A UNIDIMENSIONAL MEASURE OF HONG'S PSYCHOLOGICAL REACTANCE SCALE [1,2]

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Summary.—Research using Hong's Psychological Reactance Scale has been fraught with methodological concerns. Researchers have been unable to find a stable, reliable, and replicable factor structure. Here, results suggested that Hong's Psychological Reactance Scale is a unidimensional one with an average alpha of .74 (*SD* = .46). This value was attained by first analyzing correlation matrices reproduced from three reports on Hong's Psychological Reactance Scale and then verifying this new factor structure with original data. Tests for internal consistency supported a 1-factor solution. Tests for external consistency supported prior findings in relation to Psychological Reactance and offer evidence that the 1-factor solution is externally valid. While the authors contend that a 1-factor solution is appropriate, further testing is needed for external consistency and refinement of the measure.

Psychological Reactance (Brehm, 1966; Brehm & Brehm, 1981) assumes that, when an individual's freedom is threatened, the individual will be motivated to restore the perceived loss of freedom. One of the more widely used measures of Psychological Reactance is Hong's Psychological Reactance Scale. While the theory is useful in therapeutic and social psychological research, researchers using Hong's Psychological Reactance Scale have been unable to find a consistent, reliable, and replicable factor structure to measure the construct. Prior researchers have noted factor structures with a variety of factors and with a fluctuating collection of items on a given factor. However, given no *a priori* reason, to create a 2-, 3-, or 4-dimensional construct is methodologically unsound; it allows data to drive the theory, a questionable yet all too common procedure. Britt and Shepperd (1999) argued that as a result of the relevance of different psychometric concepts to individuals, measures of reliability and validity would show variability. Given individual differences, individuals are likely to respond differently to Hong's Psychological Reactance Scale questions. Reactance researchers may have mistakenly misinterpreted variability in their datasets to be an indication that this scale was multidimensional.

Methodologically, there are a number of concerns involving Hong's Psychological Reactance Scale. [3] The first self-report scale used to assess Psycho-

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[3]The present study focuses on Hong's Psychological Reactance Scale. However, the Therapeutic Reactance Scale (Dowd, Milne, & Wise, 1991) is also widely used.

logical Reactance by Merz (1983) had 18 items and four unnamed factors. The scale was translated from German to English by Tucker and Byers (1987).[4] According to Tucker and Byers this translated version yielded only two poorly loading factors. Tucker and Byers called these factors *behavioral freedom* and *freedom of choice*. Tucker and Byers concluded this version was "psychometrically unacceptable" (p. 814) and most likely reflected translation problems. Hong and Ostini (1989) collected their own data and evaluated Tucker and Byers' version and claimed to find a 4-factor solution. Hong and Ostini called these factors *freedom of choice, behavioral reactance, behavioral freedom*, and *conformity reactance*. Unfortunately, the factors were not clearly defined, and some of the items needed to be refined. The Hong and Ostini version was also declared "psychometrically unstable" (p. 710); again, this was attributed to translation problems. Finally, Hong (1992) and Hong and Faedda (1996) switched from an 18-item scale to a 14-item scale and then to an 11-item scale. These scales have similar, but not identical, 4-factor solutions. Hong and Faedda (1996) called their factors *emotional response toward restricted choice, reactance compliance, resisting influence from others*, and *reactance toward advice and recommendations*. Currently, Hong's 11-item scale is the most widely used version of Hong's Psychological Reactance Scale. A further study by Thomas, Donnell, and Buboltz (2001) found a 3-factor solution. These factors were *response to advice and recommendations, restriction of freedom*, and a third factor which "demonstrates a mode of interaction in which people perceive contradiction and disobedience as exciting" (Thomas, *et al.*, 2001, p. 5). While this study and the others mentioned above all supported Hong's Psychological Reactance Scale as a multidimensional construct with moderately high internal consistency, they do not show that any of the factor structures are consistent in replication. If Hong's Psychological Reactance Scale was appropriately conceived and data analyzed, such inconsistencies in replication should not appear.

The assumptions made by Hong and colleagues may be the cause of concerns about Hong's Psychological Reactance Scale. Hong and colleagues used exploratory factor analysis to analyze their data, and Hong and Faedda (1996) applied "principal components and principal axis factor analysis with varimax and oblique rotations" (p. 176). The assumptions underlying these data reduction techniques may be at fault for the concerns that the present authors have. For instance, an oblique or oblimin rotation forces the factors to be orthogonal or unrelated. It is more likely that there are interfactor correlations. Hong and Ostini (1989) stated, "the correlation between oblique factors was minimal" (p. 709). Tucker and Byers (1987) stated that the fac-

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[4]The complete Hong's Psychological Reactance Scale can be found in Appendix A (p. 579).

tors derived from their analysis were essentially orthogonal because they were correlated only at .24. This explains 6% of the variance, which is clearly not orthogonal. Regardless of this fact, they proceeded with their analyses using factors that are not orthogonal.

An attempt has been made to use confirmatory factor analysis to assess Hong's Psychological Reactance Scale. Thomas, *et al.* (2001) used both the 11-item and the 14-item versions. The authors concluded that the 11-item and the 14-item measures are good overall, but it was clear that the scale is not unidimensional. The main limitation of the 11-item and the 14-item scales, according to these authors, was an "inability to tap adequately the posited four dimensions" (Thomas, *et al.*, 2001, p. 7). However, these authors proceeded on the assumption that the prior work was methodologically sound. If one assumes facts that are not correct, then one' claims are not appropriate.

Currently, Hong's Psychological Reactance Scale is not a statistically reliable and consistent scale for measuring Psychological Reactance. As previously noted, one theory has led to a number of different solutions. For a measure to be valuable it must have internal consistency, external consistency or validity, and be replicable. Per the analyses of Merz (1983), Tucker and Byers (1987), Thomas, *et al.* (2001), and Hong and colleagues. Hong's Psychological Reactance Scale does not seem to measure a reliable construct. While the internal consistency of an individual data set is moderately good, the overall consistency is mediocre at best. One should conclude that Hong's Psychological Reactance Scale, as currently designed, is not valuable. The authors do not contend that Hong's Psychological Reactance Scale is not valuable, merely that the methods of data reduction like varimax and oblique were utilized improperly.

This study attempts to reconcile the computational and methodological issues through confirmatory factor analysis. The first part of the current study is a meta-analysis of data from studies using the scales that have been derived from Merz's (1983) original 18-item scale (Tucker & Byers, 1987; Hong & Ostini, 1989; Thomas, *et al.*, 2001). In the past, Hong's Psychological Reactance Scale data has been factor analyzed with exploratory factor analysis techniques. This paper takes a correlation matrix from Thomas, *et al.* (2001) and recreates correlation matrices from factor loadings, provided by Hong and Ostini (1989), and Tucker and Byers (1987), and reanalyzes these data with confirmatory analyses. Part two assesses external consistency and validity by collecting new data for Hong's Psychological Reactance Scale and other measures which have been shown to be related to Psychological Reactance. These measures include Rotter's Locus of Control Scale (1966), Diener's Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), and Rimon's Brief Depression Scale (Keltikangas-Jarvinen, & Rimon,

1987). Convergent validity tests by Hong and Faedda (1996) showed ratings on the Brief Depression Scale correlated with scores on Hong's Psychological Reactance Scale ($r = .15$, $p < .001$), and the scores for the Satisfaction with Life Scale correlated with those on Hong's Psychological Reactance Scale ($r = -.04$, $p < .01$). According to Buboltz, Williams, Thomas, Seeman, Soper, and Woller (2003), scores on Hong's Psychological Reactance Scale correlated with those on Locus of Control. Dowd and Wallbrown (1993) also demonstrated that scores on the Rotter Locus of Control Scale correlated with a measure of reactance (Dowd, Milne, & Wise, 1991).

<center>METHOD</center>

Study 1: Procedure

Six articles were located that dealt directly with Hong's Psychological Reactance Scale construction. These consisted of Tucker and Byers (1987), Hong and Ostini (1989), Hong and Page (1989), Hong, 1992, Hong and Faedda (1996), and Thomas, *et al*, (2001). These articles were treated in two different ways, so it is necessary to discuss the two procedures.

The Thomas, *et al.* article (2001) provided a confirmatory factor analysis of Hong's work. This article looked at the factor structure of Hong's published articles of scale construction (Hong & Page, 1989; Hong, 1992; Hong & Faedda, 1996). Across a number of studies Hong, *et al.* derived similar but not identical factor structures. This method allowed assessment of multiple versions of Hong's Psychological Reactance Scale. The current authors used the previous data and factor structures and tried to reconcile the scale problems.

Two remaining articles (Tucker & Byers, 1987; Hong & Ostini, 1989) did not include the correlation matrices in the article, so it was necessary to recreate them. The first step in this procedure was to enter the provided primary and secondary factor loadings into a Microsoft Excel© file. This file was then entered into a program called *FNX*. The program, designed by Hamilton (2002), recreates correlation matrices from primary and secondary factor loadings.

The factor structures of the previous articles (Thomas, *et al.*, 2001; Tucker & Byers, 1987; Hong & Ostini, 1989; Hong & Page, 1989; Hong, 1992; Hong & Faedda, 1996) were used as starting points for analysis. To begin with, the authors attempted to verify solutions of previous authors using the reproduced datasets from all of the studies. For instance, when the factor solution provided by Hong and Faedda (1996) was applied to all of the combined datasets, it did not yield a reliable solution. Given the unsatisfactory results, the authors attempted to combine the factor structures of previous authors. For example, items from Hong's Psychological Reactance Scale that have ever loaded on the factor labeled *freedom of choice* were en-

tered into the analysis. After converging on items to be placed on any one factor, this solution was applied to the complete dataset, which again did not indicate acceptable internal consistency. Finally, when this analysis proved fruitless, the authors tested a unidimensional measure of Hong's Psychological Reactance Scale.

Internal Consistency

To assess internal consistency, item content was assessed. Item content was evaluated by examining the items on prior scales and deciding whether they assessed similar constructs. Again, the prior factor loadings were used as a starting point. Once content of the items was evaluated to be similar by the authors' discussion, they could be used to create factors. This process was not needed for the Tucker and Byers' work as there was only one article, so no inconsistencies were reported. For all of the data, there seemed to be some possible items that did not fit. These items were flagged as possibly problematic. With regard to the work on Hong's Psychological Reactance Scale, the same item(s) loaded on different factors in various studies, which raised concerns. If the data reduction techniques done in the past were appropriate, then the factor structure should continue to be the same instead of fluctuating.

Each factor structure used to verify prior results was entered into a confirmatory factor analysis program (Hunter & Hamilton, 1992) to assess consistency and quality. As a result of the prior structures failing to replicate, a unidimensional construct was pursued. In this construct items which loaded poorly ($<.25$) were eliminated to identify the most generalizable and reliable solution. That solution was verified using a confirmatory factor analysis with all three reproduced data sets.

RESULTS

Unsatisfactory internal consistency of the factor structures of previous authors (Tucker & Byers, 1987; Hong & Ostini, 1989; Hong & Page, 1989; Hong, 1992; Hong & Faedda, 1996; Thomas, *et al.*, 2001) when using an aggregate dataset prompted the exploration of a unidimensional scale. A confirmatory factor analysis, using *CFA: BAS* (Hunter & Hamilton, 1992), and all three recreated datasets suggested the best solution to be a 1-factor solution when Items 3, 5, 7, and 10 were eliminated.

TABLE 1
CONFIRMATORY FACTOR ANALYSIS FOR PRIOR HONG'S PSYCHOLOGICAL REACTANCE SCALE DATASETS

	n	Reliability	Loading	χ^2
Hong & Ostini (1989)	379	.75	$>.40$	98.3*
Thomas, *et al.* (2001)	1444	.71	$>.32$	667.9*
Tucker & Byers (1987)	218	.69	$>.29$	134.9*

*$p < .01$.

Study 2: Procedure

To assess external validity, the 18-item Hong's Psychological Reactance Scale (Appendix A, p. 579) was used, as well as Diener's Satisfaction with Life Scale, Rotter's Locus of Control Scale, and a revised version of Rimon's Brief Depression Scale in a correlational analysis. The abridged scale created in this study to measure Hong's Psychological Reactance Scale was also included (called Abridged version). Participants completed a measure designed to assess all of the measures of relevance to this part of the study.

Participants.—There were 288 participants from Communication/Psychology classes at a private northeastern university. Participants received extra credit for their voluntary participation. Participants were given a revised survey using the scale shown in Appendix A (p. 579). There were 117 (41%) men and 171 (59%) women whose mean age was 21 yr. ($SD = 1.8$).

Internal consistency reliability.—The reliability of Hong's Psychological Reactance Scale with these new data, using the unidimensional solution as proposed in Part 1, was acceptable (Cronbach $\alpha = .73$), explaining 25% of the variance. When all of Hong's Psychological Reactance Scale items were entered into this analysis, the reliability was good (Cronbach $\alpha = .81$), explaining 25% of the variance. Diener's Satisfaction with Life Scale's reliability was poor (Cronbach $\alpha = .22$). When the fourth and fifth items were removed and the sixth item reverse-coded, the internal consistency was improved but still was unacceptable (Cronbach $\alpha = .56$). It was called the New Diener Scale. The reliability of the Rotter Locus of Control Scale was acceptable (Cronbach $\alpha = .78$) as was the internal consistency of the Rimon Brief Depression Scale (Cronbach $\alpha = .70$).

External validity.—To estimate external validity of the findings in this study, tests for convergent validity were performed. Bivariate correlations were performed to assess the relatedness between the measures discussed above.

Zero-order correlations were run to assess convergent validity. Results confirm some of the hypotheses for external validity.

TABLE 2
CORRELATION MATRIX OF TESTS FOR EXTERNAL VALIDITY

	1	2	3	4	5
1. Abridged Hong's Psychological Reactance Scale					
2. Diener	.00				
3. Rimon	.10	−.30†			
4. New Diener	.17*	.33	−.18†		
5. Hong's Psychological Reactance Scale	.98	−.01	.11	.15*	

*$p < .01$. †$p < .05$.

DISCUSSION

The most consistent fit of the data for Hong's Psychological Reactance Scale was a 1-factor solution. Eliminating Items 3, 5, 7, and 10 may not be necessary, as suggested by the high correlation between the scale with the eliminated items and with the full scale. However, these results still suggest that the most reliable solution is unidimensional in any case. This is contrary to all previous studies using the items from Merz's translated Psychological Reactance Scale; results we believe are related to use of a larger pool of data and more stringent methodological and theoretical procedures. Most researchers who have used Hong's Psychological Reactance Scale have not found a replicable and reliable solution. The internal consistency (Cronbach α) across all four datasets, the three replicated and one original, of the unidimensional scale created here was on average .74 ($SD = .46$). While other researchers have had success in finding internally consistent scales, these estimates for the scales did not replicate in other studies. The unidimensional scale created in this study had similar reliability estimates four distinct times, using the identical factor structure unlike prior authors who have allowed different items to move across dimensions. In the past researchers may have viewed variability in individual datasets as symptomatic of a multidimensional construct. However, it seems more likely, in light of the present findings and research by Mallon (1992), that Hong's Psychological Reactance Scale is unidimensional, even though individuals vary in their tendencies or proneness to be psychologically reactant.

Scores on Hong's Psychological Reactance Scale, with the unidimensional solution, correlated with ratings on Rotter's Locus of Control Scale indicating external validity. Similar results were reported in studies by Dowd and Wallbrown (1993) and Buboltz, et al. (2003). Logically, Locus of Control and Hong's Psychological Reactance Scale should be related since the focus of the latter is a reaction to the threat to freedom and control threatens freedom. However, since the data in this study precipitated a revision of the Diener scale, the evidence is tentative at best and not comparable to those of other studies. Unlike Hong and Faedda (1996), this study did not show scores on Diener's Satisfaction with Life Scale and Rimon's Brief Depression Scale were correlated with either the complete Hong's Psychological Reactance Scale or the revised model described in part one of this paper. The correlations were in the right direction but not statistically significant.

While it cannot be decided conclusively whether the present solution is the proper one, it seems to be the best fit at present. When compared further with research on the Guttman Simplex or second-order unidimensional models, this model is still the best solution. To address issues surrounding the dimenionality of constructs Hunter and Boster (1987) and Levine and McCroskey (1990) argued for the assessment of convergent and discriminant

validity. Researchers should correlate scores on the scale in question with those on other related constructs. Hunter and Gerbing (1982) argued that parallelism or external validity needs to be addressed by the same methods. Both external validity and convergent validity were assessed in the present study; further suggesting that Hong's Psychological Reactance Scale more likely represents a unidimensional construct than a multidimensional one. In a similar but unpublished study, Mallon (1992) used similar methods to verify his scale of Psychological Reactance Proneness.

Limitations

Sample size was small compared to those in other studies. The Hong and Faedda study (1996) had a sample size of 3,085. These sample size issues may have been responsible for their significant correlations or the lack of such in this study.

The program used to do the confirmatory analysis has its benefits but also has its downsides. While the product allows researchers to specify items on a given factor, it does not allow analyses like Eigenvalues, skree plots, or variance explained to be calculated. This could have been done using other statistical packages but the authors do not have access to the actual datasets and only had access to reproduced correlation matrices. However, when the original dataset collected for the external validity tests was set for either the abridged or full 1-factor solution, it explained only 25% of the variance. While this estimate may seem low, this was the most variance explained even when the program (SPSS 12) was allowed to find its own solution; the second factor explained <10% of the variance. Moreover, when the program was allowed to find its own solution a 6-factor, not a 2-, 3-, or 4-factor solution, was found. These six factors illustrate a 1-factor solution is relevant, and the other factors could be described as "crud" (Meehl, 1990) being likely the result of individual differences in proneness to be reactant. These findings further illustrate the instability of Hong's Psychological Reactance Scale.

While the solution created in Part 1 seems to be the best, there still are problems with some of the items. The Cronbach alphas of the scales were only moderate, ranging from .69 to .81, and many of the included items loaded moderately to good on the single factor and ranged from .29 to .63. This suggests that the items currently being used in Hong's Psychological Reactance Scale may not be the best representations of the construct or that the construct may be more complex than is currently thought. Thomas, *et al.* (2001) also stated that the problem with Hong's Psychological Reactance Scale is inadequate assessment of the construct.

Suggestions

It seems logical that cognitive dissonance may be correlated with Psy-

chological Reactance. Both theories offer predictions of how people will react to the removal of something as a behavioral option. In experimental situations for cognitive dissonance, when one is not allowed to do X, then X becomes less appealing as a means of reducing dissonance. Psychological Reactance predicts the opposite. These two models predict opposite outcomes and thus should be negatively correlated.

More tests of discriminant and convergent validity would be useful. The limited support for divergent and convergent validity here may be the result of sampling error or sample size so replication with a much larger sample would be informative.

Finally, a major limitation of Hong's Psychological Reactance Scale may be the methods used for assessment. Hong's Psychological Reactance Scale is a survey and relies on self-reports which means lack of independence of the limitations of other self-reports (Wilson & Nisbett, 1978). When asked to report how one would react to an emotional situation such as the loss of freedom, the participant may likely miss the emotional component which drives the threat-reaction. Participants may misreport their own reactions because they are using rational abilities and may not be tapping their reactive behaviors or may not be proud of some of the reactive behaviors they have committed. If reactance is a reaction to threats to freedom, it may be essential to set-up experiments wherein participants feel their freedom is threatened or to seek out real life situations for intensive exploration.

Conclusions

In this study datasets from a number of authors were combined and an original one collected to identify the most internally and externally consistent factor structure for Hong's Psychological Reactance Scale. This study suggested that this scale is more likely to be unidimensional than multidimensional. At best, this scale is only moderately stable and reliable, as suggested by the questionable factor loadings. However, this unidimensional construct still appears to be the most consistent and reliable construct in light of the broad cross-section of data used. It may be necessary to reconceptualize Psychological Reactance or to overhaul Hong's Psychological Reactance Scale extensively to deal with problems like crud that arise in data-reduction techniques. In fact, there is a great deal of debate about whether Reactance is a state or a trait. The results of this study suggest that this debate may be informed by rectifying scale concerns and vice a versa. Hong's Psychological Reactance Scale requires more systematic experimentation and replication so that it will have both internal consistency and external validity.

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APPENDIX A

FULL HONG'S PSYCHOLOGICAL REACTANCE SCALE
(ALL ORIGINAL ITEMS FROM MERZ SCALE)

Indicate your agreement using anchors of 1: strongly disagree and 5: strongly agree.

Item	Statement
1.	Regulations trigger a sense of resistance in me.†
2.	I find contradicting others stimulating.
3.	When something is prohibited, I usually think "That's exactly what I am going to do."‡
4.	The thought of being dependent on others aggravates me.
5.	I consider advice from others to be an intrusion.‡
6.	I become frustrated when I am unable to make free and independent decisions.
7.	It irritates me when someone points out things which are obvious to me.‡
8.	I become angry when my freedom of choice is restricted.
9.	Advice and recommendations induce me to do just the opposite.
10.	I am content only when I am acting of my own free will.†‡
11.	I resist the attempts of others to influence me.
12.	It makes me angry when another person is held up as a model for me to follow.
13.	When someone forces me to do something, I feel like doing the opposite.*
14.	It disappoints me to see others submitting to society's standards and rules.
15.	When someone forces me to do something I say to myself: Now that's exactly what I don't want to do.*
16.	It pleases me to see how others submit to social norms and constraints.*
17.	Strong praise makes me skeptical.*
18.	I react negatively when someone tries to tell me what I should or should not do.*

Note.—The scale used in the study had no labels and asterisks. Items are based on those translated and adapted by Tucker and Byers (1987, Table 1, p. 813) from Merz (1983). Reprinted with permission of Psychological Reports ©1987.
*Removed items for 14-item scale. †Removed for 11-item scale. ‡Removed items in this study.