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Personality and Individual Di erences 41 (2006) 941–950
PERSONALITY AND INDIVIDUAL DIFFERENCES
www.elsevier.com/locate/paid

Validation of locus of control scale in Chinese organizations ☆

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Received 23 August 2005; accepted 10 March 2006
Available online 30 May 2006

Abstract

The aim of this research was to revise Rotter's (1966) internal–external locus of control (LOC) scale, and especially to examine the feasibility of its use in Chinese organizations. The present study had 306 full-time employees and results showed that our Chinese revision of Rotter's Locus of Control Scale retained a single-factor structure. The scale had acceptable reliability, good criterion-related validity, and empirical validity. The psychometric properties of the revised scale supported its feasibility as a research instrument to measure LOC appropriately in Chinese employee population. The results also showed that Chinese employees today reported relatively more internal locus of control, which reflects a deviation from previous research. Implications for research on locus of control in China are discussed.

Keywords: Locus of control; Employee personality; Psychological measurement

1. Introduction

Rotter (1966) first defined locus of control as a personality attribute and generalized enduring expectancy or belief about the nature of outcomes in life. An individual with an internal locus of control views his or her outcomes as more under personal control. An individual with an external locus of control believes outcomes are more under the control of external forces, such as luck, fate

☆ This research was supported by NSFC grant # 70432002.
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0191-8869/$ - see front matter
doi:10.1016/j.paid.2006.03.018

or powerful others. Locus of control has been shown to have important applications and outcomes in a wide variety of settings, including organizations (Spector, 1988).

1.1. Measurement of LOC

Since the concept of LOC originated, many scales have been developed to measure it such as Rotter's Internal–external locus of control scale (Rotter, 1966), Nowicki-Strickland locus of control scale (Nowicki & Duke, 1983), Levenson's IPC scale (Levenson, 1981), and the Spheres of Control scale (Paulhus & Christie, 1981). However, studies of locus of control within organizations have been dominated by Rotter's Internal–external scale of general locus of control (Spector, 1988), and researchers have examined and revised it in many countries and languages (e.g., Garcia, Ramirez, & Jariego, 2002).

There have been a few studies on measurement of LOC since 1990s in China. However, most of these studies just simply translated Rotter's original scale into Chinese without evaluating it in relation to the cultural context, except Wang's (1991) study which, although it was a revised LOC scale, was only involved in an undergraduate sample. However, on the one hand, students may be di erent from working adults in the level of LOC because of the di erent exposure to social experience. On the other hand, given the dramatic rate of change in Chinese culture, it is not clear that findings in undergraduate samples one and half decades ago can be extended to the broader, older working population. Thus, our study sought to revise the LOC scale in an employee population.

1.2. Chinese societal development and LOC

The social and economic changes in recent years in China have probably led to specific changes in tendency on LOC of Chinese. Some researchers have pointed out that just as countries around the world influence their citizens' beliefs and personalities through the mechanism of culture, the social environment of di erent periods produces di erences in LOC (Twenge, 2000; Twenge, Zhang, & Im, 2004). Since the onset of economic reforms, which started in 1978, there have been great changes in Chinese life and career society (Turban, Lau, Ngo, Chow, & Si, 2001). For example, the country has moved from a completely planned to a market economy; industries and knowledge have been developing; science and technology has taken a larger part in life than before; people are more highly educated. As people's income and related purchasing power improve, a new social class (the upper middle class) has risen and continues to rapidly expand. All the above contribute to individuals feeling more in control of their lives and the environment they live in. We hypothesize that Chinese today are more internal and less external.

A key problem was to validate the revised LOC scale. Past research has found that LOC is related to many variables of personality, motivation, attitude and behavior. For example, people with an internal locus of control are high in self-e cacy (Phillips & Gully, 1997). LOC was also related to many work-related variables and directly impacted organizational outcomes. For example, people with an internal locus of control have stronger intrinsic job motivation (Spector, 1982), less work-related stress (Glazer, Stetz, & Izso, 2004; Kirkcaldy, Shephard, & Furnham, 2002), higher job satisfaction (Judge & Bono, 2001; Kirkcaldy et al., 2002; Spector, 1982), higher organizational commitment (Luthans, Baack, & Taylor, 1987), lower intention to leave (Spector,

1982), and higher performance (Bernardi, 1997; Erez & Judge, 2001; Judge & Bono, 2001; Spector, 1982). We collected all of the above measures in order to be sure of the validity of our revised Locus of Control scale.

2. Method

2.1. Participants

Questionnaires were administered to 306 full-time employees from 20 organizations. There were 147 participants from state-owned companies with a percentage of 48.04%; 34 participants from private companies with a percentage of 11.11%; 68 participants from joint-venture companies with a percentage of 22.22%; 57 participants from foreign companies with a percentage of 18.63%. From the industries, banks were 4.58% of the sample; telecommunication o ces were 5.57%; architecture o ces were 14.08%; hotels were 6.54%; restaurants were 4.58%; electric powers were 24.84%; magazines were 24.18%; informational technology were 10.13%; and 4.58% were other.

In this research sample, 59.5% of participants were male (4 did not report their gender). Participants ranged from 19 to 56 years old, with a mean age of 29.25 ± 6.94 years old. In education level, 45.4% of participants had less than an undergraduate education; 42.5% received a bachelor's degree; 12.1% received an education higher than a bachelor's degree. For position, 74% were general employees; 14.5% were directors; 9.5% were department managers; 2.0% were senior managers. Participants' length of service ranged from .5 to 36 years, with a mean of 7.3 ± 7.01 years.

2.2. Measures

Locus of control was assessed by Yang's (1997) translation of Rotter's (1966) scale. Rotter's original internal–external locus of control scale consists of 6 fillers and 23 forced-choice pairs, with one internally oriented statement and another externally oriented statement. Higher scores are indicative of externality and lower scores are indicative of internality.

Yang's (1997) translation of Levenson's (1981) internality, powerful others and chance (IPC) scales were also used to measure locus of control. It is a 7-point scale (1 = strongly disagree to 7 = strongly agree) consisting of 24 items. The internality (I) scale measures the extent to which one believes that one has control over one's life. The powerful others (P) scale concerns the belief that other persons control the events in one's life. The chance (C) scale measures the degree to which one believes that fate or luck a ects one's experiences and outcomes. Scores can range from 8 to 56 on each scale. In the present study the coe cients of internal consistency were .53 (I), .77 (P) and .75 (C).

The general Self-E cacy scale is a 22-item measure, developed and validated by Shi and Wang (2005). It requires subjects to rate the extent they agree or disagree with each statement on a 6-point scale (0 = strongly disagree to 5 = strongly agree). There are 3 lie-detecting items in the scale. The total score can range from 0 to 95. Higher scores are indicative of higher self-e cacy, and lower scores are indicative of lower self-e cacy. In the present study the internal consistency coe cient was .83.

Warr, Cook, and Wall (1979) and Furnham, Sadka, and Brewin (1992) used a 6-item scale to measure intrinsic job motivation. It is a 7-point scale (1 = strongly disagree to 7 = strongly agree). The total score can range from 6 to 42. Higher scores are indicative of higher intrinsic job motivation. In the present study the internal consistency coe cient was .78.

Ma and Liang's (1997) revised Chinese version of House and Rizzo's (1972) work stress scale was used. It consists of 11 items reflecting employees' stress experiences on work. It is a 6-point scale (1 = completely disagree to 6 = completely agree). The total score can range from 11 to 66. Higher scores are indicative of experiencing higher work-related stress. In the present study the internal consistency coe cient was .89.

The job satisfaction scale was developed by Evers, Frese, and Cooper (2000). It is a 7-point scale (1 = strongly satisfied to 7 = strongly dissatisfied) with 10 items. The total score can range from 10 to 70. Higher scores are indicative of higher job satisfaction. In the present study the internal consistency coe cients were .78 (for ''general job satisfaction''), .87 (for ''satisfaction with pay'') and .87 (for the whole scale).

The organizational a ective commitment scale has six items used by Meyer, Allen, and Smith (1993) and Chen and Francesco (2003). It is a 7-point scale (1 = strongly disagree to 7 = strongly agree). The total score can range from 6 to 42. Higher scores are indicative of higher organizational a ective commitment. In the present study the internal consistency coe cient was .91.

The intention to leave scale has three items used by Guest, Peccei, and Thomas (1993) and Proudfoot, Corr, Guest, and Gray (2001). It is a 7-point scale (1 = strongly disagree to 7 = strongly agree). The total score can range from 3 to 21. Higher scores are indicative of higher intention to leave. In the present study the internal consistency coe cient was .73.

Job performance was assessed through 20 items of Goodman and Svyantek's (1999) measure. It is a 7-point scale (1 = strongly disagree to 7 = strongly agree). The total score can range from 20 to 140. Higher scores are indicative of higher job performance. In the present study the internal consistency coe cients were .89 (for ''task performance''), .86 (for ''altruism''), and .79 (for ''conscientiousness'').

3. Results

3.1. Item analysis

First, we conducted item-total analyses. The results showed that the inter-item correlations were all significant, with correlations ranging from .18 to .56. We selected those with scores in the upper and lower 27% as extreme groups to compute every item discrimination index (see Murphy & Davidshofer, 2005). We found that di erences between these two groups in all items ranged .18–.78. As shown in Table 1, item 18 and item 23 received the lowest item-total correlations and the lowest item discriminations (both lower than .30) and therefore were deleted.

3.2. Structure validity

We conducted confirmatory factor analysis (CFA) on the remaining 21 items. Cases with missing data were deleted listwise. Results showed that the single-factor structure fit well:

Table 1
Item-total correlations and item discriminations

Item	Correlation	Discrimination
2	.41**	.50**
3	.33**	.33**
4	.31**	.39**
5	.32**	.35**
6	.35**	.45**
7	.47**	.59**
9	.56**	.66**
10	.33**	.29**
11	.56**	.66**
12	.56**	.78**
13	.39**	.47**
15	.38**	.37**
16	.49**	.58**
17	.50**	.58**
18	.26**	.20**
20	.34**	.48**
21	.43**	.53**
22	.55**	.76**
23	.18**	.18**
25	.49**	.64**
26	.38**	.51**
28	.25**	.30**
29	.38**	.53**

** $p < .01$.

$\chi^2(df = 189) = 258.26$, $p < .01$, GFI = .92; AGFI = .91; CFI = .89; and RMSEA = .036. These results meet the criteria for goodness of fit indices (>.90) and root mean square error of approximation (RMSEA < .05) (see McDonald & Ho, 2002), which means Rotter's (1966) I–E scale retained a single-factor structure in our Chinese sample.

3.3. Reliabilities

Reliability analysis showed that the Cronbach's alpha for the 21 items was .77. After two weeks, we reselected 24 participants to retest LOC. The test–retest reliability was .82.

3.4. Convergent validity

Levenson's IPC scale was also used in this study to provide another measure of general locus of control. Comparing the score of Rotter's I–E scale to the scores of Levenson's IPC scales, we found that higher external control individuals got lower scores on the ''internality'' dimension ($r(79) = -.33$, $p = .003 < .01$), and got higher scores on ''chance'' and ''powerful others'' dimensions ($r(80) = .47$, $p < .001 < .01$; $r(80) = .47$, $p < .001 < .01$). These findings show that Rotter's scale has good convergent validity.

3.5. Criterion-related validity

Correlation analyses reveal that individuals with external locus of control had lower self-e - cacy ($r(303) = -.23$, $p < .001 < .01$), lower job intrinsic motivation ($r(221) = -.19$, $p = .004 < .01$), lower organizational a ective commitment ($r(306) = -.36$, $p < .001 < .01$), higher intention to leave ($r(221) = .20$, $p = .003 < .01$), higher work-related stress ($r(80) = .35$, $p = .001 < .01$), and lower job satisfaction ($r(306) = -.41$, $p < .001 < .01$) which included lower general job satisfaction ($r(306) = -.38$, $p < .001 < .01$) and lower satisfaction with pay ($r(306) = -.35$, $p < .001 < .01$). All of the above findings were consistent with the past research, showing that Rotter's scale has certain criterion-related validity for Chinese employees.

3.6. Empirical validity

Correlation analyses showed that individuals with an external locus of control had lower job performance ($r(306) = -.27$, $p < .001 < .01$), which included lower task performance ($r(306) = -.15$, $p = .007 < .01$), fewer altruism behaviors ($r(306) = -.31$, $p < .001 < .01$), and fewer conscientious behaviors ($r(306) = -.28$, $p < .001 < .01$). This shows that Rotter's scale had certain empirical validity for Chinese employees.

3.7. Group di erences

Rotter's theory argues that there should be demographic di erences in LOC. For example, Rotter (1966) pointed out that people should become more internal as they grow older, as they work longer, and as they achieve higher management positions. In addition, people with higher education should have more internal locus of control. Finally, Rotter found that men were more internal than women in some samples. A recent study by Forte (2004) did not support these hypotheses. However, Forte only studied high level managers, which may have limited her findings. We thought it would be prudent to check for demographic di erences.

Table 2 describes the scores for each group of subjects. First, we tested for gender di erences. Males were more internal than females ($t(283.04) = -4.10$, $p < .001$), which was consistent with Rotter's (1966) theory.

Second, we tested for age e ects. Results showed that age was positively correlated with external locus of control, $r(305) = .23$, $p < .001 < .01$, which meant that older people were more external than younger people.

Third, simple correlation revealed that job tenure was significantly positively correlated with external locus of control, $r(306) = .23$, $p < .001$. However, job tenure was not significantly correlated with locus of control after controlling for age, $r(302) = .05$, $p = .380 > .05$.

Finally, we tested for education and management level di erences in locus of control. Gender and age were related to education and management level, so we included them as control variables in an analysis of covariance (ANCOVA) test. Because there were only two people at the high-level manager category, we combined the high-level manager and department manager categories. Results showed that there were no significant main e ects for the position and education variables ($F(2, 291) = .204$, $p = .816 > .05$; $F(2, 291) = .090$, $p = .914 > .05$).

Table 2
Group di erences in locus of control

Variable	Group	N	M	SD
Gender	Male	182	8.55	4.27
	Female	120	10.42	3.58
Education	Lower degree	139	8.68	4.03
	Bachelor's degree	130	9.82	4.05
	Higher degree	36	10.00	4.46
	Total	305	9.32	4.12
Position	General employees	225	8.91	4.04
	Directors	44	10.77	4.30
	Managers	35	10.00	4.05
	Total	304	9.30	4.13

3.8. Chinese employees' locus of control

There were 21 items in revised Rotter's I–E scale. In our sample, the total score ranged from 0 to 19, with a mean score of 9.31 ± 4.12. Since di erent revisions of the scale have di erent numbers of items, we used the mean score per item. As referred to Table 3, people in our sample were more internal (.443) than people in Wang's (1991) Chinese undergraduate student sample (.618) and participants in Wang's (1991) American undergraduate student sample (.486). Managers were internal (.453) in this study, while by the mean Forte (2004) got a more internal result (.300) in an American manager sample.

Although direct comparison of the results is di cult due to di erences in samples and procedures, it appears that the Chinese in our study were more internal than those in the Chinese undergraduate sample (Wang, 1991). Compared to a contemporary sample of American managers, our Chinese sample appears less internal in locus of control. Further research and comparison with undergraduate samples in China can help to test if locus of control is changing in China.

Table 3
Group comparisons in locus of control

Study	Sample	N	Item	M	SD	M/item
Wang (1991)	American undergraduates	181	23	11.17	4.29	.486
Forte (2004)	American managers	214	23	6.90	–	.300
Wang (1991)	Chinese undergraduates	268	19	11.75	3.49	.618
This research	Chinese employees	306	23	9.31	4.12	.443
This research	Chinese managers	79	23	10.43	4.18	.453

Note. The dash indicates that the SD was not reported in Forte's (2004) study.

4. Discussion

We revised Rotter's I–E scale in a Chinese employee sample. Results showed that the revised 21-item scale had good internal consistency and test–retest reliability. The internal consistency was better than Rotter's (1966) result. The examination of criterion-related validity and empirical validity showed that in Chinese employee samples, those with an external locus of control were lower in self-e cacy, lower in job intrinsic motivation, higher in work-related stress, lower in job satisfaction (including general job satisfaction and satisfaction with pay), lower in organizational a ective commitment, with higher intention to leave, and lower in job performance (lower task performance, fewer altruism and conscientiousness behaviors) than those with an internal locus of control. All of the above findings were consistent with past research (Erez & Judge, 2001; Kirkcaldy et al., 2002; Luthans et al., 1987; Phillips & Gully, 1997; Spector, 1982) and proved the importance of exploring individual di erences in locus of control in work settings.

In particular, we found some specific characteristics in Chinese locus of control. First, we found today's Chinese reported a more internal locus of control, which suggests that Chinese may be changing from external to internal locus as compared with past research (Wang, 1991). One possible explanation involves social and economic changes (Twenge, 2000; Twenge et al., 2004). In the last decade, as technology and the economy develops in China, Chinese people have more choices as consumers and can make more decisions about their own lifestyles. Such changes contribute to the increase of individualism for Chinese people (Ralston, Egri, Stewart, Terpstra, & Yu, 1999). Another possible explanation is the di erences in samples. We believe that the employee samples report more internal than the student samples because students have had a limited range of life experiences without much independence.

Second, we found that men reported a more internal locus of control than women. This is consistent with Rotter's theory (Rotter, 1966). However, recent research has inconsistent results. For example in Smith-Jentsch, Salas, and Brannick's (2001) research, men were more internal than women. While Forte (2004) found that male managers were slightly more internal than female managers, but the di erence was not significant. A possible reason might be that the subjects in Forte's sample were all managers (59.8% of them were even top level managers) and managers do need to be more internal. Most participants in our sample were general employees, who still assume unequal gender roles where women were found to be under-represented in management and faced considerable barriers in gaining management positions (Benson & Yukongdi, 2005). This may lead women to have a more external locus of control in our sample.

Finally, we found that older people were more external than younger employees in our sample. This is not consistent with the results of past research in the United States (Forte, 2004; Rotter, 1966; Smith-Jentsch et al., 2001). A possible explanation is that, as higher education improves in China with the economic reforms started in the late 1970s (Mok, 2005), the younger generation encountered educational reforms which have been designed with the goal of preparing citizens for the challenges of globalization (Law, 2004). However, the older generation was a ected by the interruptions in education caused by the Chinese Cultural Revolution from 1966 to 1977 (Meng & Gregory, 2002). Thus older employees may not be as well educated in this planned economy and may have greater di culty in keeping their career skills up-to-date. This di erence may contribute to higher external locus of control for the older generation, especially when they face the fast changes in today's workplace.

Locus of control (LOC) is an important personality attribute in work settings. It is correlated with many organizational outcomes, and is influenced by culture. In China, measuring employees' LOC is a useful way to understand individual behaviors and outcomes. It is also useful to explore how it varies as a result of di erence in age, gender, education level, position, and job tenure, and even as a result of broad social change. Researchers and practitioners operating in China should pay greater attention to the role of LOC in employee management and performance improvement.

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