

Psychological Reactance Scale

Development and Test of Its Reliability and Validity in College Students

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Abstract—Objective: To develop a questionnaire of psychological reactance and test its reliability and validity. **Methods:** At first, the structure of trait reactance was proposed according to the Psychological Reactance Theory (PRT) and analysis on the related references included three main measurements of trait reactance, which were Questionnaire for the Measurement of Psychological Reactance (QMPR), The Therapeutic Reactance Scale (TRS), and The Hong Psychological Reactance Scale (HPRS). Based on this structure of trait reactance, the preliminary questionnaire was developed. The questionnaire was given to 1681 college students who were selected by convenient sampling in 6 universities in Wuhan. **Results:** Through exploratory factor analysis ($n=479$), the result indicated that the trait reactance consisted of opposite emotion, resistance to impact, refutation, paying regard to freedom, antiauthority and independence. The Cronbach's alpha coefficient was 0.84 and the test-retest reliability was 0.86. Then confirmatory factor analysis ($n=459$) was used ($\chi^2/df=2.30$, $RMSEA=0.05$, $GFI=0.92$, $NFI=0.91$, $NNFI=0.94$, $CFI=0.94$, $IFI=0.95$). Trait reactance was found negatively related to MMPI-K subscale score, positively related to trait anger, but not related to internality, state anxiety and trait anxiety. Three factors of 16PF (vigilance, dominance and self-reliance) and two factors of EPQ (psychoticism and neuroticism) positively predicted trait reactance. It was also found that different types of temperament varied in trait reactance. **Conclusion:** The results indicate that six-dimensional structure of trait reactance is supported and the questionnaire has good reliability and validity. It can be used to measure individual trait reactance, and to be applied in related psychological researches.

Keywords—psychological reactance; psychological measurement; reliability; validity

I. INTRODUCTION

The concept of psychological reactance is originated from the research field of social psychology. Brehm SS and Brehm JW defined it as "a motivational state produced when individual's freedom is lost or going to be lost" [1], namely state reactance, directly pointing to maintaining individual's freedom. It is a specific situational variable, cannot be directly measured but be deduced on the basis of reactance effect. [1] On the other hand, Brehm SS and Brehm JW believed that individual had different reactance potential [1] and also regarded psychological reactance as "an internal

tendency of individual to generate state reactance", independent of situation and having individual difference; it is a stable personality trait [1] [2] [3] [4] [5], namely trait reactance. Many researches have explored the relationship between trait reactance and some personality variables [1] [3] [6] [7] [8] [9] [10], and have also received attention in the field of psychological counseling and treatment [11] [12] [13] [14]. Therefore, many researchers regard psychological reactance as a trait-like variable having both situational and individual differences [3] [10] [15] [16] [17].

There are three main types of tools for measuring trait reactance [17]: namely QMPR (Questionnaire for the Measurement of Psychological Reactance) [2], TRS (The Therapeutic Reactance Scale) [3], and HPRS (The Hong Psychological Reactance Scale) [4]. The QMPR was compiled by Merz in Germany in 1983. It is the first self-rating scale for directly measuring trait reactance, and totally has 18 items, including 4 factors (unnamed). The reliability of internal consistency of the whole scale at that time was 0.90, and that measured 2-3 weeks later was 0.86 [2]. However, some subsequent researches found that the English version of QMPR had poor psychometric properties; namely the structure of factors was unstable and had insufficient reliability [18] [19] [20]. Hence, QMPR is rarely applied in subsequent researches.

TRS was originally reported by researchers such as Dowd at the annual meeting of the American Psychological Association in 1984, officially published in 1991, and widely applied in subsequent researches [6] [7] [9] [10] [11]. TRS totally has 28 items, including two factors such as behavior reactance and verbal reactance. The reliabilities of internal consistencies of the factors and the whole scale were respectively 0.81, 0.75, and 0.84 at that time and those measured 1-3 weeks later were respectively 0.60, 0.57 and 0.59 [3]. Two subsequent researches revised TRS: researchers such as Buboltz retained 15 items and extracted four factors (anger to authority, sensitivity to influence, conflict avoidance, freedom maintenance) [21]; Arnou et al retained 25 items and extracted 4 factors (internal guidance, adherence to own opinion, dominance/competition, rebellion/confrontation) [11].

In 1992, Hong and Page compiled HPRS through translation and revision of QMPR. HPRS has 14 items,

including 4 factors (selection freedom, reactance against obedience, behavior freedom, reactance against suggestion and sincere advice). The reliability of internal consistency of the whole scale was 0.79 at that time, and that measured 2 weeks later was 0.89 [4]. In the past 20 years, a number of researches have explored the psychometric properties of HPRS [22] [23] [24] [25] [26] [27], and hence HPRS has become a relatively mature psychometric tool. With respect to the structure of HPRS, researchers mainly get the following four conclusions: 1) it is a four-factor model with 11 items (the four factors are respectively the emotional response to restricted selection, the reactance against obedience, the reactance against other's influence, and the reactance against suggestion and sincere advice) [22] [23] [24]; 2) it is a second-order one-factor model with 11 items [24]; 3) it is a one-dimensional model with 10 items [25] [26]; 4) it is a bi-factor model with 11 items [27].

Due to the lack of good theoretical construction, despite the efforts of researchers for nearly 30 years, the structure of trait reactance is still in the exploratory stage [26] [27]. Currently in China, there is lack of standardized psychometric tools for measuring psychological reactance; only a few researches have explored the psychological reactance of adolescents by translating foreign scales or self-made questionnaires [28] [29]. In view of the failure in QMPR translation in early years and the influence of cultural factors [5] [7] [30], it is necessary to develop standardized psychometric tools in Chinese version and make relevant researches. In this research, a Psychological Reactance Scale (PRS) was compiled and its reliability and validity were tested on the basis of the view of trait reactance.

II. OBJECT AND METHOD

A. Object

In this research, convenient sampling method was adopted. Questionnaires were distributed in the classroom in six undergraduate universities in Wuhan.

Sample 1 (n=479): 500 questionnaires were distributed in 11 classrooms of five undergraduate universities. The participants completed the PRS, MMPI-K scale [31], "Internality, Powerful Others, and Chance Scale" (IPC scale) [32], the Trait Anger Questionnaire [33], and the "State-Trait Anxiety Inventory" [34]; a total of 479 valid questionnaires were collected. Among them, there were 227 boys and 252 girls; 119 of them were in the freshman, 180 of them were in the sophomore, 105 of them were in the junior, and 75 of them were in the senior.

Sample 2 (n=459): 480 questionnaires were distributed in other 10 classrooms of the five undergraduate universities. The participants completed the PRS and 16PF (E-Dominance, G-Perseverance, L-Doubt, N-openness to chance, Q1-Experiment, Q2-Independence, and Q3 self-discipline subscales) [35]; a total of 459 valid questionnaires were collected. Among them, there were 208 boys and 251 girls; 117 of them were in the freshman, 133 of them were in the sophomore, 124 of them were in the junior, and 85 of them were in the senior.

Sample 3 (n=743): 780 questionnaires were distributed in another 7 classrooms of an undergraduate university. The participants completed the PRS and the Eysenck Personality Questionnaire Simple Scale China Edition (EPQ-RSC) [36]. A total of 743 valid questionnaires were collected. Among them, there are 378 boys and 365 girls; 64 of them were in the freshman, 358 of them were in the sophomore, 270 of them were in the junior, and 51 of them were in the senior.

B. Compilation of the Scale

1) *Item screening and forecasting scale*: The psychological reactance theory (PRT) holds that individual's state reactance occurs in real or perceived threat situation, and the reactance effect is manifested in different ways [1]. Trait reactance is involved in individual's demand for independence and the expectation for individual freedom [1], and the sensitivity to threats [37]. By analyzing the structures of items and factors of QMPR, TRS and HPRS scales in previous researches, it is found that trait reactance can be generally and theoretically described in five aspects such as emphasis on individual freedom, sensitivity to threats, independence, confrontation, and rebellion. Among them, the emphasis on individual freedom refers to the extent that an individual attaches importance to freedom in behavior and selection; the sensitivity to threats refers to individual's ability to perceive external influence; the independence refers to individual's emphasis on independent decision; the confrontation refers to the individual's emotional, verbal and behavioral performances to confront external impact; and the rebellion refers to individual's tendency to rebel or resist authority. In this research, as the structure of trait reactance is still in the exploratory stage [26] [27], the structure of trait reactance was defined as consisting of the above five dimensions, and a scale was compiled based on the dimensions. The scale was initially provided with 70 items. Then, four psychology majored graduate students were invited to interpret and classify the meanings of the topics, and delete or modify the ambiguous items; three non-psychology majored students were invited to interpret the language clarity and modify the sentences that are difficult to understand, forming a forecasting scale having 65 items. This scale was named as "Life Attitude Questionnaire". The participants completed the scale in accordance with the 6-point Likert scale (1 = "completely disagree", 6 = "completely agree").

2) *Forecasting and preliminary scale*: 350 questionnaires were distributed in the classrooms of two undergraduate universities, and 323 valid questionnaires were collected. Through item analysis and factor analysis, 24 items having low discrimination ability index, low correlation, low load, multiple loads and classification difficulties were deleted. Finally, a preliminary scale with 41 items was formed.

C. Validity Test

Psychological reactance theory and previous researches indicate that trait reactance has nothing to do with state anxiety and trait anxiety, and is positively related to trait anger, internal control, dominance, independence, doubt, and neuroticism, and negatively related to sociality, responsibility, openness, and the MMPI-K scale scores [1] [3] [6] [7] [8] [9] [10]. Therefore in this research, the aggregation validity and discriminant validity of the scale was tested by examining the relationship between trait reactance and several personality variables.

D. Statistical Methods

SPSS 11.5 was used for making descriptive statistics, correlation analysis, exploratory factor analysis, multiple regression analysis, variance analysis, and nonparametric test and so on; Lisrel 8.70 was used for making confirmatory factor analysis.

III. RESULTS

A. Validity of the Structure

Exploratory factor analysis was performed on the basis of sample one (n=479), KMO=0.85, and Bartlett's spherical test result was significantly "P<0.001". Principal component method and variance maximal orthogonal rotation were used to determine the factor load; then the items having factor load less than 0.40 and dual factors were gradually deleted; finally, 6 factors and 22 items were retained. The six factors, which were respectively named as opposite emotion, impact resistance, and refutation, emphasis on freedom, authority confrontation and independence ("Table I"). The factors respectively explained 23.32%, 10.63%, 7.30%, 5.70%, 4.86%, and 4.66 of the variance; the cumulative explaining rate reached 56.49%.

TABLE I. FACTOR LOADS OF PSYCHOLOGICAL REACTANCE SCALE

opposite emotion		impact resistance		refutation		emphasis on freedom		authority confrontation		independence	
item	load	item	load	item	load	item	load	item	load	item	load
39	0.74	5	0.70	14	0.80	25	0.76	34	0.74	4	0.75
33	0.68	15	0.66	37	0.80	16	0.64	13	0.68	11	0.64
26	0.62	7	0.66	23	0.76	8	0.59	41	0.59	18	0.62
21	0.60	12	0.62			1	0.58				
30	0.58										

^{a.} n = 479

According to previous researchers' suggestions, six non-scoring neutral interference items were added into the scale, finally forming a formal 28-item scale. By checking the correlation between total score and the factors in the scale, it is found that the factors have high correlation with the total

score and have low correlation with each other, as shown in "Table II".

By making confirmatory factor analysis on the basis of sample 2 (n=459), it is found that the 6-factor model fits well ("Table III").

TABLE II. MATRIX OF CORRELATION BETWEEN TOTAL SCORE AND FACTORS IN THE PSYCHOLOGICAL REACTANCE SCALE

	opposite emotion	impact resistance	refutation	emphasis on freedom	authority confrontation	independence	total score
opposite emotion	1						
impact resistance	0.54**	1					
refutation	0.42**	0.26**	1				
emphasis on freedom	0.30**	0.10*	0.06	1			
authority confrontation	0.50**	0.39**	0.35**	0.17**	1		
independence	0.34**	0.15**	0.23**	0.45**	0.29**	1	
total score	0.84**	0.66**	0.59**	0.51**	0.69**	0.59**	1

^{a.} Note: *P<0.05; **P<0.01; ***P<0.001; the same below.

^{b.} n=459

TABLE III. CONFIRMATORY FACTOR ANALYSIS ON THE PSYCHOLOGICAL REACTANCE SCALE

	χ^2	df	χ^2/df	RMSEA	SRMR	GFI	AGFI	NFI	NNFI	CFI	IFI	RFI
6-factor model	457.73	195	2.30	0.05	0.06	0.92	0.89	0.91	0.94	0.94	0.95	0.89
second-order model	591.00	203	2.91	0.06	0.07	0.90	0.87	0.89	0.92	0.92	0.93	0.87

^{a.} Note: $\Delta\chi^2=133.27$; $\Delta df=8$; P<0.001.

By making confirmatory factor analysis again on the basis of sample 3 (n=743), it is found that the 6-factor model is still acceptable ($\chi^2/df=3.75$, RMSEA=0.06, SRMR=0.06, GFI=0.92, AGFI=0.89, NFI=0.92, NNFI=0.93, CFI=0.94, IFI=0.94, RFI=0.90).

B. Validity

The result of test on the reliability the scale (n=459) shows that, the reliability of internal consistency of the whole scale (Cronbach α coefficient) is 0.84, and that of the factors are 0.67, 0.64, 0.74, 0.65, 0.67, and 0.59 respectively. Then, 136 participants were randomly selected from the formal testing sample to make the test again at an interval of

6 weeks; as a result, the correlation coefficient of the total score of the scale is 0.86, and those of the factors are 0.73, 0.60, 0.70, 0.71, 0.72, and 0.61 respectively.

C. Aggregation Validity and Discriminant Validity

Correlation analysis result shows ($r \geq 0.30$) that, PRS total score, opposite emotion score and influence resistance factor score are negatively correlated with MMPI-K scale score; PRS total score, opposite emotion factor score, influence resistance factor score and refutation factor score are positively correlated with trait anger; influence resistance factor score is positively correlated with trait anxiety ("Table IV").

TABLE IV. CORRELATION BETWEEN PSYCHOLOGICAL REACTANCE AND SEVERAL PERSONALITY VARIABLES

	opposite emotion	impact resistance	refutation	emphasis on freedom	authority confrontation	independence	total score
MMPI-K	-0.35**	-0.36**	-0.26**	-0.10*	-0.20**	-0.03	-0.36**
internality	0.13**	-0.05	0.07	0.15**	0.12**	0.27**	0.17**
trait anger	0.41**	0.48**	0.32**	0.05	0.18**	-0.02	0.41**
state anxiety	0.18**	0.29**	0.06	-0.11*	0.02	-0.17**	0.11*
trait anxiety	0.28**	0.37**	0.07	-0.08	0.08	-0.22**	0.18**

a. r, n=479

Multiple regression analysis was conducted stepwise by selecting 7 factors from 16PF and 4 factors from EPQ as the forecasting variables and taking PRS total score and the factor scores as the dependent variables. The result shows

that doubt, independence, and neuroticism positively predict the total score and various factor scores; dominance and neuroticism positively predict the total score and most factor scores ("Table V").

TABLE V. REGRESSION ANALYSIS ON PSYCHOLOGICAL REACTANCE AND SEVERAL PERSONALITY VARIABLES

	opposite emotion	impact resistance	refutation	emphasis on freedom	authority confrontation	independence	total score
dominance	0.11*		0.28***		0.15***	0.22***	0.20***
perseverance		-0.18***					-0.11**
doubt	0.29***	0.27***	0.20***	0.17***	0.21***	0.18***	0.34***
openness to chance (n=459)					-0.17***		
experiment		-0.12**		0.09*			
independence	0.21***	0.11**	0.14**	0.12*	0.27***	0.24***	0.28***
self-discipline	-0.12**	-0.12*	-0.16**	0.12*		0.16***	
R^2	0.17	0.19	0.16	0.06	0.18	0.15	0.26
R^2_{adj}	0.16	0.18	0.15	0.06	0.17	0.15	0.25
psychoticism internality and externality (n=743)	0.25***	0.14***	0.15***	0.15***	0.31***	0.27***	0.32***
nervous temperament	0.25***	0.29***	0.16***		0.15***		0.24***
dissimulation		-0.09**	-0.08*	0.11**		0.11**	
R^2	0.13	0.12	0.06	0.03	0.12	0.09	0.15
R^2_{adj}	0.12	0.12	0.05	0.03	0.12	0.08	0.15

a. Note: R^2 is the determination coefficient, R^2_{adj} is the adjusted determination coefficient, and the rest is normalized regression coefficient β .

According to the EPQ manual [38], T-score conversion was performed on E and N, and the participants were divided into 9 temperament types. Non-parametric test result shows that the difference of independence factor score between different temperament types has no statistical significance ($\chi^2=8.21$; $df=8$; $P>0.05$). By variance analysis, it is found that the difference of "emphasis on freedom" factor score between different temperament types has no statistical significance ($F_{(8, 734)}=1.26$; $P>0.05$); PRS total score,

opposite emotion factor score, impact resistance factor score, refutation factor score and authority confrontation factor score are different from each other in different temperament types ("Table VI").

TABLE VI. DIFFERENCES IN TEMPERAMENT TYPES OF PSYCHOLOGICAL REACTANCE

	opposite emotion	impact resistance	refutation	authority confrontation	total score
1) melancholic temperament (n=87)	17.78±3.52	11.37±2.61	9.62±2.75	10.40±2.92	82.49±10.81
2) bile-melancholic temperament(n=80)	18.38±3.57	12.46±2.82	9.93±2.92	10.46±2.41	84.05±10.68
3) bile temperament(n=38)	18.61±3.82	11.79±3.10	10.11±2.84	10.61±2.25	83.55±12.66
4) mucus-melancholic temperament(n=90)	16.60±3.47	10.53±2.21	8.80±2.61	9.36±2.47	77.86±10.68
5) mixed temperament (n=150)	17.41±3.55	11.07±2.64	9.75±2.62	9.90±2.60	81.40±9.95
6) sanguineous-melancholic temperament(n=90)	16.80±4.17	11.14±2.89	9.38±3.11	9.67±2.89	79.70±12.73
7) mucus temperament(n=35)	16.09±3.91	10.11±2.71	8.51±3.21	9.29±2.73	76.77±11.72
8) sanguineous-mucus temperament(n=108)	16.04±3.72	9.71±2.75	8.95±2.69	9.34±2.56	77.19±11.17
9) sanguineous temperament(n=86)	15.49±4.36	9.72±2.70	8.77±2.89	9.31±2.56	76.23±12.10
F(8, 734)	5.93***	9.63***	2.82**	3.00**	5.50***
Multiple afterwards	comparisons ①, ②, ③, ⑤>⑨ ②, ③>④, ⑦, ⑧ ③>⑥	①, ③, ⑤, ⑥>⑧, ⑨ ②>⑧, ⑨ ②>①, ④, ⑤, ⑥ ②, ③>⑦	③>⑦	①, ②, ③>④, ⑦, ⑧, ⑨	①, ②, ③>⑦, ⑧, ⑨ ②, ③>④

a. Note: the "Multiple comparisons afterwards" type P<0.05.

b. $\chi^2, n=743$

IV. DISCUSSIONS

A. Contents and Structure of the Scale

Items of the scale are compiled from four dimensions: individual freedom, sensitivity to threats, independence and confrontation. By exploratory factor analysis, it is found that trait reactance has six dimensions:

- Opposite emotion: it is an emotion that individual often experiences when his/her individual freedom is threatened;
- Influence resistance: it refers to individual's tendency to resist external impact;
- Refutation: it refers to individual's tendency to argue against others;
- Emphasis on freedom: it refers to the extent to which individual attaches importance to individual freedom;
- Authority confrontation: it refers to individual's tendency to rebel or resist authority;
- Independence: it refers to the extent to which individual values on independent determination.

This indicates that trait reactance is a multi-dimensional phenomenon. By examining the first three dimensions and their items, it is revealed that they are basically consistent with the two dimensions originally conceived (sensitivity to threats, and confrontation against threats). Thereby, the contents and structure of trait reactance in this research are effective, feasible and comprehensive.

B. Reliability and Validity

Total score of the scale is highly correlated with each factor (r is ranged within 0.51-0.84), and the correlation between the factors is low (r is ranged within 0.06-0.54). By analyzing the confirmatory factors, it is found that the 6-factor model fits well. Therefore, the structure of the scale structure has good validity, and dimension points should better be used in the research. The Cronbach α coefficient and the test-retest reliability of the total scale are all above 0.80; the Cronbach α coefficient of each factor ranges from 0.59 to 0.74, with an average of 0.66; the reliability of each factor is 0.60-0.73, with an average of 0.68. The reliability of the scale is generally acceptable. In addition, due to the trait like attribute, psychological reactance is easy to be affected by the situation, while the test situation is an important factor affecting the reliability. Hence, the measurement of psychological reactance is prone to be unstable to some extent.

Over this research, it is found that psychological reactance was negatively correlated with MMPI-K scale score, positively correlated with trait anger, and irrelevant to internality, state anxiety, and trait anxiety. This result is basically consistent with previous research conclusions [3] [8]. As shown in "Table V", doubt, independence, dominance, psychoticism, and nervous temperament positively predict psychological reactance, which is basically consistent with previous research conclusions [6] [7] [9] [10]. In addition, there was no research to examine the relationship between trait reactance and temperament type. Combined with the characteristics of different temperament types and on the basis of psychological reactance theory, it can be inferred that the reactance level of bile-melancholic

temperament individual is higher than that of sanguineous-mucus temperament individual. The results shown in "Table 6" well validate this inference, and also reflect the trait attributes of psychological reactance. The above results indicate that the scale has good aggregation validity and discriminant validity.

V. CONCLUSION

There are still some limitations in this research. For example, the sample homogeneity is high, because the participants are all from undergraduate universities in Wuhan and thus have limited representativeness; the reliability of individual factors is not satisfactory; the measurement tools used in the research are self-evaluation scales and thus have monomethod bias. Future researches should consider applying the scales to test the groups other than college students, strictly unify the testing procedures, and appropriately modify individual scale items. Moreover, based on the trait-like attribute of psychological reactance, it is necessary to conduct more social psychology experiments in the context of Chinese culture, to enrich and deepen the theoretical research on psychological reactance. In addition, relevant researches can be also carried out in fields such as psychological counseling and treatment, clinical psychology, and public (especially adolescent) health education, so that psychology can better serve the society.

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