In a Dark Time: The Interconnections Among Psychopathy, Temporal Focus and Time Spatialization

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In many spoken and signed languages, individuals construct spatial representations of time along the sagittal axis. According to the Temporal Focus Hypothesis, the direction of front-back time mapping is shaped by the balance of attention directed to past and future events. Based on previous empirical findings that psychopathy is negatively associated with the future time perspective, we investigated the interconnections among psychopathic traits, temporal-focus attention, and implicit space-time mappings in Chinese university students (N = 328). The results showed that participants who thought about time adhered to the future-in-front pattern scored lower on measures of psychopathy than those who thought about time adhered to the past-in-front pattern. In addition, we replicated the inverse correlation between psychopathy and future focus in the Chinese population. Taken together, our findings suggest that individual differences in psychopathy underpinning temporal-focus attention are associated with individuals' time spatialization, which lend support for the Temporal Focus Hypothesis.

Keywords: psychopathy, Temporal Focus Hypothesis, space-time mappings, time perspective

Introduction

Psychopathy is commonly defined as a personality disorder marked by a set of interpersonal and emotional traits including persistent violations of social rules and norms, showing no regard for right and wrong, and the remorseless use of others (Hare, 1991; Ray & Ray, 1982). Several studies have shown that psychopathic individuals tend to discount the value of delayed rewards, which suggests a negative relationship between psychopathy and future time perspective (Jonason et al., 2010). Such results can be explained by Life History Theory, which posits that dark personality traits are associated dominantly with a fast life history strategy with increased incentives to obtain short-term benefits and to overvalue immediate rewards (Gladden et al., 2009). Although prior work has offered support for the robust link between psychopathy and future orientation, it is still an open question whether psychopathic traits are associated with other aspects of time conceptualizations such as space-time mappings. In addition, most published research in this area has been conducted in western, educated, industrialized, rich, and democratic (WEIRD) societies (Henrich et al., 2010), more studies are needed to extrapolate the findings onto the general population.

According to Conceptual Metaphor Theory, when thinking and talking about abstract domains such as time, people often recruit concrete domains such as space which come from our bodily experience (Lakoff & Johnson, 1980; Medimorec, 2020; Rolke et al. 2013; Sun & Zhang, 2021). For instance, English speakers talk and gesture about the future as being in front of them and the past as behind, as shown in expressions such as "*look forward to the future*" and "*look back into the past*" (Casasanto & Jasmin, 2012; Clark, 1973). The metaphorical association between space and time, however, is more complex than these linguistic examples suggest. In marked contrast to English speakers, Aymara people, an indigenous nation in the Andes, tend to map the past onto a front position and the future as behind. For instance, *nayra pacha* (front/time) in Aymara is frequently used to refer to the past and *qhipa pacha* (back/time) represents the future time (Núñez & Sweetser, 2006).

To understand such cross-cultural variations in the directions of the front-back time mapping, scholars have focused on a range of cultural, linguistic, and cognitive factors. According to the Temporal Focus Hypothesis (TFH), people's time spatialization depends on how they characteristically think about the past and the future (de la Fuente et al., 2014). This

hypothesis assumes that when individuals attend to the things in the environment, they usually orient their eyes, head, and body to the objects, and hence place the objects in front of them. Accordingly, past-focused individuals tend to conceptualize the past as in front, while future-focused individuals tend to conceptualize the future as in front. For example, Moroccans, who preserve the traditional cultural values, were more prone to think about time adhered to the past-in-front pattern than Spaniards who put emphasis on economic growth and technological advancements (de la Fuente et al., 2014). Such findings suggest that temporal focus is a strong predictor of the direction of implicit space-time mapping, supporting the TFH.

Various cultural and individual differences variables related to temporal-focus attention were found to predict implicit sagittal timelines, for example, factors such as life experiences (Li & Cao, 2017), age (Bylund et al., 2020), and religious experience (Li & Cao, 2018). In addition, an emerging line of studies has shown possible links between individual differences in personality (i.e. levels of conscientiousness) and mental sagittal space-time mappings (Li & Cao, 2019). For instance, research results have shown that optimism is strongly related to future time perspective (Scheier & Carver, 1985). Replicating and extending these findings, Li and Cao (2020) found that people who mapped the future in front displayed higher levels of optimism than those who mapped the past in front. This pattern of results suggests that individual temporal-focus attention is an important factor explaining people's spatial-temporal thinking, consistent with the TFH.

Surprisingly, the existing literature concerning the interconnections among personality differences, temporal focus, and space-time mappings focused solely on positive personality traits (e.g., conscientiousness and optimism). The role of Dark Triad has not been investigated before, although several studies have shown that these traits are associated with the way people non-consciously construe the past, the present and the future (Bjørnebekk & Gjesme, 2009). The Dark Triad personality refers to the three interrelated and social-aversive traits of Machiavellianism, psychopathy, and narcissism (Paulhus & Williams, 2002). These constructs especially psychopathy have been shown to be predominantly linked to a tendency to discount future consequences (Jonason et al., 2010). For instance, Birkás and Csathó (2015) found that there was a negative correlation between the future time perspective and psychopathy. This is possibly because high psychopathy individuals tend to live in the present moment and to select immediate over delayed rewards (Zimbardo & Boyd, 2008).

Despite these findings suggesting that psychopathy could be negatively associated with a future-oriented attitude, little is known about the role of psychopathy in time spatialization.

Aiming to fill these gaps in the knowledge, the current investigation tested these potential links by using the self-report instruments that assess psychopathy features, and temporal-focus attention. Based on previous findings that there is a negative association between psychopathy and future-oriented thinking, we expect that individuals thinking about time adhered to the future-in-front pattern, who have a stronger future focus, should evidence a lower level of psychopathy.

Method

Participants

A total of 328 Chinese undergraduate students (167 women and 161 men; age 18–25 years, $M = 20$, $SD = 2.9$) took part in the study for a small monetary reward. All participants were native speakers of Chinese from Mainland China.

Materials and Procedure

We used a three-part questionnaire to assess participants' time spatialization, psychopathy, and temporal focus, respectively. The Time Diagram Task in the first part of the questionnaire, which was used to index implicit space-time mappings, was adapted from de la Fuente et al. (2014: Experiment 1). This approach has been used successfully in many published studies especially in Chinese populations (Li & Cao, 2020). In this paper-pencil-task, participants were presented with a picture that featured a cartoon character named Hua Li, with an empty box placed in front of him and one box behind him (see Figure 1). Next, participants read a cover story that Hua Li visited a friend who loved plants yesterday and was about to visit another friend who liked animals tomorrow. Finally, participants were informed to write the Chinese character "植" (for "plant") into the box that they thought represented past events and the Chinese character "动" (for "animal") into the box that they thought represented future events. To control for the influence of the animal/plant preference and the order of questions, animal/plant-to-time assignment were fully counterbalanced across participants.
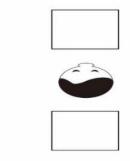

Figure 1. The time diagram task presented to the participants.

In Part 2 of the questionnaire, participants completed the Chinese version of the Psychopathy Subscale from the Dirty Dozen Scale (Jonason & Webster, 2010). Although the subscale only comprises of 4 items, it has sufficient psychometric properties as discussed and supported in previous construct validation research (e.g. Cronbach's α = 0.757; Geng et al., 2015). The subscale also demonstrated acceptable internal consistency in the current study, Cronbach's α = 0.78. The participants indicated how much they agreed with statements such as "*I tend to lack remorse*" on a five-point Likert scale (1= *strongly disagree*, 5 = *strongly agree*).

In Part 3 of the questionnaire, the Chinese version (Li & Cao, 2019) of the Temporal Focus Scale (TFS; Shipp et al., 2009) was used to measure participants' attentional focus on time: past-focused statements (e.g., "*I think about things from my past*"; Cronbach's α = 0.80) and future-focused statements (e.g, "*I focus on my future*"; Cronbach's α = 0.83). Participants indicated how well each statement describes their feeling at the current moment on a seven-point Likert type scale from 1 (*strongly disagree*) to 7 (*strongly agree*).

Results

At the end of this study, participants were asked what they thought was the purpose of the study. Participants' debriefing reports revealed no conscious awareness of the interconnections among psychopathy, temporal focus and implicit space-time mappings. 54.6% of participants tended to place the future in the box that was in front of the character. We performed a series of t-tests to analyze participants' responses to the Time Diagram Task. As shown in Table 1, participants who mapped the future in front scored lower on measures of psychopathy ($M = 2.10$; $SD = 0.74$) than those who mapped the past in front ($M = 2.50$; $SD = 0.98$), t (326) = 4.21, $p < .001$, $d = 0.46$, 95%CI[-0.5870, -0.2130], which is consistent with our predictions. Additionally, the results also showed that there was a significant inverse relationship between psychopathy ($M = 2.28$; $SD = 0.88$) and future-oriented thinking ($M = 4.46$; $SD = 1.30$), r (326) $= -.42$, $p < .001$, 95%CI[-0.505, -0.327], which is consistent with prior findings (Birkás & Csathó, 2015).

We conducted a two-way mixed model ANOVA to analyze the responses to the TFS, with one between-subjects factor (Group: past-in-front vs. future-in-front) and one within-subjects factor (Temporal Focus: past vs. future). The dependent variable is the average agreement with the past- and future-related statements. As predicted by the TFH, the interaction between Group and Temporal Focus was significant, $F(1, 326) = 47.42$, $p < .001$, $\eta_p^2 = .13$. Concretely, the pairwise tests showed that participants who placed the future in front engendered a stronger future focus

than those who placed the past in front ($p < .001$). Meanwhile, participants who placed the past in front engendered a stronger past focus than those who placed the future in front ($p = .001$).

Table 1

T-Test Analyses of the Time Diagram Task With Psychopathy Scores and Temporal Focus Scale

	Past-in-front mapping (N = 149)		Future-in-front mapping (N = 179)			
	M	SD	M	SD	t	p
Psychopathy	2.50	0.98	2.10	0.74	4.16	< .001
Past-focus statements	4.64	1.20	4.14	1.38	3.46	= .001
Future-focus statements	4.05	1.29	4.82	1.18	5.59	< .001

Discussion

To understand how individuals conceptualize time along the sagittal space, extant research has primarily relied on cultural and individual differences in variables such as positive personality characteristics (Li & Cao, 2019, 2020). The current study extended this research stream by investigating the role of dark personality in spatial-temporal thinking, focusing specifically on psychopathic traits. The results showed that individuals who tended to be more future-focused and to conceptualize the future as in front evidenced a lower degree of psychopathic traits.

This research offers several theoretical and practical contributions to multiple literatures. First, the present findings contribute to the personality literature by advancing the understanding of the role of the psychopathy, an under-explored category of influence on time cognition. In the past few decades, an increasing amount of empirical research has highlighted the impact of dark personality traits on intertemporal choice (Gladden et al., 2009). For instance, Jonason et al. (2010) found that individuals, who scored higher on psychopathy, were more likely to choose smaller-sooner rewards (e.g., 100 dollar now) than larger-later rewards (e.g., 1000 dollar in a year). Yet, research has not paid more attention to how the dark side of personality is related to time spatialization. By focusing on one common aspect of people's dark personality, we demonstrated a negative correlation between psychopathy and future-oriented thinking in a non-WEIRD population of Chinese people. Thus, the results suggest that future research should consider dark personality features when investigating spatial conceptions of time across different samples (e.g., normal and forensic populations).

Second, the current research extends the burgeoning literature on factors accounting for the total variance in the choice of

location for future and past. Very recently, a large-scale cross-cultural study tested the TFH across 22 countries and found that cultural values toward time can only explain 11.9% of the total variance in the direction of implicit space-time mappings (Callizo-Romero *et al.*, 2020). Such findings suggest that there remains a significant degree of heterogeneity within a group. It is likely that other variables, alongside cultural attitudes toward time, may have contributed to the observed effects. In the current research, for the first time in the literature, we tested the role of psychopathy traits underpinning temporal focus in time spatialization. The findings showed that psychopathy covaried with a prominent profile of future focus, which made a unique prediction of conceptualizations of time along the sagittal axis, supporting the TFH.

Third, the findings of the present study have important clinical implications. A wealth of data suggests that psychopathy is strongly related to negative emotionality and aggressive behaviors (Hicks & Patrick, 2006; Webster et al., 2014). Based on the negative relationship between psychopathy and future focus, we suggest that therapeutic interventions based on time perspective could provide a therapeutic approach to attenuating the adverse psychological impact of psychopathy. For instance, Zhao et al. (2018) provided some initial evidence that consideration of future consequences (CFC) can serve as a therapeutic intervention to reduce aggression associated with psychopathy. However, cultivating a positive personality trait such as CFC might be difficult in real-life contexts. The current research suggests that a therapy based on linguistic training such as using future-in-front mapping in spoken metaphors to increase individuals' attention to the future events could offer a simple therapeutic tool for buffering the effect of psychopathy on negative behaviors.

We acknowledge that the findings in the present study face some potential limitations. One limitation is that research subjects predominantly consisted of Chinese university students. Some research has shown pronounced variation in conceptualizations of time across different populations within a single culture (Li & Cao, 2018). For instance, Duffy and Feist (2014) found that UK university students were more likely to evoke an ego-moving representation (responding *Friday*) than UK administrators when interpreting an ambiguous temporal statement such as "*Next Wednesday's meeting has been moved forward 2 days. What day is the meeting, now it has been moved*". Thus, the generalizability of findings in representative or even clinical populations in China and other cultures may warrant further investigation. Additionally, the criterion measures used in the current research were self-report instruments, which may suffer from shared method variance and could inflate relationships.

References

Birkás, B., & Csathó, Á. (2015). Size the day: The time perspectives of the Dark Triad. *Personality and Individual Differences, 86*, 318–320.

Bjørnebekk, G., & Gjesme, T. (2009). Future time orientation and temperament: Exploration of their relationship to primary and secondary psychopathy. *Psychological Reports*, *105*(1), 275–292.

Bylund, E., Gygax, P., Samuel, S., & Athanasopoulos, P. (2020). Back to the future? The role of temporal focus for mapping time onto space. *Quarterly Journal of Experimental Psychology*, *73*(2), 174–182.

Callizo-Romero, C., Tutnjević, S., Pandza, M., Ouellet, M., Kranjec, A., Ilić, S., ... & Santiago, J. (2020). Temporal focus and time spatialization across cultures. *Psychonomic Bulletin & Review*, *27*, 1247–1258.

Casasanto, D., & Jasmin, K. (2012). The hands of time: Temporal gestures in English speakers. *Cognitive Linguistics, 23*, 643–674.

Clark, H. H. (1973). Space, time, semantics, and the child. In T. E. Moore (Ed.), *Cognitive development and the acquisition of language* (pp. 27–63). New York: Academic Press.

de la Fuente, J., Santiago, J., Román, A, Dumitrache, C., & Casasanto, D. (2014). When you think about it, your past is in front of you: How culture shapes spatial conceptions of Time. *Psychological Science, 25*, 1682–1690.

Duffy, S. E., & Feist, M. I. (2014). Individual differences in the interpretation of ambiguous statements about time. *Cognitive Linguistics*, *25*(1), 29–54.

Geng, Y.-G., Sun, Q.-B., Huang, J.-Y., Zhu, Y.-Z., & Han, X.-H. (2015). Dirty dozen and short dark triad: A Chinese validation of two brief measures of the dark triad. *Chinese Journal of Clinical Psychology*, *23*(2), 246–250.

Gladden, P. R., Figueredo, A. J., & Jacobs, W. J. (2009). Life history strategy, psychopathic attitudes, personality, and general intelligence. *Personality and Individual Differences, 46*, 270–275.

Hare, R. D. (1991). *The Psychopathy Checklist–Revised (PCL-R)*. Toronto, Ontario, Canada: Multi Health Systems.

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, *466*(7302), 29–29.

Hicks, B. M., & Patrick, C. J. (2006). Psychopathy and negative emotionality: Analyses of suppressor effects reveal distinct relations with emotional distress, fearfulness, and anger-hostility. *Journal of Abnormal Psychology*, *115*(2), 276–287.

Jonason, P. K., & Webster, G. D. (2010). The dirty dozen: A concise measure of the dark triad. *Psychological Assessment*, *22*(2), 420–432.

Jonason, P. K., Koenig, B. L., & Tost, J. (2010). Living a fast life: The Dark Triad and life history theory. *Human Nature, 21*, 428–442.

Lakoff, G., & Johnson, M. (1980). *Metaphors we live by.* Chicago, IL: University of Chicago Press.

Li, H., & Cao, Y. (2017). Personal attitudes toward time: The relationship between temporal focus, space-time mappings and real life experiences. *Scandinavian Journal of Psychology*, *58*(3), 193–198.

Li, H., & Cao, Y. (2018). Karma or immortality: Can religion influence space-time mappings? *Cognitive Science*, *42*(3), 1041–1056.

Li, H., & Cao, Y. (2019). Planning for the future: The relationship between conscientiousness, temporal focus and implicit space-time mappings. *Personality and Individual Differences*, *141*, 111–116.

Li, H., & Cao, Y. (2020). Best wishes for the future: The link between dispositional optimism and mental sagittal space-time mappings. *Personality and Individual Differences*, *166*, 110212.

Medimorec, S. (2020). The effects of day of the week on temporal ambiguity resolution. *Psychological Reports*, *125*(2), 882–889.

Núñez, R. E., & Sweetser, E. (2006). With the future behind them: Convergent evidence from Aymara language and gesture in the crosslinguistic comparison of spatial construals of time. *Cognitive Science, 30*(3), 401–450.

Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality*, *36*(6), 556–563.

Ray, J. J., & Ray, J. A. B. (1982). Some apparent advantages of subclinical psychopathy. *The Journal of Social Psychology*, *117*(1), 135–142.

Rolke, B., Fernández, S. R., Schmid, M., Walker, M., Lachmair, M., López, J. J. R., ... & Vázquez, C. (2013). Priming the mental time-line: effects of modality and processing mode. *Cognitive Processing*, *14*(3), 231–244.

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4*, 219–247.

Shipp, A. J., Edwards, J. R., & Lambert, L. S. (2009). Conceptualization and measurement of temporal focus: The subjective experience of the past, present, and future. *Organizational Behavior and Human Decision Processes*, *110*(1), 1–22.

Sun, J., & Zhang, Q. (2021). How do Mandarin speakers conceptualize time? Beyond the horizontal and vertical dimensions. *Cognitive Processing*,*22*(2), 1–11.

Webster, G. D., Gesselman, A. N., Crysel, L. C., Brunell, A. B., & Jonason, P. K. (2014). An actor—Partner interdependence model of the Dark Triad and aggression in couples. *Personality and Individual Differences, 60*, S16.

Zhao, Y., Wei, J., Chen, Y., & Xia, L. (2018). Consideration of future consequences (CFC) serves as a buffer against aggression related to psychopathy. *PloS one*, *13*(9), e0203663.

Zimbardo, P. G., & Boyd, J. N. (2008). *The time paradox.* New York: Free Press.