

## DEVELOPMENT AND PSYCHOMETRIC PROPERTIES OF THE SCALE FOR SELF-CONSCIOUSNESS ASSESSMENT<sup>1</sup>

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*Summary.*—This scale development employed Duval and Wicklund's (1972), Carver's (1979), and Zaborowski's (1987) theories on self-consciousness. The aim of the study was to create a new method to assess the self-consciousness construct, in an effort to operationally express self-consciousness, while circumventing existing metric and other impediments. Initially, 38 pilot interviews were conducted with undergraduate psychology students, and two studies followed, one on 494 participants and one on 248 participants. Exploratory factor analysis models, equivalence testing, followed by a third confirmatory factor analysis study on a separate sample of 216 participants, resulted in a final 24-item scale. A four-factor structure of two public and two private self-consciousness dimensions emerged. The Scale for Self-Consciousness Assessment (SSCA) can be of use in various areas of psychological research, possibly in concurrent use with other constructs of interest, due to its theoretical and research importance and its adequate psychometric properties.

The concept of self-consciousness entails coding, processing, and integrating information about the self (Wicklund, 1975; Cramer, 2000). According to Ito (1998), consciousness comprises three different levels: wakefulness, awareness, and self-consciousness. Consciousness in humans is directed to the self so that an individual is "aware of what is going on in his or her internal world" (Ito, 1998, p. 191). The process of self-consciousness is made up of both content and form. Content refers to the *information* that is being attended to, while one is preoccupied with self. Form refers to the *manner* in which such information is processed (Zaborowski, 1987; Cramer, 2000).

Self-consciousness as a term has been used by James (1892), Coolidge (1907), Mead (1914), Vygotsky (1925/1999), and more recently by Duval and Wicklund (1972), Wicklund (1975), Fenigstein (1997), Fenigstein, Scheier, & Buss (1975), Zaborowski (1987), and other researchers. General theories on the functioning of self-consciousness have been supported empirically, namely, Duval and Wicklund's theory (1972), Hull and Levy's theory (1979), Carver's theory (1979; Scheier & Carver, 1985), and Zaborowski's theory (1987). Wicklund's theory places emphasis on the content of self-consciousness, Hull's theory gives priority to form, while Zaborowski's theory assumes a dialectical interaction of form and content. Wicklund, Carver, and others have argued that self-consciousness entails

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processes involved in matching a person's momentary condition against one's own standards. Hull argued that self-consciousness entails processes of coding information pertaining to the self. Zaborowski's theory seems to account for a broader range of phenomena than Wicklund's and Hull's theories. Wicklund has coined the notion of salient self-components upon which a person's attention is focused, while Zaborowski employs the concept of content centers of self-consciousness. Zaborowski's theory admits the operation of different standards in external self-consciousness and places the emphasis on the standard of inner justice which functions in both external and internal self-awareness. So, according to different theories, emphasis has been placed on different—independent or interactive—facets of self-consciousness.

Zaborowski (1980, 1987) distinguished between internal and external self-consciousness; the internal facet relates to egocentrism, individualism, negative emotional responses toward the self (e.g., sense of guilt), low self-esteem, etc. Defensive self-awareness and ill disposition stemming from it may be an even more negative expression of this internal facet. In contrast, the external facet is an objective, socialized processing of the self. An intermediate form between the two facets is reflective self-consciousness (appraisal and evaluation of self and others, assessment of duties and rights and recollection of needs and emotions). Carver and Scheier (1998) have demonstrated that individuals who mostly attend to their own inner thoughts and feelings are high in private self-consciousness, while those who mostly view themselves as social objects tend to see themselves according to others' view of them and are sensitive to others' reactions to their behavior. Finally, the terms "self-consciousness" and "self-awareness" have been used interchangeably by Zaborowski (1987) and later on by other researchers (Silvia & Gendolla, 2001; Wickens & Stapel, 2008, 2010). For Duval and Wicklund (1972) though, self-awareness is the state of self-focused attention, whereas the trait is called self-consciousness, with objective self-awareness being the *ability* to become the object of one's own attention (Heinemann, 1979).

Fenigstein, *et al.* (1975) devised a 23-item scale (Self-Consciousness Scale, SCS) to measure individual differences in self-consciousness. They supported the distinction between self-consciousness and self-awareness. Self-awareness refers to a state of self-directed attention, while self-consciousness refers to dispositional self-directed attention. Factor analysis of the Fenigstein, *et al.* scale (1975) revealed that self-consciousness consisted of three factors: public self-consciousness, private self-consciousness, and social anxiety. Fenigstein, *et al.* argued that "the private self-consciousness factor was concerned with attending to one's inner thoughts and feelings. The public self-consciousness factor was defined by general awareness of

the self as social object that has an effect on others. The social anxiety factor was defined by a discomfort in the presence of others" (p. 523).

Although the SCS has been widely used by many researchers, supporting the three-factor structure (e.g., Buss, 1980; Bernstein, Teng, & Garbin, 1986), and has demonstrated construct validity in a variety of contexts (e.g., Carver & Glass, 1976), some investigators have supported a four-factor structure and some others a five- or a six-factor structure (Anderson, Bohon, & Berrigan, 1996; Chan 1996; Cramer, 2000). Burnkrant and Page (1984) applied confirmatory factor analysis models to the original SCS items, and concluded that a four-factor structure better fit the data. Five items, regarding all dimensions, were omitted. They revealed that the factor of private self-consciousness could be divided into two separate factors: the "self-reflectiveness" and "internal state awareness." These subscales have been used in many studies (e.g., Piliavin & Charng, 1988; Conway & Giannopoulos, 1993; Watson & Biderman, 1993; Reeves, Watson, Ramsey, & Morris, 1995). Other researchers, such as Mittal and Balasubramanian (1987), have suggested that the public self-consciousness factor could also be divided into two separate factors: "style consciousness" and "appearance consciousness." Cramer (2000), through confirmatory factor analysis, supported the four-factor structure as the most stable, comprehensive, and replicable factor structure.

The Self-Consciousness Scale (SCS) has been translated and used in many countries (Australia, France, French-speaking Canada, Germany, Hong Kong, The Netherlands, Italy, Portugal, Spain, Sweden, and Turkey). It has also been employed in Greek settings by the first three authors of the present study (Veligekas & Mylonas, 2001; Veligekas, Mylonas, & Gari, 2001; Veligekas, Mylonas, Gari, Ploubidis, & Mantzavinou, 2003) with samples of university students and track and field athletes. Methods of back-translation were implemented for these studies with three psychologists translating this scale from English to Greek and two English literature teachers back-translating the scale into English (van de Vijver & Leung, 1997). By employing exploratory and confirmatory analysis models, it was shown that at least six of the original items were psychometrically weak for the specific cultural setting and possibly culturally biased (van de Vijver & Leung, 1997; Poortinga, 1989) and could not be reliably implemented. It was also shown that a two-factor model, with social anxiety removed from the latent variables, provided a better fit for both samples. Thus, several operational definition problems might be active for some of the items and/or for the dimensions, at least in respect to the Greek cultural reality.

Following these initial psychometric analyses, it seemed appropriate to attempt assessing self-consciousness through a novel Scale for Self-Con-

sciousness Assessment as constructed on the basis of the psychometric outcomes and the operational definition clarifications reached via the two 2001 studies. This scale was constructed as follows: in respect to the international and the Greek evidence, the main effort was directed so as to integrate the operational definitions provided by Fenigstein, *et al.* (1975) and the theoretical aspects proposed by Duval and Wicklund (1972) and also by Zaborowski (1987) and Carver (1979), taking cultural issues into account as well (Lalwani, Shrum, & Chiu, 2009). The final product of such an attempt should avoid possible bias in terms of culture (Poortinga & van de Vijver, 1987; van de Vijver & Tanzer, 1997) and reflect the main theoretical structures as evident in the literature. It was expected that at least a two-factor structure (private and public self-consciousness) would hold for this new scale, but the presence of more specific facets could also be possible. Four studies (a pilot and three main ones) are presented hereafter.

#### PILOT STUDY

The first step toward creating the Scale for Self-Consciousness Assessment was the interview techniques implemented at the item construction stage. These interviews were carried out according to the theoretical directions given by Duval and Wicklund (1972), Wicklund (1975), and Zaborowski (1987). The interviewees were 38 undergraduate psychology students from the University of Athens. The questions used for these interviews were constructed in respect to: (a) the following construct definitions: "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" (Chang, 1988, p. 635), (b) the operational definitions proposed by Fenigstein, *et al.* (1975) and by Zaborowski (1987), and (c) the factor structure evidence distinguishing between the two private self-consciousness and two public self-consciousness dimensions (Burnkrant & Page, 1984; Mittal & Balasubramanian, 1987).

Through the interview stage, the conceptual facets along with the cognitive procedures related to self-consciousness were addressed and the outcome was a set of 104 items. Those items were then administered to a pilot sample of university students ( $N = 54$ ) and were evaluated for their basic statistical properties. Some of those items (22 in number) were eliminated on the basis of those properties, mostly due to metric and methodological discrepancies such as very high intercorrelations and/or extremely low shared variance. The remaining 82 items (intermediate version) resulted in the scale to be tested under a first psychometric attempt through Study 1.

## STUDY 1

*Sample and Procedure*

The aim of this first study was to use principal components analysis to explore the factor structure of the 82-item questionnaire, constructed in the pilot study. The sample for this first study consisted of 494 participants (39% men, 61% women). Of these, 319 were university students (65%) and 175 were non-student adults (35%). The university students ( $M$  age = 22 yr.) were recruited from several departments of the University of Athens (Philosophy, Psychology, Theology, Physics, Medicine, and Physical Education & Sports) and from the National Metsovion Polytechnic School of Athens. The non-student adults ( $M$  age = 34 yr.) were employed mainly as clerks (56%); 11% were doctors or lawyers, 9% were in other various occupations and 10% were unemployed. A large part of the non-student adult sample (43%) came from rural areas, and the remaining 57% from the urban area of Athens. All participants responded to the 82-item questionnaire on a 5-point Likert-type scale with anchors 5: Always true for me and 1: Never true.

*Results*

For the 494 participants, a hierarchical cluster analysis for all 82 items was employed in an attempt to identify homogeneous sets of data. The results indicated several clusters of variables but 20 items were not part of any of these homogeneous sets and they were excluded from further analysis. Three items were verbally similar to other items and were excluded as well, in order to avoid possible sources of collinearity. Thus, 59 items (revised version) remained in the item pool and they were analyzed further through exploratory factor analysis models. The participant/variable ratio for this analysis was approximately 8, satisfying the large sample prerequisite (Kline, 1993; Streiner, 1994; Bryant & Yarnold, 1995). For these analyses and all exploratory factor analyses in all studies, principal component and orthogonal rotation of axes methods were employed (cut-off loading for inclusion of items in the factors was .45), as the aim at this stage was to arrive at a scale with dimensions as clear but also as stable and independent of each other as possible.

A four-dimensional structure appeared plausible with 40.38% of the variance being explained. The first component (explaining 11.6% of the variance) was related to public self-consciousness and consisted of 13 items on appearance. The second component (10.5% of the variance) was related to private self-consciousness and consisted of 13 items on self-reflection estimates. The third component (9.8% of the variance) was related to private self-consciousness as well, but consisted of 16 items reflecting

TABLE 3  
CONFIRMATORY FACTOR ANALYSIS OUTCOMES (STUDY 3)

Model	$\chi^2$	df	p	$\chi^2/df$	RMSEA	GFI	CFI	TLI	$\Delta\chi^2$ *	$\Delta df$
Independence model <sup>a</sup>	4,561.34	861	<.00001	5.298						
Single-factor model <sup>b</sup>	3,342.77	495	<.00001	6.753	.164	.15	.47			
Two-factor model <sup>c</sup>	1,838.35	494	<.00001	3.721	.113	.12	.66	.527 <sup>b-c</sup>	1,504.42	1
Four-factor hypothetical model <sup>d</sup>	1,020.69	489	<.00001	2.087	.071	.74	.82	.601 <sup>c-d</sup>	817.66	5
Hypothetical modified model <sup>e</sup>	633.55	459	<.00001	1.380	.042	.85	.93	.860 <sup>c-e</sup>	1,204.80	35
Reduced (27-item) model <sup>f</sup>	583.22	318	<.00001	1.834	.062	.83	.88	.233 <sup>d-f</sup>	437.47	171
Reduced modified model <sup>g</sup>	533.60	315	<.00001	1.694	.059	.84	.89	.362 <sup>d-g</sup>	487.09	174
Four-factor 24-item model <sup>h</sup>	433.18	246	<.00001	1.761	.059	.86	.91	.300 <sup>d-h</sup>	587.51	243
24-item modified model <sup>i</sup>	276.70	231	<.05 (= .021)	1.198	.030	.90	.97	.818 <sup>d-i</sup>	743.99	258

\*All  $\Delta\chi^2$  values are statistically significant at the .00001 level. <sup>a</sup>All variables uncorrelated. <sup>b</sup>All 33 items loading on a single latent variable. <sup>c</sup>33-item solution assuming two factors, a Private Self-Consciousness and a Public Self-Consciousness. <sup>d</sup>33-item hypothetical solution replicating the zero cross-loadings factor structure found during study 2 (see also Tables 1 and 2). <sup>e</sup>Modifications imposed on (d) in respect to direct paths from latent variables to observed ones and in respect to correlations between item-specific variances. <sup>f</sup>Reduced four-factor 27-item model (six items eliminated to avoid suggested cross-loadings). <sup>g</sup>Modifications imposed on (f) in respect to direct paths from latent variables to observed ones. <sup>h</sup>Reduced four factor 24-item model (three more items eliminated to avoid suggested cross-loadings). <sup>i</sup>Modifications imposed on (h) in respect to correlations between item-specific variances only.

observed variables and a number of interrelated item-specific variances. These modifications were tested as well but the  $\chi^2$  was still significant although RMSEA dropped to .042. One might argue that this model should be accepted, even though the fit was far from perfect. One might indeed consider this model final and stop testing at this point, but the fact that such a model contained six direct links of factors to items which clearly belonged to other dimensions and would have to be considered as cross-loading in the final structure—let alone the correlated item-specific variances—called for more extensive actions. It was thus decided to treat these six items as possible disturbances and exclude them from further analysis, recomputing the models for a 27-item scale.

*Model 5: Four-factor, 27-item model.*—Each of the 27 items was related to its respective factor as indicated through Study 2 (loadings in Table 1). The fit indices were not as good as those for the modified 33-item model 4, but were certainly better than the fit indices for the unmodified model 4. Thus, it was decided to pursue this further and compute modification



suggestions for the 27-item model as well. Three more direct paths from latent variables to those observed were suggested (albeit not in accord with original expectations), so the model had to be redefined according to these suggestions and the fit indices were recomputed. Although, some gains in fit indices were observed, the three cross-loading items were excluded from further analysis and a 24-item scale was tested.

*Model 6: Four-factor, 24-item model.*—Once more, each of the 24 items was related to its respective factor as was indicated through Study 2 (loadings in Table 1). There was some improvement in fit statistics. When modification suggestions were computed, no direct paths were suggested although a number of correlations between item-specific variances were suggested. Some of them referred to covariances between items of the same factor (e.g., within the Self-Reflectiveness, Private Self-Consciousness factor) but some (53%) of these correlated covariances ran across different factors showing some non-orthogonality between these factors. This final modified model was tested provisionally accepting a manageable amount of non-orthogonality; then the fit indices along with the standardized indices for the correlations of item specific variances were recomputed. Fit statistics were much better. No modification indices could be suggested for this final model (Fig. 1). Considering all, this model was the best fitting model and was the least complicated in terms of interpretation, as by computing the standardized estimates for the correlations between item-specific variances it was evident that these were very small and did not indicate alarming intercorrelation among factors (median estimated correlation = .12, the highest estimate for correlation of item specific variances across different factors being .19).

Estimates of reliability were computed for these four factors (the first consisting of 8 public self-consciousness items, the second consisting of eight private self-consciousness items, the third consisting of four public self-consciousness items and, the fourth consisting of four private self-consciousness items). The standardized Cronbach's  $\alpha$  indices for these factors were .92, .80, .70, and .74, respectively. Following Hair, Black, Babin, and Anderson (2010), we also applied Equation 2 to gain better insight in respect to construct reliability, and extending this, to construct convergent validity. These estimates were .91, .80, .72, and .70 for the first to fourth factors, respectively. Where,  $L$  is the standardized factor loading of each observed variable on the factor,  $n$  is the number of loadings, and  $e$  is the error variance associated with each observed variable:

$$CR = \frac{\left( \sum_{i=1}^n L_i \right)^2}{\left( \sum_{i=1}^n L_i \right)^2 + \left( \sum_{i=1}^n e_i \right)} \quad [2]$$

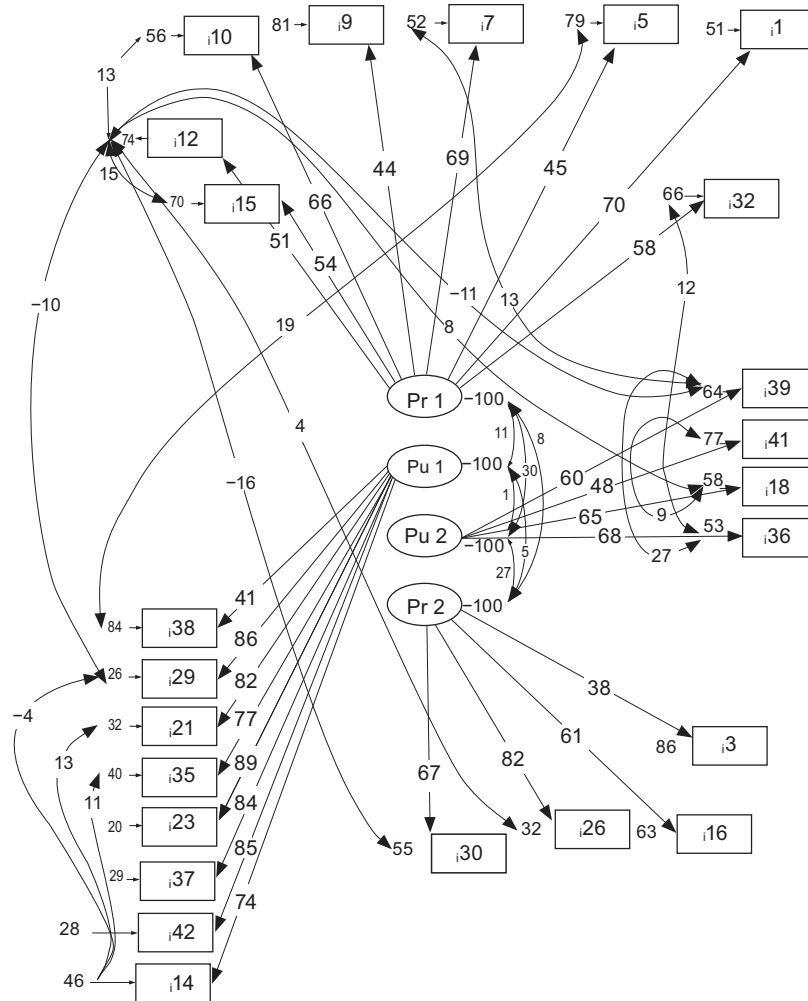


FIG. 1. Final factor structure for the 24-item Scale for Self-Consciousness Assessment. Pu 1 = Public Self-Consciousness factor (1st factor), "appearance", 8 items, Cronbach  $\alpha$  = .92, CR = .91. Pr 1 = Private Self-Consciousness (2nd factor) "self-reflectiveness in respect to actions", 8 items, Cronbach  $\alpha$  = .80, CR = .80. Pu 2 = Public Self-Consciousness factor (3rd factor), "social fit," 4 items, Cronbach  $\alpha$  = .70, CR = .72. Pr 2 = Private Self-Consciousness (4th factor), "self-knowledge," 4 items, Cronbach  $\alpha$  = .74, CR = .70.  $\chi^2 = 276.70$ ,  $df = 231$ ,  $p = .02$ , RMSEA = .03. All parameter values appear as the actual coefficients  $\times 100$ .