

## **Validation of the Social Appearance Anxiety Scale: Factor, Convergent, and Divergent Validity**

Cheri A. Levinson and Thomas L. Rodebaugh

*Assessment* published online 5 April 2011

DOI: 10.1177/1073191111404808

The online version of this article can be found at:  
<http://asm.sagepub.com/content/early/2011/03/09/1073191111404808>

---

Published by:



<http://www.sagepublications.com>

**Additional services and information for *Assessment* can be found at:**


**Email Alerts:** <http://asm.sagepub.com/cgi/alerts>

**Subscriptions:** <http://asm.sagepub.com/subscriptions>

**Reprints:** <http://www.sagepub.com/journalsReprints.nav>

**Permissions:** <http://www.sagepub.com/journalsPermissions.nav>

# Validation of the Social Appearance Anxiety Scale: Factor, Convergent, and Divergent Validity

Assessment  
XX(X) 1–7  
© The Author(s) 2011  
Reprints and permission: <http://www.sagepub.com/journalsPermissions.nav>  
DOI: 10.1177/1073191111404808  
<http://asm.sagepub.com>  


Cheri A. Levinson<sup>1</sup> and Thomas L. Rodebaugh<sup>1</sup>

## Abstract

The Social Appearance Anxiety Scale (SAAS) was created to assess fear of overall appearance evaluation. Initial psychometric work indicated that the measure had a single-factor structure and exhibited excellent internal consistency, test–retest reliability, and convergent validity. In the current study, the authors further examined the factor, convergent, and divergent validity of the SAAS in two samples of undergraduates. In Study 1 ( $N = 323$ ), the authors tested the factor structure, convergent, and divergent validity of the SAAS with measures of the Big Five personality traits, negative affect, fear of negative evaluation, and social interaction anxiety. In Study 2 ( $N = 118$ ), participants completed a body evaluation that included measurements of height, weight, and body fat content. The SAAS exhibited excellent convergent and divergent validity with self-report measures (i.e., self-esteem, trait anxiety, ethnic identity, and sympathy), predicted state anxiety experienced during the body evaluation, and predicted body fat content. In both studies, results confirmed a single-factor structure as the best fit to the data. These results lend additional support for the use of the SAAS as a valid measure of social appearance anxiety.

## Keywords

social appearance anxiety, social anxiety, fear of negative evaluation, validity, factor analysis

Individuals with social anxiety disorder experience many types of social fear. Fears such as social interaction anxiety, fear of scrutiny, and fear of negative evaluation have a long history of research as domains of social anxiety and have been assessed using measures such as the Social Interaction Anxiety Scale (SIAS), Social Phobia Scale (Mattick & Clarke, 1998), and the Brief Fear of Negative Evaluation Scale (BFNE; Leary, 1983). However, fear of negative evaluation of one's overall appearance has been less thoroughly examined, with most such research concentrating on social physique anxiety as measured by the Social Physique Anxiety Scale (E. A. Hart, Leary, & Rejeski, 1989). The Social Physique Anxiety Scale focuses on concerns about one's body form and structure (e.g., muscle tone and body proportions) and does not take into account other aspects of appearance such as hair, facial features, or complexion. Given the importance that society places on aspects of appearance beyond physique (e.g., Cunningham, 1998), it seems wise to examine fear of overall appearance evaluation.

The Social Appearance Anxiety Scale (SAAS; T. A. Hart et al., 2008) was created to assess this fear and was rationally derived based on current measures of social anxiety, body image dissatisfaction, and body dysmorphic disorder. Items were selected to assess a general construct of appearance anxiety rather than anxiety over specific aspects of

appearance (e.g., one's eyes or mouth). T. A. Hart et al. (2008) found initial support for a single-factor structure, as well as high test–retest reliability and internal consistency. They also found, in support of convergent validity, that the SAAS was positively associated with measures of social anxiety above and beyond measures of body dissatisfaction and depression. T. A. Hart et al. (2008) suggested that future work should further examine the factor validity of the SAAS in other samples, examine divergent validity, and assess convergent validity with additional measures. In the current studies, we examined the factor, convergent, and divergent validity of the SAAS in two samples of students. Moving beyond self-report alone, we incorporated a behavioral task that included measurements of body fat and body mass index (BMI). Overall, we hypothesized that the SAAS would exhibit an excellent factor structure, as well as excellent convergent and divergent validity.

<sup>1</sup>Washington University in St. Louis, St. Louis, MO, USA

## Corresponding Author:

Cheri A. Levinson, Department of Psychology,  
Washington University in St. Louis, 1 Brookings Drive,  
Campus Box 1125, St. Louis, MO 63130, USA  
Email: [Cherialevinson@wustl.edu](mailto:Cherialevinson@wustl.edu)

## Study 1

### Hypotheses

1. The SAAS will show an excellent single-factor structure.
2. The SAAS will correlate positively with neuroticism and negative affect and negatively with extraversion because these constructs correlate moderately with social anxiety (Bienvenu, Hettema, Neale, Prescott, & Kendler, 2007; Watson, 2005).
3. The SAAS will predict social anxiety over and above measures of neuroticism, negative affect, and extraversion.
4. The SAAS will exhibit excellent divergent validity with measures that are not theoretically related to social appearance anxiety (e.g., openness, agreeableness, and conscientiousness).

### Method

**Participants.** The participants were 323 students who were mostly White ( $n = 196$ , 61%) and female ( $n = 219$ , 68%), with a mean age of 19.00 years ( $SD = 1.07$ ). Other ethnicities reported included Asian or Pacific Islander ( $n = 78$ , 24%), Black ( $n = 25$ , 8%), multiracial ( $n = 17$ , 5%), Hispanic ( $n = 3$ , 1%), ethnicity not listed ( $n = 2$ , 1%), and American Indian ( $n = 1$ , 1%).

**Measures.** All self-report measures in Study 1 and Study 2 use Likert-type response scales.

The SAAS (T. A. Hart et al., 2008) is a 16-item measure developed to assess anxiety about being negatively evaluated by others because of one's overall appearance, including body shape. Example items from the SAAS are "I am concerned people would not like me because of the way I look" and "I get nervous when talking to people because of the way I look."

The SIAS (Mattick & Clarke, 1998) is a 20-item measure designed to assess social interaction anxiety: Items describe anxiety-related reactions to a variety of social interaction situations. Overall, research on the scale suggests good to excellent reliability and good construct and convergent validity (Heimberg & Turk, 2002), especially when the three reverse-scored items are omitted, as they are here (e.g., Rodebaugh, Woods, & Heimberg, 2007).

The BFNE (Leary, 1983) is a 12-item measure that assesses fear of negative evaluation, which is a central component of social anxiety. The BFNE correlates with measures of social anxiety and has excellent psychometric properties when the four reverse-scored items are excluded, as they are here (Rodebaugh et al., 2004).

The Mini-International Personality Item Pool (Donnellan, Oswald, Baird, & Lucas, 2006) is a 20-item short form measure of the five basic factors of personality: extraversion, neuroticism, agreeableness, conscientiousness, and

openness. It has been shown to have acceptable internal consistencies, in addition to good convergent, discriminant, and criterion-related validity with other Big Five measures (Donnellan et al., 2006).

The Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988) is a 20-item measure of positive (e.g., *excited*) and negative (e.g., *scared*) activated affect. Watson et al. (1988) report good internal consistency and convergent and discriminant validity. The trait (*to what extent you generally feel this way*) instructions were given. In the current study, we used the negative affect scale (NA) because of its strong relationship with social anxiety.

**Data analytic procedure.** Because of the limited response options of the SAAS scale, we considered the items to be categorical for the purpose of the confirmatory factor analysis (CFA). We used the robust weighted least squares estimator, implemented in the Mplus program (Version 6.1, Muthén & Muthén, 1998-2010), which is appropriate for categorical data. Global model fit was evaluated using the following: (a) comparative fit index (CFI; Bentler, 1990), (b) Tucker-Lewis incremental fit index (TLI; Tucker & Lewis, 1973), and (c) root mean square error of approximation (RMSEA; Steiger & Lind, 1980). The magnitudes of these indices were evaluated with the aid of recommendations by Hu and Bentler (1999), which are considered appropriate for weighted least squares estimator. Essentially, for the CFI and TLI, values of .90 and above were considered adequate, whereas values of .95 or above were considered very good; for the RMSEA, values of .09 and below were considered adequate and .05 or less were considered very good.

**Validity analyses.** To test convergent and divergent validity, we explored the relationship between the SAAS and personality traits, negative affect, fear of negative evaluation, and social interaction anxiety using correlation matrices, tests of correlated correlations, and multiple regression.

### Results and Discussion

**Confirmatory factor analysis.** We first tested the original single-factor structure of the 16 items of the SAAS and obtained reasonable fit (CFI = .97, TLI = .96, RMSEA = .12). The RMSEA, which is a measure of the variance in items not accounted for by the model, did not meet criteria for acceptable fit. We fit several models to isolate ways in which the model might fail to account for variance in the items. In the first model, we tried to improve fit by removing the only item about feeling comfortable with one's appearance (Item 1), which did not result in change in any fit index. Four SAAS items refer to *worry*, raising the possibility of specific shared error variance among these items. If not modeled, such correlated error variance would lead to higher RMSEA values. Adding correlated error terms among these items did not improve the fit statistic (RMSEA = .13). Finally, we tested a single-factor structure in Caucasian participants in case

**Table 1.** Study 1: Zero-Order Correlations—Social Appearance Anxiety, Convergent, and Divergent Measures

	Convergent Measures						Divergent Measures			Mean (SD)
	SAAS	SIAS	BFNE	NA	Neur	Extra	Open	Agree	Consc	
SAAS	.94	.50**	.60**	.37**	.34**	-.17**	-.02	.00	-.09	31.03 (13.98)
SIAS		.92	.63**	.42**	.23**	-.53**	-.07	-.20**	-.07	22.27 (11.93)
BFNE			.93	.37**	.35**	-.19**	-.07	.03	-.04	23.24 (7.41)
NA				.88	.51**	-.09	-.07	-.18**	-.28**	19.40 (6.52)
Neur					.77	.00	-.05	.00	-.14*	11.00 (3.48)
Extra						.79	.00	.27**	-.18**	12.76 (3.54)
Open							.71	.05	-.05	15.13 (2.75)
Agree								.73	.05	16.60 (2.51)
Consc									.78	14.26 (3.43)

Note. SAAS = Social Appearance Anxiety Scale; SIAS = Social Interaction Anxiety Scale; BFNE = Brief Fear of Negative Evaluation Scale; NA = negative affect scale; Neur = Neuroticism; Extra = extraversion; Open = openness; Agree = agreeableness; Consc = conscientiousness. Cronbach's alpha is on the diagonal. \* $p < .05$ . \*\* $p < .001$ .

additional variance in item responses might be related to ethnicity, but we did not detect improved fit.

To test if an alternative factor structure would exhibit better fit, we divided the data set into random halves, conducted an exploratory factor analysis, and then ran a CFA in the second half of the data. A two-factor structure suggested Items 2 and 3 would load on a separate factor. However, this two-factor structure did not improve fit (CFI = .97, TLI = .97, RMSEA = .12). Because the three-factor structure was unclear (i.e., only one item loaded on the third factor, and that item also loaded on a second factor), we did not confirm this factor structure in the second half of the sample. Finally, based on the exploratory factor analysis, we ran a CFA with a single-factor structure, with a correlated error term for Items 2 and 3. These items refer to feeling “nervous” and “tense,” and it seemed plausible to us that the similar wording in successive items could lead to the specific shared error variance among these items. We found an improved fit for this single-factor structure (CFI = .97, TLI = .97, RMSEA = .11); however, the RMSEA fit statistic was still not adequate. For subsequent analyses in this study, we continued to use the original 16-item single-factor structure (i.e., we scored the measure as a single-factor measure) because the original one-factor model in these data retained the best fit we could find (with excellent fit for the CFI and TLI) and obtained excellent fit in its initial psychometric evaluation (T. A. Hart et al., 2008).

**Zero-order correlations.** Table 1 displays the convergent and divergent relationships between the SAAS, BFNE, SIAS, NA, and Big Five personality traits. The hypothesized convergent and divergent relationships with the SAAS were found. The SAAS correlated strongly with the measures of social anxiety (SIAS and BFNE) and had medium correlations in the expected direction with NA, neuroticism, and extraversion. In regard to divergent relationships, the SAAS did not significantly correlate with openness, agreeableness, or conscientiousness.

**Correlated correlations.** As expected, the SAAS was related to NA, neuroticism, and extraversion. We tested if these convergent zero-order relationships significantly differed from the divergent relationships (Meng, Rosenthal, & Rubin, 1992). The differences between the correlation between the weakest convergent relationship and the SAAS (extraversion  $r = -.17$ ) and the corresponding correlation with two of the three divergent measures were not statistically significant, although the difference from the correlation with openness approached significance (openness:  $z = 1.91$ ,  $p = .056$ ; conscientiousness:  $z = 1.13$ ,  $p = .258$ ). All other convergent relationships differed significantly from the three divergent relationships ( $z$ s  $> 2.53$ ,  $p$ s  $< .011$ ). Thus, the SAAS showed robust convergent validity with the measures most related to social anxiety.

**Multiple regression analyses.** To test if the SAAS could significantly predict social anxiety over and above neuroticism, NA, and extraversion, we entered the SAAS, neuroticism, NA, and extraversion into one regression as predictor variables of the SIAS and BFNE. SAAS (part  $r = .38$ ,  $p < .001$ ) significantly predicted the SIAS over and above extraversion (part  $r = -.52$ ,  $p < .001$ ), neuroticism (part  $r = .00$ ,  $p = .243$ ), and trait NA (part  $r = .29$ ,  $p < .001$ ). The SAAS (part  $r = .46$ ,  $p < .001$ ) also significantly predicted BFNE over and above extraversion (part  $r = -.10$ ,  $p = .095$ ), neuroticism (part  $r = .12$ ,  $p = .032$ ), and trait NA (part  $r = .11$ ,  $p = .061$ ).

## Conclusions

Most of the hypotheses for Study 1 were supported. Factor analyses indicated that the SAAS exhibited excellent fit for two out of the three fit indices. However, the RMSEA was not optimal. Further modification did not result in an RMSEA fit statistic that had acceptable or good fit. Thus, the original single-factor structure had the best fit of any model

that we considered plausible. The SAAS exhibited all hypothesized convergent and divergent relationships: It was related to fear of negative evaluation, social interaction anxiety, negative affect, neuroticism, and extraversion, whereas it was not related to openness, agreeableness, or conscientiousness. Tests of correlated correlations indicated that the most robust convergent relationships were with all convergent measures other than extraversion. The SAAS was a unique predictor of social anxiety, above and beyond some of the constructs most associated with social anxiety symptoms. These results lend additional support that the SAAS is a psychometrically valid measure of social appearance anxiety. However, because fit for the RMSEA was not optimal, and all convergent and divergent relationships were based on self-report alone, we further explored the psychometric properties of the SAAS in a second sample.

## Study 2

### Hypotheses

1. The SAAS will show a single-factor structure with good fit.
2. The SAAS will exhibit convergent relationships with BMI, body fat content, self-esteem, and trait anxiety.
3. The SAAS will exhibit excellent divergent validity with measures not theoretically related to social appearance anxiety (ethnic identity and sympathy).
4. The SAAS will predict social interaction anxiety over and above self-esteem and trait anxiety.
5. The SAAS will predict state anxiety experienced when body measurements are obtained.

### Method

**Participants.** The 118 participants were students who were mostly White ( $n = 84$ , 71%) and female ( $n = 73$ , 62%), with a mean age of 19.31 years ( $SD = 1.20$ ). Other ethnicities reported included Asian or Pacific Islander ( $n = 23$ , 20%), Black ( $n = 6$ , 5%), multiracial ( $n = 3$ , 3%), Hispanic ( $n = 1$ , 1%), and ethnicity not listed ( $n = 1$ , 1%).

**Additional measures.** The SAAS, Mini-International Personality Item Pool, and SIAS, as described in Study 1, were used in addition to the following.

The Rosenberg Self-Esteem Measure (RSEM; Rosenberg, 1965) is a 10-item, one-factor measure sometimes referred to as the gold standard for measuring self-esteem because of its strong reliability and validity across ages and cultures (Corwyn, 2000).

The State-Trait Anxiety Measure (STAI-A; Bieling, Antony, & Swinson, 1998) is a seven-item, shortened version

of the original STAI (Spielberger, 1983) that assesses trait anxiety. Bieling et al. (1998) recommended the items for the STAI-A on the basis of factor analytic work focused on determining which STAI items measure anxiety (vs. depression).

Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992) is a 12-item measure that assesses the ethnic identity across different ethnic groups. The MEIM has been shown to have adequate reliability and good convergent validity with measures of acculturation, discrimination, and racial identity development (Phinney, 1992).

The Sympathy Facet (Johnson, 2001) is a four-item measure that assesses sympathy toward others. The sympathy subscale is considered to capture a facet of agreeableness. An example item is, "I am interested in other people's problems."

The Brief State Anxiety Measure (Berg, Shapiro, Chambless, & Ahrens, 1998) is a six-item version of the State-Trait Anxiety Inventory (Spielberger, 1983) used to measure state anxiety. Berg et al. (1998) report that this measure showed good internal consistency and a high correlation with the full 20-item scale ( $r = .93$ ). This measure was used at three time points: Before the body evaluation was explained and once before and after the body evaluation task. Measurements taken at Time 2 (right before the body evaluation) and Time 3 (right after the body evaluation) were highly correlated ( $r = .79$ ) and were thus standardized and summed to create an overall measure of state anxiety experienced during the body evaluation.

**Body evaluation apparatus.** During the body evaluation, we measured body fat content, height, and weight. Body fat content was measured using a Baseline Body Fat Monitor Model 12-1122 (Fabrication Enterprises, Inc., White Plains, NY), height was measured using a wall hanging height chart, and weight was measured using an Omron HBF-400 scale (Omron Healthcare, Inc, Bannockburn, IL). A subset of participants ( $n = 27$ ) returned approximately a week later and were readministered the body evaluation measurements to examine reliability of the body evaluation. All measures at Time 1 and Time 2 were highly correlated: body fat ( $r = .86$ ), height ( $r = .99$ ), weight ( $r = .92$ ), thereby demonstrating good test-retest reliability.

**Procedure.** Participants gave written informed consent and filled out the packet of the aforementioned measures that included the Brief State Anxiety Measure (Time 1) as the last measure. After packet completion the participant underwent a body evaluation, described as follows: Participants were told,

I am now going to give you a body evaluation. I will take your height, weight, and measure your body fat content. You will be told your measurements at the end of the study. I am going to leave to get the equipment and I will be back in a couple of minutes.

Research assistants left the room for approximately 3 minutes to retrieve the body fat content device and scale. On their return, the participant was given the state anxiety Time 2 measure and told to fill it out with how he or she is "feeling at this very moment." Participants were then instructed to stand up and remove their shoes. Participants' height, weight, and body fat content were measured. During each measure the participants were instructed to face away from the scale, height chart, and the body fat content device so that their results would not be seen. After these measurements the Time 3 state anxiety measure was administered. Participants were then given their measurements and debriefed.

## Results

**Confirmatory factor analysis.** We again tested the proposed single-factor structure of the SAAS. Fit indices ranged from adequate to excellent (CFI = .98, TLI = .98, RMSEA = .09). We also tested the single-factor model with the error variance of Items 2 and 3 correlated (CFI = .98, TLI = .98, RMSEA = .08). A nested chi-square test determined that the second model did not represent a significant improvement in fit ( $p = .780$ ). It should be noted that for samples with fewer than 200 cases, RMSEA has been found to be an underestimate of model fit (Curran, Bollen, Chen, Paxton, & Kirby, 2003). Thus, although the RMSEA was only borderline acceptable, we would expect that similar actual fit in a larger sample would result in either acceptable or good fit.

**Zero-order correlations.** Table 2 displays the convergent and divergent relationships between the SAAS, BMI, body fat content, RSEM, STAI, MEIM, and sympathy. Consistent with hypothesis, the SAAS was significantly correlated with body fat content, RSES, and STAI. Against hypothesis, the SAAS was not significantly correlated with BMI. Both hypothesized divergent relationships were found: The SAAS was not significantly correlated with MEIM or sympathy.

**Correlated correlations.** The difference in the correlations between the weakest convergent relationship and the SAAS (body fat content,  $r = .26$ ) and ethnic identity ( $z = 1.83$ ,  $p = .067$ ) and sympathy ( $z = 1.95$ ,  $p = .051$ ) trended toward significance. All other convergent relationships differed significantly from the divergent relationships ( $z_s > 4.19$ ,  $ps < .001$ ).

**Predictive validity: Multiple regression analyses.** To test if the SAAS could predict SIAS over and above trait anxiety and self-esteem, we entered the RSEM, STAI, and SAAS as predictor variables and social interaction anxiety as the dependent variable. The SAAS (part  $r = .27$ ,  $p = .004$ ) significantly predicted social interaction anxiety over and above STAI (part  $r = .33$ ,  $p < .001$ ) and RSEM (part  $r = .04$ ,  $p = .660$ ).

**Body evaluation: Multiple regression analyses.** As hypothesized, the SAAS (part  $r = .28$ ,  $p = .034$ ) significantly predicted state anxiety experienced during the body evaluation

over and above state anxiety before the body evaluation was explained (part  $r = .64$ ,  $p < .001$ ), neuroticism (part  $r = .17$ ,  $p = .074$ ), and social interaction anxiety (part  $r = -.04$ ,  $p = .069$ ) such that as scores on the SAAS increased, state anxiety experienced during the body evaluation also increased.

## Overall Discussion

Our results lend additional support to the SAAS as a valid measure of social appearance anxiety. Our factor analysis results suggest that the SAAS is best conceptualized as a single-factor, 16-item scale, which replicates the factor structure found by T. A. Hart et al. (2008). We also found evidence for strong convergent and divergent validity. In regard to convergent validity, the SAAS was highly correlated with measures of social interaction anxiety, fear of negative evaluation, and trait anxiety. The SAAS was moderately, but not strongly, correlated with self-esteem, negative affect, neuroticism, and extraversion. These results suggest that social appearance anxiety may be construed as a type of anxiety and, to be more specific, as a form of social anxiety. The relationship between social appearance anxiety and broader constructs is consistent with previous research that has found a relationship between social anxiety and neuroticism, extraversion, and negative affect (Bienvenu et al., 2007; Watson, 2005). Additionally, though the SAAS was related to many constructs, it exhibited appropriate divergent relationships that suggest that social appearance anxiety is not associated with every type of self-report measure but rather that it has a specific function as a social anxiety measure.

In addition to the bivariate relationships with these constructs, the SAAS predicted both social interaction anxiety and fear of negative evaluation over and above negative affect, neuroticism, and extraversion. The SAAS also predicted social interaction anxiety over and above trait anxiety and self-esteem. T. A. Hart et al. (2008) found that social appearance anxiety was highly related to social anxiety and that it tapped into a unique proportion of variability in social anxiety beyond negative body image and depression. Our results, taken with this previous research, suggest that social appearance anxiety is a unique predictor of social anxiety beyond constructs such as trait anxiety, self-esteem, negative affect, and certain personality variables.

Turning to the behavioral task, the SAAS was able to predict state anxiety felt during the task over and above state anxiety before the body evaluation was explained, neuroticism, and social interaction anxiety. Arguably, this result is the most striking evidence of validity we found, because it derives from a test of whether scores on a measure are functionally related to what the measure purports to assess (cf. Borsboom, Mellenbergh, & van Heerden, 2004). Variation

**Table 2.** Study 2: Zero-Order Correlations—Social Appearance Anxiety, Convergent, and Divergent Measures

	Convergent Measures						Divergent Measures		Mean (SD)
	SAAS	SIAS	Body Fat	BMI	Self-Esteem	Trait Anxiety	Ethnic Identity	Sympathy	
SAAS	.95	.53**	.26**	.12	.52**	.63**	-.03	.03	30.23 (13.22)
SIAS		.95	.07	-.02	.38**	.57**	-.08	.11	19.34 (11.36)
Body fat			.86	.64**	.10	.11	.06	.17	22.01 (7.43)
BMI				.92	-.01	.04	.06	.15	22.13 (3.31)
Self-esteem					.94	.52**	-.19*	.09	7.32 (6.91)
Trait anxiety						.81	-.20*	.12	12.08 (3.61)
Ethnic identity							.94	-.05	30.38 (8.44)
Sympathy								.92	11.57 (1.50)

Note. SAAS = Social Appearance Anxiety Scale; SIAS = Social Interaction Anxiety Scale; BMI = body mass index. A reliability index (Cronbach's alpha or test-retest reliability, as appropriate) is reported on the diagonal.

\* $p < .05$ . \*\* $p < .001$ .

in the SAAS was able to predict variation in state anxiety as a result of evaluation of appearance, which provides clearer evidence of the measure's validity than more general convergent and divergent relationships with other constructs. Additionally, this relationship was not accounted for by neuroticism or social interaction anxiety but was unique to social appearance anxiety.

These results provide evidence that individuals who are high in social appearance anxiety are likely to become anxious during an activity when their appearance may be judged. It seems plausible that such appearance anxiety may have implications that extend to a variety of situations in people's daily lives. For example, it may be that individuals high in social appearance anxiety avoid situations in which their appearance may be evaluated (e.g., attending exercise classes) or that these individuals experience higher social anxiety in certain situations because of fear of appearance evaluation (e.g., giving a public speech). Future research should test if these relationships exist. If these hypotheses are supported, it seems probable that individuals high in social appearance anxiety would exhibit negative health outcomes such as obesity or high cholesterol levels. Indeed, in this study we found that social appearance anxiety was related to body fat content. Research should explore if social appearance anxiety contributes to the relationship that has been found between poor physical health outcomes and social anxiety (Acarturk, de Graaf, van Straten, ten Have, & Cuijpers, 2008).

Finally, there were several limitations in these studies. Both our samples were somewhat small and could have been more diverse. Additionally, we did not test if fear of others noticing anxiety in one's appearance (i.e., blushing) contributed to high scores on the SAAS. Nevertheless, we believe that these results provide further evidence that the SAAS is a valid measure of social appearance anxiety and that social appearance anxiety is a valid construct. Future research should test the psychometric properties of the SAAS

in clinical samples and should examine social appearance anxiety in the etiology of social anxiety, body image disorders, and negative health behaviors in these populations. In conclusion, we believe that the current results, taken together with previous research (T. A. Hart et al., 2008), suggest that the SAAS is a valid measurement of anxiety in situations where appearance evaluation may be likely.

### Acknowledgments

We would like to thank Alison Cohn and Reuben Karchem for their research assistance, as well as Katya Fernandez for helpful reviews of previous drafts.

### Declaration of Conflicting Interests

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

### Funding

The authors received no financial support for the research and/or authorship of this article.

### References

- Acarturk, C., de Graaf, R., van Straten, A., ten Have, M., & Cuijpers, P. (2008). Social phobia and number of social fears, and their association with comorbidity, health-related quality of life and help seeking: A population-based study. *Social Psychiatry & Psychiatric Epidemiology*, *43*, 273-279.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*, 238-246.
- Berg, C. Z., Shapiro, N., Chambless, D. L., & Ahrens, A. H. (1998). Are emotions frightening? II: An analogue study of fear of emotion, interpersonal conflict, and panic onset. *Behaviour Research and Therapy*, *36*, 3-15.
- Bieling, P. J., Antony, M. M., & Swinson, R. P. (1998). The Stait-Trait Anxiety Inventory, Trait version: Structure and content re-examined. *Behaviour Research and Therapy*, *36*, 777-788.

- Bienvenu, O. J., Hettema, J. M., Neale, M. C., Prescott, C. A., & Kendler, K. S. (2007). Low extraversion and high neuroticism as indices of genetic and environmental risk for social phobia, agoraphobia, and animal phobia. *American Journal of Psychiatry*, *164*, 1714-1721.
- Borsboom, D., Mellenbergh, G., & van Heerden, J. (2004). The concept of validity. *Psychological Review*, *111*, 1061-1071.
- Corwyn, R. (2000). The factor structure of global self-esteem among adolescents and adults. *Journal of Research in Personality*, *34*, 357-379.
- Cunningham, M. R. (1986). Measuring physical attractiveness: Quasi-experiments on the sociobiology of female facial beauty. *Journal of Personality and Social Psychology*, *50*, 925-935.
- Curran, P. J., Bollen, K. A., Chen, F., Paxton, P., & Kirby, J. B. (2003). Finite sampling properties of the point estimates and confidence intervals of the RMSEA. *Sociological Methods & Research*, *32*, 208-252.
- Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The Mini-IPIP Scales: Tiny-yet-effective measures of the Big Five Factors of Personality. *Psychological Assessment*, *18*, 192-203.
- Hart, E. A., Leary, M. R., & Rejeski, W. (1989). The measurement of social physique anxiety. *Journal of Sport & Exercise Psychology*, *11*, 94-104.
- Hart, T. A., Flora, D. B., Palyo, S. A., Fresco, D. M., Holle, C., & Heimberg, R. G. (2008). Development and examination of the Social Appearance Anxiety Scale. *Assessment*, *15*, 48-59.
- Heimberg, R. G., & Turk, C. L. (2002). Assessment of social phobia. In R. G. Heimberg & E. Becker (Eds.), *Cognitive-behavioral group therapy for social phobia: Basic mechanisms and clinical strategies* (pp. 107-126). New York, NY: Guilford Press.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1-55.
- Johnson, J. A. (2001, May). *Screening massively large data sets for non-responsiveness in web-based personality inventories*. Invited talk to the joint Bielefeld-Groningen Personality Research Group, University of Groningen, Netherlands.
- Leary, M. R. (1983). A brief version of the Fear of Negative Evaluation Scale. *Personality and Social Psychology Bulletin*, *9*, 371-375.
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, *36*, 455-470.
- Meng, X., Rosenthal, R., & Rubin, D. B. (1992). Comparing correlated correlation coefficients. *Psychological Bulletin*, *111*, 172-175.
- Muthén, L. K., & Muthén, B. O. (1998-2009). *Mplus user's guide* (5th ed.). Los Angeles, CA: Author.
- Phinney, J. S. (1992). The Multigroup Ethnic Identity Measure: A new scale for use with diverse groups. *Journal of Adolescent Research*, *7*, 156-176.
- Rodebaugh, T. L., Woods, C. M., & Heimberg, R. G. (2007). The reverse of social anxiety is not always the opposite: The reverse-scored items of the Social Interaction Anxiety Scale do not belong. *Behavior Therapy*, *38*, 192-206.
- Rodebaugh, T. L., Woods, C. M., Thissen, D. M., Heimberg, R. G., Chambless, D. L., & Rapee, R. M. (2004). More information from fewer questions: The factor structure and item properties of the original and Brief Fear of Negative Evaluation Scale. *Psychological Assessment*, *16*, 169-181.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Spielberger, C. D. (1983). *The State-Trait Anxiety Inventory manual*. Menlo Park, CA: Mind Garden.
- Steiger, J. H., & Lind, J. C. (1980, May). *Statistically-based tests for the number of factors*. Paper presented at the Annual Spring Meeting of the Psychometric Society, Iowa City, IA.
- Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, *38*, 1-10.
- Watson, D. (2005). Rethinking the mood and anxiety disorders: A quantitative hierarchical model for DSM-V. *Journal of Abnormal Psychology*, *114*, 522-536.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The Positive and Negative Affect Schedule scales. *Journal of Personality and Social Psychology*, *54*, 1063-1070.