Exposure to thin and non-thin bodies elicits ‘feeling fat’: Validation of a novel state measure

Samantha Wilson, PhD, Adrienne Mehak, BA, Sarah E. Racine, PhD

Department of Psychology, McGill University, 2001 avenue McGill College, Montréal, QC,
Canada, H3A 1G1

Author Note

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Correspondence concerning this article should be addressed to Samantha Wilson, Department of Psychology, McGill University, 2001 McGill College, Montréal, Québec, Canada (H3A 1G1). Contact: samantha.wilson@mail.mcgill.ca

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Abstract

'Feeling fat' refers to the subjective experience of carrying excess weight and relates to severity of eating pathology. Despite research suggesting that 'feeling fat' fluctuates across contexts, this construct is almost exclusively assessed in terms of frequency or as a trait. Examining state 'feeling fat' in response to external stimuli can inform us of the nature of this construct. In an experimental study, 290 community women were exposed to five categories of affective (pleasant, aversive, and neutral) and body (thin and non-thin) images in quasi-random order. Self-Assessment Manikin (SAM) valence and arousal rating scales as well as a novel SAM 'feeling fat' scale were rated for each image. Theoretically-relevant constructs (i.e., trait 'feeling fat', thin-ideal internalization, body dissatisfaction, eating pathology) were also measured. Body images elicited greater state 'feeling fat' than affective images, with images of non-thin bodies producing higher state 'feeling fat' than thin bodies. Positive correlations were observed between state 'feeling fat' in response to thin and all variables of interest, whereas associations between these variables and 'feeling fat' in response to non-thin images were small or non-significant. The development of a state measure of 'feeling fat' allows for the investigation of triggers of this bodily experience and will facilitate future research.

Keywords: 'feeling fat'; body image; measurement; Self-Assessment Manikin

Highlights

- 'Feeling fat' is greater in response to body images than to affective images
- Images of non-thin bodies elicited the strongest 'feeling fat'
- Relations between 'feeling fat' and external variables differ by body image type
- The Self-Assessment Manikin (SAM) 'feeling fat' scale is a valid state measure
- SAM 'feeling fat' scale captures fluctuations in this bodily experience

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1. Introduction

‘Feeling fat’ is defined as the subjective experience of carrying excess weight that is not entirely correlated with objective body mass (Striegel-Moore et al., 1986; Tiggeman, 1996). This construct has been found to be an important facet of body image, distinct from other components such as over-evaluation of shape and weight (Linardon et al., 2018) and body dissatisfaction (Tiggeman, 1996). Network analyses have identified ‘feeling fat’ as among the most central eating disorder (ED) symptoms in clinical samples of adults (Christian et al., 2020; Elliott et al., 2020) and children/adolescents (Goldschmidt et al., 2018). These results are consistent with research indicating that ‘feeling fat’ is related to both ED symptom severity (Linardon et al., 2018; Messer & Linardon, 2021) and treatment outcome (Calugi et al., 2018). In non-clinical samples, ‘feeling fat’ has been associated with eating pathology and body dissatisfaction, as well as other factors relevant for EDs including perfectionism, low self-esteem, perceived pressure to be thin, and the tendency to engage in social comparison (Lam et al., 2002; Mehak & Racine, 2019; 2021; Pink et al., 2021; Streigel-Moore et al., 1986; Tiggeman, 1996).

Despite evidence highlighting the relevance of ‘feeling fat’ for eating pathology, the modest body of extant literature is limited by measurement issues. Most studies have measured ‘feeling fat’ using a single item from the Eating Disorders Examination-Questionnaire (EDE-Q; Calugi et al., 2018; Christian et al., 2020; Goldschmidt et al., 2020; Levinson et al., 2020; Linardon et al., 2018; Mehak & Racine, 2019; 2021; Messer & Linardon, 2021). However, the EDE-Q only assesses frequency of ‘feeling fat’ over the past 28 days. Other less-commonly used measures of ‘feeling fat’ (e.g., Body Attitudes Questionnaire-Feeling Fat subscale; BAQ-FF) ask participants about their typical experience of ‘feeling fat’ in response to various situations like

being unable to get one’s clothes on. While the EDE-Q item and BAQ-FF are adequate measures of general ‘feelings of fatness’, these assessments may not capture fluctuations in ‘feeling fat’ that are likely to occur across time and context.

Clinical descriptions of ‘feeling fat’ suggest that the intensity of this experience fluctuates independent of changes in body weight (Fairburn, 2008). Cognitive-behavioural therapy for EDs targets ‘feeling fat’ by identifying triggers of this experience, such as negative mood and events that increase bodily awareness (Fairburn, 2008). Consistent with clinical impressions, a recent qualitative study reported that negative sense of self, heightened bodily awareness, and the feeling of being out of control were thematically linked to ‘feelings’ of fatness (Major et al., 2019). Additionally, an early ecological momentary assessment (EMA) study found that ‘feeling fat’ was highest immediately before and after binge eating episodes and decreased following the use of compensatory behaviours (Powell & Thelen, 1996). Roth and Armstrong (1993) asked individuals about their ‘feelings’ of fatness in different situations and found that degree of ‘feeling fat’ differs across a variety of affective, body-relevant, and social contexts. Finally, a recent study found that individuals who reported greater alexithymia and perfectionism experienced increased ‘feeling fat’ when reading vignettes describing situations involving negative social comparison, but not other types of situations (Pink et al., 2021).

Taken together, clinical conceptualizations and initial research suggest that ‘feeling fat’ is a state that fluctuates based on internal and external circumstances. As such, research on ‘feeling fat’ would benefit from the development of a state measure capable of capturing the dynamic nature of this experience. The ‘State Feelings of Fat’ scale (Zhang et al., 2021) was recently developed to address some of these limitations. However, the 9-item format of this measure is cumbersome for use in experimental and EMA research requiring repeated assessment of

‘feeling fat’ in response to various situations and stimuli. In order to assess fluctuations in the experience of ‘feeling fat’ in real time, a quick and easily administered measure is necessary.

To respond to the need for brief and precise measurement in this area, the present experimental study developed and validated a one-item, pictorial measure of state ‘feeling fat’. Specifically, the Self-Assessment Manikin (SAM; Bradley & Lang, 1994), a widely-used assessment tool in experimental research, was adapted to measure ‘feelings’ of fatness and was used to assess fluctuations in this experience elicited by exposure to thin and non-thin images of women’s bodies. In addition to the benefits of a pictorial measure (e.g., reduced need for translation and modification for groups with lower literacy), the SAM ‘feeling fat’ scale can be used as a rapid, stand-alone measure and is easily integrated into studies using other SAM scales. While similar to visual analogue scales in terms of functionality, the SAM provides a visual representation of the construct, which may resonate with some individuals in a way not possible with traditional one-item measures. As women are disproportionately affected by EDs (Udo & Grilo, 2018) and ‘feeling fat’ has been primarily studied in this group, the experimenters chose to examine the experience of ‘feeling fat’ in a community sample of women. It was hypothesized that exposure to thin images would elicit greater state ‘feeling fat’ than would non-thin images or body-irrelevant stimuli, as ‘feeling fat’ has been associated with the tendency to engage in social comparison and sociocultural pressures to conform to the thin-ideal (Major et al., 2019; Pink et al., 2021; Roth & Armstrong, 1993; Striegel-Moore et al., 1986). It was also hypothesized that state ‘feelings’ of fatness in response to body images would be associated with trait ‘feeling fat’ and other theoretically related constructs including eating pathology, body dissatisfaction, and thin-ideal internalization. The development of a brief state measure of ‘feeling fat’ may allow for

more rigorous examination of the antecedents and consequences of this experience, contributing to our understanding of this important clinical construct.

2. Methods

2.1. Participants

Participants were recruited from Prolific, an online recruitment platform specifically designed for academic research (Palan & Schitter, 2018). Inclusion criteria: female; 18 to 50 years old; currently residing in either the United Kingdom, Canada, or the United States; ability to read and understand English. These criteria were specified on the Prolific website and were verified via demographic questions. Of the 321 participants recruited, 13 withdrew from the study immediately after signing up and 12 withdrew before completing the study. Partial completers were compensated proportionally for the amount of the study completed (full compensation was £5.63) and their data were deleted. Six additional participants were excluded from the analyses as they had multiple indicators of unreliable data (i.e., rapid completion time defined as 1 *SD* below the mean, failed attention check questions, image ratings wildly inconsistent with normative data).

The final sample ($N = 290$) included women ranging in age from 18 to 50 ($M = 28.70$, $SD = 7.85$) years. Most participants (87.2%) reported currently residing in the United Kingdom, with the remaining sample residing in the United States (7.9%) and Canada (4.8%). Participants primarily identified as White (78.3%), with 5.5% identifying as South Asian, 2.8% as Black, 2.4% as Chinese, 1.4% as Filipino, 0.7% as Hispanic or Latin American, 0.7% as Arab, 0.7% as West Asian, 0.3% as Korean, 0.3% as Japanese, 3.8% as multiracial, 2.8% as other, and 0.3% preferred not to indicate their ethnicity.

2.2. Stimuli

Three sets of images were created for the present study. Participants were randomly assigned to view one of the three image sets. This procedure allowed us to gather pilot rating data on a larger number of body images and was modelled off previous studies generating normative rating data for food images (Miccoli et al., 2014; 2016). Each image set was comprised of 60 images representing five image categories: thin bodies, non-thin bodies, aversive, pleasant, and neutral. Images were presented in quasi-random order such that neither two body images nor two images from the same affective category were presented consecutively.

2.2.1. Body images. Over 200 images of thin and non-thin female bodies were selected from the internet using the Google Images search engine (search terms included 'model' and 'plus-size model'). To be consistent with the other images used in this study (see below), only body images with a comparable image resolution were selected. Further, preference was given to images with a larger proportion of the body visible and that depicted women of colour (to increase the diversity of the images). Each participant viewed 12 images of 'thin' women and 12 images of 'non-thin' women during the picture-viewing task. All images were cropped to remove faces but were not otherwise edited. All of the images were front-facing and none depicted isolated body parts. Body images were matched across image sets using the following categories: race of model (i.e., White or Black); proportion of body visible (i.e., full-body versus torso-only); amount of clothing worn (i.e., underwear/swimsuit, both legs and arms mostly visible, legs or arms partially visible, fully covered [e.g., jeans, long shirt]); and presence or absence of tattoos. Participants were asked to rate each body image using a scale ranging from 1 to 9 (1 = *emaciated*, 3 = *thin*, 5 = *healthy*, 7 = *overweight*, 9 = *obese*; Dodd et al., 2017). As expected, across all image sets, thin images ($M(SD) = 2.93[.53]-3.39[.56]$) received significantly lower ratings on this scale than non-thin images ($M(SD) = 7.69[.64]-7.89[.68]$; $t_s = 48.2-50.12$; $p_s <$

.001). Internal consistency of these ratings was good for thin images ($\alpha s = .81-.85$) and excellent for non-thin images ($\alpha s = .90-.92$). Means and standard deviations for ratings of each body image are presented in Supplemental Tables 1 and 2.

2.2.2. Affective images. The International Affective Picture System (IAPS; Lang et al., 2008) is a database of approximately 1000 images. Participants viewed 12 aversive (6 threat, 6 disgust/mutilation), 12 pleasant (6 nurturant, 6 erotic), and 12 neutral (objects) IAPS images. Ratings of IAPS images were used as points of comparison for evaluating responses to body images. IAPS images were selected and then matched across image sets using normative data for valence and arousal ratings in women (Lang et al., 2008).

2.3. Measures

Cronbach's alpha values obtained for each measure in the present study are presented in Table 2.

2.3.1. Eating pathology. The Eating Disorder Examination-Questionnaire, short form (EDE-QS; Gideon et al., 2016) is a 12-item version of the widely used EDE-Q (Fairburn & Beglin, 1994). The EDE-QS assesses eating pathology in the last 7 days and produces a global score. In a large community sample of women, the EDE-QS demonstrated excellent internal consistency ($\alpha = .91$) and large correlations with the original EDE-Q in both women who reported an ED ($r = .82$) and those who did not ($r = .91$; Gideon et al., 2016).

2.3.2. Trait 'feeling fat'. The 13-item 'feeling fat' subscale of the Body Attitudes Questionnaire (BAQ; Ben-Tovim & Walker, 1991) was administered (example item: 'I feel fat when I wear clothes that are tight around the waist'). The BAQ-FF was chosen to measure 'feeling fat' at the trait level as it assesses this construct across diverse contexts providing more information than would a single-item measure. Moreover, this measure has demonstrated high

convergent validity with other measures of attitudes toward the body, including the Body Shape Questionnaire ($r = .81$; Ben-Tovim & Walker, 1991).

2.3.3. Body Dissatisfaction. The Body Shape Questionnaire, version 8C (BSQ-8C; Evans & Dolan, 1993) is an 8-item self-report questionnaire that assesses body dissatisfaction. This measure has demonstrated excellent internal consistency ($\alpha = .92$) and high convergent validity with the shape concern subscale of the EDE-Q (Welch et al., 2012).

2.3.4. Thin-ideal internalization. The 5-item 'Internalization: Thin/Low Body Fat' subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4; Schaefer et al., 2015) assesses thin-ideal internalization. This subscale has demonstrated good-to-excellent internal consistency (α s: .82-.91; Schaefer et al., 2015).

2.3.5. State measures. The Self-Assessment Manikin (SAM; Bradley & Lang, 1994) is a 9-point pictorial rating scale designed for rating IAPS images. In the present study, the valence (1 'unhappy' to 9 'happy') and arousal (1 'calm' to 9 'excited') scales were used. Additionally, a novel SAM 'feeling fat' scale was created (see Figure 1). The figure on the far left represents 'no feelings of fatness' (1) and the figure on the far right depicts 'extreme feelings of fatness' (9). 'Feelings' of fatness were defined for participants as 'feeling physically bigger or being more aware of parts of your body that you consider fat' (see Figure 1 for full rating instructions).

2.4 Procedure

The present study was approved by the Research Ethics Board at [institution redacted] and conforms to the Declaration of Helsinki ethical standards. The study was described on Prolific as: "An investigation of how women rate images that vary in emotional content, including images of women's bodies." Interested individuals completed the study through Qualtrics and provided informed consent. They read instructions for the picture-viewing task and

for using SAM scales to rate images. Understanding of the SAM rating procedure was verified via three multiple-choice questions; participants who responded incorrectly were redirected back to the instructions page. Participants were then randomized to one of three matched image sets. The picture-viewing task involved viewing 60 images for 6 seconds each. Participants then rated each image using the SAM valence, arousal, and 'feeling fat' scales. Subsequently, participants completed a battery of questionnaires. Participants were debriefed and provided with contact information for psychological resources.

3. Statistical Analyses and Results

Three separate within-subjects repeated-measures ANOVAs were conducted to determine whether SAM ratings of valence, arousal, and 'feeling fat' differed by picture type (pleasant, neutral, aversive, thin, non-thin). To account for potential differences across the three matched image sets, image set was entered as a between-subjects factor. A Greenhouse-Geisser correction accounted for sphericity violations for analyses of arousal and 'feeling fat', while a Huynh-Feldt correction was used for valence ratings, as the Greenhouse-Geisser epsilon value exceeded .75 (Verma, 2016). Levene's test indicated heteroscedasticity in the valence and 'feeling fat' models; thus, a heteroscedasticity-consistent standard error estimator (HC3) was applied (Hayes & Cai, 2007). A Sidak correction was applied to all analyses to account for familywise error.

Repeated-measures ANOVA results are presented in Table 1. SAM valence ratings of affective images followed the expected pattern (pleasant > neutral > aversive). Images of thin bodies were rated as significantly less pleasant than pleasant images but more pleasant than all other image categories. Non-thin images were rated as significantly more pleasant than aversive images and equivalent to neutral images. Statistically significant differences in arousal ratings were also observed across most image categories. Thin images received significantly higher

arousal ratings than images of non-thin bodies, and both types of body images received greater arousal ratings than neutral images. Finally, both types of body images elicited significantly greater levels of ‘feeling fat’ than each affective image type, with non-thin images receiving significantly higher ‘feeling fat’ ratings than thin images. The interaction between picture type and image set was statistically significant for valence ratings ($F[6.12, 877.84] = 3.49, p = .002, \eta_p^2 = .02$), but not for arousal ($F[5.32, 762.90] = 1.89, p = .09, \eta_p^2 = .01$) or ‘feeling fat’ ratings ($F[3.25, 466.75] = 2.12, p = .09, \eta_p^2 = .02$).

Means, standard deviations, and correlations between SAM ‘feeling fat’ ratings and theoretically-relevant constructs are reported in Table 2. ‘Feeling fat’ ratings in response to thin images were significantly positively correlated with all variables of interest. Surprisingly, SAM ‘feeling fat’ ratings in response to non-thin images were uncorrelated with trait ‘feeling fat’ and negatively correlated with SAM ‘feeling fat’ in response to thin images.

4. Discussion

In the present study, a state measure of ‘feeling fat’ was developed by adapting the SAM, a pictorial rating scale widely used in experimental research. We observed differences in subjective ‘feelings’ of fatness across image types, supporting the notion that ‘feeling fat’ is a state that can be influenced by external stimuli (e.g., Fairburn, 2008). Moreover, the SAM ‘feeling fat’ scale appears to capture fluctuations in this experience and may therefore improve measurement of this important clinical construct.

As hypothesized, state ‘feeling fat’ was greater in response to body images as compared to affective images. Additionally, ‘feelings’ of fatness were greater in response to non-thin rather than thin images. This result was unexpected given previous associations between ‘feeling fat’, social comparison, and pressure to conform to the thin-ideal (e.g., Pink et al., 2021; Striegel-

Moore et al., 1986). Further, this finding is at odds with previous results suggesting that exposure to non-thin body stimuli can elicit improved body satisfaction and perceptions of one's own body as smaller (Bould et al., 2018; Moreno-Dominguez et al., 2019). 'Feeling fat' in response to non-thin images may, however, reflect a desire to avoid becoming overweight, as opposed to the desire to attain thinness, manifested as internalized weight stigma (e.g., Mehak et al., 2018) and/or fear of becoming the overweight self (e.g., Wilson, 2020). This interpretation is consistent with findings directly linking 'feeling fat' to both fear of weight gain and fear of negative evaluation (Calugi et al., 2018; Levinson et al., 2020; Major et al., 2019). It is also important to note that non-thin images received 'neutral' valence ratings (i.e., around the scale midpoint and similar to neutral images) and low arousal ratings while receiving the highest 'feeling fat' ratings; this highlights the added value of measuring 'feeling fat' when seeking to understand the experience of body stimuli.

In line with hypotheses and past research, state 'feeling fat' in response to thin images was positively associated with trait 'feeling fat', eating pathology, body dissatisfaction, thin-ideal internalization, and BMI (Lam et al., 2002; Linardon et al., 2018; Major et al., 2019; Mehak & Racine, 2020; Striegel-Moore et al., 1986; Tiggeman, 1996). Relationships between state 'feeling fat' in response to non-thin images and these variables were either non-significant or smaller in magnitude. Interestingly, state 'feeling fat' ratings to thin and non-thin bodies were negatively correlated. These unexpected results may suggest a potential issue with the validity of the SAM 'feeling fat' scale, which should be investigated further in future research. That said, we hypothesize that this negative relationship points to individual differences in the types of stimuli that elicit 'feeling fat'. While the tendency to 'feel fat' in response to thin images relates to theoretically-relevant constructs, other unexamined constructs such as internalized weight stigma

or BMI may be more relevant to 'feeling fat' in response to non-thin bodies. This pattern of findings highlights the importance of measuring 'feeling fat' as a state; individual differences in the types of internal and external cues that trigger 'feeling fat' would not be evident when using a trait measure. In addition to continued examination of the triggers of 'feeling fat', future research should also evaluate how enduring state 'feelings' of fatness are and whether certain types of body stimuli elicit longer-lasting effects on 'feeling fat' than others.

The present study is strengthened by the use of an experimental design, a large sample size, the use of a validated measure of general 'feeling fat', the presentation of ecologically-valid images of women (i.e., images reflecting media content), and the inclusion of both thin and non-thin body types. Further, the development of a pictorial 'feeling fat' scale allows for a brief, one-item assessment of 'feeling fat' that is compatible with other SAM scales and circumvents linguistic barriers and literacy issues.

Limitations of the study include a lack of diversity in the sample as well as the exclusion of male participants and images of men. However, the gender-neutral nature of the SAM allows future studies to examine the experience of 'feeling fat' in men without requiring modification. Nonetheless, the use of such a gender-neutral figure in the SAM 'feeling fat' scale that does not highlight specific body parts or indicators of body size (e.g., thigh gap in women) may in some ways limit its ecological validity. This decision, however, was made to avoid triggering the experience of 'feeling fat' with the scale itself and to prevent unintended measurement of body dissatisfaction and/or perceptual experience of the body. Finally, we did not include a trait measure of social comparison, which may have helped refine our understanding of how the tendency to compare oneself to others potentially influences the degree of 'feeling fat' elicited in response to body images. For example, the tendency to engage in social comparison may

influence the relationship between BMI and state 'feeling fat' observed in the present study, as women at different body weights may relate differently to body stimuli.

Overall, the present study contributes to the study of 'feeling fat' through the development and validation of a one-item state measure of this construct. Differences in 'feelings' of fatness in response to different image types support the ability of the novel SAM 'feeling fat' scale to detect fluctuations in this experience across time and contexts. Associations between this scale and theoretically-relevant constructs also support the validity of this measure. The SAM 'feeling fat' scale will ideally contribute to research on this important clinical construct through the facilitation of future EMA and experimental studies that require repeated assessment of 'feeling fat'.

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Table 1

Results of within-subjects repeated-measures ANOVAs for SAM ratings of valence, arousal, and 'feeling fat'

	Pleasant	Aversive	Neutral	Thin	Non-thin	<i>F</i> (df)	η_p^2
SAM Valence						797.67 (3.06, 877.84)***	0.74
<i>M</i> (<i>SD</i>)	6.76 (0.96) ^a	2.27 (0.80) ^b	4.71 (0.75) ^c	5.41 (1.27) ^d	4.51 (1.33) ^c		
SAM Arousal						185.66 (2.66, 762.90)***	0.39
<i>M</i> (<i>SD</i>)	4.64 (1.73) ^a	4.54 (2.11) ^a	2.37 (1.41) ^b	3.63 (1.83) ^c	2.94 (1.67) ^d		
SAM FF						38.72 (1.63, 466.75)***	0.12
<i>M</i> (<i>SD</i>)	3.86 (1.68) ^a	3.88 (1.72) ^{ab}	3.81 (1.67) ^{ac}	4.34 (2.31) ^d	5.15 (2.50) ^e		

Note. SAM = Self-Assessment Manikin; FF = 'feeling fat'; η_p^2 = partial eta squared.

The SAM valence, arousal, and 'feeling fat' scales are rated from 1 (least) to 9 (greatest).

Differing alphabetic superscripts represent significant ($p < .05$) pairwise differences between image types.

*** $p < 0.001$

Table 2

Correlations and descriptive statistics for state 'feeling fat' in response to thin and non-thin images as well as trait 'feeling fat', eating pathology, body dissatisfaction, thin-ideal internalization, and body mass index

Measure	1	2	3	4	5	6	7
1. SAM FF-thin	-						
2. SAM FF-non-thin	-.24***	-					
3. BAQ-FF	.39***	.11	-				
4. EDE-QS	.34***	.13*	.72***	-			
5. BSQ-8C	.41***	.12*	.82***	.82***	-		
6. SATAQ	.25***	-.05	.47***	.58***	.55***	-	
7. BMI	.29***	.21***	.42***	.27***	.38***	.001	-
Mean	4.34	5.15	47.27	11.78	26.75	3.16	25.71
<i>SD</i>	2.31	2.50	12.27	7.70	10.62	1.03	7.78
α	.98	.98	.81	.88	.93	.83	-

Note. SAM FF-thin = Self-Assessment Manikin Feeling Fat scale in response to thin images; SAM FF-non-thin = Self-Assessment

Manikin Feeling Fat scale in response to non-thin; BAQ-FF = Body Attitudes Questionnaire, 'feeling fat' subscale; EDE-QS = Eating

Disorder Examination-Questionnaire, short version; BSQ-8C = Body Shape Questionnaire, version 8C; SATAQ = Sociocultural

Attitudes Towards Appearance Scale, version 4, 'Internalization: Thin/Low Body Fat' subscale; BMI = body mass index.

Greater scores indicate greater levels of 'feeling fat' (SAM-FF-thin, SAM-FF-non-thin, BAQ-FF), eating pathology (EDE-QS), body dissatisfaction (BSQ-8C), and thin-ideal internalization (SATAQ).

* $p < .05$; *** $p < .001$

Figure 1

Self-Assessment Manikin Feeling Fat Rating Scale and instructions

The last feeling that you will rate is the dimension of feeling of fatness (this can mean feeling physically bigger or being more aware of parts of your body that you consider fat) versus no feelings of fatness. At one extreme of the scale, you felt extreme feelings of fatness while viewing the picture. If you felt extreme feelings of fatness watching the picture, click on the figure at the right of the row. On the other end, if you did NOT feel any feelings of fatness, click on the figure at the left of the row. Use this scale to tell us how you felt while viewing the picture: if you felt extreme feelings of fatness or no feelings of fatness at all. As with the previous scales, you can represent intermediate levels of feelings of fatness by clicking on any of the other figures or the spaces between figures.

Note. Self-Assessment Manikin (SAM) scale adapted for the assessment of state 'feeling fat'. These instructions, which were written to mirror those of the existing SAM scales, were presented before the task began. During the task, the SAM 'feeling fat' scale was presented on its own after each image.