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Article

Investigating Regulatory Focus Questionnaire in Chinese Undergraduate Students

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Abstract: Motivation shapes students' cognition (instrumental or integrated goals), behavior (intended effort), and emotions (e.g., sadness or joy). These aspects are directed by two important and universal motivation systems: promotion and prevention. The two motivation constructs, measured by Regulatory focus questionnaire (RFQ), have been validated by samples (university students in US and high school students in New Zealand) in English speaking countries. However, it is yet to know whether the reliability and validity of the two constructs apply to a sample from the Eastern culture (e.g., China) and respond to the questionnaire in a different language (i.e., Chinese). To bridge the gap, this study analyzes data collected from a sample of Chinese undergraduate students who respond to a Chinese version of RFQ. Results showed that minor changes to the original questionnaire were necessary and appropriate for ensuring the validity and reliability of the measure when applying this questionnaire to this population.

Keywords: motivation; prevention; promotion; RFQ; L2 motivation

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1. Introduction

Motivation is a key factor that influences students to choose their goals, strategies to pursue goals, and achievement [1]. Promotion and prevention are two motivation orientations that help to explain how students choose (positive or avoid negative) goals, and prefer distinct strategies (speed or accuracy) in goal pursuits. Regulatory focus questionnaire (RFQ) [2] has been widely used to measure the two motivation constructs among student samples. However, there are also several other questionnaires to measure the two constructs and have mixed results for their validity. Taking into account the scales available, Nakkawita & Higgins argued that "we recommend the Regulatory Focus Questionnaire for measuring regulatory focus in an educational context" [1].

2. Research Aims

In line with the recommendation from Nakkawita & Higgins, this study aims to assess the factorial validity and reliability of a Chinese version of RFQ to assess the promotion and prevention motivations among Chinese undergraduates [1-3]. The primary objective of this study is to examine and identify the sets of items that provide reliable and valid measurements of promotion and prevention for these students. The second goal of the study is to evaluate whether the two constructs are independent from each other for this population. Investigating the reliability and validity of promotion and prevention is important because (i) Higgins proposed that both constructs are independent motivation dimensions, (ii) researchers are able to use two reliable and valid scales to measure two important motivation aspects and their relations with key important factors in leaning context, and (iii) teachers and educators access to student information regarding the two motivation and design corresponding intervention programs [2,4].

3. Regulatory Focus Theory

Higgins' proposed that one key aspect of motivation is that people are motivated to be effective in achieving desired outcomes in goal pursuits [2]. This value effectiveness involves two important motivation focuses. Regulatory focus theory argues that promotion focus concerns the aspect of approaching desired outcomes and avoiding undesirable outcomes, whereas prevention focus concerns the aspect of avoiding negative outcomes. Notably, Regulatory Focus Theory proposed that advancement and protection are two independent motivations that fulfill two separate essential requirements for survival (growth and safety, respectively) [1]. People having high levels of promotion see their goals as hope, inspiration and positive outcomes to attain. To achieve their desirable outcomes, these individuals prefer eager strategies for maximizing gains even when they risk making mistakes or losses; when they attain their promotion goals, they experience intense feelings of joy, and feel sad when their goals fail. In contrast, people having high level of prevention perceive their goals as duty and obligations to fulfill. To avoid undesirable outcomes, these individuals prefer vigilant strategies for minimizing losses and avoiding making mistakes even when they face opportunities for better outcomes; when they maintain their prevention goals, they experience calmness, but when they fail, they feel high levels of anxiety [5].

These two independent motivation orientations differ in magnitudes among individuals, in cultures and under situations/contexts. Specifically, students in some cultures such as the US and New Zealand have higher levels of promotion whereas students in other cultures such as China and Japan have higher levels of prevention [3]. Students have higher levels of promotion at the start of a new term whereas they have higher levels of prevention at the end of a term [1,6].

4. Method, Samples, Instruments, and Data Analysis

A total of 387 undergraduate students from a local public university in central north China were invited to participate in this study. There were 114 males (29.50%) and 273 females (71.50%). There were 358 freshmen (92.51%), 19 sophomore students (4.91%), and 10 junior students (2.58%). On a 1 to 7 Likert scale (strongly disagree to strongly agree), these non-English major students self-reported their responses to the RFQ scales. The survey consisted of two sections. The first section of the survey contained three items regarding gender, year in university, and major. The second section of the survey included six items measuring promotion and five items measuring prevention. For better understanding the RFQ items, the English version items used by Gao et al. in Chinese undergraduate students were translated by the author into Chinese and then translated back to English by two other translators to ensure the Chinese version would not distort the meaning of original items [3]. A Chinese version of RFQ was administered among the participants.

Before data collection, ethical approval from the Institutional Review Board was obtained. English teachers for some classrooms were contacted and were told the purpose and procedures of the survey, and some teachers agreed to invite their students at the beginning of their class to scan a QR code to access the questionnaire via an online platform, Wenjuanxing. The students were told that their participation of the survey was voluntary and confidential (no incentive was rewarded and no personal information such as emails or names was collected). They were able to quit completing the survey any time. When students responded to the survey questions, Participants were not allowed to skip any questions. Therefore, no missing values were detected in the survey. It took the students around 3 to 5 minutes to complete the survey.

This study involved two phases of data analyses. First, one-factor confirmatory factor analyses were separately conducted to detect the strong indicators for promotion and prevention, respectively. Notably, the values larger than 0.500 for standardized factor loadings of items are retained as strong indicators of their respective constructs [3]. For CFA model fit, the criteria include indexes (comparative fit index, CFI; the Tucker-Lewis index,

TLI; values larger than 0.90 indicate good model fit), and the root mean square error of approximation (RMSEA; values smaller than 0.05 indicate better model fit, and values up to 0.08 are deemed acceptable). These criteria were consistent with recommendations and practices in Hodis and Hodis to ensure the factorial quality of the indicators of promotion and prevention [4]. Second, two-factor CFAs were conducted to identify improper model fit in the overall model and assess the correlations between promotion and prevention.

5. Results

Mplus version 8.3 was employed to perform confirmatory factor analysis (CFA). The values for skew and kurtosis for regulatory focus indicators suggest that no violations of multivariate normality (MVN) occurred. Consistent with methodological recommendations, cut-off values larger than absolute value 2.00 (for skewness) and 7.00 (for kurtosis) indicate a potential violation of MVN [3]. In this study, skew values for promotion items ranged from −0.570 to 0.180; kurtosis values varied from −0.083 to 0.496, while the skewness of the prevention items ranged from −0.562 to 0.838. For the prevention items, kurtosis values fell between −0.578 and 0.281. Therefore, no violations of MVN were found for all items that measured promotion and prevention. The construct reliability for promotion was good: Cronbach's Alpha = 0.825; the construct reliability for prevention was good: Cronbach's Alpha = 0.724.

5.1. Promotion of Confirmatory Factor Analysis (CFA)

A one-factor confirmatory factor analysis (CFA) model was used to assess promotion, utilizing six indicators. The measurement model demonstrated an acceptable fit to the data: Chi-square (9, n = 387) = 64.040, p < 0.01; CFI = 0.946; TLI = 0.910; RMSEA = 0.131, with a 90% confidence interval (CI) for RMSEA ranging from 0.103 to 0.161. Standardized loadings were significant for each item. Results in Table 1 showed that all items (except for Q4) had standardized factor loadings larger than 0.500 (i.e., from 0.565 to 0.870, respectively). Although Q4 showed an absolute magnitude larger than 0.500, its negative value excluded this item from being a strong indicator of promotion, because this item should have been reverse scored but was not (Q4: "Compared to most people, I am typically able to get what I want out of life"). These results suggested that five items (Q6, Q9, Q10, Q12, Q15) seemed to be robust indicators of promotion in this population (see Table 1). Therefore, the five indicators were retained to rerun the one-factor promotion of CFA.

Table 1. Likelihood-Based Estimates of Summary Statistics and Standardized Coefficients and Standard Deviations for the One-Factor of Promotion Items.

Item	Standardized factor loading		Standard error		Skew	Kurtosis	Mean item	Variance item
Q4	-0.715		0.029		0.180	0.232	3.150	1.512
Q6	0.793	0.768	0.023	0.025	-0.107	0.250	4.408	1.668
Q9	0.776	0.795	0.024	0.023	-0.042	0.367	4.411	1.524
Q10	0.870	0.896	0.018	0.017	-0.084	-0.083	4.561	1.673
Q12	0.657	0.630	0.033	0.034	-0.489	0.231	5.127	1.666
Q15	0.565	0.545	0.038	0.039	-0.570	0.496	5.258	1.602

Note. N = 387. CFA = confirmatory factor analysis. Item numbers, in the first column, correspond to the numbers of the survey questions in the present research.

A one-factor confirmatory factor analysis (CFA) model was used to assess promotion, utilizing five indicators. The measurement model demonstrated a strong fit with the data: Goodness-of-fit statistic (5, n = 387) = 36.416, p < 0.01; CFI = 0.963; TLI = 0.926; Approximation error in the model fit = 0.127, with the 90% interval of confidence (CI) for approximation error in the model fit spanning [0.091, 0.168]. Standardized factor loadings were significant for all five items. The findings presented in Table 1 demonstrate that all five items (i.e., Q6, Q9, Q10, Q12, Q15) had standardized factor loadings (italicized) larger than 0.500

(i.e., from 0.545 to 0.896, respectively). These results suggest that the final five items served as reliable indicators of promotion within this population (see Table 1). Therefore, these five indicators appropriately measured promotion and were retained for subsequent phases of analyses.

5.2. Avoidance

The Single-factor CFA Model for Risk Avoidance: Five variables. First, four reverse scored items (Q8, Q11, Q13, and Q17) were re-coded. The model showed a satisfactory fit to the data: Goodness-of-fit statistic (5, n = 387) = 21.162, $p < 0.01$; CFI = 0.959; TLI = 0.918; RMSEA = 0.091, with 90% RMSEA confidence bounds spanning [0.053, 0.133]. The value for Q5 was not significant (p = 0.124) and its factor loading was small (0.086); the factor loading for Q17 (0.272) was far below 0.500, despite being statistically significant. Importantly, standardized loadings were significant for the remaining items. As presented in Table 2, the three remaining indicators (i.e., RQ8, RQ11 and RQ13) had standardized loadings larger than 0.500 (0.697, 0.849, 0.703; respectively; see Table 2). Because this study aimed to identify strong indicators of prevention for subsequent analyses, the weak items Q5 and RQ17 were not retained (Q5 "As a child, I often obeyed rules and regulations that were established by my parents"; Q17 "Not being careful enough has gotten me into trouble at times").

Table 2. Maximum-Likelihood Estimates of Descriptive Statistics and One-Factor CFA Standardized Loadings and Standard Errors of Prevention Items.

Item	Standardized factor loading			Standard error	Skew	Kurtosis	Mean	Variance
Q5	0.086			0.056	-0.562	0.185	5.078	1.756
RQ8	0.697	0.698	0.683	0.035	-0.313	-0.578	4.491	2.612
RQ11	0.849	0.847	0.878	0.031	-0.838	0.281	5.163	2.467
RQ13	0.703	0.703	0.682	0.035	-0.722	0.167	5.199	2.252
RQ17	0.272	0.276		0.054	0.259	-0.309	3.514	2.053

Note. N = 387. CFA = confirmatory factor analysis. Item numbers, in the first column, corresponded to the numbers of the survey questions in this present research. Items beginning with the letter "R" (i.e., RQ8, RQ11, RQ13, and RQ17) were subjected to reverse scoring prior to the analysis.

The Single-factor for Prevention with Four (Three) variables showed an acceptable fit to the data: Goodness-of-fit statistic (2, n = 387) = 12.221, p < 0.01; CFI = 0.973; TLI = 0.920; RMSEA = 0.115, with 90% confidence range for RMSEA extending from [0.059, 0.180]. Although RMSEA is slightly above the commonly accepted threshold, the model fit was considered acceptable. The value for Q17 was significant and its factor loading (0.276) was still far below 0.500. However, standardized loadings were significant for the remaining items. As presented in Table 2, the three remaining indicators (i.e., RQ8, RQ11 and RQ13) had standardized loadings larger than 0.500 (0.698, 0.847, 0.703; respectively), thus suggesting that the set of three items proved to be strong measures of risk avoidance (see Table 2). Because this study aimed to identify strong indicators of prevention for subsequent analyses, the weak item RQ17 was not retained. The one-factor CFA model had a good fit, and the standardized loadings were all larger than 0.500 (0.683, 0.878, 0.682; respectively; see Table 2). Taking all of these aspects into account, and in line with findings from previous research, the three items (i.e., RQ8, RQ11 and RQ13) well measured prevention in this population and were employed in subsequent analyses (see Table 2) [3].

5.3. The Two-Factor CFA Model for Promotion (Five Indicators) and Prevention (Three Indicators)

The two-factor CFA model of promotion and prevention adopted a highly restrictive structure to measure the two constructs. Specifically, the two-factor CFA model for pro-

motion did not permit cross-loadings or correlated residuals (five measures) and protection (three measures). The model had a good fit to the data: Chi-square (19, n = 387) = 102.714, p < 0.01; CFI = 0.934; TLI = 0.903; RMSEA = 0.107, with the 90% the confidence interval of RMSEA, with values [0.087, 0.127]. Table 3 displays the standardized estimates for the parameters of this model. A review of the standardized factor coefficients, reported in Table 3, shows that all factor loadings were statistically significant and of sizeable magnitudes (all larger than 0.500; see Table 3).

Table 3. Likelihood-Based Estimates of Two-Factor CFA Standardized Coefficients and Standard Deviations for Promotion and Risk Avoidance Items.

Indicator	Normalized Factor Coefficient	Standard error	Scale
Q6	0.770	0.025	PRO_2
Q9	0.799	0.023	PRO_3
Q10	0.892	0.017	PRO_4
Q12	0.629	0.034	PRO_5
Q15	0.543	0.039	PRO_6
RQ8	0.690	0.037	PRO_2
RQ11	0.879	0.033	PRE_3
RQ13	0.673	0.036	PRE_4

Note: N = 387. CFA = confirmatory factor analysis. Item numbers, in the first column, corresponded to the numbers of the survey questions in this present research. Items beginning with the letter "R" (i.e., RQ8, RQ11, and RQ13) were reverse scored before the analysis. Item identifiers in the second column align with those; PRO = promotion; PRE = precaution [2].

Importantly, a weak but statistically significant correlation was observed between the promotion and protection factors (i.e., r = −0.187; p < 0.01). The findings were consistent with those reported by Higgins et al., where the correlation between the promotion and prevention factors was r = 0.21 (p < 0.01) [2]. Both correlations had comparable magnitudes (close to 0.20). However, the correlation was positive in Higgins et al., whereas it was negative in this study [2]. Therefore, the results suggested that the final set of eight indicators in Chinese (i.e., the five promotion items and the three prevention items) worked well in measuring the two constructs (promotion and prevention) within this sample [7].

6. Future Directions of Research and Conclusion

Regulatory focus theory proposed that promotion and prevention are two independent constructs and research has shown that they are not along a continuum. Further research could examine whether the RFQ on 1-4, and 1-6 Likert scales are consistent for year 1 to 4 Chinese students in vocational and/or academic universities. Moreover, the results regarding the correlations between the promotion and prevention were not consistent: they were not significantly correlated in Gao et al. and Jiang & Papi, but significantly correlated in this study. In addition, Higgins also argued that promotion and prevention work together with locomotion and assessment. Future research could explore and identify profiles defined by the four motivation factors. Importantly, regulatory focus has been recently introduced to motivation research for foreign language learning (second language acquisition), so future research could apply RFQ to measure the interrelations between L2 learners' regulatory focus and their motivation, emotions, and behaviour during their L2 goal pursuits. Future researchers could also assess the relations between RFQ (on the one hand) and eager and vigilant strategies in L2 (on the other hand; the latter two reflect promotion and prevention, respectively). Recent research also introduced regulatory mode in L2; future research could also measure the relations between regulatory focus and L2 regulatory mode motivations.

The RFQ has been widely used in university student populations. Results in this study indicate that promotion and prevention items had worked well in the population

after minor changes to some items following the practice in Gao et al. One item dropped and five items retained provided a reliable and valid measurement of promotion. To measure prevention, three of the five items retained (i.e., one item together with one of the four reverse-score items dropped) worked well. These items that remained in the two scales were successful in measuring promotion and prevention as independent factors.

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