2. *MFSa.* The MFS assesses one's perception of having been exposed to social environments that have either facilitated or constricted the development of an assertive and critical voice towards social stereotypes and other constraining discourses. The MFSa, the adult form of this scale, addresses current experiences during adulthood and has 15 items (see see first paragraph of section 3.1.3. Statistical analyses for criteria utilized in the final deletion of items). Items address having an assertive voice and a critical stance towards (vs. collusion with) varied constraining dominant views (e.g., "I have been encouraged to act in line with what I believed in and what I am passionate about") and complying with (or contesting) gender related stereotypes of women (e.g., "As a girl/woman I have learned that my body should be groomed/presented in a "feminine"/sexualized way (e.g., apply nail polish, put on make-up, wear tight clothing)") (see Table 2 for a complete list of items). Higher scores reflect exposure to more positive learning experiences in relation to constraining social discourses.

3.1.2.1.3. *SPRCSa.* The SPRCS covers experiences of accessing, or being barred from, social power and empowering relational connections related to inhabiting bodies associated with social privilege or disenfranchisement. The SPRCSa, the adult form of this scale, addresses current experiences during adulthood and has 22 items (see first paragraph of section 3.1.3. Statistical analyses, for criteria utilized for final deletion of items). Items address experiences such as: prejudicial treatment and harassment (e.g., "I have experienced teasing/harassment/discrimination (related to, for example, gender, financial/educational status, ethnic-cultural background, sexual orientation, health/(dis)ability, weight, other") and relational connections that are (dis)empowering (e.g., "I have had positive role models (e.g., strong, confident, powerful, respectful of their body)") (see Table 3 for a complete list of items). Higher scores reflect more positive experiences of social power and positive relational connections with others and communities.

3.1.2.2. **Alternative measures of social experiences.** The second set of quantitative measures used in the study were measures of social experiences, utilized to assess convergent validity of the PFSa, MFSa, and SPRCSa. Two measures that address physical and sexual violations were used to assess the construct validity of the PFSa. Three measures that evaluate the degree of internalization of femininity-related stereotypes regarding appearance and behavior were used to the assess convergent validity of the MFSa. Two measures, addressing harassment experiences related to gender and other dimensions of social location were used to assess convergent validity of the SPRCSa.

3.1.2.2.1 Sexual Experiences Questionnaire: Unwanted Sexual Attention subscale (SEQ-USA). The SEQ-USA is a 6-item subscale of the Sexual Experiences Questionnaire (Fitzgerald, Gelfand, & Drasgow, 1995) which refers to, "sexual attention that is unwanted and unreciprocated by the recipient" (Fitzgerald Drasgow, Hulin, Gelfand, & Magley, 1997, p. 580). The subscale includes items such as, "Have you been in a situation where a male touched you (e.g., laid a hand on your bare arm, put an arm around your shoulders) in a way that made you feel uncomfortable?" Items range from 1 (*Never*) to 5 (*Most of the time*), with higher scores indicating more unwanted sexual experiences (Fitzgerald et al., 1997) and a mean score per item is calculated. The reported Cronbach's alpha of this subscale is .82 (Fitzgerald et al., 1997). In terms of validity, the authors reported that the scale correlated with several measures of psychological well being, such as measures of mental health and satisfaction with life, and with subjective ranking of one's health (Fitzgerald et al., 1997). Since it addresses sexual violations, the SEQ-USA is utilized in the present investigation to assess the construct validity of the PFSa.

3.1.2.2.2 *Sexual and Physical Abuse Questionnaire* (SPAQ*). The* SPAQ *(*Kooiman, Ouwehand, & ter Kuile, 2002) is a 6-item self-report questionnaire designed to assess the prevalence of sexual and physical abuse experiences. The SPAQ provides response options in a Yes/No format to indicate presence versus absence of abuse. Endorsed items (i.e., Yes/presence of abuse items) were scored as "1" and summed to provide an overall score of abuse, with higher scores indicating more experiences of abuse. An example item is, "Has anyone ever touched your sex organs in a sexual manner and against your will?" Kooiman et al. (2002) reported satisfactory criterion validity, particularly for sexual abuse, as it showed agreement with a

well-established structured interview for sexual and physical abuse. Since the SPAQ addresses physical and sexual violations, it is the second measure used in the present investigation to assess the construct validity of the PFSa.

3.1.2.2.3 *Femininity Ideology Scale: Stereotypic Image and Activities (FIS-S).* The FIS-S (Levant, Richmond, Cook, Tanner House, & Oupont, 2007) is an 11-item subscale of the Femininity Ideology Scale, which assesses the endorsement of stereotypes about appearance expectations of women (i.e., "A woman should have a petite body") as well as behavioural expectations of women ("A woman should not show anger"). The responses range along a 5-point scale, from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), with higher scores representing greater endorsement of traditional feminine norms. The score for this subscale is calculated by adding the individual item scores and dividing by the number of items. Cronbach's alpha for the Stereotypic Image and Activities subscale was reported by Levant et al. (2007) to be .89. In terms of convergent validity, as expected, Levant et al. (2007) found that the subscale correlated with the Passive-Acceptance and Revelation subscales of the Feminist Identity Scale. Since it addresses the internalization of gender stereotypes about women, the FIS-S is used in the present investigation to assess the construct validity of the MFSa.

3.1.2.2.4 *Sociocultural Attitudes Towards Appearance Questionnaire-3: Internalization-General (SATAQ-IG).* The Internalization-General (IG) subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-3 (SATAQ-3; Thompson, van den Berg, Roehrig, Guarda & Heinberg, 2004) is a 9-item measure that refers to the degree to which women have internalized idealized media norms of body weight, shape, and other appearance characteristics (e.g., "I compare my body to the bodies of people who are on TV"). Response options range along a 5-point scale from 1 (*Definitely Disagree*) to 5 (*Definitely Agree*). Items on the IG subscale are averaged such that higher scores reflect greater acceptance and internalization of appearance-related media ideals. The subscale has good psychometric properties, with reliability coefficients ranging from .92-.96, as well as convergent validity, as the subscale correlates positively with measures of body dissatisfaction and drive for thinness (Thompson et al., 2004). Since it addresses the internalization of appearance stereotypes, the SATAQ-IG is a second measure used in the present investigation to assess the construct validity of the MFSa.

3.1.2.2.5 *Silencing the Self Scale: Silencing the Self Subscale (STSS-S).* The STSS-S (Jack & Dill, 1992) is a 9-item subscale of the Silencing the Self Scale that evaluates the degree to which a person silences their own thoughts and feelings in a relational context so as to avoid conflict and possible rupture (e.g., "I don't speak my feelings in an intimate relationship when I know they will cause disagreement"). Items are rated along a 5-point scale that ranges from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*), such that higher scores indicate greater self-silencing. Internal consistency alpha coefficients for the STSS subscales range from .78 to .90 and test-retest reliability coefficients for the total scale among women range from .88 to .93 (Jack & Dill, 1992). In terms of construct validity, like other subscales of the STSS, the STSS-S was positively correlated with depressive symptomatology, and as expected, it was lowest among a group of women university students and highest among residents of a battered women's shelter (Jack & Dill, 1992). In terms of construct validity, STSS as a whole and the STSS-S subscale, in particular, have been associated with the inhibition of feelings, negative thoughts about the body, disordered eating behaviors, and depression among women (e.g., Zaitsoff, Geller, and Srikameswaran, 2002). Since it addresses the suppression of one's voice, especially anger and other negative feelings, the STSS-S is the third measure used in the present investigation to assess the construct validity of the MFSa.

3.1.2.2.6. *Everyday Discrimination Scale (EDS).* The EDS (Williams, Yu, Jackson, &Anderson) is a 10-item scale that is designed to assess the frequency of chronic, common, and less overt discriminatory experiences (e.g., "In your day-to-day life, how often have you been treated with less courtesy than other people"). Each item is ranked on a four-point scale: 1 (*Never*), 2 (*Rarely*), 3 (*Sometimes*), and 4 (*Often*), and then recoded to a binary format of 0 (Never or Rarely) and 1 (Sometimes or Often) and summed to create a total score, with higher total scores indicating more frequent perceived discrimination (Lewis, Aiello, Leurgans, Kelly, & Barnes, 2010). The scale has demonstrated strong internal consistency (Cronbach's alpha .88). In terms of validity, the scale is correlated with measures of mental and physical health among African American, Asian, and White women and men (Lewis et al., 2010; Williams et al., 1997). Since it addresses exposure to discrimination and harassment, the EDS is used in the present investigation to assess the construct validity of the SPRCSa.

3.1.2.2.7. *Sexual Experiences Questionnaire: Gender Harassment Subscale (SEQ:GH).* The SEQ-GH is a 6-item subscale of the Sexual Experiences Questionnaire (SEQ; Fitzgerald et al., 1995) which assesses, "the most commonly reported form of offensive sex-related behaviour, is not intended to elicit sexual cooperation but, rather, consists of crude verbal, physical, and symbolic behaviours that convey hostile, offensive, and misogynist attitudes" (Fitzgerald et al., 1997, p. 580). This subscale includes items such as, "Have you ever been in a situation where a male "put you down" or was condescending to you because of your sex?" Participants respond on a 5-point scale, ranging from 1 (*Never*) to 5 (*Most of the Time*), and item scores averaged, with higher scores indicating greater exposure to gender harassment. The reported Cronbach's alpha of this subscale is .81(Fitzgerald et al., 1997). The SEQ is correlated with measures of mental and physical health and satisfaction with life satisfaction (Fitzgerald et al., 1997). Since it addresses exposure to discrimination and harassment regarding gender, the EDS is the second measure used in the present investigation to assess the construct validity of the SPRCSa.

3.1.3. Statistical analyses. First, towards further refinement of the PFSa, MFSa, and SPRCSa measures, we examined the response patterns on scale items and decided on further item deletion or retention on a case-by-case basis, utilizing the same criteria that were applied in the pilot study. In addition, we conducted an initial exploratory factor analysis. Items were also deleted if their communality coefficients were below .30 on two or all three developmental phases, if they cross-loaded (>.30) on two factors or more and if they did not load highly on any of the factors (i.e., factor loading <.30). Applying these criteria, the PFS had 25 items in adulthood and adolescence (and 22 in childhood) and the MFS and SPRCS had 15 and 22 items, respectively, for all developmental phases.

Prior to data analyses, data were examined for missing data. On the measures of PFSa, MFSa, and SPRCSa, the rates were 0.70-0.77%. Rates of missing data on all other measures were in the 0.19-1.00%, besides SATAQ (1.58%) and STSS (4.78%; likely related to the measure asking about one's behaviour within a partnership relationship). Due to the low degree of missing data, and to maintain power, a pairwise deletion approach was selected for all correlation and factor analyses. Listwise deletion was used for the calculation of the internal reliability coefficients: Cronbach's alpha (Cronbach, 1951) and McDonald's omega (McDonald, 1970; 1999).

We conducted correlation using the open-source software R version 4.0.2 (R Core Team, 2020). We ran our Exploratory Factor Analyses (EFAs) using the psych package (Revelle, 2020) to explore the multi-dimensional nature of the final versions of the PFSa, MFSa, and SPRCSa. For all EFAs, we used unweighted least squares (ULS) estimation with Pearson correlations and used the recommended oblimin rotations to allow for correlations between the factors. We chose the number of factors to extract by examining several statistical criteria in balance with the qualitative theory. Namely, we examined eigenvalues > 1.00 (Kaiser, 1960), parallel analysis (Horn, 1965) the minimum average partial (MAP) test (Velicer, 1976), and standardized root mean square residuals (SRMR) values under .05. All factor loadings reported were from the oblimin rotated factor solution which allows for correlations between the factors. To derive reliability coefficients of the factors we used both Cronbach's alpha and McDonald's omega, since McDonald's omega is less impacted by the number of items (e.g., McNeish, 2018).

3.2. Results and Discussion

3.2.1. Preliminary analyses and assumptions. Scores on all measures were examined for normality of distribution through histograms and descriptive statistics. Scales scores were approximately normally distributed although the SPAQ, EDS, and FIS-S demonstrated some slight positive skew and the SPAQ scores were somewhat platykurtic (see statistics for skewness and kurtosis in the Notes section of Table 4). Bivariate scatterplots were examined to check for nonlinearity for the EFAs. None of the bivariate plots were suggestive of nonlinear relationships Means, standard deviations, and correlations among all measures are included in Table 4.

3.2.2. Factor structure of the PFSa, MFSa, and SPRCSa.

3.2.2.1. ***The physical domain: Social factors derived from the PFSa.*** We decided on a 6-factor solution which was supported by the number of eigenvalues, parallel analysis, and low SRMR (.03). The six factors explained 44% of the variance (see second column of Table 1 for a list of quantitative factors and the percent of variance they explained, and McDonald's omega coefficients; scale items, factor loadings, and communality are included in the third to tenth columns). The derived factors included: a) safety (P/SF) referring to experiences of safety versus violations; b) body disciplining (P/BD) addressing freedom versus exposure to coercive pressures to alter one's appearance; c) physical activities (P/PA) describing support versus barriers to engaging in joyful physical activities; d) physical movement (P/MV) involving freedom versus restrictions to movement and action in the public sphere; d) care-of- body (P/CB) including opportunities versus barriers to practicing informed and constructive bodily care; and e) sexual desires (P/SD) concerning opportunities versus barriers to engaging in positive and attuned responses to sexual desire.

As can be gleaned from the first two columns of Table 1, the derived quantitative factors, as expected, corresponded with the constructs that emerged in the analyses of qualitative narratives. The only differences were that in the qualitative analyses, physical activities (P/PA) and freedom of movement (P/MV) were subsumed under a broader construct entitled physical engagement, and safety (P/SF) and body disciplining (P/BD) were subsumed under the broader construct of body ownership.

3.2.2.2. ***The mental domain: Social factors derived from the MFSa.*** Eigenvalues, the parallel analysis, the MAP test, and a low SRMR (.04) all supported a 3 factor solution for the MFSa.The three factors explained 41% of the variance (see second column of Table 2 for a list of quantitative factors and the percent of variance they explained, and McDonald's omega coefficients; scale items, factor loadings, and communality are included in the third to seventh columns). The derived factors included: a) general resistance (M/GR) referring to social conditions that support, or restrict, the freedom of voice and opinions, as well as that help maintain a general resistant stance towards, versus collusion with, oppressive pressures and expectations; b) appearance-related resistance (M/AR) addressing social environments that enhance or inhibit freedom from, or a critical stance towards, oppressive social discourses that construct a woman's body as a deficient object requiring ongoing repair in order to fit with idealized societal images of women; and c) comportment-related resistance (M/CR) describing social conditions that enhance or suppress resistance towards oppressive discourses of femininity, expecting women to act 'docile' and demure. As can be gleaned from the first two columns of Table 2, the derived factors corresponded, as expected, with the constructs that emerged in the analyses of qualitative narratives.

3.2.2.3. ***The social power and relational connections domain: Social factors derived from the SPRCSa.*** Eigenvalues, the parallel analysis, the MAP test, and a low SRMR (.04) all supported a 4-factor solution that explained 48% of the variance (see second column of Table 3 for a list of quantitative factors and the percent of variance they explained, and McDonald's omega coefficients; scale items, factor loadings, and communality are included in the third to eighth columns). The derived factors included: a) prejudice and harassment (SPRC/PH) referring to freedom versus exposure to discrimination, negative prejudicial treatment, and harassment; b) appearance-based social power (SPRC/ABSP) addressing access to social power that is either free from, or contingent upon, one's appearance and conformance to idealized standards of appearance for girls/women; c) empowering relational connections (SPRC/ERC) describing the presence, versus a lack, of positive relational connections with individuals and communities that provide a sense of belonging and support and that increase one's experience of social power with others in the world; and d) gender equity (SPRC/GE)

involving experiences of gender equity versus inequity in one's immediate social environment.

As can be gleaned from the first two columns of table 3, the derived factors, as expected, corresponded overall with the constructs that emerged in the analyses of qualitative narratives. It should be noted, however, that the fourth qualitative construct of membership in equitable communities relates to being a member of equitable communities in relation to gender, social/racial heritage, or other social dimensions, while the parallel quantitative factor addresses only gender equity; this reflects the more restricted content covered by the quantitative measure of this factor.

Altogether, factor analyses of the PFSa, MFSa, and SPRCSa yielded six factors in the physical, three in the mental, and four in the social power and relational connections domains that corresponded overall with the constructs that emerged in the analyses of qualitative narratives of girls and women about experiences in the social environment that shaped their experiences of embodiment. Tables 1-3 provide a visual representation of these similarities between the findings of the qualitative and qualitative analyses in the mixed-method program of research on embodiment. The quantitative factors, therefore, provide cross-method validation of the constructs which emerged in the qualitative analyses and that comprise key components of the DTE.

3.2.3. Internal consistency reliability coefficients. Cronbach's alpha and McDonald's omega (McDonald, 1970; see also McNeish, 2018) coefficients were .85 and .90 for PFSa, .83 and .87 for MFSa, and .90 and .93 for SPRCSa, respectively. These values support the internal consistency of the PFSa, MFSa, and SPRCSa. The Cronbach's alpha and McDonald's omega coefficients for the PFSa factors were .86 and.89 for safety (P/SF), .79 and .76 for physical activities (P/PA), .71 and .72 for movement (P/MV), .68 and .71 for body disciplining (P/BD), and .68 and .69 for care of the body (P/CB), respectively. The sexual desires (P/SD) factor, concerning opportunities to engaging in positive and attuned responses to sexual desire, has only two items and therefore no reliability coefficients could be calculated. The Cronbach's alpha and McDonald's omega coefficients for the three MFSa factors were .81 and.87 for general resistence (M/GR), .74 and.82 for appearance resistance (M/AR), and .72 and.78 for comportment resistance (M/AR), respectively. The Cronbach's alpha and McDonald's omega

coefficients for the four SPRCSa factors were .86 and.89 for prejudice and harassment (SPRC/PH), .83 and .89 for empowering relational connections (SPRC/ERC), .82 and .83 for appearance-based social power (SPRC/ABSP), and .82 and .84 for gender equity (SPRC/GE), respectively. Reliability coefficients for the 13 factors, therefore, ranged from very good to acceptable.

3.2.4. Convergent Validity. In examining the patterns of correlations of the PFSa, MFSa, and the SPRCSa and their respective factors with measures used to assess convergent validation, it is of value to consider that the three scales themselves are strongly intercorrelated (*r*=.70-.77 range). Such correlations are in line with the DTE that emphasizes the concurrent operation of facilitative and disruptive social conditions (Piran, 2017). Table 4 includes the correlations of the total scales with convergent validity measures, while Table 5 includes the correlations of the 13 factors with these measures.

As expected (Table 4), the PFSa was most strongly negatively correlated with validation measures that assess exposure to a range of violations, specifically the SEQ-USA that assesses sexual harassment (*r*=-.41) and the SPAQ that assesses sexual violations (*r*=-.45). Regarding the six factors of the PFSa, safety (Table 5) (P/SF), as expected, had the highest correlations with the two alternative measures that assess a range of bodily violations (SEQ-USA: *r* = -.56; SPAQ *r* = -.59); however, the correlations were also strong with measures of exposure to prejudice and harassment (EDS: *r* = -.52; SEQ-GH *r* = -.52). As expected, the correlations of the five other physical freedom factors were in the small range with all validation measures, with one exception. The body disciplining factor (P/BD) was correlated in the moderate range with the measures of internalization of appearance standards (SATAQ-IG: *r* = -.46).

Regarding MFSa (Table 4), the MFSa was most strongly negatively correlated with validation measures that assess the internalization of constraining social discourses related to gender, including the FIS-S (*r*=-.36), the SATAQ-IG (*r*=-.44), and the STSS-S (*r*=-.41). Regarding the three mental freedom factors (Table 5), the general resistance factor (M/GR) was most strongly correlated with silencing of one's voice (STSS-S: *r*=-.41), the appearance resistance factor (M/AR) was most strongly correlated

with the internalization of idealized appearance standards (SATAQ-IG: r=-.72), and the comportment resistance factor (M/CR) was most strongly correlated with a measure of collusion with the internalization of stereotyped behaviours for women (FIS-S: r=-.34).

Regarding SPRCSa (Table 4), as expected, the scale was most strongly negatively correlated with measures that assess exposure to prejudice and harassment, including the EDS (*r*=-.58), and SEQ-GH (*r*=-.44). Regarding the four factors of the SPRCSa (Table 5), as expected, the prejudice and harassment factor (SPRC/PH) was most strongly correlated with the two alternative measures of discrimination and harassment (EDS: *r* =-.59; SEQ-GH: *r* =-.48), though it was also similarly correlated with a measure of sexual and physical violations (SPAQ: *r* = -.46). The other notable correlation of SPRCS factors is the strong correlation between the freedom from appearance based social power (SPRC/ABSP) and the internalization of appearance standards (SATAQ-IG: *r* =-.58).

Overall, the pattern of correlations with measures of convergent validity provides initial support regarding the construct validity of the scales. In particular, PFSa and its safety factor were correlated, as expected, with alternative measures of violations. The MFSa and its three factors were most highly correlated with measures of the internalizations of constraining social discourses: general resistance with a measure of self silencing, appearance resistance with a measure of internalization of appearance standards, and comportment resistance with a measure of internalized behavioral stereotypes of femininity. The SPRCSa and its prejudice and harassment factor were most strongly correlated with alternative measures of prejudice and harassment. However, there were a few exceptions to these patterns. The safety factor of the PFSa was also negatively correlated in the strong range with measures of prejudice and harassment, indicating the documented vulnerability of individuals exposed to prejudice and harassment to experiences of violations (e.g., Piran, 2020). Similarly, the body disciplining factor of the PFSa and the appearance-based social power factor of the SPRCSa were also correlated in the moderate and strong, respectively, range with a measure of internalization of idealized appearance standards, likely representing a similar focus on appearance standards.

3.2.5. Incremental Validity. We tested the incremental validity of factors in the three domains of social experiences for which we had alternative measures that addressed similar constructs. The PFSa includes a factor (P/SF) that assesses safety. We aimed to assess whether this safety factor would predict the experience of embodiment above and beyond the variance accounted for by two alternative measures of violations: a measure of Sexual and Physical Abuse (the SPAQ) and a measure of sexual harassment (the SEQ-USA). SPAQ and SEQ-USA were entered in Step 1 into a hierarchical multiple regression equation predicting the experience of embodiment, and P/SF was entered in Step 2. The final model was significant ($F(3,386) = 29.10$, R^2=.18, p<.001, ΔR^2 = .083). The statistically significant increment in R^2 at step 2 of 8.3%, supported the incremental validity of the safety factor over the other two measures of safety.

The MFSa includes a general resistance factor (M/GR) that assesses social conditions that support or restrict the development of an assertive and critical voice. We aimed to assess whether this factor would predict the experience of embodiment above and beyond the variance accounted for by the STSS-S, a measure the assesses the silencing of one's voice. The overall model was significant ($F(2,377) = 82.43$, R^2=.30, p<.001, with M/GR uniquely adding 14% to the prediction of the variance of the experience of embodiment over and above STSS-S (i.e., ΔR^2 =.14, p<.001).

The MFSa also includes an appearance resistance factor (M/AR) that assesses social conditions that enhance or inhibit the development of resistance towards appearance pressures. We aimed to assess whether this factor would predict the experience of embodiment above and beyond the variance accounted for by the SATAQ-IG, a measure that assesses the internalization of appearance pressures. The SATAQ-IG was entered in Step 1 into a hierarchical multiple regression equation predicting the experience of embodiment and the M/AR was entered in step 2. The final model was significant ($F(2,386) = 92.74$, R^2=.32, p<.001, M/AR ΔR^2 = .02, p<.001). Although, statistically significant, the increment in R^2 at step 2 was 2%.

The third factor of the MFSa, the comportment resistance factor (M/CR), addresses social conditions that enhance or suppress resistance towards social stereotypes of femininity, expecting

women to act 'docile' and demure. We assessed incremental validity in two different ways. First, we aimed to assess whether this factor would predict the experience of embodiment above and beyond the variance accounted for by the STSS-S, a measure that assesses the silencing of one's voice, as the silencing of one's voice is related to acting demure. The overall model was significant ($F(2,378) = 56.98$, $R^2=.23$, $p<.001$, with the M/CR variable uniquely adding 7% of the variance (i.e., $\Delta R^2 =.07$, $p<.001$). The statistically significant addition supported the incremental validity of the comportment resistance factor. The FIS-S measures adherence to stereotypic femininity ideology in terms of both appearance and comportment. We aimed to assess whether the combination of the appearance resistance factor (M/AR) and the comportment resistance factor (M/CR) of the MFSa would predict the experience of embodiment above and beyond the variance explained by the FIS-S, a measure of adherence to stereotypic femininity ideology in appearance and comportment, and the SATAQ-IG that assesses the internalization of appearance pressures. The FIS-S and SATAQ-IG were entered in Step 1 into a hierarchical multiple regression equation predicting the experience of embodiment and M/AR and M/CR were entered in Step 2. The final model was significant ($F(4, 384,xx) = 61.79$, $R^2=.39$, $p<.001$,$\Delta R^2 =.059$, $p < .001$). The statistically significant increment in R^2 at step 2 of 5.9% supported the incremental validity of M/AR and M/CR over the FIS-S and SATAQ-IG.

The SPRCSa includes one factor that assesses exposure to prejudice and harassment (SPRC/PH). We aimed to assess whether this factor of exposure to prejudice and harassment would predict the experience of embodiment above and beyond the variance accounted for by two alternative measures of exposure to prejudice and harassment: a measure of exposure to discrimination (the EDS), and a measure of exposure to gender harassment (the SEQ-GH). The EDS and SEQ-GH were entered in Step 1 into a hierarchical multiple regression equation predicting the experience of embodiment and the SPRC/PH was entered in Step 2. The final model was significant ($F(3,387) = 75.37$, $R^2=.37$, $p<.001$, SPRC/PH $\Delta R^2=.14$, $p<.001$). The statistically significant increment in R^2 at step 2 of 14% supported the incremental validity of SPRC/PH.

To summarize, the findings support the incremental validity of the safety factor (P/SF) of the

PFSa, the general resistance factor (M/GR), the appearance resistance factor (M/AR), and the comportment resistance factor (M/AR) of the MFSa, as well as the prejudice and harassment factor (SPRC/PH) of the SPRCSa.

Overall, this study provided information regarding the derived factor structure of the PFSa, MFSa, and SPRCSa, which aligned with the qualitative findings of the mixed-method research program on social factors associated with the experience of embodiment. It also provided initial support regarding the internal consistency, construct and convergent validity of the PFSa, MFSa, and SPRCSa, as well as incremental validity of several factors of these scales. The next study sought to examine the stability of the factor structure.

4.0 Study 2: Consistency of Factor Structure

Study 2 aimed to replicate and test the factor structures described in Study 1 with a new community-based sample by conducting a confirmatory factor analysis (CFA). This involved testing several competing CFA models. The first model (Model 1) involved a single factor model for each of the three scales' items to test whether all their respective items can be captured by a single total score. The second model (model 2) was a higher order model with 6 factors identified for PFSa, 4 factors for MFSa, and 4 factors for SPRCSa (as delineated in Tables 1-3, respectively). This higher order model is consistent with a subscale conceptualization whereby the factors represent subscales, and the higher order factor captures the correlations between the factors. A third model (model 3) involved testing the expected number of factors without a higher factor, should a higher order model show poor fit. We hypothesized that the CFAs would support the factor structures described in Study 1.

4.1. Method

4.1.1. Participants and procedure. The study included 376 cisgender women (*M*age = 34.52; *SD* = 9.84) who were recruited from various areas in the United Kingdom via an online-survey platform. Participants, ages 18-55, described their ethnic identity as Asian or Asian British (4.8%), Black, Black British, Caribbean or African (5.6%), Multiple ethnic (3.8%), White (85.5%), or other (0.3%). One

participant self-described as Middle Eastern (0.3%). Most participants (85.3%) did not report a significant health issue at the time of study completion. Participants described their sexual orientation as asexual (0.5%), bisexual (8.3%), bisexual panromantic (0.3%), demisexual (0.3), heterosexual/straight (85.4%), lesbian/gay (2.4%), pansexual (1%), unsure (0.5%), and other (1%). Parental education was used as a proxy to assess social class background (Erola, Jalonen, & Lehti, 2016). About half, 44.4%, of participants had a father whose highest educational qualification was at or above undergraduate university level; the equivalent proportion for maternal qualifications at this level was 23.6%. For comparison, 47% of UK adults aged 16-64 had a level 4 QSF qualification in 2020-21 or the equivalent of first year undergraduate education ('education and training', 2021). This indicates that the educational level of participants' parents was broadly similar to, or slightly below, the UK average.

Ethical approval was obtained from both Newcastle and Durham University Ethics Committees. Study advertisements invited participants to take part in a study that aimed at furthering an understanding about how women feel about their bodies and how different factors such as social experiences and body awareness affect women's relationship with their body. Recruitment took place via Prolific (https://www.prolific.co) and only UK-based women matching the age range with English as their native language were invited to take part. Those who completed the study package were offered compensation at an hourly rate of £7.50. The data of three women who completed the surveys were excluded resulting in a final sample size of 373. One of these participants failed two attention check items embedded in the surveys; the others showed questionable response patterns (i.e., selecting the same response for all items, only choosing one or two response options throughout).

4.1.2. Statistical analysis. Each CFA model was run using the lavaan package (Rosseel, 2012) for structural equation modeling. Path diagrams for Model 2 for the three scales are included in Appendix A. The models were all estimated using a robust diagonally weighted least squares (WLSMV) estimator on Pearson correlations. The WLSMV estimator was deemed most appropriate for these data because the items did not follow a multivariate normal distribution (see e.g., Flora & Curran, 2004; Li, 2016). The rate of missing data for the PFSa and SPRCSa were 1.19% and 0.73%, respectively. The

MFSa had no missing data. Due to the low degree of missing data and to maintain consistency with the approach used in the previous EFA analyses, we used pairwise deletion in all CFA models. The following model fit statistic cut-offs were considered indicative of a good fitting model: CFI $\geq$ .95, RMSEA $\leq$ .08, SRMR $\leq$ .08.

4.2. Results and Discussion

4.2.1. Confirmatory factor analyses. Confirmatory factor analyses were conducted for PFSa, MFSa, and SPRCSa.

4.2.1.1. Model fit of the CFA models for PFSa. The one factor model (Model 1) demonstrated poor fit for PFSa ($\chi^2(275) = 1371.24$, $p < .001$ (Scaling factor = 4.85), CFI = .570, RMSEA = .104 with 90% CI [.098, .109], SRMR = .131). PFSa higher order model (Model 2) demonstrated poor fit as well ($\chi^2(269) = 910.84$, $p < .001$ (Scaling factor = 4.46), CFI = .748, RMSEA = .080 with 90% CI [.074, .086], SRMR = .096). Upon examining the loadings, correlations, modification indices, and residuals, the poor fit stemmed from two places: the correlation structure between the 6 factors was inconsistent (i.e., some correlations were low while others were moderate to high), and several of the items demonstrated high cross loadings with multiple factors. Consequently, a higher order factor was not statistically supported so we examined a correlated 6 factor model (Model 3) next.

Model 3 was in closer proximity to the model fit cut-offs, but still demonstrated suboptimal model fit statistics ($\chi^2(260) = 732.74$, $p < .001$ (Scaling factor = 3.96), CFI = .814, RMSEA = .070 with 90% CI [.064, .076], SRMR = .077. Given the close proximity to the model fit cut-offs we investigated the residual covariance matrix for the model and found that the largest residual pertained to cross-loadings of items 2, 6, 7, 9, 13, and 15. While all these items correlated most highly with items in their own original factors derived through EFA in Study 1 (delineated in Table 1), they also cross-loaded on other factors in this confirmatory study. A closer scrutiny of these items revealed that, most commonly, these items were phrased in a general way that would explain such cross-loadings. Item 6, “In my social environment I have felt free and uninhibited”, part of the body disciplining (P/BD) factor, alludes to a general experience of freedom, while other items on this factor address very specific pressures to alter

their physical appearance. The same applies to three items in the safety factor (P/SF). Items 7 and 9 ("I have experienced unwanted sexually harassing behaviors (e.g., body touched, my skirt flipped"; "I have experienced verbal sexual harassment (e.g., someone calling me sexual names, commenting on my appearance in a sexual manner)"), referring to sexual harassment experiences that are common, and item 13 ("I have felt neglected (by family/partner/community/society), do not refer specifically to the experience of safety, unlike similar items in Fitzgerald et al.'s (1995) sexual harassment scale. The cross-loading found with item 2 ("Others (e.g., parents, teachers, partners) have supported me in being as active as I wanted to be", part of the physical activities (P/PA) factor, likely relates to the similarity of its phrasing to items that are part of the care of the body factor (P/CB) that focuses on others' help in taking care of the body. This item needs to be revised such that it is more similar to other items in the physical activities factor. We include initial revisions of items 2, 6, 7, 9, 13, and 15 in the Notes section of Table 1. However, for this study, we removed these items, and re-examined model fit. These changes improved the fit statistics such that the RMSEA and SRMR were well within our model fit thresholds, but the CFI was slightly below the .95 the cut-off. Specifically, the model fit statistics were $\chi^2(137) = 239.65$, $p < .001$ (Scaling factor = 3.37), CFI = .931, RMSEA = .045 with 90% CI [.035, .054], SRMR= .05. Despite the slightly low CFI, we believe that this model fits the data reasonably well. Further statistical details for each item and factor are included in Table 6.

4.2.1.2. Model fit of the CFA models for MFSa. The one factor model (Model 1) demonstrated poor fit for MFSa ($\chi^2(90) = 842.12$, $p < .001$ (Scaling factor = 2.61), CFI = .463, RMSEA = .150 with 90% CI [.141, .159], SRMR = .147). Higher order model fit stats (model 2) were suboptimal as the CFI was slightly below the .95 cutoff ($\chi^2(87) = 211.94$, $p < .001$ (Scaling factor = 1.85), CFI = .911, RMSEA = .062 with 90% CI [.052, .073], SRMR = .057). We therefore examined the residual matrix and found that, after accounting for the shared latent variable, two items were highly correlated at r =.62 (items 2 and 3). The wording of these two items is very similar (item 2: "I have learned that being physically strong conflicts with being a girl/woman"; item 3: "I have learned that being powerful (at home/work/social groups) conflicts with being a girl/woman"). When we slightly revised the model to

allow for a residual correlation between them, the model fit statistics are excellent, supporting the three factor and higher order structure ($\chi^2(86) = 119.71$, $p = .01$ (Scaling factor = 1.84), CFI = .976, RMSEA= .032 with 90% CI [.017, .046], SRMR = .042). The statistical details for the items and factors for the higher order model are included in Table 7.

4.2.1.3. Model fit of the CFA models for SPRCSa. The one factor model (Model 1) demonstrated poor fit for SPRCSa ($\chi^2(209) = 1127.77$, $p < .001$ (Scaling factor = 3.62), CFI = .686, RMSEA = .109 with 90% CI [.103, .115], SRMR = .114). Higher order model fit stats (model 2) were suboptimal as the CFI was slightly below the .95 cutoff ($\chi^2(205) = 487.46$, $p < .001$ (Scaling factor = 3.30), CFI = .904, RMSEA = .061 with 90% CI [.054, .068], SRMR = .066. We therefore examined the residual matrix and found that after accounting for the shared latent variable, two items still were highly correlated at $r = .69$ (items 2 and 3). The wording of these two items is very similar (Item 2: "I have experienced teasing/harassment/discrimination (related to, for example, gender, financial status, ethno-cultural background, sexual orientation, health/(dis)ability, other)"; Item 3: "I have experienced teasing/harassment/discrimination related to my appearance (e.g., physical features, skin colour, clothes)"). When we slightly revised the model to allow for a residual correlation between the two items, the model fit statistics improved although the CFI was still sub-optimal, $\chi^2(204) = 429.80$, $p < .001$ (Scaling factor = 3.26), CFI = .923, RMSEA = .055 with 90% CI [.047, .062], SRMR = .061. Given the close proximity to the model fit cut-offs, we investigated the residual covariance matrix for the model and found that the largest residual pertained to cross-loadings of item 5 of the prejudice and harassment factor (SPRC/PH: "I have been exposed to verbal discrimination that has made me feel uncomfortable in my body (e.g., called fat, whore, bitch, racial slur, etc.)"). We therefore removed item 5 and fit stats were excellent (CFI of .96, RMSEA of .04, SRMR of .05). The statistical details for the items and factors in the higher order model are included in Table 8.

Overall, the confirmatory factor analysis supported the consistency of the factor structure of the PFSa, MFSa, and SPRCSa. In addition, the confirmatory factor analyses supported a higher model for the MFSa and SPRCSa, but not for the PFSa. These results are also in line with the results regarding a higher level factor in Study 1 with the Canadian sample. We plan to pursue further psychometric investigations of the three scales with revisions to six PFSa items, and, possibly, to one item in the SPRCSa. Note, however, that the correlations of PFSa original and revised factor scores were very high (total: r=.96; safety (P/SF): r=.94; physical activities (P/PA): r=.96; body disciplining (p/BD): .91).

The SPRCs original and a revised total and prejudice and harassment factor (SPRC/PH) scores were virtually identical at *r*=.995.

4.2.2. Internal consistency reliability coefficients. Cronbach's alpha and McDonald's omega coefficients were .85 and .93 for MFSa and .90 and .92 for SPRCSa, respectively; no reliability coefficients are provided for the PFSa, since the CFA did not support the presence of a higher order general PFSa factor. These values support the internal consistency of the MFSa and SPRCSa. The Cronbach's alpha and McDonald's omega coefficients for the PFSa factors were .80 and.82 for safety (P/SF), .64 and .68 for physical activities (P/PA), .58 and .62 for movement (P/MV), and .71 and .73 for care of the body (P/CB). Coefficients were not calculated for body disciplining (P/BD) and sexual desire (P/SD) as these factors had only two items. The Cronabach's alpha and McDonald's omega coefficients for the three MFSa factors were .87 and .90 for general resistence (M/GR), .83 and.87 for appearance resistance (M/AR), and .78 and .87 for comportment resistance (M/AR), respectively. The Cronbach's alpha and McDonald's omega coefficients for the four SPRCSa factors were .84 and.89 for prejudice and harassment (SPRC/PH), .83 and .90 for empowering relational connections (SPRC/ERC), .81 and .85 for appearance-based social power (SPRC/ABSP), and .85 and .85 for gender equity (SPRC/GE), respectively. Overall, while results for the PFSa factors of safety (P/SF) and care of the body (P/CB) were good to acceptable, respectively, the results for the physical activities and movement factors (.68 and .62 Mcdonald's omega, respectively) were relatively low. Results for the seven factors of the MFSa and SPRCSa scales were very good. The lower reliability coefficients of PFSa factors in the confirmatory study, compared with Study 1, likely reflect the exclusion of particular items from the PFSa scale. Following the planned revisions of the PFSa, in particular, we aim to conduct further studies of internal reliabilities of PFSa factors.

5.0 Study 3: Test-Retest Reliability

This study aimed to assess the temporal stability of the PFS, MFS, and SPRCS through testing the test-retest reliability of their scores. We used a three-week interval between the two administrations of the tests, similarly to the interval used in the test-retest studies of measures that assess the quality of

the experience of living in the body (e.g., Body Appreciation Scale – 2: Tylka & Wood-Barcalow, 2015; Experience of Embodiment Scale: Piran et al., 2020). In line with the DTE, changes in experiences on the 13 factors of social conditions will affect changes in the quality of the experience of living in the body and would, therefore, follow a similar timeline.

5.1. Method

5.1.1. Participants and procedure. Ethics approval was obtained from the University of Toronto Ethics Committee. Women aged 18-45 were eligible to participate. Participants were 64 women, ages 18-45 (M = 29.49, SD = 4.68). They described their ethnic identity as Asian (9.4%), White (68.8%), and other (21.8%). Participants identified their sexual orientation as bisexual (3.1%), heterosexual (73.4 %), lesbian (9.4%), non-discriminate (1.6%), pansexual (4.7%), or queer (7.8%). Over half of the participants (53.1%) were students at the time of the study, and most (71.8%) were employed. Parental education was used as a proxy to assess social class background (Erola et al., 2016). Parental education of the sample was high, with 67.2% of fathers having completed a university education and 42.1 % of mothers, compared with the Canadian population-based percentage of 28.2% among adult Canadians (Statistics Canada, 2017).

Participants were recruited through email advertisements on two university campuses. Women aged 18-45 were eligible to participate. The recruitment material informed participants that the study involved the development of a scale about the way women live in their bodies. Participants completed the survey online. Participants were required to complete the measures of social experiences, in addition to a demographic questionnaire. They provided their email address at the end of the survey to be contacted to complete the study package again three weeks later. Study participants also created a unique identifier that they were informed would be used to connect their responses from the two time points. Participants who completed the study package were eligible to receive compensation in the form of a $20 gift card.

5.2. Results and Discussion

Descriptive statistics demonstrate that scores on the PFSa, MFSa, and SPRCSa changed very little across the three week time period (Table 9). The stability of the scales was supported with Pearson correlations for the total and subscale scores all demonstrating good to excellent test retest reliability as all correlations were over .75 (Table 9). We also calculated coefficients of internal reliability. Cronbach's alpha and McDonald's omega were at or above .82 and .88, respectively, for PFSa, MFSa, and SPRCSa during times 1 and 2. McDonald omega coefficients of 11 subscales were .80 or above at times 1 and 2. However, these coefficients were .68 and .72 for P/MV and .81 and .76 for P/GE at times 1 and 2, respectively. Internal reliabilities, therefore, ranged from very good to acceptable.

6. Overall Discussion

This paper describes the development and initial psychometric program of study of three measures of women's experiences in the social environment that are anchored in cisgender girls' and women's narratives about social experiences that have shaped the quality of their lives in their bodies (Piran, 2017). The present investigation relates to the adult form of the scales, referring to adult participants' ratings of current experiences in the social environment. The PFSa refers to physical experiences in the adult social environment, the MFSa addresses exposure in adulthood to dominant

social discourses, and the SPRCSa reflects experiences in adulthood of social power and relational connections with others and with communities. This focus on current experiences in adulthood relates to the developmental perspective of the DTE, whereby adult women continue to make important changes in their lives during adulthood that can affect their experiences of embodiment (Piran, 2017). The construction of these quantitative measures from qualitative narratives comprised a key component of the mixed-method research program on embodiment that followed a specific sequential qualitative-quantitative approach (Piran & Teall, 2012), involving the development of quantitative questionnaires based on qualitative narratives (Creswell et al., 2011). Such scales, in turn, provide the opportunity to test, confirm, and generalize qualitative findings, as well as enhance further knowledge development and transfer (Creswell et al., 2011). The overall goal of the mixed-method research program on embodiment was to develop a 'bottom-up' social theory of factors in the social environment that shape the experience of embodiment, anchored in cisgender girls and women's narratives, informed by both qualitative and quantitative research.

The psychometric study provided cross-method validation of the factors in the physical, mental, and social power and relational connections domains that have previously emerged as qualitative constructs in the study of girls and women's narratives about social factors that shaped their experiences of embodiment and that have provided the basis for the DTE (Piran, 2017). As described in this paper, two quantitative studies with women, one conducted in Canada and the other in the UK, with different distributions of ethnic heritages, yielded comparable factor structures. The study also provided initial support regarding the internal consistency, test re-test reliability, and construct validity of the scales, though internal consistency coefficients of two PFSa subscales were lower in the UK sample. The study also provided initial support regarding the incremental validity for the safety factor of the PFSa, the general, appearance, and comportment factors of the MFSa, and the prejudice and harassment factor of the SPRCSa, as they predicted the experience of embodiment above and beyond the variance accounted for by measures that assess theoretically similar constructs. Both the Canadian and UK studies indicated the presence of a higher order factor in the MFSa and the SPRCSa, as well as factors assessing

dimensions of this general factor. These results support the use of total scores of the MFSa and the SPRCSa, as well as of scores derived from their different factors. While the same six factors were found in the Canadian and UK studies, the results in both samples did not support the presence of a higher order factor in the PFSa. In the calculation of scores on the different factors of the PFSa, MFSa, and SPRCSa, we have used the mean score on each of these factors as this allows for comparisons of facilitative and adverse experiences in the social environment between the different factors.

The PFSa, MFSa, and SPRCSa contribute to the current body of knowledge in several ways. First, anchored in cisgender girls and women's narratives about experiences in the social environment that shaped their experiences of embodiment, the scales, and their derived factors, capture a broad range of social experiences. For example, the six quantitative factors of the PFSa address body safety (safety vs. violations), body disciplining (freedom vs. exposure), physical activities (joyful immersion vs. barriers), movement and actions in the public sphere (freedom vs. restrictions), care of the body (opportunities vs. barriers), and opportunities to engage in positive and attuned responses to sexual desire (exposure vs. barriers). In contrast, most explorations of physical experiences within the body image literature have focused on three of these areas: physical violations (e.g., Smolak & Murnen, 2002), physical activities (e.g., Campbell & Hausenblas, 2009), and, more recently, research on food deprivation (e.g., Becker, Middlemass, Taylor, Johnson, & Gomez, 2017) within the broader area of care of the body. Similarly, the MFSa includes three quantitative factors that address social experiences that either support or oppress the freedom of voice and of resistance towards oppressive views and stereotypes. In particular, the MFSa includes a general resistance factor as well as two factors addressing resistance to (vs. collusion with) femininity-related appearance and comportment pressures. In contrast, most studies on voice and resistance (vs. collusion) in the field of body image have focused on appearance-related pressures (e.g., Hausenblas et al., 2013; Schaefer et al., 2015), though a few studies have included the exploration of comportment-related pressures (e.g., Morrison & Sheahan, 2009; Piran & Cormier, 2005). In a similar vein, the four quantitative factors of the SPRCS address prejudice and harassment (freedom vs. exposure), non-appearance-based social power (access vs. barriers),

empowering relational connections with individuals and communities (access vs. barriers), and membership in a gender-equitable immediate social environment. In contrast, most studies that have examined the domain of social power and disenfranchisement have focused on one of these areas, namely: stigma and harassment (e.g., Bucchianeri, et al., 2014; Puhl et a., 2008; Tabaac., Perrin, & Benotsch, 2018). The PFSa, MFSa, and SPRCSa, therefore, capture and quantify experiences in the social environment that, to date, have not comprised foci of study in relation to body image.

A second contribution of the PFSa, MFSa, and SPRCSa is the opportunity to study integrated sociocultural models of body image development. Notably, by capturing the range of protective and related risk factors addressed by the DTE, the scales allow for the quantitative testing of the theory in line with the overall goal of the mixed-method research program on embodiment (Piran & Teall, 2012). Yet, researchers may be interested in studying specific components of the DTE within and across domains. For example, regarding the social power domain, researchers could study the buffering effects on body image of empowering relational connections or of non-appearance-related sources of social power within the context of exposure to harassment. Similarly, across domains, researchers could, for example, examine the buffering effects on body image of having an assertive and critical voice within the context of harassment or a history of body violations.

A third contribution of the PFSa, MFSa, and SPRCSa relates to the DTE focus on intersectionality (Piran, 2017). As Piran (2017) elaborates, each of the factors of these scales (e.g., safety, care of body, harassment) is shaped by the intersection of dimensions of social locations. The scales and their derived factors, therefore, provide a specific lens through which intersectionality and embodiment can be studied. Researchers may choose to study the associations of specific sites of intersection of social locations with protective and risk factors. Further, such research could also help clarify the cumulative effect on body image of several protective (and related risk) factors at specific intersections of social locations.

Overall, then, the PFSa, MFSa, and SPRCSa, and their related factors, provide researchers with opportunities to study the impact of a broader range of experiences in the social environment on embodiment and related body image measures, including experiences that have received less research

attention to date. They further allow the study of integrated social theories of body image and of the impact of intersecting dimensions of social location on specific protective and related risk factors. Interestingly, study participants often commented that they found completing the three scales educational in that it expanded their insights about their body journeys. We plan to examine the possibility of utilizing the scales in clinical situations since the exploration of the complex social environment provides therapists with the opportunity to provide clients with validation of otherwise commonly silenced experiences (Piran, 2017).

6.1. Limitations and Future Research

This is the initial program of study of the psychometric properties of the PFSa, MFSa, and SPRCSa and further studies of their factor structure, reliability, and validity, are advisable. The four studies reported in this paper included only cisgender Canadian and British women, and samples included a majority of White (pilot, Study 2, and Study 4) and Asian (Study 1) participants, while other ethnic groups were not adequately represented. Canadian, but not British, participants also reported on higher percentages of parental higher education compared to the general population. In particular, further study of the scales should take place among women with a range of ethnic identities and social classes, adolescent, younger, and older and adolescent women, transgender women, women with a range of sexual orientations, women with disabilities, and clinical groups. While the PFSa, MFSa, and SPRCSa scales are intercorrelated, their correlations with their corresponding validation measures tended to be higher than the correlations of the other two scales with these validation measures.

However, further study of discriminant validity of these scales is needed. Further, in the present study, the array of measures used to study the validity of the scales was limited by the overall time required by participants to complete the battery of tests. Future studies should include, in particular, not only measures of adverse social experiences, but also measures of facilitative social experiences, such as the Body Acceptance by Others scale (Tylka & Homan, 2015; Swami et al., 2021). In addition, individuals' descriptions of gender identities have expanded especially during the past 10 years. Our qualitative

research program took place between 2001-2016 and the quantitative program between 2014-2022. While we have found consistency in our findings over time, it is possible that, currently, participants may describe their gender identities differently.

Another issue relates to the valence of the items of the different quantitative factors. As described in the Method section, in constructing the items, we looked for the most common narrative(s) on each descriptive theme; at times the most common themes addressed facilitative and at other times, adverse, experiences. For example, the most common narratives related to safety involved the breach of safety rather than descriptions of experiences of safety. In examining this pattern of responses during the qualitative analyses (Piran, 2017), we found that the most common themes often reflected dominant and widely-disseminated social discourses (mores, values) that were most accessible to participants. In order to keep the quantitative items as 'experience-near' as possible, we decided not to temper with these narratives by changing the valence of items; such processes may involve shifts in associated cognitive processes and could, possibly, alter psychometric properties of scales (Suárez-Alvarez et al., 2018). Consequently, several quantitative factors are reversed scored in order to have all factors uniformly range in a continuum from higher values, representing facilitative social conditions, to lower values representing adverse social conditions. While reverse scoring is not an uncommon approach in the field, such as the use of reverse scoring on the Self Compassion Scale (Neff, 2003) and the Body Image Acceptance and Action Questionnaire (Sandoz, Wilson, Merwin, & Kellum, 2013), conceptual questions may be raised about the meaning of reverse scores (e.g., Webb, Wood-Barcalow, & Tylka, 2019).

The present quantitative investigation comprised a component of a large scale mixed-method research program. In line with the qualitative research program results, after deriving the initial factors utilizing EFA in Study 1, we conducted a second study whereby we tested, utilizing CFA, a hierarchical model. In line with the DTE (Piran, 2017), the hierarchical model posits that scale items load on subscales, that, in turn, load on a general factor. As described above, results of the CFA supported the presence of general factors in the mental and social power and relational connections domains. We recognize that this is the first program of research of these scales and that subsequent studies may opt to,

as has been the case with the research program on the Self-Compassion Scale (Neff, 2003), to explore the factor structure of these scales utilizing other theoretical models (such as bifactor models: e.g., Neff, Whittaker, & Karl, 2017) or statistical approaches (bifactor analyses with exploratory structural equation modeling: e.g., Rakhimov, Realo & Tang, 2022).

Continued studies with the scales can further inform possible revisions. Based on the results of the present investigations, we are planning to enhance the focus of items that cross-loaded on more than one factor in the confirmatory study likely due to their general phrasing, as described earlier in this paper in relation to the PFSa (see Table 1 for recommended minor revisions to specific items of the PFSa). Further, the PFSa factor addressing opportunities to engage in positive and attuned responses to sexual desire includes only two items and we would likely add another item to this factor. In addition, internal consistency coefficients on two factors of the PFSa, specifically physical activities and freedom of movement in the public sphere, were relatively low in Study 2 where participants age range was 18-55, while they were within the acceptable range in Studies 1 and 3, where participants age range was 18-45. Further study is needed to examine the psychometric qualities of these two factors among older women. Other possible revisions of the scales relate to the content areas they currently cover compared with the qualitative inquiries. For example, the MFSa addresses social conditions related to the development of an assertive voice and to resistance towards, or compliance with, femininity-related appearance and comportment discourses. However, as Piran (2017) describes, constraining social discourses that shape embodiment exist in relation to all dimensions of social location, besides those related to inhabiting a woman's body. While we had a very large pool of narratives related to the latter, the pool of items related to specific discourses associated with other dimensions of social locations (e.g., specific heritages), was smaller. This is an important area for further study. In a similar vein, the gender equity factor of the SPRCSa is narrower in breadth than the 'communities of equity' construct described by Piran (2017), which includes equity in relation to varied dimensions of social location (and their intersections). We plan to expand the measure in the future to reflect this broader emphasis. Another factor that needs broadening is the freedom of movement in the public sphere of the PFSa, where we aim to include possible challenges to such freedom related to varied social locations (in addition to gender). This is the first study of these scales, and we anticipate that accumulated research with different samples will inform possible further content-related revisions of the scales.

Lastly, while we may add items to the PFSa, MFSa, and SPRCSa, an additional path in revising

the scales could involve shortening other aspects of these scales, to enhance their use in research. As new data accumulates in different research centers about the scale, we may pursue such a psychometric investigation. Such work will likely involve revisiting the challenge of item redundancy. Of note, we encourage researchers to contact the first author for updates as to the progress of the abbreviated versions as well as permission to use our scales. We are also currently completing reports about the adolescent and childhood versions of the scales, whereby adult participants report retrospectively on their experiences during adolescence and childhood.

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Table 1: Items and Factor Solutions for the Adult Physical Freedom Scale (PFSa)

Qualitative Constructs (Piran, 2017)	Quantitative Factors (%; ω)	Items	PFSa Factors						
			P/SF	P/BD	P/PA	P/MV	P/CB	P/SD	h^2
Body Ownership: Physical Safety	P/SF (15%; .89)								
	7*	I have experienced unwanted sexually harassing behaviors (e.g., body touched, my skirt flipped)[a]	**0.77**	0.11	-0.11	-0.07	0.09	-0.07	0.67
	8*	I have felt pressure to engage in sexual activities that I was not comfortable with (e.g., kissing, unwanted touching, giving a blowjob)	**0.67**	0.05	-0.03	0.00	0.13	0.02	0.52
	9*	I have experienced verbal sexual harassment (e.g., someone calling me sexual names, commenting on my appearance in a sexual manner) [a]	**0.68**	0.14	-0.05	-0.05	0.15	-0.23	0.62
	10*	I have experienced sexual violation (e.g., unwanted touching, rape)	**0.69**	-0.13	-0.02	-0.01	0.01	0.15	0.47
	11*	I have been physically violated (e.g., hit, slapped, pushed, kicked)	**0.63**	-0.11	0.03	0.08	-0.14	0.12	0.39
	12*	Events in my life have made me feel scared in my body	**0.58**	0.04	0.15	0.11	-0.11	0.16	0.45
	13*	I have felt neglected (by family/partner/community/society) [a]	**0.55**	0.07	0.23	0.16	-0.03	0.07	0.50
	15*	I have felt unsafe in my physical environment/surroundings/social environment [a]	**0.46**	0.08	0.17	0.09	0.01	0.05	0.33
	22*	I have been negatively labelled/punished/harassed for personal choices/decisions I made about my sexual activity/interests/behaviors (e.g., called prude/slut)	**0.62**	-0.02	0.08	0.02	-0.07	-0.06	0.38
Body Ownership: Body Disciplining	P/BD (6%; .71)								
	4*	There have been strong pressures in my social environment to look "feminine" (e.g., thin, sexualized, neat, groomed, no body hair).	-0.03	**0.66**	0.02	0.07	-0.01	0.00	0.46
	5*	I have felt constant pressure to meet idealized standards of appearance in my social environment (e.g., related to weight, hair colour/texture, skin tone)	0.03	**0.82**	0.00	0.01	-0.05	0.05	0.69
	6	In my social environment, I have felt free and uninhibited in my body [a]	0.05	**0.39**	0.26	-0.03	0.11	0.04	0.31
Physical Engagement: Physical Activities	P/PA (8%; .76)								
	1	I have had the opportunity to engage in physical activities that have helped me feel confident in my physical abilities	-0.06	0.08	**0.47**	-0.03	0.03	0.02	0.30
	2	Others (e.g., parents, teachers, partners) have supported me in being as active as I wanted to be [a]	0.08	0.02	**0.48**	-0.02	0.16	0.01	0.26
	3	I have engaged in enjoyable physical leisure activities	0.01	0.05	**0.62**	-0.07	-0.03	0.06	0.39
	14	My family/social circles have engaged in activities that made me feel joy in my body (e.g., dance, music, hiking, outdoor picnics)	-0.04	-0.03	**0.56**	0.07	0.13	0.01	0.40
	20	I have had the opportunity to engage in activities (e.g., sports, play, yoga, meditation, massage) that have helped me feel immersed/connected in my body	-0.09	0.01	**0.50**	0.01	0.17	-0.02	0.34

Physical Engagement: Movement	P/MV (6%; .72)								
	16*	I have been more restricted in selecting friends/dating than boys/men I know	-0.01	0.01	0.01	**0.66**	0.05	-0.06	0.44
	17*	As a girl/woman, I have had less freedom to engage in activities in public settings than boys/men (e.g., walk/play outside, go to bars/clubs, use public facilities for sports)	0.07	0.04	0.06	**0.71**	-0.04	-0.10	0.53
	18*	I was not encouraged to be in touch with my sexual desires (e.g., due to morality/religion, control)	-0.07	0.05	-0.10	**0.63**	0.10	0.17	0.47
Care-of-Body Practices	P/CB (5%; .69)								
	19	Significant women in my life have modeled and/or have encouraged me to engage in self-care	0.06	-0.08	0.22	0.01	**0.39**	0.16	0.35
	21	I have received useful information from a trusted person that has helped guide me with respect to living in a girl's/woman's body (e.g., information about puberty, staying active while menstruating, sex, pregnancy)	0.07	-0.03	0.12	0.08	**0.64**	0.02	0.53
	23	I have received information (e.g., from parents, teachers, doctors, friends) that helped me make wise and informed decisions involving my health.	0.07	-0.03	0.05	0.04	**0.53**	0.18	0.40
Bodily Desires	SD (4%; -[b])								
	24	In my sexual experiences I have felt that my wishes have been considered and respected.	0.18	0.00	0.07	-0.02	0.02	**0.56**	0.40
	25	Positive intimate/sensual/sexual experiences have helped me to be more in tune with and aware of my body.	-0.07	0.12	0.03	0.00	0.14	**0.65**	0.50

Note: P/SF = Physical domain/Safety; P/PA = Physical domain/Physical Activities; P/MV = Physical domain/Movement; P/BD = Physical domain/Body Disciplining; P/CB = Physical domain/Care of Body; P/SD = Physical domain/Sexual Desire; All composites are mean scores to allow for comparison amongst domains with a different number of items.

(%; ω) = (percent variance on PFS explained by the factor; McDonalds' omega for the factor)

*items that are reverse-scored

h^2 is the communality; factor loadings over 0.30 are in bold

[a]We have made minor revisions to specific items and recommend using these revised items: Item 2: I have received support from others (e.g., parents, teachers, partners) in being as active as I wanted to be; Item 6: In my social environment, I have felt free of external pressures to alter my body; Item 7: I have experienced unwanted sexually harassing behaviors (e.g., body touched, my skirt flipped) that made me feel unsafe; Item 9: I have experienced verbal sexual harassment (e.g., someone calling me sexual names, commenting on my appearance in a sexual manner) in a way that made me feel unsafe; Item 13: Neglect by family/partner/community/society has made me feel unsafe; Item 15: I have felt unsafe in my physical environment

[b] P/SD has only 2 items, which disallows the calculation of reliability coefficients

Pairwise deletion used *N* per correlation varied from 397 to 412

Table 2: Items and Factor Solutions for the Adult Mental Freedom Scale (MFSa)

Qualitative Constructs	Quantitative Factors	Items	MFS Factors			
(Piran, 2017)	(%; ω)		M/GR	M/AR	M/CR	h^2
Critical Stance/Protection	M/GR (18%; .87)					
	1	I have been encouraged to follow my dreams/passions in life (e.g., interests, career goals, leisure activities)	**0.64**	0.02	-0.01	0.41
	4	I have had opportunities to make my voice heard in groups (e.g., classroom, family, work) when I didn't agree with what was said	**0.64**	0.04	-0.06	0.43
	5	I have been encouraged to express my emotions, including anger	**0.57**	-0.02	0.09	0.37
	6	I have been encouraged to act in an assertive manner	**0.54**	-0.12	0.13	0.34
	7	In my social environment I have been valued for reasons other than my appearance	**0.53**	-0.02	0.05	0.30
	8	I have been supported in having views and perspectives that were different from people around me	**0.62**	0.02	-0.02	0.38
	9	I have been encouraged to act in line with what I believed in and what I am passionate about	**0.76**	0.02	-0.03	0.56
Femininity - Appearance:	M/AR (12%; .82)					
Woman's Body as a Deficient Object:	12*	The images of girls and women that I have seen on TV/movies/magazines/books have contributed to my feeling poorly about myself	0.03	**0.67**	0.01	0.46
	13*	I have felt that my body should look like a model's body	0.03	**0.61**	-0.04	0.37
	14*	As a girl/woman I have learned that my body is more acceptable when I modify it from its natural state (e.g., straighten hair, shave/wax/pluck body hair, perfume body).	0.02	**0.62**	-0.05	0.37
	15*	As a girl/woman I have learned that my body should be groomed/presented in a "feminine"/sexualized way (e.g., apply nail polish, put on make-up, wear tight clothing).	-0.06	**0.67**	0.10	0.48
Femininity: Comportment	M/CR (11%; .78)					
Woman as Docile	2*	I have learned that being physically strong conflicts with being a girl/woman	-0.03	0.02	**0.66**	0.43
	3*	I have learned that being powerful (at home/work/social groups) conflicts with being a girl/woman	0.00	-0.03	**0.76**	0.56
	10*	I have learned that as a girl/woman it was important that I not act too "dominant" (e.g., act nice, proper, quiet, considerate, demure)	0.09	0.06	**0.56**	0.39
	11*	I have learned that, as a girl/woman I should control my appetites/desires	0.11	0.24	**0.37**	0.31

Note: M/GR = Mental domain/General Resistance; M/AR = Mental domain/Appearance Resistance; M/CR = Mental domain/Comportment Resistance.
EFA was estimated using OLS with oblimin rotation
(%; ω) = (percent variance on MFS explained by the factor; McDonalds' omega for the factor)
*items that are reverse-scored
h^2 is the communality; factor loadings over 0.30 are in bold

Pairwise deletion used. *N* per correlation varied from 398 to 412

Table 3: Items and Factor Solutions for the Adult Social Power and Relational Connections Scale (SPRCSa)

Qualitative Constructs (Piran, 2017)	Quantitative Factors (%; ω)	Items	SPRCS Factors				
			SPRC/ PH	SPRC/ ABSP	SPRC/ ERC	SPRC/ GE	h^2
Prejudice/ Harassment	SPRC/PH (15%; .89)						
	2*	I have experienced teasing/harassment/discrimination (related to, for example, gender, financial status, ethno-cultural background, sexual orientation, health/(dis)ability, other)	**0.83**	-0.05	-0.05	0.04	0.67
	3*	I have experienced teasing/harassment/discrimination related to my appearance (e.g., physical features, skin colour, clothes)	**0.81**	0.02	-0.03	-0.02	0.64
	4*	I have felt uncomfortable in public places (e.g., pools, streets, schools) because of different personal characteristics (e.g., gender, ethno-cultural, weight/other appearance features, disability/health status, financial status)	**0.46**	0.23	0.05	0.00	0.36
	5*	I have been exposed to verbal discrimination that has made me feel uncomfortable in my body (e.g., called fat, whore, bitch, racial slur, etc.)	**0.65**	0.02	0.06	-0.03	0.45
	6*	I have felt that I had no social power	**0.36**	0.04	0.26	0.16	0.37
	7*	My gender/ethno-cultural background/financial status/ sexual orientation has restricted the things I have been able to do	**0.41**	0.15	0.10	0.17	0.40
	8*	I have felt scared or worried to share with others certain aspects about myself (e.g., sexual abuse, sexual orientation, religious beliefs, etc.)	**0.41**	0.09	0.09	0.19	0.36
	9*	I have been verbally and/or emotionally abused	**0.48**	-0.02	0.13	0.11	0.34
	15*	I have felt less powerful and/or privileged than others	**0.34**	0.18	0.12	0.24	0.43
Appearance-based Social Power	SPRC/ABSP (13%; .83)						
	16*	I have been preoccupied with how to alter my body to make it more acceptable/desirable (e.g., make up, exercise, clothing, straightening hair, hair colour, plastic surgery)	0.16	**0.58**	-0.08	-0.04	0.46
	17*	My sense of power in the world is strongly tied to how I physically attractive/desirable I feel.	0.04	**0.74**	0.02	-0.08	0.55
	18*	I'm afraid to lose my social power in the world if I don't fit idealized standards of appearance for girls/women	-0.08	**0.78**	0.00	0.06	0.45
	19*	I have worried about losing social power as I age because of gaining weight, stretch marks, wrinkles or other natural changes related to puberty, pregnancy, menopause, older age.	0.01	**0.58**	0.05	0.05	0.39
Empowering Relational Connections	SPRC/ERC (13%; .89)						
	1	Important people in my life have made me confident and proud of my body	-0.05	0.15	**0.51**	0.08	0.36
	10	I have felt the sense of belonging to a community.	0.13	0.01	**0.66**	-0.09	0.46
	11	I have been able to be part of a social group(s) that I desired being part of	0.03	0.02	**0.74**	-0.08	0.53
	12	I have been able to talk about personal and emotional matters with someone I trust	0.00	-0.08	**0.74**	-0.03	0.49

	13	I have had close, loving, and supportive relationships (e.g., with family, friends, partner)	-0.07	-0.02	**0.69**	0.12	0.51
	14	I have had positive role models (e.g., strong, confident, powerful, respectful of their body).	-0.09	0.12	**0.57**	0.17	0.46
Membership in Equitable Communities	SPRC/ GE (10%; .84)						
	20*	The needs and wishes of the boys/men members of my family have been prioritized over girls/women members	0.04	-0.04	0.00	**0.76**	0.59
	21*	Women in my household felt limited/frustrated/depressed because they were not able to follow their aspirations	0.05	0.01	0.07	**0.70**	0.56
	22*	Men in my household have had more power than women in my household	0.00	0.02	-0.04	**0.84**	0.69

Note: SPRC/PH = Social Power Relational Connections domain/Prejudice and Harassment; SPRC/ERC = Social Power Relational Connections domain/Empowering Relational Connections; SPRC/ABSP = Social Power Relational Connections domain/Freedom from Appearance-based Social Power; SPRC/GE = Social Power Relational Connections domain/Gender Equity. All composites are mean scores to allow for comparison amongst domains with a different number of items.
(%; ω) = (percent variance on SPRCS explained by the factor; McDonald's' omega for the factor)
*items that are reverse-scored
h^2 is the communality; factor loadings over .30 are bolded
Pairwise deletion used. *N* per correlation varied from 400 to 412

Table 4
Means, Standard Deviations, Alphas, and Pearson Correlations among the Measures of the Study

	1	2	3	4	5	6	7	8	9	10
1. PFSa	.85									
2. MFSa	.70**	.81								
3. SPRCSa	.77**	.71**	.89							
4. SEQ-USA	-.41**	-.25**	-.36**	.91						
5. SPAQ	-.45**	-.34**	-.43**	.51**	.78					
6. FIS-S	-.23**	-.36**	-.29**	.15**	.08	.87				
7. SATAQ-IG	-.33**	-.44**	-.40**	.22**	.19**	.30**	.96			
8. STSS-S	-.33**	-.41**	-.36**	.14**	.11*	.26**	.18**	.88		
9. EDS	-.48**	-.38**	-.58**	.41**	.37**	.17**	.23**	.25**	.78	
10. SEQ-GH	-.40**	-.28**	-.44**	.72**	.41**	.11*	.22**	.15**	.45**	.89
M	3.57	3.40	3.41	2.35	0.21	1.78	3.21	2.49	2.96	2.53
SD	0.59	0.63	0.74	0.89	0.27	0.68	1.07	0.85	2.48	0.85
skew	-0.54;	-0.04	-0.24	0.58	1.31	0.87	-0.37	0.07	0.67	0.25
kurtosis	0.14	-0.18	-0.52	-0.02	0.82	0.46	-0.66	-0.19	-0.31	-0.33

Note: PFSa = Physical Freedom Scale Adulthood; MFSa = Mental Freedom Scale Adulthood; SPRCSa = Social Power Relational Connections Scale Adulthood; SEQ-USA = Sexual Experiences Questionnaire – Unwanted Sexual Attention subscale; SPAQ = Sexual and Physical Abuse Questionnaire; FIS-S = Femininity Ideology Scale – Stereotypic Image and Activities subscale; SATAQ-IG = Sociocultural Attitudes Towards Appearance Questionnaire - Internalization General subscale; STSS-S = Silencing the Self – Silencing the Self Subscale; EDS = Everyday Discrimination Scale; SEQ-GH = Sexual Experiences Questionnaire – Gender Harassment subscale;
All variable composites are mean scores.
Cronbach's alpha for each measure is presented along the diagonal.
Pairwise deletion was used so the *N* per correlation ranges from 380 to 412.

Table 5

Means, Standard Deviations and Pearson Correlations of DTE-derived Social Factors with Validation Measures

	P/SF	P/PA	P/MV	P/BD	P/CB	P/SD	M/GR	M/AR	M/CR	SPRC/PH	SPRC/ERC	SPRC/ABSP	SPRC/GE
SEQ-USA	-.56**	-.08	-.05	-.15**	-.14**	-.00	-.13*	-.22**	-.21**	-.39**	-.12*	-.28**	-.20**
SPAQ	-.59**	-.10	-.05	-.11*	-.20**	-.10*	-.25**	-.29**	-.18**	-.46**	-.21**	-.23**	-.28**
FIS-S	-.10*	-.20**	-.18**	-.17**	-.15**	-.14**	-.25**	-.20**	-.34**	-.18**	-.25**	-.34**	-.16**
SATAQ-IG	-.24**	-.20**	-.09	-.46**	-.10	-.15**	-.12*	-.72**	-.19**	-.32**	-.20**	-.58**	-.08
STSS-S	-.24**	-.21**	-.19**	-.13*	-.20**	-.22**	-.42**	-.16**	-.27**	-.30**	-.30**	-.25**	-.23**
EDS	-.52**	-.18**	-.24**	-.18**	-.17**	.01	-.27**	-.24**	-.31**	-.59**	-.32**	-.33**	-.38**
SEQ-GH	-.52**	-.07	-.11*	-.20**	-.10	-.15**	-.10*	-.26**	-.28**	-.48**	-.11*	-.31**	-.28**
M	3.81	3.84	3.06	2.39	3.94	3.82	3.94	2.39	3.46	3.23	4.00	2.78	3.59
SD	0.95	0.78	1.19	0.90	0.86	0.97	0.75	0.96	1.00	0.98	0.82	1.04	1.22

Note: P/SF = Physical domain/Safety; P/PA = Physical domain/Physical Activities; P/MV = Physical domain/Movement; P/BD = Physical domain/Body Disciplining; P/CB = Physical domain/Care of Body; P/SD = Physical domain/Sexual Desire; M/GR = Mental domain/General Resistance; M/AR = Mental domain/Appearance Resistance; M/CR = Mental domain/Comportment Resistance; SPRCS/PH = Social Power Relational Connections domain/Prejudice and Harassment; SPRCS/ERC = Social Power Relational Connections domain/Empowering Relational Connections; SPRCS/ABSP = Social Power Relational Connections domain/Freedom from Appearance-based Social Power; SPRCS/GE = Social Power Relational Connections domain/Gender Equity. All composites are mean scores to allow for comparison amongst domains with a different number of items.
SEQ-USA = Sexual Experiences Questionnaire – Unwanted Sexual Attention subscale; SPAQ = Sexual and Physical Abuse Questionnaire; FIS-S = Femininity Ideology Scale – Stereotypic Image and Activities subscale; SATAQ-IG = Sociocultural Attitudes Towards Appearance Questionnaire - Internalization General subscale; STSS-S = Silencing the Self – Silencing the Self Subscale; EDS = Everyday Discrimination Scale; SEQ-GH = Sexual Experiences Questionnaire – Gender Harassment subscale;
Pairwise deletion was used so the *N* per correlation ranges from 380 to 412.
*$p < .05$; **$p < .01$

Table 6

PFS 6- factor model, Proportion of Variance Explained, and Factor Correlations

	factor	loading	R^2	Factor Correlations					
Item 1	P/PA	.27	.07						
Item 3	P/PA	.66	.44		P/PA	P/BD	P/SF	P/MV	P/BC
Item 14	P/PA	.69	.48	P/PA					
Item 20	P/PA	.67	.46	P/BD	.16				
Item 4	P/BD	.74	.54	P/SF	.09	.29			
Item 5	P/BD	.97	.94	P/MV	.25	.38	.56		
Item 8	P/SF	.77	.59	P/BC	.70	.15	.18	.23	
Item 10	P/SF	.74	.55	P/SD	.47	.08	.36	.29	.50
Item 11	P/SF	.53	.28						
Item 12	P/SF	.71	.50						
Item 22	P/SF	.59	.35						
Item 16	P/MV	.60	.36						
Item 17	P/MV	.65	.42						
Item 18	P/MV	.46	.21						
Item 19	P/BC	.66	.44						
Item 21	P/BC	.67	.45						
Item 23	P/BC	.71	.50						
Item 24	P/SD	.79	.62						
Item 25	P/SD	.60	.35						

Note: P/SF = Physical domain/Safety; P/PA = Physical domain/Physical Activities; P/MV = Physical domain/Movement; P/BD = Physical domain/Body Disciplining; P/CB = Physical domain/Care of Body; P/SD = Physical domain/Sexual Desire;
Loading is the standardized loading, R^2 is the proportion of variance accounted for by the factor. Factor correlations of .15 or higher are statistically significant at $p < .05$
N=373

Table 7

MFS Higher Order Model Factor Loadings and Proportion of Variance Explained

	factor	loading	R^2		*MF Loading*	R^2
Item 1	M/GR	.63	.40			
Item 4	M/GR	.70	.49	M/GR	.52	.27
Item 5	M/GR	.73	.53	M/CR	.82	.68
Item 6	M/GR	.68	.47	M/AR	.53	.28
Item 7	M/GR	.68	.47			
Item 8	M/GR	.74	.55			
Item 9	M/GR	.79	.62			
Item 2	M/CR	.42	.17			
Item 3	M/CR	.51	.26			
Item 10	M/CR	.77	.60			
Item 11	M/CR	.82	.67			
Item 12	M/AR	.72	.52			
Item 13	M/AR	.84	.70			
Item 14	M/AR	.66	.44			
Item 15	M/AR	.72	.52			

Note: M/GR = Mental domain/General Resistance; M/AR = Mental domain/Appearance Resistance; M/CR = Mental domain/Comportment Resistance.
Loading is the standardized loading, MF loading represents the standardized loading on a higher order MFS factor, R^2 is the proportion of variance accounted for by the factor. Factor correlations of .15 or higher are statistically significant at $p < .05$.
N=373

Table 8

SPRCS Higher Order Model Loadings and Proportion of Variance Explained

	factor	loading	R^2		*SPRC Loading*	R^2
Item 1	ERC	.68	.46			
Item 10	ERC	.66	.43	ERC	.61	.37
Item 11	ERC	.69	.48	PH	.90	.81
Item 12	ERC	.62	.39	ABSP	.63	.40
Item 13	ERC	.65	.42	GE	.70	.49
Item 14	ERC	.72	.51			
Item 2	PH	.58	.33			
Item 3	PH	.58	.33			
Item 4	PH	.64	.41			
Item 6	PH	.67	.45			
Item 7	PH	.71	.50			
Item 8	PH	.61	.37			
Item 9	PH	.63	.40			
Item 15	PH	.60	.36			
Item 16	ABSP	.64	.40			
Item 17	ABSP	.77	.60			
Item 18	ABSP	.77	.59			
Item 19	ABSP	.69	.48			
Item 20	GE	.82	.67			
Item 21	GE	.81	.66			
Item 22	GE	.80	.64			

Note: SPRCS/PH = Social Power Relational Connections domain/Prejudice and Harassment; SPRCS/ERC = Social Power Relational Connections domain/Empowering Relational Connections; SPRCS/ABSP = Social Power Relational Connections domain/Freedom from Appearance-based Social Power; SPRCS/GE = Social Power Relational Connections domain/Gender Equity.
Loading is the standardized loading, SPRC loading represents the standardized loading on a higher order SPRCS factor, R^2 is the proportion of variance accounted for by the factor. Factor correlations of .15 or higher are statistically significant at $p < .05$. N=373

Table 9

Test-Retest Means, Standard Deviations, and Reliability (N = 64)

	Time 1	Time 2		
	M (*SD*)	*M* (*SD*)	*r* [95% CI]	Cohen's *d*
PFSa Total	3.72 (0.58)	3.74 (0.56)	.96 [.93, .97]	.16
P/SF	3.53 (1.01)	3.55 (0.96)	.94 [.90, .96]	.07
P/BD	3.71 (1.03)	3.59 (0.95)	.84 [.75, .90]	.21
P/PA	3.98 (0.73)	3.97 (0.75)	.90 [.85, .94]	.03
P/MV	3.35 (1.06)	3.43 (1.02)	.92 [.87, .95]	.18
P/CB	3.98 (0.94)	3.97 (0.92)	.87 [.80, .92]	.17
P/SD	4.23 (0.73)	4.29 (0.78)	.75 [.62, .84]	.12
MFSa Total	3.35 (0.57)	3.40 (0.58)	.92 [.86, .95]	.22
M/GR	4.05 (0.62)	4.07 (0.68)	.90 [.83, .94]	.06
M/AR	2.08 (0.93)	2.17 (1.00)	.90 [.84, .94]	.17
M/CR	3.38 (0.88)	3.46 (0.93)	.82 [.72,.89]	.16
SPRCSa Total	3.31 (0.63)	3.31 (0.66)	.95 [.91, .97]	.10
SPRC/PH	3.05 (0.91)	3.10 (0.92)	.96 [.93, .97]	.20
SPRC/ABSP	2.56 (0.97)	2.64 (1.01)	.93 [.88, .96]	.17
SPRC/ERC	4.00 (0.74)	3.95 (0.81)	.87 [.78, .92]	.08
SPRC/GE	4.10 (0.99)	3.96 (1.03)	.88 [.81, .93]	.23

Note: P/SF = Physical domain/Safety; P/PA = Physical domain/Physical Activities; P/MV = Physical domain/Movement; P/BD = Physical domain/Body Disciplining; P/CB = Physical domain/Care of Body; P/SD = Physical domain/Sexual Desire; M/GR = Mental domain/General Resistance; M/AR = Mental domain/Appearance Resistance; M/CR = Mental domain/Comportment Resistance; SPRCS/PH = Social Power Relational Connections domain/Prejudice and Harassment; SPRCS/ERC = Social Power Relational Connections domain/Empowering Relational Connections; SPRCS/ABSP = Social Power Relational Connections domain/Freedom from Appearance-based Social Power; SPRCS/GE = Social Power Relational Connections domain/Gender Equity.
r is the Pearson correlation for the (sub)scale across time, and Cohen's *d* is the standardized mean difference from Time 1 to Time 2.
N=64

Highlights

The Physical Freedom Scale – adulthood (PFSa) covers a range of physical experiences

The Mental Freedom Scale – adulthood (MFSa) addresses exposure to social stereotypes

The Social Power and Relational Connection Scale (SPRCSa) addresses social power

The PFSa, MFSa, and SPRCSa demonstrate good reliability and validity among women

The PFSa, MFSa, and SPRCSa can be used to test integrated sociocultural theories

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