

## ***Trimming the Fat Reveals a One-Factor Construct of Hong's Psychological Reactance Scale***

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**ABSTRACT** - It is unclear whether one should measure psychological reactance as a global one-factor trait or a multidimensional complex of traits. There is evidence on both sides of this debate, and we sought to add to that conversation. In two studies, we attempted to determine the best factor structure of Hong's Psychological Reactance Scale. First ( $N = 240$ ), we conducted Principal Components Analyses, demonstrating that a one factor solution with eight items removed was the best fit. Second ( $N = 266$ ), a confirmatory factor analysis demonstrated this 10-item scale had reasonable psychometric properties and assessments of the nomological network suggested this scale was negatively correlated with tendencies to abdicate to authority and positively with tendencies to aggress. Our results suggest that a one-factor structure is reasonable for assessing psychological reactance.

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What is psychological reactance? Despite its long history, there is little agreement on what psychological reactance is. However, in terms of defining it, most researchers have focused on whether or not it is a *state* or a *trait* related to an aversion to restrictions or threatened restrictions (e.g., Brehm & Brehm, 1981). This appears to be a false dichotomy; it is both a *state* and a *trait* (Buboltz, Woller, & Pepper, 1999; Dillard & Shen, 2005; Seemann, Buboltz, Thomas, Soper, & Wilkinson, 2005).

When treated as a trait, a further debate has yet to be resolved and one that is quite fundamental to the nature of personality constructs and may be instrumental in understanding the nature of psychological reactance. The most common trait measure is Hong's Psychological Reactance Scale (HPRS: e.g., Hong, 1992).<sup>1</sup> There is little agreement in terms of the factor structure of this measure, which may be a function of limited theory behind trait psychological reactance and a poor quality measure. In this study, we attempt to determine what the best factor structure of HPRS is via Principal

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<sup>1</sup> Psychological reactance can also be treated as a psychological *state* (Miller, Burgoon, Grandpre, & Alvaro, 2006; Miller, Lane, Deatrck, Young, & Potts, 2007; Reinhart, Marshal, Feeley, & Tatzauer, 2007) and measured as a trait with a clinical measure (e.g., Dowd & Wallbrown, 1993).

Components Analysis, Confirmatory Factor Analysis, and assessments of the surrounding nomological network.

As a rule, those who have attempted to assess psychological reactance have done so with little theoretical guidelines, using more data-driven approaches to providing evidence of the factor structure of trait psychological reactance. Using this inductive approach, authors have arrived at a variety of factor structures ranging from two (Merz, 1983; Tucker & Byers, 1987), to three (Donnell, Thomas, & Buboltz, 2001; Thomas, Donnell, & Buboltz, 2001), and four (Hong, 1992; Hong & Page, 1989) factors. In each case, the items that loaded on each factor were different. When researchers have attempted to verify the appropriate factor structure comparing these solutions to a one-dimensional, the global trait fared superior to the others (Jonason & Knowles, 2006) and had adequate psychometric properties (Shen & Dillard, 2005). This one-dimensional conceptualization has proven useful in communication research (Dillard & Shen, 2005) and to be valid (Jonason, 2007).

A major problem with this inductive approach is that “bad items” can create error in the matrix; a common problem in personality measures (Meehl, 1990). Therefore, what is necessary is a Principal Components Analysis (PCA) procedure. PCA is a procedure for item reduction; eliminating low quality items (Hatcher, 1994). Prior research suggests that HPRS has low quality items and these authors saw cause to eliminate items (Hong & Faedda, 1989; Jonason & Knowles, 2006). Via PCA analyses, we will trim away the poor items, or the fat, to provide evidence and confirmation for HPRS one-dimensional structure.

A common way to assess the validity of a measure is to assess its surrounding nomological network with related personality variables (Cronbach & Meehl, 1955). In this case, we propose that measures related to abdication of freedom to authority figures will be related to scores on HPRS because of the central role that restricted freedom plays in psychological reactance (e.g., Brehm & Brehm, 1981). Specifically, religiousness and authoritarianism will be negatively correlated with rates of psychological reactance. Authoritarianism is an overall ideological trait (Altemeyer, 1988; Duckitt, 2000), reflective of an escape from freedom (Fromm, 1941) and submission to authority (Altemeyer, 1996). Like authoritarianism, religiousness may reflect some degree, and a special type of, relinquishment of freedom to an authority (Altemeyer, 2004).

Alternatively, psychological reactance may be a negative emotional, aggressive, or anger-based response to threats to freedom (Berkowitz, 1973; Eagly & Chaiken, 1993; Dillard & Meijinders, 2002; Dillard & Shen, 2005; Nabi, 2002; Quick & Stephenson, 2007; Rains & Turner, 2007; Wicklund, 1974). Anger is an aggression-based response when dealing with threats in one’s environment (Rubin, 1986) and results in an attack on the agent causing the threat (Lazarus, 1991). Therefore, tendencies to be psychologically reactant will be positively correlated with measures of aggression towards others.

### **Study 1**

The advantage of a PCA is that it helps researchers determine emergent factor structures among a set of items and suggests what items might be psychometrically poor. Using a method we will call *trimming the fat*, we improve the quality of the scale by

eliminating items that loaded below .40 and ones that load above .30 on multiple factors. We hope to arrive at a more refined structure of HPRS.

### **Method**

*Participants.* Two hundred-forty ( $M_{Age} = 25$ ,  $SD_{Age} = 7.80$ ,  $Range_{Age} = 18-65$ , 51% male, 49% female) undergraduates in communication classes from the Northeastern U.S. received extra credit in their communication courses for their participation.

*Measures.* Hong's 18-item Psychological Reactance Scale (Hong & Page, 1989) was used. Participants were asked how much they agreed (1 = *not at all*; 5 = *very much*) with statements like "I become frustrated when I am unable to make free and independent decisions."

### **Results**

To begin, we allowed the factor analysis to find its own factor structure based on the data. It resulted in a seven-factor solution, where each factor had an Eigen value greater than 1.00. The total amount of variance accounted for was 61.95%. Bartlett's test of sphericity was significant ( $\chi^2(153) = 699.37$ ,  $p < .01$ ) and the Kaiser Meyer Olkin test was sufficiently large (KMO = .77). Figure 1 contains a Scree plot.

As we conducted our trimming the fat procedure, all multidimensional factor solutions proved unviable leaving a global, trait measure of HPRS. A one-factor solution (Cronbach's  $\alpha = .74$ ) accounted for 21.01% of the variance when all items were included. When we trimmed the fat, a single factor accounted for 30.62% of the variance (Bartlett's  $\chi^2(66) = 473.00$ ,  $p < .01$ ; KMO = .79). This one factor solution was internally consistent ( $\alpha = .76$ ). It was composed of items 1, 2, 3, 6, 7, 10, 12, 13, 14, and 15 of HPRS. Figure 1 contains a Scree plot reflecting this.

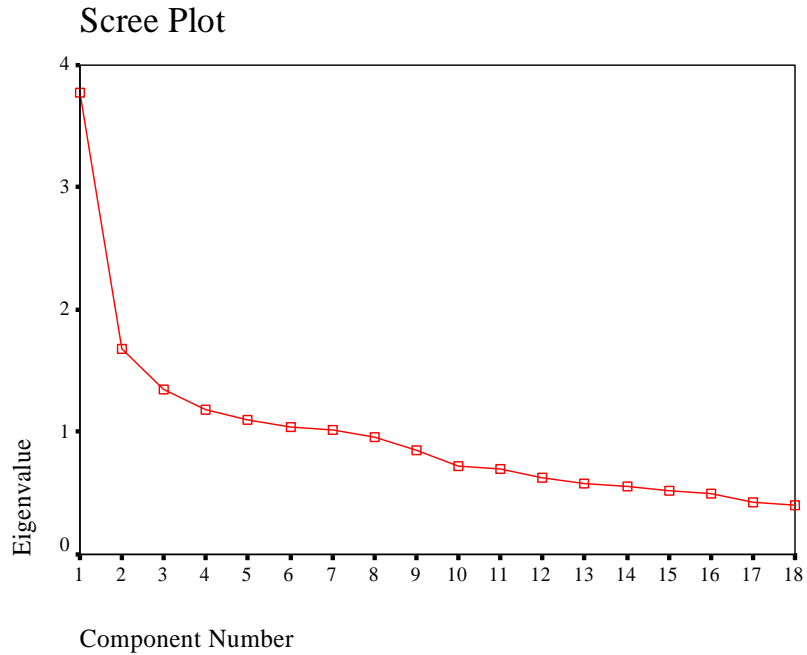
Although a multidimensional structure proved unviable, they accounted for more variance than the one-factor solution did. A two-factor solution accounted for a total of 30.31% of the variance when all items were included. A three-factor solution accounted for a total of 37.82% of the variance when all items were included. A four-factor solution accounted for a total of 44.39% of the variance when all items were included. However, in each case, when we eliminated cross-loading items and low quality items each one of these fell out.

### **Discussion**

Our evidence suggests that a one-factor solution is reasonable (Jonason & Knowles, 2006; Shen & Dillard, 2005). Although this one-factor solution does not account for a large amount of variance, both Scree plots strongly suggest a one-factor solution. In efforts to reduce this instability, we have reduced the scale by eight items to a 10-item scale. Although we lose between 10 and 40% of the variance accounted for by dropping items, dropping items provides a psychometrically better scale.

**Figure 1**  
*Scree plots of the principal component analyses on  
Hong's Psychological Reactance Scale*

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## Study 2

In Study 2, we verify the elimination of the eight items with a Confirmatory Factor Analysis (CFA). We also assess correlations with personality traits that may be related to psychological reactance: *tendency to aggress* and *tendency to abdicate authority*. Such evidence should add to our claim that a one-factor structure can reasonably measure psychological reactance.

### Method

*Participants.* Two hundred sixty-six ( $M_{Age} = 20$ ,  $SD_{Age} = 2.43$ ,  $Range_{Age} = 18 - 30$ , 44% male, 66% female) undergraduates from the Northeastern U.S. received extra credit in their psychology and communication courses for their voluntary participation in the study.

*Measures.* We used the 18-item HPRS. We averaged these items to create an index of trait, psychological reactance using all the items ( $\alpha = .68$ ) and using just the ten items from above ( $\alpha = .82$ ).

To measure *the tendency to abdicate authority to others* we measured authoritarianism ( $\alpha = .85$ ; Altemeyer, 1988, 1996, 2004) and religiousness ( $\alpha = .85$ ; Jonason, 2009). For the former, participants were asked how much they agreed (1 = *not at all*; 5 = *very much*) with the statements like “The way things are going in this country, it’s going to take a lot of ‘strong medicine’ to straighten out the troublemakers, criminals, and perverts.” For the latter, participants were asked to rate (1) how much do you follow the teachings or dogma of your faith, (2) how frequently do you attend services at your place of worship, (3) how often do you pray, (4) how religious are you, and (5) how strong would you rate the strength of your religiousness. For each scale, we averaged items to create an index.

To measure *tendency to aggress* we measured argumentativeness ( $\alpha = .83$ ; Infante & Rancer, 1982) and verbal aggressiveness ( $\alpha = .77$ ; Levine, Beatty, Limon, Hamilton, Buck, Chory-Assad, 2004). For the former, participants were asked how much they agreed (1 = *not at all*; 5 = *very much*) with statements like “Arguing over controversial issues improves my intelligence.” For the latter, participants were asked how much they agreed (1 = *not at all*; 5 = *very much*) with statements like “I like poking fun at people who do things that are very stupid in order to stimulate their intelligence.” For each scale, we averaged items to create an index.

### Results

A CFA of the 10-item scale had an acceptable (SRMR = .07; RMSEA = .09; GFI = .91) fit. In contrast, a CFA with all eighteen items was a worse fit (SRMR = .08; RMSEA = .11; GFI = .85). Using this 10-item measure, psychological reactance and threats to freedom were negatively correlated and psychological reactance and the tendency to aggress were positively correlated.

**Table 1**  
***Assessing the One Factor Measure of Hong's Psychological Reactance Scale***

	1	2	3	4	5	6
1. Age of the participant	--					
2. Psychological Reactance (10-item)	-.09	--				
3. Authoritarianism	.23**	-.30**	--			
4. Religiousness	.25**	-.29**	.40**	--		
5. Verbal aggressiveness	-.07	.40**	-.06	-.12	--	
6. Argumentativeness	-.13*	.28**	-.25**	-.21**	.34**	--

Note:  $N = 266$  \*  $p < .05$  \*\*  $p < .01$

### ***Discussion***

The reduction of the HPRS to a 10-item measure appears to be justified. It returned a better fit than the full HPRS. However, the fit was only slightly improved by the elimination of the items, suggesting the scale itself may simply not be of high quality. Nevertheless, this measure of psychological reactance was positively correlated with the tendency to aggress and negatively correlated with the tendency to abdicate power to authority.

### **General Discussion**

The debate as to the nature of psychological reactance has overshadowed the debate as to the nature of the factor structure of measuring psychological reactance. Measurement is an important tool in psychometrics and settling on a measurement standard may actually aid in the definition of psychological reactance. Without proper measurement, the debate as to the nature of any personality construct is premature. We contend that without reasonable theory to propose a multifactor solution, researchers should seek simplicity (i.e., minimal factors). Simplicity may provide for the necessary time to conduct research to understand the nature of trait psychological reactance. A similar process has occurred for sociosexuality where it was originally conceived of as a one-dimensional measure (Simpson & Gangestad, 1991) and now is thought to be composed of at least two (Webster & Bryan, 2007) if not three (Jackson & Kirkpatrick, 2007) dimensions.

We sought simplicity in the current study. It lead us to drop a number of low quality items from the HPRS as suggested by prior work (Hong & Faedda, 1996; Jonason & Knowles, 2006) and provided a higher quality and shorter measure of trait psychological reactance. We suggest that although this measure has only reasonable psychometric properties, this may be a price that researchers are willing to pay when using short measures. Short measures tend to be less psychometrically sound than longer, more extensive inventories (Kline, 2000). What this means, however, is that our results are inconsistent with most work using HPRS (e.g., Donnell et al., 2001; Hong, & Faedda, 1996; Tucker & Byers, 1987) and only consistent with a minority of work suggesting a one-dimensional, global trait (Jonason, 2007; Jonason & Knowles, 2006; Shen & Dillard, 2005).

As evidenced for the validity of the abbreviated measure of HPRS, we correlated it with related constructs. Global psychological reactance was negatively correlated with abdication to authority (i.e., authoritarianism and religiousness) and positively correlated with a tendency to aggress (i.e., verbal aggressiveness and argumentativeness). Future work should adopt this measure in more rigorous theoretical research to further assess its usefulness.

This study is not without limitations. First, despite the improved psychometric properties associated with our ten-item measure, it still evidenced moderate internal consistency and only reasonable fit. We encourage future work not to improve on the HPRS, but, instead, design a new measure altogether. Second, we only used a limited set of personality traits to assess the validity of the truncated measure. Future work should use a larger range of measures as well as alternative measures of psychological reactance and create a multitrait-multimethod matrix. Third, we relied on college students to assess our measures validity. Although this is commonly done, to more accurately understand the psychometric properties larger scale samples will be useful.

Although psychological reactance has been around in the psychological ether for near 50 years, it is rarely used and does not even show up in some textbooks (e.g., Plotnik & Kouyoumdjian, 2008). It may be that the rather low profile that psychological reactance has is a function of both its ill-defined nature and its questionable psychometric properties. Our evidence suggests that when you trim fat away from HPRS you are left with a reasonable, one-dimensional personality trait. By trimming the fat, we have provided much needed clarification of HPRS. This should be invaluable in those set on understanding both psychological reactance and how it functions in social and personality psychology.

#### Author Note

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