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Future orientation as a mediator between perceived environmental cues in likelihood of future success and procrastination

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ABSTRACT

Within the evolutionary framework of life history approach, procrastination—the purposive delay of an intended task—is seen as a life history trait characterized by prioritizing immediate benefits with little regard for long-term consequences under particular environmental conditions. The present study proposes that environment cues indicating a low likelihood of future success may lead to greater procrastination, and temporal orientation may represent a mediator underlying this relationship between likelihood of future success and procrastination. A total of 252 undergraduate students completed the Probability Judgments Scale to assess likelihood of future success in their environments, the Future Orientation Scale to assess future orientation, and three scales to assess procrastination. Structural equation modeling indicated that, as predicted, lower likelihood of future success in the environments predicted greater procrastination, a relationship that exhibited both a direct pathway and an indirect pathway through future orientation. These results define the life history origin of procrastination. Limitations and suggestions for future research are discussed.

1. Introduction

Procrastination is conceptualized as a form of self-regulatory failure involving the purposive delay of intended tasks (Ferrari, 2010; Steel, 2007). However, the causes of procrastination are not completely understood (Ferrari, 1994; Steel, 2007). Recent research mainly focuses on proximate levels of analysis. For example, research has found that proximal factors, such as personality (Díaz-Morales, Cohen, & Ferrari, 2008; Lyons & Rice, 2014), self-esteem (Chen, Shi, & Wang, 2016; Ferrari, 1994), life stress (Tice & Baumeister, 1997), as well as poor self-regulation skills (Steel, 2007), were associated with procrastination. However, there are relatively few studies looking at ultimate explanations about procrastination. In particular, they did not provide an evolutionary framework for predicting the conditions that evoke procrastination. In the present study, we aim to add to the existing literature by examining the ultimate causes for the evolution of information-processing mechanisms that are designed to produce procrastination under particular environmental conditions.

Our research is based on an evolutionary life history (LH) model. According to this theoretical model, environmental ecology is crucial for an individual's survival and reproduction success, and, as a result, individuals have evolved sensitivity to their environmental conditions (Belsky, Steinberg, & Draper, 1991; Chisholm, 1993; Ellis, Figueredo, Brumbach, & Schlomer, 2009). In both human and non-human animal research, environmental harshness is defined as the exposure to extrinsic morbidity-mortality cues in the local ecology; it is characterized by resource scarcity, the general depletion of internal physiological and external material resources (Ellis et al., 2009). It tends to shape fast LH strategies, characterized by investments in immediate rewards and short-term opportunism, rather than slower LH strategies, characterized by long-term investments and willingness to delay gratification. We should expect the information-processing mechanisms responsible for calibrating LH strategies to be designed to take, as input, cues to the harshness of environmental conditions. In evolutionary history, the potential benefits of faster strategies in harsh environments may have outweighed the costs, whereas the reverse would have been true in favorable environments. Evidence has been accumulating for the role of environmental harshness on fast LH behavioral and psychological correlates, documenting, for example, that perception of harsh environment was associated with a lower sense of control (Mittal & Griskevicius, 2014) and criminal violence and teenage conceptions (Copping, Campbell, & Muncer, 2013).

Of particular relevance to the present study is that almost none of the associated research has been informed by evolutionary considerations within the LH theoretical framework. One notable exception is the recently published study by Chen and Chang (2016). Their study, using structural equation model analysis, showed that procrastination was negatively associated with a slow LH strategy, measured by the

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Mini-K scale (Figueredo et al., 2006). This seems to suggest that procrastination may be part of a fast LH strategy. Drawing on the LH theory, we assume that, as a fast LH strategy, procrastination may serve to adaptively respond to harsh environmental cues indicating that the likelihood of future success is low and hence their future fitness payoffs may never be realized. Exiting literature has indicated that harsh environmental cues indicating that the likelihood of future success is low were more likely to induce fast LH strategies. For example, based on the demographic data in Chicago, America, the life expectancy in communities was highly correlated with local homicide rates (Wilson & Daly, 1997). The same results were found from the data of England and Wales National Census (Copping et al., 2013). Based on the literature, it was expected that individuals who perceived that the environment cues indicating a low likelihood of future success would be more likely to show high levels of procrastination.

In addition, pervious research has indicated that environmental condition was related to temporal orientation (Chen & Chang, 2012; Griskevicius, Tybur, Delton, & Robertson, 2011; Kruger, Reischl, & Zimmerman, 2008), and that temporal orientation was particularly relevant to procrastination (Chen & Chang, 2016; Ferrari & Díaz-Morales, 2007; Sirois, 2014; Steel, 2007). From the conception of temporal orientation (Brislin & Kim, 2003; Zimbardo & Boyd, 1999), people with present orientation tend to live in the here and now and to have a short-term perspective, whereas people with future orientation tend to have a long-term perspective (Brislin & Kim, 2003; Zimbardo & Boyd, 1999). Temporal orientation has been considered as a proxy for LH strategy (Dunkel & Kruger, 2015; Dunkel & Weber, 2010; Ponzi et al., 2015). We propose that temporal orientation might be a psychological mediator that drives individuals' behaviors associated with fast and slow LH strategies under particular environmental conditions. For example, using temporal orientation to measure the LH strategy, Kruger et al. (2008) found that it mediated the relationship between poor neighborhood environment and risk-taking behaviors. In line with this view, we hypothesized that temporal orientation should mediate the association between the perceived environmental cues in likelihood of future success and procrastination. After all, if people perceive that they have a low likelihood of future success in their environments, they have little to lose by being opportunistic over prioritizing long-term future goals (thereby reflecting a low level of future orientation). As a result, we expected low level of future orientation to be an evolved psychological design feature of fast LH strategies that motivates functional outputs such as procrastination (Chen & Chang, 2016).

The goal of this study is to test procrastination both as a direct and as an indirect behavioral outcome of perceived environmental cues in lower likelihood of future success, through mediation of future orientation. Specifically, perceived environmental cues in lower likelihood of future success was expected to be positively correlated with procrastination and to be negatively correlated with future orientation, and future orientation was expected to be negatively correlated with procrastination. The model is presented in Fig. 1. We tested the three associations in a sample of undergraduate students. Using structural equation modeling, we employed the multiple-indicator approach to measure the three latent constructs. We used three scales (i.e., the General Behavioral Procrastination; the Adult Inventory of Procrastination; the Tuckman Procrastination Scale) to measure the procrastination construct. We used three subscales (i.e., time perspective, anticipation of future consequence, and planning ahead) of the future orientation scale to measure the future orientation construct. We also used three subscales (i.e., resource acquisition, social rank, and offspring survivability) of the Probability Judgments Scale to measure the construct of perceived environmental cues in likelihood of future success. We relied both on the overall model fitness statistics and significance tests of specific paths to examine the direct association between perceived environmental cues in likelihood of future success and procrastination, as well as the indirect association between these two constructs through the mediation of future orientation.

2. Method

2.1. Participants and procedure

Two hundred and fifty-two Chinese undergraduates (85 males, 167 females; mean age = 19.77 years, $SD = 1.13$) at a large public university took part in the study. After having the purpose of the research explained to them in class, they were voluntarily recruited from psychology courses in exchange for partial fulfillment of course requirements. Participants were provided a website link and instructed to complete an online survey. It took approximately 5 min to complete the five scales with a total of 76 items. The order of the scales completed is as follows in the Measures subsection.

2.2. Measures

2.2.1. General behavioral procrastination scale

The Chinese version of this scale (Chen & Chang, 2016; Chen et al., 2016) measures an individual's tendencies in procrastination across a variety of delay tasks (Lay, 1986). It consists of 20 items (e.g., "A letter may sit for days after I write it before mailing it."; $\alpha = 0.82$). Participants responded to these statements using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). All items were averaged to generate a composite procrastination score where higher scores indicated higher levels of procrastination.

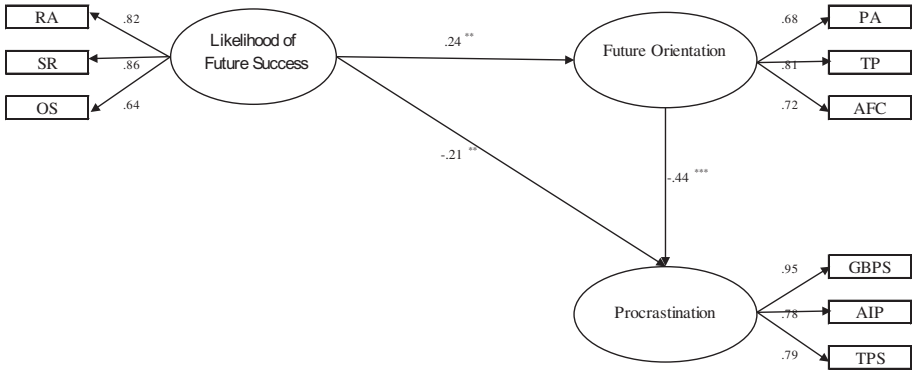

Fig. 1. The model depicting the associations among likelihood of future success in environments, future orientation and procrastination. Note. RA, SR, and OS: Resources Acquisition, Social Rank, Offspring Survivability subscales of the Probability Judgments Scale; GBPS: General Behavioral Procrastination Scale; AIP: Adult Inventory of Procrastination; TPS: Tuckman Procrastination Scale; PA, TP, and AFC: Planning Ahead, Time Perspective, and Anticipation of Future Consequence subscales of the Future Orientation Scale. $^{**}p < 0.01$; $^{***}p < 0.001$.