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Consideration of future consequences: Preliminary evidences for a four-factor distinction

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ABSTRACT

Consideration of either future consequences or immediate consequences plays an important role in our daily decision-making. However, no general consensus has been reached as to whether the construct – consideration of future consequences – consists of one factor or multiple factors. To examine the latent structure, we conducted two studies. In Study 1, we collected data online from 494 participants with the Consideration of Future Consequences (CFC) scale, and performed confirmatory factor analyses (CFAs) of alternative models derived from previous studies. The results indicated that a four-factor model fitted the data best. In Study 2, we administrated the CFC scale and an inter-temporal choice questionnaire to another sample of 496 participants in classrooms. Cross-validation with CFA demonstrated the four-factor solution as the best fit model. In addition, the four factors were differently correlated with the discounting rate facing various rewards. Further multilevel analysis indicated that two factors among the four moderated the magnitude effect. All these findings provided evidences for a four-factor distinction in the CFC scale.

1. Introduction

In everyday life, people usually consider between the immediate and future outcomes of their current actions when making decisions. While some are concerned with future consequences, others focus on immediate ones. Strathman, Gleicher, Boninger, and Edwards (1994) proposed a construct of "consideration of future consequences (CFC)" to describe such a stable individual difference. They defined the CFC as "the extent to which individuals consider the potential distant outcomes of their current behaviors and the extent to which they are influenced by these potential outcomes" (Strathman et al., 1994, p. 743). They further developed and validated a 12-item CFC scale to quantify individual differences on this construct. This scale has been widely used in many areas, such as health behaviors (e.g., Adams & Nettle, 2009; Joireman, Lasane, Bennett, Richards, & Solaimani, 2001), academic behaviors (e.g., Joireman, 1999), and financial behaviors (e.g., Joireman, Kees, & Sprott, 2010; Joireman, Sprott, & Spangenberg, 2005).

1.1. Factor structure of the CFC

In their original framework, Strathman et al. (1994) regarded the CFC as a unidimensional construct. At one end were people who weighted more on future consequences, and at the other end were those who attached more importance to immediate consequences. Both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) of the CFC scale supported a single factor solution. Accordingly, most of prior studies used an average or a sum of the five future items and the seven reversed-coded immediate items as a measure of the CFC tendency (e.g., Joireman, 1999).

However, several recent studies have raised doubts about the unidimensionality of this scale. Most of them supported a two-factor structure of the CFC scale with theoretical and empirical evidences (e.g., Adams, 2012; Joireman, Balliet, Sprott, Spangenberg, & Schultz, 2008; Petrocelli, 2003).

Petrocelli (2003) conducted the first systematic examination of the latent structure of the CFC scale. Based on a principal-components factor analysis with varimax rotation in a sample of 644 undergraduate students, he found two correlated factors: one, consisted of seven reverse-coded immediate items and a future item, was related to concerning immediate consequences, while the other, consisted of four future items, was related to concerning future consequences. A CFA supported the two-factor solution against the one-factor solution.

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Joireman et al. (2008) suggested a slightly different two-factor model. They named one factor with five future items as CFC-Future (CFC-F), and the other factor with seven immediate items as CFC-Immediate (CFC-I). They compared the two-factor model and Strathman et al.'s (1994) one-factor model using CFA on an aggregated database of 986 respondents, and found the two-factor model had a significantly better fit to the data. This two-factor model has also been confirmed by other researchers (e.g., Adams, 2012; Toepoel, 2010). Toepoel (2010) validated the CFC with 11 waves' data (1996–2006) from a panel study in the Netherlands among a sample aged 16 and over. He used the same EFA procure as Petrocelli (2003) did, and found the two-factor solution underlying the CFC. Adams (2012) compared this two-factor model and Strathman et al.'s (1994) one-factor model in a U.K. sample of 800 participants using CFA, and found that the two-factor solution fitted the data better.

In addition, some researchers proposed other alternative models. Rappange, Brouwer, and van Exel (2009) compared Strathman et al.'s (1994) one-factor model and Petrocelli's (2003) two-factor solution with a sample of 2006 young adolescents in the Netherlands, but the results of neither model were acceptable. They then employed PCA with varimax rotation, and a multiple-factor solution emerged: one factor consisting of seven immediate items, and the other two factors consisting of the remaining future items. Hevey et al. (2010) speculated that the two-factor model might have been caused by the method effects of item wording. They compared two one-factor models (Petrocelli, 2003; Strathman et al., 1994), two two-factor models (Joireman et al., 2008; Petrocelli, 2003), and their own model (one-factor model with correlated errors) among 590 young adults, and found that their own model provided the best fit. Ryack (2012) extended the dimensionality examination of the CFC scale from college student samples to a sample of professional financial advisors, and found that a four-factor solution was supported.

So far, most studies on the latent structure of the scale have been conducted on Western samples, such as the US (e.g., Joireman et al., 2010), the U.K. (e.g., Adams, 2012), as well as the Netherlands (e.g., Rappange et al., 2009; Toepoel, 2010). Only two studies fit a specific model to data collected on Chinese samples (Liu, Wang, & Jiang, 2013; Zhang, Wang, & Pearce, 2014), but neither made systematic comparisons between all possible models. Therefore, the first aim of this study was to find out which model would be supported by adapting the CFC to the Chinese cultural context and exploring the nature of the CFC construct among two large Chinese samples.

According to Hofstede's cultural dimensions, most Western countries hold a strong short-term orientation, evidenced by focusing on the present and the past, valuing immediate need gratification, and spending; by contrast, Eastern cultures (e.g., China, Korea, and Japan) have a long-term orientation, characterized as fostering values involving future-oriented rewards, persistence, and thrift (Hofstede & Minkov, 2010). Chinese people might exhibit similar characteristics as financial advisors in Ryack's (2012) study when weighting immediate and future consequences. Therefore, we speculated that the factor structure might display a similar four-factor solution with that in Ryack's (2012) study.

1.2. The CFC and temporal choice

Temporal choices involve a balance between long-term larger rewards and short-term smaller rewards (Joireman et al., 2008). Temporal discounting refers to the tendency of animals and people to prefer the smaller sooner rewards over the larger later rewards (e.g., Green, Myerson, Holt, Slevin, & Estle, 2004). Several studies have examined the relationship between temporal discounting and the CFC or two CFC factors. Joireman et al. (2005) found that temporal discounting was negatively related to CFC scores. In addition, Joireman et al. (2008) found that temporal discounting was positively related to CFC-I, while negatively related to CFC-F. Charlton (2011) reported temporal discounting was negatively correlated with CFC total scores, and positively correlated with CFC-I scores, but was not related to CFC-F scores.

In the abovementioned three studies, an average discounting rate (DR) was used. However, reward size affects DR, which is also referred to as magnitude effect (Loewenstein & Prelec, 1992). The larger the reward size, the lower the DR. This phenomenon is very common in many temporal discounting circumstances (Green, Fristoe, & Myerson, 1994). It is still unknown whether the CFC factors differed in the prediction of temporal discounting when people face varied sizes of rewards. Therefore, the second aim was to find whether the CFC factors played different roles in the prediction of inter-temporal choice, and examine whether they moderated the magnitude effect. Given the fact that little empirical data is available for ascertaining the mechanism underlying the magnitude effect (Loewenstein & Prelec, 1992; Loewenstein & Thaler, 1989), we were not going to formulate specific hypotheses about how the CFC factors would moderate the effect of amount on DR.

1.3. Overview

In Study 1, we compared the fits of several factor models of the scale by means of confirmatory factor analysis with a Chinese sample. In Study 2, we repeated the similar procedure with another Chinese sample, and related the CFC scores to inter-temporal choices.

2. Study 1

Confirmatory factor analysis of the CFC scale

2.1. Methods

2.1.1. Participants.

Undergraduate and postgraduate students who attended a statistics course in a university in Nanjing, China were recruited to participate in an online study. The final sample consisted of 229 males (46.4%) and 265 females (53.6%). Their ages ranged from 16 to 35 years ($M = 22.26$, $SD = 2.55$). They received course credits as reimbursement.

2.1.2. Measures

2.1.2.1. The CFC scale. The scale was used to assess participants' concern with future consequences. It was developed by Strathman et al. (1994), and has been widely used (e.g., Joireman et al., 2008). It comprised five future items (e.g., "When I make a decision, I think about how it might affect me in the future.") and seven immediate items (e.g., "My convenience is a big factor in the decisions I make or the actions I take."). Participants were asked to respond to each item on a seven-point Likert scale (1 = very uncharacteristic of me; 7 = very characteristic of me).

2.2. Results

2.2.1. Confirmatory factor analysis

We conducted CFAs of the data on the CFC scale with LISREL 8.72 (Jöreskog & Sörbom, 2005), comparing five competing models identified in the prior studies (see Table 1). These models included Strathman et al.'s (1994) one-factor model (Model 1), Hevey et al.'s (2010) one-factor model (Model 2), Petrocelli's (2003) two-factor model (Model 3), Joireman et al.'s (2008) two-factor model (Model 4), and Ryack's (2012) four-factor model (Model 5a).

The estimation method was Maximum Likelihood. The multivariate normality test indicated non-normality of the data (χ^2 (2, $N = 494$) = 471.99, $p < .001$). Therefore, the scaled χ^2 statistics (Satorra & Bentler, 1988) for adjusting for non-normality were employed. Goodness-of-fit was assessed for the five models, using the Tucker–Lewis Index (TLI), root mean square error of approximation (RMSEA), and the comparative fit index (CFI). An excellent fit is indicated by RMSEA ≤ .06, and