



FACTOR INTERPRETATIONS OF THE SELF-CONSCIOUSNESS SCALE

Lei Chang*

Chinese University of Hong Kong, Shatin, N.T., Hong Kong

(Received 24 May 1997)

Summary—Fenigstein, Scheier & Buss's (1975) 3-factor model, Burnkrant & Page's (1984) 4-factor model and Mittal & Balasubramanian's (1987) 5-factor model of the Self-Consciousness Scale (SCS) were tested using the revised SCS (Scheier & Carver, 1985a) on a sample of 354 undergraduate students. Burnkrant and Page's 4-factor model showed superiority over the other two models in a confirmatory factor analysis. This finding was cross-validated in another sample of 354 undergraduate students. It is concluded that the division of the private self-consciousness subscale is adequate, whereas the division of the public self-consciousness subscale is not justified. © 1998 Elsevier Science Ltd. All rights reserved

Key-Words: the Self-Consciousness Scale, Private Self-Consciousness, Public Self-Consciousness, Social Anxiety, factor structure, validity.

FACTOR INTERPRETATIONS OF THE SELF-CONSCIOUSNESS SCALE

In 1975, Fenigstein, Scheier and Buss published the Self-Consciousness Scale (SCS). It has 23 items measuring individual differences along three dimensions: Private Self-Consciousness, Public Self-Consciousness and Social Anxiety. Private Self-Consciousness represents a self-focused attention to reflect on covert, hidden and personal aspects that are not easily accessible to others, e.g. private motives, feelings and beliefs. Public Self-Consciousness has a propensity to attend to those self-aspects that are also exhibited to the public, e.g. appearance and mannerisms. Finally, Social Anxiety which is derived from public self-consciousness represents apprehensiveness or doubt over being evaluated by others in a social context (Fenigstein *et al.*, 1975).

This three-factor structure was extracted from a principal components analysis using Variamax rotation based on 179 male and 253 female college students (Fenigstein *et al.*, 1975). Each item was rated on a scale of 0 (extremely uncharacteristic) to 4 (extremely characteristic) (Fenigstein *et al.*, 1975). The Self-Consciousness Scale has since been widely used (Buss, 1980; Carver & Scheier, 1981; Scheier & Carver, 1983, 1985a) and has demonstrated construct validity in a variety of contexts (Carver & Glass, 1976; Carver & Scheier, 1978; Turner, Scheier, Carver & Ickes, 1978) and across cultures (Rime & Le Bon, 1984; Nystedt & Smari, 1989; Ruganci, 1995; Seek, 1994; Vleeming & Engelse, 1981).

Ten years later, Scheier and Carver (1985a) published a revised version of the Self-Consciousness Scale. Most of the revision was in item wording, using, "language that was simpler than in the original item" (Scheier & Carver, 1985a, p. 689). Item 3, "Generally, I'm not very aware of myself", was dropped from private self-consciousness. The revised version thus has 22 items. Another change was that the original five Likert-type scale points were made into four points and the verbal labels of the original scale points were changed to "a lot like me", "somewhat like me", "a little like me" and "not at all like me". The revised version was intended for the general population other than college students (Scheier & Carver, 1985a). Psychometric evaluations of the revised version by these authors were, however, based on college students. The three-factor structure was sustained in the revised version (Scheier & Carver, 1985a).

Simultaneously, psychometric investigations by other researchers raised questions about the factor structure of the original version of the SCS. Among them, the study by Burnkrant & Page

* To whom all correspondence should be addressed: Lei Chang, Department of Educational Psychology, Chinese University of Hong Kong, Shatin, N.T., Hong Kong. E-mail: leichang@cuhk.edu.hk
Preparation of the manuscript was supported by a Direct Grant from the Chinese University of Hong Kong.

(1984) is most influential. From a confirmatory factor analysis of the original 23-item SCS, they concluded that a 4-factor instead of the 3-factor structure fits the data. Their data were obtained from 360 adult women not in college and 198 college students. Their analysis results supported the division of the Private Self-Consciousness into two separate factors of "self-reflectiveness" and "internal state awareness". Two items were deleted because they resulted in lower reliability estimates. By the same reliability criteria, two items were taken out of the Public Self-Consciousness subscale and one item was excluded from the Social Anxiety subscale.

The study by Burnkrant and Page (1984) instigated a debate over the factor structure of the SCS. Several studies were subsequently published in support of Burnkrant & Page's division of the Private Self-Consciousness subscale (Lennox, Welch, Wolfe & Zimmerman, 1987; Piliavin & Charng, 1988). Others, however, refuted the division and defended Fenigstein et al.'s (1975) original unidimensional structure of the Private Self-Consciousness subscale (Bernstein, Teng & Garbin, 1986; Bissonnette & Bernstein, 1990; Britt, 1992). Among the strongest support of Burnkrant & Page's finding is discriminant validity evidence provided by Piliavin and Charng (1988). They correlated the Self-Reflectiveness and Internal State Awareness sub-scales with a scale of identity seeking. Identity seeking correlated with Self-Reflectiveness at 0.299 and 0.226 in their U.S.A. and Polish samples and with Internal State Awareness at -0.220 and -0.057 for the two samples, respectively. Differential correlations were also found when the two subscales were correlated with a self-esteem measure in their Polish sample.

There has also been controversy regarding the dimensionality of the Public Self-Consciousness subscale. Using partial correlations to determine unidimensionality, Mittal & Balasubramanian (1987) identified two separate public self-consciousness subscales which they named "style consciousness" and "appearance consciousness". Their approach also supported Burnkrant and Page's (1984) division of the Private Self-Consciousness Scale. Watson, Hickman, Morris, Stutz & Whiting (1994) provided additional support for the division of the Public Self-Consciousness. In their study, the partial correlation with Concern for Dieting was higher for Appearance Consciousness whereas the partial correlations with Social Anxiety and Self-Esteem were higher for Style Consciousness.

Thus, there are three interpretations of the SCS which are represented by a 3-factor (Fenigstein *et al.*, 1975; Scheier & Carver, 1985a), a 4-factor (Burnkrant & Page, 1984) and a 5-factor (Mittal & Balasubramanian, 1987) structure. There has not been an analysis that tests all three structures. Two of the three structures have been based on the old but not the new SCS scale which was intended to replace the old scale. The present study used confirmatory factor analysis to fit the three models on data obtained from the revised Self-Consciousness Scale. In addition, the Life Orientation Test (Scheier and Carver, 1985b) was used to examine the discriminant validity of the different factor structures. Dispositional optimism and pessimism measured by the LOT are expected to relate to self-consciousness and social anxiety. Both the LOT and SCS have been used to predict mental well-being such as coping with depression (Scheier, Carver & Bridges, 1994; Reeves, Watson, Ramsey & Morris, 1995) worry and anxiety (Lauver & Younggran, 1995; Pruzinsky & Borkovec, 1990) and loneliness (de Jong-Gievel, 1987).

METHOD

Participants were 708 undergraduate students from a metropolitan university in the south east of the U.S.A. Most of the participants were first year students who were enrolled in different sections of an introductory calculus course. They were given the 22-item revised Self-Consciousness Scale and the 8-item Life Orientation Test (LOT; Scheier & Carver, 1985b) at the beginning of a class period. Responses were collected either at the end of the class period or during the next class. Both scales were administered on a 4-point Likert-type scale using the scales' original verbal labels. Testing was anonymous. Personal information such as gender and age was not sought from the participants although gender was very much equally distributed. The sample was randomly split into two halves, which are subsequently referred to as Samples 1 and 2, of 354 cases each to cross-validate the results.

A 30×30 covariance matrix based on each of the two samples was analysed using maximum likelihood (ML) estimation in LISREL-7 (Joreskog & Sorbom, 1988). The goodness-of-fit indicators

provided by LISREL-7 were evaluated. These included (1) the overall χ^2 which tests the difference of lack of fit between a hypothesized model and a saturated or just-identified model that has zero lack of fit, (2) the root mean square residual (RMR) which indicates the average discrepancy between the elements in the hypothesized and sample covariance matrices, (3) the goodness-of-fit-index (GFI) and (4) the adjusted goodness-of-fit-index (AGFI) adjusting for degrees of freedom. Both of these indices indicate the proportion of variance and covariance jointly explained by the model that is being tested (Joreskog & Sorbom, 1988). Because χ^2 is sensitive to sample size, model complexity, and departure from multivariate normality, the ratio of χ^2 to degrees of freedom (χ^2/df), which compensates for some of these "sensitivity" problems, was also used to evaluate model fit. Because the three models tested in this study represent a parameter-nested sequence, the χ^2 difference test of the lack of fit between two nested models was examined as the most important criterion for comparing models.

Two subjective indices of fit were also evaluated. One of them was the Bentler and Bonett (1980) normed fit index (BBI). BBI was chosen from among several subjective indices because of its wide usage in the literature (Sternberg, 1992). The other subjective fit index was the Tucker & Lewis (1973) non-normed fit index (TLI). According to Marsh (1993), TLI is the only widely used index that compensates for the more restricted model and provides an unbiased estimate. Both BBI and TLI range from zero, indicating total lack of fit, to 1.00 indicating perfect fit.

RESULTS

The three models—the original 3-factor model (Fenigstein *et al.*, 1975), the 4-factor model (Burnkrant & Page, 1984) and the 5-factor model (Mittal & Balasubramanian, 1987) were tested within each of the two randomly split samples. Also tested was a null model to set a base line for model comparisons. The null model was a no-factor model where only the error-uniqueness was estimated.

Two sets of analyses were conducted within each sample. In the first set, no items were deleted from the test. In the other set of analyses, the items that Burnkrant and Page (1984) and Mittal & Balasubramanian (1987) eliminated as bad items were examined to see if they needed to be dropped. By a criterion that an item's factor loading be larger than 0.20 or its error/uniqueness be smaller than 0.80, four items were eliminated. Two of the four items, Item 9 from Private Self-Consciousness and Item 12 from Social Anxiety, were deleted by Burnkrant & Page (1984) and Mittal & Balasubramanian (1987). The other two deleted items were Item 2 from Public Self-Consciousness and Item 8 from Social Anxiety. (Item numbers used here correspond to those used in the publications that are cited). These two items had the poorest properties according to the analysis by Scheier & Carver (1985a). In their analysis, Item 2 loaded equally on both Private and Public Self-Consciousness. It also had the lowest loading of 0.38 among Public Self-Consciousness items in both their original and revised forms of the SCS. Item 8 also had the lowest loadings of 0.27 and 0.40 among Social Anxiety items in their analyses of the two forms of the SCS. Other researchers also found these two items problematic (Seek, 1994; Heinemann, 1979). Items 17 and 21 which Burnkrant & Page (1984) eliminated and Items 7 and 23 which Mittal and Balasubramanian (1987) eliminated were found to be good items and were retained in this set of analyses.

In these two sets of analyses, goodness-of-fit indicators from the three models were similar. Table 1 contains values of different goodness-of-fit indexes from these models. However, the χ^2 difference test clearly indicated the superiority of the 4-factor model. For the analysis involving all items, the χ^2 difference between the 3-factor and 4-factor models was 20 for Sample 1 and 27 for Sample 2. With $df = 3$, these χ^2 reductions were significant, $P < 0.001$ and thus, justified the addition of a fourth factor. In the analyses with the reduced number of items, χ^2 differences were 20 and 28 with 3 degrees of freedom. They were again significant, $P < 0.001$.

The addition of a fifth factor was shown to be unjustified by the χ^2 difference test. For the analyses involving all the items, the χ^2 difference between the 4-factor and 5-factor models was 10 and 13 for the two samples with 4 degrees of freedom. For the analyses on the reduced items, it was 6 and 10 with 4 degrees of freedom. These χ^2 reductions were not significant at $P < 0.05$.

Table 1. Goodness-of-fit indicators of competing models

Model	χ^2	<i>df</i>	χ^2/df	GFI	AGFI	RMR	BBI	TLI	$\Delta\chi^2$
<i>Using all 22 items</i>									
<i>Sample 1</i>									
Null	2681	231	11.61	0.41	0.35	0.24	—	—	—
3-factor	613	206	2.98	0.87	0.84	0.07	0.77	0.81	—
4-factor	592	203	2.92	0.87	0.84	0.07	0.78	0.82	21*
5-factor	584	199	2.93	0.87	0.84	0.07	0.78	0.82	8
<i>Sample 2</i>									
Null	1874	231	8.11	0.47	0.42	0.20	—	—	—
3-factor	626	206	3.04	0.85	0.82	0.07	0.66	0.71	—
4-factor	599	203	2.95	0.86	0.83	0.07	0.68	0.73	27*
5-factor	586	199	2.94	0.86	0.83	0.07	0.69	0.73	13
<i>Using 18 items</i>									
<i>Sample 1</i>									
Null	2206	147	15.01	0.42	0.33	0.25	—	—	—
3-factor	356	132	2.70	0.89	0.87	0.05	0.84	0.88	—
4-factor	336	129	2.60	0.90	0.87	0.05	0.85	0.89	20*
5-factor	330	125	2.64	0.90	0.87	0.05	0.85	0.88	6
<i>Sample 2</i>									
Null	1874	147	12.75	0.49	0.41	0.20	—	—	—
3-factor	350	132	2.65	0.89	0.86	0.05	0.81	0.86	—
4-factor	322	129	2.50	0.90	0.87	0.05	0.83	0.87	28*
5-factor	312	125	2.50	0.91	0.87	0.05	0.83	0.87	9

* $P < 0.01$.

The superiority of the 4-factor model was further supported by the structural associations among the SCS and LOT constructs. Four of the eight LOT items connote optimism and four connote pessimism. These two sets of items were shown to represent two correlated factors (Chang & McBride-Chang, 1996; Marshall & Lang, 1990). Thus, in addition to the SCS Subscales, two LOT factors, Optimism and Pessimism, were also estimated. The structural associations with Optimism and Pessimism were distinctively different for the two private self-consciousness factors, Self-Reflectiveness and Internal State Awareness, which were defined by the 4-factor model. Structural relations between these two factors and Social Anxiety were also distinctively different. These structural relations, however, were identical across the two public self-consciousness factors, Style Consciousness and Appearance Consciousness, which were defined by the 5-factor model. This information is contained in Table 2.

DISCUSSION

One clear conclusion drawn from these analyses is that the 5-factor model introduced by Mittal & Balasubramanian (1987) is inadequate. Neither the set of goodness-of-fit indicators nor the more powerful χ^2 difference test lend support for the separation of Public Self-Consciousness into two factors. The failure of this model is further shown by the nearly identical structural associations between these two ill defined public self-consciousness factors and other constructs. These structural relations among latent constructs should be more trustworthy than the observed correlations reported by existing research because the former have been corrected for measurement errors. These nearly identical associations are resilient across two samples and across two sets of analyses that used either the full set of items or a reduced set of items. According to Widaman (1985), stability of common parameter estimates is an important criterion in assessing covariance models. The differential structural relations were equally stable for the two private self-consciousness factors, Self-Reflectiveness and Internal State Awareness. This stability further support the failure of the 5-factor model and superiority of the 4-factor model (Burnkrant & Page, 1984).

The superiority of the 4-factor model over the 3-factor model was shown by the significant χ^2 difference tests. The adequacy of this model was further supported by the clearly differentiating structural associations with other constructs and the stability of these associations across analyses. There was one weakness in this 4-factor model, however. In this model, the three factor loadings

Table 2. Associations between the SCS and LOT scales

	SR	ISA	SC	AC
<i>Using all items</i>				
Sample 1				
Social anxiety	0.42	0.12	0.45	0.46
Optimism	0.05	0.22	-0.03	0.03
Pessimism	-0.21	-0.01	-0.21	-0.18
Sample 2				
Social anxiety	0.20	0.03	0.39	0.37
Optimism	-0.11	0.21	-0.03	-0.02
Pessimism	-0.42	0.01	-0.29	-0.13
<i>Deleting 4 items</i>				
Sample 1				
Social anxiety	0.42	0.14	0.43	0.46
Optimism	0.01	0.22	-0.04	0.03
Pessimism	-0.22	-0.02	-0.21	-0.18
Sample 2				
Social anxiety	0.20	0.05	0.38	0.36
Optimism	-0.10	0.21	-0.02	-0.02
Pessimism	-0.44	-0.01	-0.27	-0.13

Note: SR: Self-Reflectiveness; ISA: Internal State Awareness; SC: Style Consciousness; AC: Appearance Consciousness.

associated with the Internal State Awareness factor were lower than almost all of the other factor loadings. The average factor loading of the SCS items excluding these three items was 0.65 whereas the average of these three item loadings was 0.41. Further research should focus on generating additional reliable items which contribute to this factor. An attempt to collapse the two private self-consciousness factors seems to be unjustified given the clearly differentiating relations these two factors had with other constructs presented both in this study and in the literature (Conway & Giannopoulos, 1993; Piliavin & Charng, 1988; Reeves *et al.*, 1995). Because Self-Reflectiveness and Internal State Awareness repeatedly showed opposite correlations with depression (Reeves *et al.*, 1995; Watson & Biderman, 1993; Watson *et al.*, 1994), Reeves *et al.* (1995) defined these two scales as a healthy "dysphoria-enhancing" influence vs an unhealthy "dysphoria-inhibiting" effect, respectively (p.440). The present finding that these two scales correlated in the opposite directions with the two life orientation factors lends support to this interpretation.

The merit of the original 3-factor model is parsimony. However, collapsing the two separate private self-consciousness scales to achieve parsimony did not receive empirical support from this study. Given the Reeves *et al.* (1995) interpretation, there is also no theoretical justification for collapsing the two factors. Thus, a 4-factor interpretation of the Self-Consciousness Scale seems adequate. One way to retain the parsimonious 3-factor structure is perhaps by modifying the three items that make up the Internal State Awareness factor. In addition to these items, Item 2 of Public Self-Consciousness and Items 8 and 12 from Social Anxiety which performed poorly in this study and several other studies also need reconsideration.

REFERENCES

- Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, *88*, 588-606.
- Bernstein, I. H., Teng, G., & Garbin, C. P. (1986). A confirmatory factoring of the Self-Consciousness Scale. *Multivariate Behavioral Research*, *21*, 459-475.
- Bissonnette, V. & Bernstein, I. H. (1990). Artifacts can replicate: A reply to Piliavin and Charng. *Personality and Social Psychology Bulletin*, *16*, 554-561.
- Britt, T. W. (1992). The Self-Consciousness Scale: On the stability of the three-factor structure. *Personality and Social Psychology Bulletin*, *18*, 748-755.
- Burnkrant, R. E., & Page, Jr., T. J. (1984). A modification of the Fenigstein, Scheier & Buss Self-Consciousness Scales. *Journal of Personality Assessment*, *48*, 629-637.
- Buss, A. H. (1980). *Self-consciousness and social anxiety*. San Francisco: Freeman.
- Carver, C. S., & Glass, D. C. (1976). The self-consciousness scale: A discriminant validity study. *Journal of Personality Assessment*, *40*, 169-172.

- Carver, C. S., & Scheier, M. F. (1978). Self-focusing effects of dispositional self-consciousness, mirror presence, and audience presence. *Journal of Personality and Social Psychology*, *36*, 324–332.
- Carver, C. S. & Scheier, M. F. (1981). *Attention and self-regulation: A control-theory approach to human behavior*. New York: Springer-Verlag.
- Chang, L., & McBride-Chang, C. (1996). The factor structure of the Life Orientation Test. *Educational and Psychological Measurement*, *56*, 325–329.
- Conway, M., & Giannopoulos, C. (1993). Self-esteem and specificity in self-focused attention. *Journal of Social Psychology*, *133*, 121–123.
- de Jong-Gievel, J. (1987). Developing and testing a model of loneliness. *Journal of Personality and Social Psychology*, *53*, 119–128.
- Fenigstein, A., Scheier, M. F., & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology*, *43*, 522–527.
- Heinemann, W. (1979). The assessment of private and public self-consciousness: A German replication. *European Journal of Social Psychology*, *9*, 331–337.
- Joreskog, K. G., & Sorbom, D. (1988). *LISREL 7: A guide to the program and application*, Spss Inc.
- Lauver, D., & Youngran, T. (1995). Optimism and coping with breast cancer symptoms. *Nursing Research*, *44*, 202–207.
- Lennox, R., Welch, L., Wolfe, R. & Zimmerman, B. (1987). Assessment of Self-Consciousness. *Representative Research in Social Psychology*, *17*, 53–73.
- Marsh, H. W. (1993). Stability of individual differences in multiwave panel studies: Comparison of simplex models and one-factor model. *Journal of Educational Measurement*, *30*, 157–183.
- Marshall, G. N., & Lang, E. L. (1990). Optimism, self-mastery, and symptoms of depression in women professionals. *Journal of Personality and Social Psychology*, *59*, 132–139.
- Mittal B. & Balasubramanian, S. K. (1987). Testing the dimensionality of the Self-Consciousness Scales. *Journal of Personality Assessment*, *57*, 53–68.
- Nystedt, L., & Smari, J. (1989). Assessment of the Fenigstein, Scheier & Buss Self-Consciousness Scale: A Swedish translation. *Journal of Personality Assessment*, *53*, 342–352.
- Piliavin, J. A. & Charng, H. (1988). What is the factorial structure of the Private and Public Self-Consciousness Scales? *Personality and Social Psychology Bulletin*, *14*, 587–595.
- Pruzinsky, T., & Borkovec, T. D. (1990). Cognitive and personality characteristics of worriers. *Behavior Research and Therapy*, *28*, 507–512.
- Reeves, A. L., Watson, P. J., Ramsey, A., & Morris, R. J. (1995). Private self-consciousness factors, need for cognition, and depression. *Journal of Social Behavior and Personality*, *10*, 431–443.
- Rime, B., & Le Bon, C. (1984). Le concept de conscience de soi et ses operationalisations. *L'Année Psychologique*, *84*, 535–553.
- Ruganci, R. N. (1995). Private and public self-consciousness subscales of the Fenigstein, Scheier & Buss Self-Consciousness Scale: A Turkish translation. *Personality and Individual Differences*, *18*, 279–282.
- Scheier, M. F., & Carver, C. S. (1983). Two sides of the self: one for you and one for me. In J. Suls & A. Greenwald (Eds), *Psychological perspectives on the self (Vol. 2)*. Hillsdale, NJ: Erlbaum.
- Scheier, M. F. & Carver, C. S. (1985a). The Self-Consciousness Scale: A revised version for use with general populations. *Journal of Applied Social Psychology*, *5*, 687–699.
- Scheier, M. F. & Carver, C. S. (1985b). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology*, *4*, 219–247.
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A re-evaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, *67*, 1063–1078.
- Seek, D. T. L. (1994). Assessment of private and public self-consciousness: A Chinese replication. *Journal of Clinical Psychology*, *50*, 341–348.
- Sternberg, R. J. (1992). Psychological Bulletin's top 10 "Hit Parade". *Psychological Bulletin*, *112*, 387–388.
- Tucker, L. R., & Lewis, C. (1973). The reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, *38*, 1–10.
- Turner, R. B., Scheier, M. F., Carver, C. S., & Ickes, W. (1978). Correlates of self-consciousness on trait attribution. *Journal of Research in Personality*, *12*, 431–438.
- Vleeming, R. G., & Engelse, J. A. (1981). Assessment of private and public self-consciousness: A Dutch replication. *Journal of Personality Assessment*, *45*, 385–389.
- Watson, P. J., & Biderman, M. D. (1993). Narcissistic Personality Inventory factors, splitting and self-consciousness. *Journal of Personality Assessment*, *61*, 41–57.
- Watson, P. J., Hickman, S. E., Morris, R. J., Stutz, N. L., & Whiting, L. (1994). Complexity of self-consciousness subscales: Correlations of factors with self-esteem and dietary restraint. *Journal of Social Behavior and Personality*, *9*, 761–774.
- Widaman, K.F. (1985). Hierarchically nested covariance structure models for multitrait-multimethod data. *Applied Psychological Measurement*, *9*, 1–26.