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| RESEARCH ARTICLE

That Which Does Not Kill You on Wednesday Makes You Stronger On Friday: A Bidirectional Relationship between Resilience and Time

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| ABSTRACT
Empirical studies on the influential factors of temporal conceptualization have evinced that emotions and personality traits involving the approach-related motivation tend to produce a preference for the ego-moving perspective. Building on this insight, the current research introduced the positive and approach-oriented trait of resilience and investigated its influence on the contextualized interpretation of movement of event in time. Results indicated that resilience correlated positively with the ego-moving perspective, such that participants with higher resilience scores were more likely to adopt the ego-moving perspective when reasoning about a temporal ambiguity than those with lower such scores (Study 1). Furthering the correlation, Study 2 made a causal inquiry and revealed that participants primed with a resilient attitude chose to perceive themselves as approaching an academically stressful event (in line with the ego-moving perspective) more frequently than did those primed with a maladaptive attitude. Finally, Study 3 examined the reverse impact of temporal perspective on resilience and the results showed that participants exposed to the ego-moving perspective-framed academic adversity tended to vicariously approach the scenario with a resilient attitude more than did those subjected to the same scenario phrased from the time-moving perspective. Taken together, the pattern of results supports the embodied cognition theory by evidencing that conceptually disparate domains may be reciprocally influenced via a shared embodied link.

| KEYWORDS
Ego-moving Perspective; Time-moving Perspective; Resilience; Approach Motivation; Embodied Cognition

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1. Introduction

Across cultures, the imperceptible lapse of time is conceptualized in terms of spatial movement (Boroditsky, 2000; Boroditsky & Ramscar, 2002; Casasanto & Boroditsky, 2008; Clark, 1973; Evans, 2004; Fuhrman & Boroditsky, 2010; Gu et al., 2017; Lakoff & Johnson, 1980; Loermans, de Koning, & Krabbendam, 2019; Moore, 2014; Rothe-Wulf, Beller & Bender, 2015; Yu, 1998). This space-based temporal construal is linguistically manifested in a dual system of metaphorical representation: one visualizes the experiencer (*ego*) as approaching a given future event and is hence named the *ego-moving* metaphor whereas the other imagines a certain future event (*time*) as coming toward the *ego* and is thus termed the *time-moving* metaphor (Bender & Beller, 2014; Bender, Beller, & Bennardo, 2010; Feist & Duffy, 2020; Li, 2020). No shortage of these two types of space-time metaphors can be found, respectively, in conventionalized Chinese expressions such as "*喜迎龙年*(*We are approaching The Year of Dragon*)" and "*龙年将至*(*The Year of Dragon is approaching us*)".

However, are these two types of space-time metaphors but a linguistic phenomenon, or is temporal passage, as is theorized, conceptually underlain by motion in space (Clark, 1973)? If it is the latter, it should follow that thinking about a particular spatial

motion would influence thinking about a particular temporal movement (Matlock et al., 2011). To test this and in a pioneering experiment, McGlone and Harding (1998) devised a temporally ambiguous paradigm, the interpretation of which would rely on either of the two metaphors. They first primed participants with contextualized statements put together using either the ego-moving metaphor (e.g., *We passed the deadline two days ago*) or the time-moving metaphor (e.g., *The deadline passed us two days ago*) before presenting them with the temporally ambiguous target question that read: *The meeting originally scheduled for next Wednesday has been moved forward two days. What day is the meeting now that it has been moved?* The question would elicit an either-or answer of next *Friday* or *Monday* that respectively corresponded with the adoption of the ego-moving or the time-moving perspective. The results showed that participants interpreted the ambiguity in a metaphor-consistent way such that those primed with the ego/time-moving-phrased statements tended to offer a Friday/Monday response. In so doing, the psychological reality of the binary space-time metaphors was proven. Drawing on this insight and the paradigm thereof, cognate lines of research have successively excavated that physical motion (Boroditsky & Ramscar, 2002), fictive motion (Matlock, 2004a; 2004b; Matlock, Ramscar & Boroditsky, 2005) and abstract motion (Matlock, 2010; Matlock et al., 2011) can all exert an influence on the way time is conceptualized, forming an ensemble of empirical evidence attesting to the claim that the abstract domain of time is grounded in the concrete domain of space (Boroditsky, 2000; Lakoff & Johnson, 1999).

The blended knowledge of the spatial substrate of time and the bodily-grounded nature of emotion (Barrett & Lindquist, 2008) initiated extended lines of inquiry into the influence emotional reactions might have on the conceptualization of time, which converged in demonstrating that when reasoning about the ambiguous "Next Wednesday's meeting" question, positive emotions (e.g., happiness) tended to orient people toward the ego-moving perspective whereas negative emotions (e.g., anxiety) tended to instill a partiality for the time-moving perspective (Lee & Ji, 2014; McGlone & Pfiester, 2008; Richmond et al., 2012; Zheng et al. 2019). For example, Margolies and Crawford (2008) found that participants who imagined an enthusiasm-provoking event were more likely to describe that they were approaching the event (in agreement with the ego-moving perspective) whilst those who imagined a dread-provoking event were more likely to feel that the event was approaching them (in agreement with the time-moving perspective). Nevertheless, the pairings of positivity with the ego-moving perspective and negativity with the time-moving perspective are tenable but for one exception. Anger, the archetypal negative emotion turned out to have a closer connection with the ego-moving perspective. This exceptional finding was ascribed to the fact that anger and the ego-moving metaphor are similarly embodied in an approach-related tendency in spatial movement (Hauser, Carter, & Meier, 2009). To better illustrate, anger often produces behavioral engagement and is positively correlated with trait measures of approach motivation (Harmon-Jones, 2003; Hauser et al., 2009). In a similar vein, the ego-moving metaphor is represented as the ego actively advancing toward a future event, which bears no small resemblance to the approach-related spatial movement implicated in anger. As a result, the approach-related motivation triggered by anger would be able to activate the same motivation implicit in the ego-moving metaphor, whereby anger-ego-moving perspective association is formed. It is thus safer to conclude that emotional experiences with approach-related motivations are more likely to bring on the ego-moving perspective whereas emotional experiences with avoidance-related motivations, such as anxiety and depression that are accompanied with lack or loss of personal agency (Richmond et al., 2012) are more likely to call forth the time-moving perspective (Zheng et al., 2019). Most importantly, the directionality of the emotional influence on time can be reversed such that the adoption of the ego-moving perspective tended to generate emotional positivity (save anger: Hauser et al., 2009) whilst the adoption of the time-moving perspective tended to engender emotional negativity (Margolies & Crawford, 2008; McGlone & Pfiester, 2009; Ruscher, 2011). For instance, contrary to participants who completed the ego-moving scheduling task that reported significantly higher happiness scores, those who completed the time-moving scheduling task reported considerably higher anxiety and depression scores (Richmond et al., 2012: Study 3).

The embodied nexus between time and emotion was later extended to that between time and individual differences such as personality and behavior (Duffy & Evans, 2017; Duffy & Feist, 2014; Duffy & Feist, 2017; Duffy, Feist, & McCarthy, 2014). In one study, uniting the connection between the ego-moving/time-moving perspective with the approach/avoidance motivation and that between the approach/avoidance-related tendencies with high power-/low power-signifying poses in space, Duffy and Feist (2017) investigated the relationship between power poses and temporal perspectives. Their results showed that compared to participants who held a low-power pose, those who adopted a high-power pose exhibited a stronger liking for the ego-moving perspective.

Taken together, the empirical literature reviewed on the metaphorical representation of time testifies to the elasticity of temporal construal by evincing that spatially grounded aspects of human experiences may modulate temporal perspective via a shared embodied link (Hauser et al., 2009). Taking the existing research further, the next step would be to ask what other spatially based

factors might exert an influence on the conceptualization of time. To this end, the current research introduced the thus far untapped factor of resilience with special attention paid to the possible bidirectional relationship between resilience and the contextualized temporal comprehension. Other than the academic interest, the rationale behind the choice of resilience involves a social dimension. In a time when transformational reforms are cutting across major social sectors in China, the educational front there sees undergraduates being weighed down by mounting academic demands and vertiginous policy modifications. With endless urging for timely adjustment, compounded by the uncertainty about the raging COVID-19 pandemic and the resultant ill-prepared transition to online classes as a substitute for face-to-face learning (Zhan et al., 2021), it is perhaps unsurprising that Chinese university students were found to be at a high risk for depressive and anxiety symptoms (Fu et al., 2020; Luo et al., 2021). This mental health emergency prevalent in the younger population has attracted the attention of the Chinese Ministry of Education, with the development and enhancement of psychological resilience proving to be one of the palliative remedies (Wu et al., 2020). Therefore, the cognizance of the social status quo of aggravating mental health among the student population, the empirical results demonstrating a positive correlation between personality traits and temporal conceptualization (e.g., Duffy & Feist, 2014; Duffy & Feist, 2017; Richmond et al., 2012) and the identification of resilience as a positive personal quality (Connor & Davidson, 2003) serves as an extra layer of motivating force for the juxtaposition of resilience and time under examination, as this investigative attempt might shed some light on a different approach to mitigating the mental health epidemic.

2. Resilience and the ego-moving perspective

Resilience is defined as the capacity to positively cope with and overcome adversities (Daniel & Wassell, 2002; García-Martínez et al., 2022; Masten, 2014; Vos et al., 2021). A cumulative thread of research on resilience has shown that resilience is negatively correlated with mental distresses such as depression and anxiety (Barzilay et al., 2020) but positively correlated with personality traits such as optimism (Maheshwari & Jutta, 2020), hope (Nephtaly, 2019), happiness (Hofgaard et al., 2021) and extraversion (McDonnell & Semkovska, 2020; Oshio et al., 2018). For example, when examining the mediating effect of resilience on the relationship between social support and happiness in the context of people's ongoing fight against the COVID-19 pandemic, Tan and collaborators (2021) discovered that resilience was positively related to happiness such that individuals with higher levels of resilience reported a stronger sense of happiness. Meanwhile, in an investigation into the neurobiological fundamentals of a new psychological resilience measurement scale and its efficacy, researchers found that forward-looking items (approach/avoidance motivation schemas) in general correlated with higher levels of resilience and that approach motivation schemas in particular had a positive impact on resilience (Rossouw & Rossouw, 2016).

Recall that approach-related motivation is positively associated with with the ego-moving perspective (Hauser et al., 2009; Richmod et al., 2012; Zheng et al., 2019) and given that resilience is a positive personal quality that implicates approach motivation (Kannangara et al., 2018; Rossouw & Rossouw, 2016), we hypothesized that resilience would have a stronger association with the ego-moving perspective than the time-moving alternative. To test this, Study 1 examined the correlation between resilience and time by comparing people's level of resilience with their contextualized interpretation of an ambiguous temporal question. The specific prediction made was that people who scored higher on the resilience scale should be more likely to adopt the ego-moving perspective when reasoning about the temporal ambiguity. To ascertain the relationship by eliminating a possible confounding factor, Study 2 used priming to examine the causal role of resilience in molding people's temporal perspective. Finally, previous research has suggested that the ego-moving metaphor may afford more agentic control and positivity than the time-moving metaphor (Margolies & Crawford, 2008; Richmond et al., 2012). For instance, when making affective speculations about a mother's grief intensity and duration over her son's passing, participants primed with the ego-moving metaphor predicted shorter grieving periods than did those primed with the time-moving metaphor (Ruscher, 2011). Drawing on this insight, Study 3 probed into the reverse influence of temporal representation on the evaluative judgement of resilience, with the surmise made thereof that compared with the time-moving perspective, the ego-moving perspective would instil a stronger level of perceived resilience.

3. Present studies

3.1 Study 1: The relationship between resilience and people's contextualized temporal perspective

3.1.1 Participants

A total of 81 undergraduate students (53 females; M_{age}: 19.99 years; SD_{age}: 0.75 years) from two universities in southwest China participated in the study. All of them were Han Chinese from the Chinese mainland. To compensate for the participants' time, each was given a Deli notebook.

3.1.2 Materials and procedure

Participants were seated in quiet classrooms. On the desks were laid out a booklet of three A4 printouts. On the first page was the Connor-Davidson Resilience Scale (CD-RISC-10) (Campell-Sills & Stein, 2007), which is a 10-item unidimensional scale that measures one's adaptability to challenging physical and emotional circumstances (e.g., "*Tend to bounce back after illness or hardship*" or "*Not easily discouraged by failure*"). The Chinese version of the CD-RISC-10 has been applied in various empirical

studies with consistent good reliability and validity (Cheng et al., 2020; She et al., 2020; Wang et al., 2010; Ye et al., 2017) and as such, it was recycled in the current study. The translation of the 10-item scale was rendered, back-translated and double-checked by two Translation course lecturers with CATTI (China Accreditation Test for Translators and Interpreters) certificate. Each item was to be rated on a 5-point ascending scale with *0* ("not true at all") anchored at the left and *4* ("true almost always") at the right end of a straight line. The final rating of each participant should range from *0* to *40*, with a higher rating indicating stronger level of resilience. Cronbach's alpha for the scale used in the current sample was 0.94. The next page posed the Chinese adverb-omitted version of the original ambiguous paradigm (McGlone & Harding, 1998). Concretely, the question read, "*原定于下周三开的会议，现将其**移动**两天。请问会议现在周几召开?*" ("Next Wednesday's meeting has been ***moved*** two days. What day is the meeting now that it has been moved?") (Li, 2020), complete with a blank line below to be filled in with the answer. The instruction preceding the question made it clear that there was no right or wrong about the answer and that an intuitive response was essential. The third and final page was used to collect demographic information such as age, gender, first language and ethnicity. All participants performed the tasks in full and debriefing showed that none pinpointed the purpose of the study. All the data therefore were included and entered into SPSS Statistics 25.0 for analysis.

3.1.3 Results and discussion

Consistent with our prediction, a bivariate correlation analysis revealed that there was a positive interaction between resilience and temporal perspective ($r(79) = 0.39$; $p < 0.001$). In concrete terms, descriptive statistics showed that participants who opted for the rescheduled meeting to be postponed until next "Friday" (in alignment with the ego-moving perspective) scored significantly higher on the resilience scale (55.56%; $M = 24.67$; $SD = 3.90$) than those interpreted it as being brought forward to next "Monday" (in alignment with the time-moving perspective) (44.44%; $M = 21.61$; $SD = 3.37$), $t(79) = -3.72$, $p < 0.001$; 95% CI = [1.42 – 4.69] by an independent- samples t-test).

Study 1 thus provided preliminary evidence for a connection between resilience and people's metaphorical perspective on time. However, previous research has suggested that resilient people generally tend to have high levels of happiness (Mei et al., 2021) that were found to conduce to a bias in favor of the ego-moving perspective (Richmond et al., 2012). Probing into the influence of emotional states on perspective preference, for example, Zheng and collaborators (2019: Study 1) found that participants induced with an overridingly happy emotion exhibited a stronger liking for the ego-moving metaphor than did those exposed to a dominantly anxious scenario. Therefore, the possibility that the observed positive correlation might be the effect of co-existing happiness rather than resilience per se could not be discounted. To eliminate this possible confounding variable, we then carried out an investigation into the causal role of resilience in shaping people's temporal perspective. To do this, Study 2 employed a priming task to examine whether exposure to a resilient stimulus (vs. a maladaptive one) would make people more inclined toward the ego-moving perspective when reasoning about the temporal ambiguity.

3.2 Study 2: The causal role of resilience in influencing people's contextualized temporal perspective

3.2.1 Participants

One hundred and twenty undergraduates in their third or fourth year from two universities in southwest China were recruited for the study. All of them were Han Chinese from Chinese mainland and none had been participants in Study 1. Each participant was gifted a Deli notebook as a compensation for their time.

3.2.2 Materials and procedure

Participants were randomly and evenly assigned to the resilience condition ($N = 60$; 35 females; $M_{age} = 21.52$ years; SD_{age}: 0.70 years) and the maladaptation condition ($N = 60$; 38 females; $M_{age} = 21.30$ years; SD_{age}: 0.77 years). They sat in front of classroom desks on which there had been placed a booklet of three pages, with the prime, the target questions and the demographic information printed on each page in this order. The prime was based on the Academic Resilience Scale (ARS-30) (Cassidy, 2016), which comprises a resilience elicitation paradigm and related rating items. The paradigm is a vignette describing an academic adversity that typifies the experience of university students and the scale items represent behavioral and cognitive-affective responses to the said adverse situation. In order to adapt it for the current study, three alterations were made.

The first was to append a resilient and a maladaptive response respectively to the same vignette, whereby two contrastive priming conditions with each containing exactly 216 words were formed. Specifically, the resilient response was framed using three items from Factor 1 (Perseverance) and Factor 2 (Reflecting and adaptive help-seeking) of the ARS-30 and the maladaptive response extracted four items from Factor 3 (Negative affect and emotional response) of the same scale (Cassidy, 2016).

Second, the personal noun was changed from the second person "you" in the original English vignette to the first person "I" in the current Chinese version, together with their corresponding possessive adjectives. The consideration behind this was that within the second person pronoun there might embed an internal perspective that would translate into the comprehender's agentive

involvement (Sato & Bergen 2013), which might in turn contribute to a propensity for the ego-moving perspective. To illustrate, research into the lexical and grammatic interplay of the *Next Wednesday's meeting* statement found that when the subject was added using the second person (i.e., *You have just emailed a colleague informing her that you have moved forward next Wednesday's meeting two days. For confirmation, what day has the meeting been rescheduled to?*) or the third person (i.e., *You have just received an email from a colleague informing you that she has moved forward next Wednesday's meeting two days. For confirmation, what day has the meeting been rescheduled to?*), participants exhibited a tendency to decode the temporal ambiguity from the ego-moving and the time-moving perspective, respectively. It was only when the subject was that of the first person that the participants showed no bias for either perspective (i.e., *I have just emailed a colleague informing her that I have moved forward next Wednesday's meeting two days. For confirmation, what day has the meeting been rescheduled to?*) (Feist & Duffy, 2015). In so doing, the changed pronoun in the backstory should preempt partiality for either perspective from which the subsequent target question was to be answered. The completed primes were then translated, back-translated and double-checked by two Translation course lecturers with CATTI certificate (see **Table 1**). In a pretest, 11 nonparticipatory students for each condition were recruited to grade the level of resilience (the ability to adapt positively to the difficult situation in question) manifested in each response on an ascending scale of *1* to *9*, with higher score indicating higher level of resilience and the results turned up a significant difference between the scores given by two conditions ($p < 0.001$, by a sign test). To make sure that the prime was adequately induced, participants in the current study were instructed to first peruse the vignette by answering two short-answer questions: "1) *故事中的我发生了什么事儿?* (*What happened to me in the story?*)"; and "2) *我对此作何反应* (*How did I react?*)" before rating the first target question of resilience "*我在该困境面前表现出了几分的顺应力* (How resilient was I in the face of this difficult situation?)" on a scale of *1* to *9* with larger number indicating higher level of resilience.

Finally, in order for the prime and the second target time question to have a smooth transition, and inspired by the experiment design employed in related research (Duffy & Evans, 2017; Margolies & Crawford, 2008), we customized the probe of the "*Next Wednesday's meeting*" statement and attached one follow-up question. To illustrate, first, the neutral term "meeting" in the Chinese disambiguation paradigm (Li, 2020) was replaced by "assignment deadline for the revised work" as per the specific context, rendering the altered target temporal question into: "*原定于下周三截止的**修改稿提交时间**现被移动了两天，请问现在的截止日期改到了哪**天**?* (*Next Wednesday's **assignment deadline for the revised work** has been moved two days. What **day** is the deadline due now that it has been moved?*)". Second, subsequent to the "day" question was added an emotional valence question asking, "*下列两种表述中，哪一种最恰当地描述了你对改期后的感受?* (*Which one of the following two statements best describes how you feel about this change?*)", to which "*1. 我离截止日期越来越近* (*a. I am getting closer to the deadline*)" and "*2. 截止日期离我越来越近* (*b. The deadline is getting closer to me*)" were optional responses. Again, all the translation was rendered, back-translated and double-checked by two Translation course lecturers with CATTI certificate.

To avert the possible confounding influence of happy feelings, all participants first reported their overall happiness on a scale of *1* to *9* where 1 indicated "not in the *least*" and 9 indicated "*extremely*". They read the vignette next, completed the comprehension questions and gave resilience ratings. An inclusion criterion stipulating that ratings admissible must be higher than the cutoff score of *5* in the resilience condition and lower than that in the maladaptation condition was applied to ensure the success of priming for ensuant analysis. After rating resilience, participants proceeded to answer the "day" question and the attendant "approach" question. Finally, participants filled out their demographic information of age, gender, first language and ethnicity.

That anticipating a negative future event would be more likely to evoke the time-moving perspective in general (Lee & Ji, 2014; Margolies & Crawford, 2008) and that due to stress and anxiety brought about by exams and assessments (Mofatteh, 2020), university undergraduates in particular tended to adopt the time-moving perspective when assignment deadlines were to be moved forward (Duffy & Evans, 2017) gave rise to the prediction that participants in the maladaptation condition would prefer to view the deadline as approaching them and favor the time-moving perspective accordingly. On the other hand, calling to mind that resilience features positivity and the approach-related motivation (Rossouw & Rossouw, 2016; Tan et al., 2021), we posited that in comparison, participants in resilience condition would be more likely to perceive themselves as approaching the deadline and correspondingly adopt the ego-moving perspective.

Table 1 Contrasting primes of resilience and maladaptation for eliciting responses to the ambiguous temporal question in Study 2

Vignette	Resilient prime	Maladaptive prime
我收到的最近一次作业的分数是“不及格”。最近的另两次作业分数也比我预想的要糟糕。我有明确的职业目标，不想让家人失望，所以我的目标是尽可能取得优异的成绩。导师对作业的反馈充满批评，其中提到我“理解不到位”和“写作和表达能力差”等不足，但同时也给出了改进建议。批改我另外两份作业的导师也给出了类似的反馈。 (*I have received my mark for a recent assignment and it is a "fail." The marks for two other recent assignments were also poorer than I would want as I am aiming to get as good a degree as I can because I have clear career goals in mind and don't want to disappoint my family. The feedback from the tutor for the assignment is quite critical, including reference to "lack of understanding" and "poor writing and expression," but it also includes ways that the work could be improved. Similar comments were made by the tutors who marked my other two assignments.*)	面对这种情况，我会更加努力，继续尝试，利用不同的学习方法和反馈对我的作业进行改进。我也会给自己打气，并从我的家人和朋友那里寻求鼓励。 (*In response to the situation, I would work harder and keep trying, using difference ways to study and the feedback to improve my work. I would also give myself encouragement and seek encouragement from my family and friends.*)	面对这种情况，我将非常失望，可能会感到抑郁。我会觉得一切都被毁了，都在朝着不好的方向发展。我开始觉得我在大学里获得成功的机会很渺茫。 (*In response to the situation, I would be very disappointed and probably get depressed. I would feel like everything was ruined and was going wrong. I would begin to think my chances of success at university were poor.*)

3.2.3 Results and discussion

The average scores of happiness were 5.28 for the resilience condition and 5.46 for the maladaptation condition. An independent-samples t-test showed no statistically significant difference between the two conditions ($t(106) = 0.94$; $p = 0.35$; 95% CI = [-0.57 - 0.20]). The screening of priming efficacy found six answers in each condition that registered 5 in the resilience assessment and were thus excluded, reducing the final pool for analysis to 108 (65 females; $M_{age} = 21.37$ years; SD_{age}: 0.72 years).

The results were mixed. Contrary to prediction, although a much higher proportion of participants in the resilience condition (63.0%; $p = 0.08$; $Z = -1.77$; by a sign test) than in the maladaptation condition (38.9%; $p = 0.89$; $Z = -0.14$) decided on the ego-moving perspective by interpreting the rescheduled deadline to mean next "Friday", this difference was statistically indistinguishable, as revealed by a chi-square test of independence, $\chi^2_{1, 54} = 0.20$, $p = 0.65$, Cramer's $V = 0.06$. Regarding the emotional reaction to the event, however, a reliable difference was detected between the two conditions. Concretely, a preponderance of participants in the resilience condition (72.2%) preferred to describe themselves as getting closer to the deadline (in accordance with the ego-moving representation), compared to a little over half of the participants in the maladaptation condition (51.9%) who preferred the same description. The same statistical analysis yielded a meaningful interaction between conditions and the emotional reactions to the event, $\chi^2_{1, 54} = 12.34$, $p < 0.001$, Cramer's $V = 0.48$. Noteworthily, whilst participants in the resilience condition expressed a clear-cut preference of ego approaching to event approaching ($p = 0.02$; $Z = -3.13$), those in the maladaptation condition felt ambivalent ($p = 0.89$; $Z = -0.14$). Finally, to determine whether the way the temporal ambiguity (the "day" question) was interpreted was related to how the event was emotionally perceived (the "approach" question), such that answering "Friday" would tally with the perception of the ego approaching the deadline whilst answering "Monday" would dovetail

with the perception of the deadline approaching the ego, another round of chi-square test of independence was performed. The results showed that answers to the "approach" question of emotional response did not predict those to the "day" question of temporal perspective in either the resilience condition ($\chi^2_{1, 54} = 0.08$, $p = 0.78$, Cramer's V = 0.04) or the maladaptation condition ($\chi^2_{1, 54} = 1.39$, $p = 0.24$, Cramer's V = 0.16).

Taken together, the results in Study 2 confirmed the influence of resilience on time such that in contrast to maladaptation, resilience was more likely to subserve behavioral approach that accords with the ego-moving perspective. Veering off the prediction, however, was the indistinguishable manners in which the rearranged deadline was construed, for the primes did not nudge participants in the resilience condition toward a proclivity for "Friday" or those in the maladaptation condition toward a predilection for "Monday". Possible attribution thereof could be made to a confluence, or rather a clash of factors involving time, emotion and motivation. To wit, resilience itself is approach-related (Rossouw & Rossouw, 2016), as is mentioned before and also corroborated by the significant majority (72.2%) in the resilience condition who perceived themselves as approaching the event. However, a stress-inducing event such as the assignment deadline has a negative valence for students that tends to invoke the time-moving perspective (Duffy & Evans, 2017). With the two contradicting forces simultaneously at play, it was possible that the influence of approach-related motivation might have countervailed (but not overridden) that of the event negativity and consequently reduced an otherwise "Friday" bias to a neutral stance. On the other hand, participants induced with a maladaptive stimulus must have been unenthusiastic about the deadline, which might well have inclined them toward the time-moving perspective (and led to a preference for "Monday") (Lee & Ji, 2014; Margolies & Crawford, 2009). At the same time, however, they might have psychologically wished to maximize the distance between where they stood now and where the unpleasant future event might lie by postponing it until later (to "Friday"), as would be the normal behavior of people when they face unpalatable future eventualities (Chen & Bargh, 1999), thus rendering an otherwise "Monday" bias to an ambivalence. This aberration echoed the finding made by Duffy and Evans (2017). In one study, they examined the interaction between extraversion, event valence and temporal perspective by changing the original neutral probe of "meeting" into the positive probe of "party", as in *Next Wednesday's* ***party*** *has been moved forward two days*. *What day has the event been rescheduled to?* and made the unexpected discovery that participants with higher extraversion scores did not turn out to favor "Friday" more than did those with lower such scores. For explanation, they offered the possibility that while extroverts might tend to perceive themselves as actively approaching the event (and preferring "Friday"), this tendency could be offset by their wish for the event to come sooner (and wanting it to be on "Monday") (Experiment 1). Possible presence of a counteractive effect and the finding that how the rescheduled event was felt did not predict how the rescheduled event was interpreted were also a reminder that the "day" question and the "approach" question may not be as synchronized as thought before (cf. Boroditsky & Ramscar, 2002); after all, one can wish a future event to come earlier and at the same time feeling they are approaching it (Hauser et al., 2009). Given that the "day" and the "approach" questions tap into different conceptualizations of time and space (Margolies & Crawford, 2008) and when the event is of an unequivocally negative valence, as was the case with the current probe (i.e., "assignment deadline"), the more direct "approach" question (i.e., "I am approaching the event" or "The event is approaching me") might be more fit for purpose as our concern was with emotional attitude encoded in approach and avoidance in space (Hauser et al., 2009).

Recall that in the ego-moving metaphor, time is conceptualized as a still landscape against which the ego actively approaches a given future event (Clark 1973; Lakoff & Johnson, 1999), thus making the ego-moving perspective an approach-related representation of time (Hauser et al., 2009; Margolies & Crawford, 2008) and that approach-related motivation positively impacts resilience (Rossouw & Rossouw, 2016), we went one step further asking whether resilience could be reversely modulated by temporal representation by manipulating the temporal perspective and plumbing the perceived level of resilience. Based on the existent findings that both the ego-moving metaphor and resilience are more closely associated with the approach-related motivation (Hauser et al., 2009; Rossouw & Rossouw, 2016), we postulated that participants who were exposed to an academically stressful scenario framed from the ego-moving perspective would be more likely to adopt a resilient attitude than those subjected to the same scenario framed from the time-moving perspective.

3.3 Study 3: The reverse influence of temporal perspective on perceived resilience

3.3.1 Participants

One hundred and two undergraduates in their second and third year from two universities in southwest China participated in the study. All of them were Han Chinese from Chinese mainland and none had been participants in either of the forgoing studies. Participants were given a Deli notebook as a compensation for their time.

3.3.2 Materials and procedure

Participants were randomly and evenly divided into the ego-moving ("ME"; 33 females; M_{age} = 20.33 years; SD_{age}: 0.55 years) or the time-moving ("MT"; 32 females; M_{age} = 20.45 years; SD_{age}: 0.64 years) conditions (N = 51 each). They were seated in quiet

classrooms while completing a written questionnaire consisting of experiment materials printed on one side of a copy paper and demographic information on the other side. The materials comprised a scenario, a temporal prime and the target question thereon. Concretely, the scenario recycled the elicitation vignette used in Study 2 (**Table 1**) but with two alterations made. First, the subject of the vignette was changed from "I" to "Li Hua", the Chinese equivalent of a generic male name, together with the corresponding possessive adjectives (i.e., "his" in lieu of "my"). Second, to the end of the vignette was attached a temporal prime phrased from either the ego-moving angle (ME condition): "*李华原定于下周三和导师约见进一步详谈论文。随着**李华**离面谈越来越近，他得知日期被移到了**下周五*** (*The meeting with the tutor to discuss in further detail about Li Hua's work is originally set next **Wednesday**. As **Li Hua** gets closer to the event, he learns that it has been moved to next **Friday***)" or the time-moving angle (MT condition): "*李华原定于下周三和导师约见进一步详谈论文。随着**面谈**越来越近，他得知日期被移到了**下周一*** (*The meeting with the tutor to discuss in further detail about Li Hua's work is originally set next **Wednesday**. As **the event** gets closer, Li Hua learns that it has been moved to next **Monday***)" (Margolies & Crawford, 2008). Subsequent to the required perusal of the vignette and the rescheduling prime, participants needed to give an intuitive response to the target question that asked: "*你认为李华会如何为面谈作准备* (*How do you think Li Hua would prepare for the meeting*?)" by choosing "*1. 他很可能会自我激励并继续努力* (*a. He would probably give himself encouragement and keep on trying*) (resilient attitude)" or "*2. 他很可能会心灰意冷且不思进取*(*b. He would probably feel everything was ruined and give up trying*)" (maladaptive attitude). As before, all the translation was rendered, back-translated and double-checked by two Translation course lecturers with CATTI certificate.

3.3.3 Results and discussion

In line with the prediction, more participants in the ME condition (78.4%) than in the MT condition (52.9%) vicariously chose the resilient attitude in response to the academically stressful situation. To determine whether the difference between the proportions was statistically significant, a chi-square test of independence was applied, which revealed a difference not attributed to chance ($\chi^2_{1, 251} = 12.47$, $p < 0.001$, Cramer's $V = 0.49$). The results were in support of resilience being characterized by approach-related motivation (Rossouw & Rossouw, 2016). The behavioral approach tendency embedded in the ego-moving representation must have activated the similarly grounded tendency subsumed in resilience, causing an event (of negative valence) framed from the ego-moving perspective to arouse resilience more easily than that which was phrased from the time-moving perspective, whereby a bidirectional relationship between time and resilience was established.

4. General discussion

4.1 Overview

Three studies were conducted to investigate the relationship between resilience and time. In Study 1, we examined the correlation between levels of resilience and the preferred temporal perspective from which a temporally ambiguous event was reasoned about. The results showed that participants who scored higher on the resilience scale interpreted the temporal ambiguity from the ego-moving perspective more frequently than did those who reported lower such scores. This connection consists with the observation that positive personality traits are typically associated with the ego-moving representation of time (Richmond et al., 2012; Zheng et al., 2019). The possibility that the evidence for a correlation might be contaminated by a confounding factor justified a further investigation into the causal role of resilience in modulating the temporal perspective (Study 2). The results revealed that participants exposed to the resilience prime were more inclined to perceive themselves as approaching an academically stressful event (in congruence with the ego-moving representation) than did those induced with the maladaptation prime. This finding coheres with and supports the theoretical account that resilience, similar to the ego-moving representation, features the approach-related behavioral tendency in space (Rossouw & Rossouw, 2016). Taking into consideration the shared approach motivation entailed in resilience and the ego-moving perspective, the third and final study probed into the reverse influence of temporal perspective on perceived resilience. The results indicated that participants who were subjected to an ego-moving-framed academically adverse situation were more likely to vicariously adopt a resilient attitude than those presented with the same situation framed from the time-moving angle, thus establishing a bidirectional relationship between the two conceptually disparate domains of resilience and time both grounded in the approach-related motivation.

4.2 Discussion

Spatially, approach motivation encourages behavioral tendencies to engage whereas avoidance motivation prompts behavioral tendencies to withdraw (Hauser et al., 2009). Approach and avoidance motivations represent fundamental aspects of personality (Elliot & Thrash, 2002). Indeed, converging research findings have evidenced the respective association between positive (e.g., extraversion) and negative temperaments (e.g., neuroticism) with approach- and avoidance-related motivations (Harmon-Jones, 2007). Serving as its cognitive substrate, spatial motivations of approach and avoidance can be mapped onto the conceptualization of time (Margolies & Crawford, 2008). Specifically, approach motivation characterizes the ego-moving representation wherein the ego is seen as actively approaching the future, whereas avoidance motivation typifies the time-moving representation in which

the ego is viewed as passively waiting for the future to approach. Sharing the same spatially grounded motivation allows the pairwise association of otherwise unrelated concepts of personality and time to be formed, such that positive personality traits correspond with the ego-moving representation (Duffy & Feist, 2014) and negative personality traits with the time-moving representation (Richmond et al., 2012). Described as the healthy adaptation to circumstances of difficulties and adversities, resilience entails goal- and future-mindedness (Kannangara et al., 2018). This implies that individuals of such characteristic may be more predisposed to behavioral approach toward some future goal, which mirrors the schematic movement of the ego in the ego-moving representation. Indeed, participants with preexisting higher resilience levels (Study 1) and those induced with a contextualized resilience prime (Study 2) both favored seeing themselves as the temporal agent approaching the event in question. To the extent that positive traits are pegged to the ego-moving perspective, our findings are both consistent and confirmatory. What is less coherent, however, is the link between maladaptation and the time-moving perspective. As shown in Study 2, as opposed to the propensity for the avoidance-oriented choice (i.e., "The deadline was getting closer to me") hypothesized on the association between event and emotional negativity and avoidance-related motivation (Zheng et al., 2019), the maladaptation-primed participants did not manifest affinity for either description. To account for this ambivalence, we considered the following three possibilities.

The first has to do with the possibility that participants sampled in Study 2 were relatively resilient in the first place. Given the emotionally stressful situation (i.e., "assignment deadline for the revised work") concerned particularly with students and people's natural antipathy to unpleasantness that tends to evoke the time-moving perspective and the avoidance-motivation (Lee & Ji, 2014; Zheng et al., 2019), the general presumption was that the academically adverse situation should provoke among all student participants the avoidance-related motivation. However, exposure to the resilience prime would be tantamount to the participants being injected with an extra dose of resilience or at least affirming their preconceived attitude, which could reinforce or retain their existing stout ability of coping, so much so that their resilient attitude in the face of an adverse situation would override the opposing tendency to avoid the situation, as seen in the prevailing preference for thinking of themselves as the moving agent toward the rescheduled event (i.e., the answer to the "approach" question). Contrarily, as mentioned earlier, the "assignment deadline" situation was in and of itself a stressor unique to students, which might have weakened their otherwise robust resilience. This, coupled with the opposing stimulus of attitudinal withdrawal received by the participants in the maladaptation condition, could only have compounded the already debilitating resilience. Although still insufficient to overrule the resilience-dictated predilection for the approach-related motivation, the combined negative forces might have been adequate to neutralize it, resulting thus in no partiality for either emotional description. This conjecture, however, might be rendered unlikely when taking into consideration the indistinguishable manners in which the two conditions disambiguated the "day" question. Participants in the resilience condition of Study 2 were not biased in favor of the "Friday" interpretation in a statistically significant way, as they should have been had they been resilient originally (as suggested by the results in Study 1).

The second possibility concerns the directional differences embedded in the approach and avoidance motivations and the impacts they may map onto the metaphorical perspectives on time (Duffy & Feist, 2017). Concretely, approach motivation denotes the movement in a forward direction and avoidance motivation connotes the movement in a backward direction (Elliot, 2006). As a consequence of people's everyday navigation through space being predominantly dictated by the forward movement, it follows that people should encounter considerably less difficulty assimilating the directionally accustomed stimulus of approach than the directionally unwonted stimulus of avoidance. By this logic, participants induced with resilience, which implicates approach-related motivation and therefore forward locomotion, would be merely strengthening what is the behavioral norm, activating relatively easily the similarly grounded ego-moving perspective. On the contrary, those induced with maladaptation, which involves avoidance-related motivation and the uncustomary backward locomotion, might encounter contradiction and resistance, leading as a result to an ambivalence in temporal movement.

The third possibility consists in the strength of the nexus between the avoidance motivation and the backward movement and by extension, the time-moving representation. In a recent investigation into the relationship between power poses and the preferred perspective in disambiguating the "Next Wednesday's meeting" question, Duffy and Feist (2017) discovered that whilst assumption of high-power poses, which activated the approach motivation produced significantly more "Friday" responses (in accordance with the forward movement implicit in the ego-moving representation), holding low-power poses, which triggered the avoidance motivation did not effect a predilection for either perspective. Similarly in an earlier study, using the same disambiguation paradigm and priming participants with numerical or alphabetical sequences of forward (e.g., *5 to 17* or *G to P*) or backward (e.g., *17 to 5* or *P to G*) directionality with a view to examining the influence of abstract motion on temporal perspective, Matlock and collaborators (2011) found that whereas counting up the numbers and the letters prompted the interpretation of putting off the next Wednesday's meeting until next "Friday" (in harmony with the ego-moving perspective) rather than that of bringing it earlier to next "Monday", counting them down produced preference for neither (Experiments 1 & 2). To explain this common anomaly, Duffy & Feist (2107) proposed that avoidance-related motivations precipitate not only passive behaviors (as seen in a static ego waiting for the future time to approach) but also the absence of movement altogether (as seen in the stasis of the ego). In other words,

the connection between the avoidance motivation and the backward motion is less hard and fast, affording the alternative of the avoidance-motivated factors to exert no moving impact on the temporal movement. Pursuant to this supposition, the unpleasant "assignment deadline" situation and the maladaptive prime might well have elicited an avoidance-related motivation among the participants that translated to motionlessness in space and consequently impartiality in temporal reasoning. Given the spatial movement (or rather the lack thereof if seen from the ego's perspective) entailed in the time-moving representation, one might find the coupling of motionlessness (in lieu of avoidance) and the time-moving representation more fitting; after all, a motionless ego waiting for the future time to approach (e.g., "The deadline is getting closer to me" in Study 2) does not perforce equate avoiding it (Hauser et al., 2009). Of course, more empirical research is called for before the nature and strength of the association can be ascertained.

4.3 Implications

Beyond being defined as an ability (e.g., García-Martínez et al., 2022), psychological resilience is also a desirable individual characteristic (Hirano, 2020). As the world is still recovering from the aftermath of the COVID-19 pandemic, resilience has become an even more relevant quality (Kaye-Kauderer et al., 2021; Wang et al., 2020), not least for the Chinese university student population among whom mental ailments like anxiety and depression have been found to be prevalent (Li et al., 2021; Wei et al., 2021; Zhao et al., 2021). In Study 3, it was found that participants primed with the ego-moving perspective exhibited a stronger likelihood of choosing (albeit vicariously) to positively deal with an academic adversity. That the ego-moving representation is metaphorically conceptualized as the ego actively approaching a future event, which renders it a future-oriented perspective and that future time orientation is intimately linked with positivity (Richmond et al., 2012; Zimbardo & Boyd, 1999) inherent in resilience (e.g., Hofgaard et al., 2021) should create an alternative path to resilience enhancement for university students, which is to inculcate in them a future-oriented temporal attitude in general and the ego-moving perspective of time in particular.

5. Conclusion

A continuum of investigations into the influential factors of temporal thinking has revealed that spatially grounded factors can shape people's construal of time (Duffy & Evans, 2016; Duffy & Feist, 2014; Duffy et al., 2014; Hauser et al., 2009; Richmond et al., 2012). Added now to this accruing cumulation is the psychological trait of resilience. The bidirectional relationship uncovered between resilience and time in the current research provides further evidence supporting the embodied cognition theory that conceptually dissimilar abstract domains can influence each other on the premise of a shared embodied grounding. It also highlights the interconnection between emotional response, cognitive reasoning and psychological trait, which should inform future inquiries intersecting the trifecta.

That said, however, several limitations of the present research must be noted with reference to their interpretations. First, the fact that our samples only comprised university students in China and that the priming tasks were of a purely academic nature limited the generalizability of the findings. Future research will benefit from a wider spectrum of population with the relationship between resilience and time scrutinized in a more professional context. For example, experiences of setbacks and adversities are a fact of life for not only individuals but also teams and organizations (Hoegl & Hartmann, 2021). How and whether temporal perspective inculcation can be introduced to the resilience process at the organizational level (Kahn et al., 2018) would seem a necessary step forward to test the generalization of the results found herein. Second, the accretion of evidence has indicated that people's metaphorical perspective on time is subject to a conglomeration of factors (Feist & Duffy, 2023) and although we have allowed for a relatively salient confounding variable (i.e., happiness), there is always the possibility that other coufounding factors (e.g., extraversion and introversion) may be simultaneously at play that cannot be completely avoided (Li & Cao, 2020). Therefore, future experimental studies incorporating other potentially confounding predictors should be designed to test the robustness of the correlational and causal relationship between resilience and temporal perspective preference.

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References

[1] Barzilay, R., Moore, T. M., Greenberg, D. M., DiDomenico, G. E., Brown, L. A., White, L. K., Gur, R. C., & Gur, R. E. (2020). Resilience, COVID-19-related stress, anxiety and depression during the pandemic in a large population enriched for healthcare providers. *Translational psychiatry*, *10*(1), 291. https://doi.org/10.1038/s41398-020-00982-4

[2] Bender, A. & Beller, S. (2014). Mapping spatial frames of reference onto time: A review of theoretical accounts and empirical findings. *Cognition*, *132*(3), 342-382. https://doi.org/10.1016/j.cognition.2014.03.016

[3] Bender, A., Beller, S., & Bennardo, G. (2010). Temporal frames of reference: Conceptual analysis and empirical evidence from German, English, Mandarin Chinese, and Tongan. *Journal of Cognition and Culture*, *10*(3–4), 283–307. http://dx.doi.org/10.1163/156853710X531195

[4] Block, J., & Kremen, A. M. (1996). IQ and Ego-Resiliency: Conceptual and Empirical Connections and Separateness. *Journal of Personality and Social Psychology*, *70*, 349-361.http://dx.doi.org/10.1037/0022-3514.70.2.349

[5] Boroditsky, L. (2000). Metaphoric structuring: understanding time through spatial metaphors. *Cognition*, *75*(1), 1–18. https://doi.org/10.1016/S0010-0277(99)00073-6

[6] Boroditsky, L., & Ramscar, M. (2002). The roles of body and mind in abstract thought. *Psychol. Sci.*, *13*(2), 185–189. 10.1111/1467-9280.00434

[7] Botor, N. J. (2019). Hope Predicts Happiness with Life, Personal Well-Being, and Resilience Among Selected School-going Filipino Adolescents. *International Journal of Sciences: Basic and Applied Research*. 42. 125-141.

[8] Campbell-Sills, L., & Stein, M. B. (2007). Psychometric Analysis and Refinement of the Connor-Davidson Resilience Scale (CD-RISC): Validation of a 10-Item Measure of Resilience. *Journal of Traumatic Stress*, *20*,1019-1028.https://doi.org/10.1002/jts.20271

[9] Carver, C. S., & Harmon-Jones, E. (2009). Anger is an approach-related affect: Evidence and implications. *Psychological Bulletin, 135*(2), 183–204. https://doi.org/10.1037/a0013965

[10] Casasanto, D., & Boroditsky, L. (2008). Time in the mind: Using space to think about time. *Cognition*, *106*(2), 579–593. https://doi.org/10.1016/j.cognition.2007.03.004

[11] Cassidy S. (2016). The Academic Resilience Scale (ARS-30): A New Multidimensional Construct Measure. *Frontiers in psychology*, *7*, 1787. https://doi.org/10.3389/fpsyg.2016.01787

[12] Chen M., Bargh J. A. (1999). Consequences of automatic evaluation: immediate behavioral predispositions to approach or avoid the stimulus. P*ers. Soc. Psychol. Bull. 25*, 215–224 10.1177/0146167299025002007

[13] Cheng, C., Dong, D., He, J., Zhong, X., & Yao, S. (2020) Psychometric properties of the 10-item Connor–Davidson Resilience Scale (CD-RISC-10) in Chinese undergraduates and depressive patients. J. Affect. Disord., 261, 211–220.

[14] 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.

[15] Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). *Depression and anxiety*, *18*(2), 76–82. https://doi.org/10.1002/da.10113

[16] Daniel B., & Wassell S. (2002). *Adolescence: Assessing and Promoting Resilience in Vulnerable Children 3*. London: Jessica Kingsley Publishers Ltd.

[17] Duffy, S. E., & Evans. V. (2017). The top trumps of time: Factors motivating the resolution of temporal ambiguity. *Language and Cognition*, *9*(2), 293-315. doi:10.1017/langcog.2016.8

[18] Duffy, S. E., & Feist, M. I. (2014). Individual differences in the interpretation of ambiguous statements about time. *Cognitive Linguistics*, *25*(1), 29–54. 10.1515/cog-2013-0030

[19] Duffy, S., & Feist, M. (2017). Power in time: The influence of power posing on metaphoric perspectives on time. *Language and Cognition, 9*(4), 637-647. 10.1017/langcog.2016.33

[20] Duffy, S., Feist, M., & McCarthy, S. (2014). Moving through time: the role of personality in three real-life contexts. *Cognitive Science*, *38*(8), 1662–1674. https://doi.org/10.1111/cogs.12124

[21] Elliot, A. J. (2006). The Hierarchical model of approach avoidance motivation. *Motivation and Emotion*, 30, 111-116. doi:10.1007/s11031-006-9028-7

[22] Elliot, A. J., & Thrash, T. M. (2002). Approach-avoidance motivation in personality: Approach and avoidance temperaments and goals. *Journal of Personality and Social Psychology, 82*(5), 804–818. https://doi.org/10.1037/0022-3514.82.5.804

[23] Evans, V. (2004). *The structure of time: Language, meaning and temporal cognition*. Amsterdam: The Netherlands: John Benjamins.

[24] Feist, M., & Duffy, S. (2015). Moving beyond 'Next Wednesday': The interplay of lexical semantics and constructional meaning in an ambiguous metaphoric statement. *Cognitive Linguistics*, *26*(4), 633–656. https://doi.org/10.1515/cog-2015-0052

[25] Feist, M., & Duffy, S. (2020). On the path of time: Temporal motion in typological perspective. *Language and Cognition*, *12*(3), 444-467. https://doi.org/10.1017/langcog.2020.7

[26] Feist, M. I., & Duffy, S. E. (2023). To each their own: a review of individual differences and metaphorical perspectives on time. *Frontiers in Psychology*, *14*, 1213719. https://doi.org/10.3389/fpsyg.2023.1213719

[27] Fu, W., Yan, S., Zong, Q., Anderson-Luxford, D., Song, X., Lv, Z., & Lv, C. (2021). Mental health of college students during the COVID-19 epidemic in China. *Journal of affective disorders*, *280*(Pt A), 7–10. https://doi.org/10.1016/j.jad.2020.11.032

[28] Fuhrman, O., & Boroditsky, L. (2010). Cross-cultural differences in mental representations of time: Evidence from an implicit nonlinguistic task. *Cognitive Science*, *34*(8), 1430–1451. https://doi.org/10.1111/j.1551-6709.2010.01105.x

[29] García-Martínez, I, Augusto-Landa, J. M, Quijano-López, R. & León, S, P. (2022) Self-Concept as a Mediator of the Relation Between University Students' Resilience and Academic Achievement. *Front. Psychol. 12*:747168. 10.3389/fpsyg.2021.747168

[30] Gu, Y., Mol, L., Hoetjes, M., & Swerts, M. (2017). Conceptual and lexical effects on gestures: The case of vertical spatial metaphors for time in Chinese. *Language*, *Cognition and Neuroscience*, *32*(8), 1048–1063. https://doi.org/10.1080/23273798.2017.1283425

[31] Hauser, D., Carter, M., & Meier, B. (2009). Mellow Monday and furious Friday: The approach-related link between anger and time representation. *Cognition and Emotion*, *23*(6), 1166–1180. http://dx.doi.org/10.1080/02699930802358424

[32] Hirano M. (2020) Individual Differences in Psychological Resilience. In: Nara Y., Inamura T. (eds) Resilience and Human Histo ry. Translational Systems Sciences, vol. 23. *Springer*, Singapore. https://doi.org/10.1007/978-981-15-4091-2_3

[33] Hoegl, M., & Hartmann, S. (2021). Bouncing back, if not beyond: Challenges for research on resilience. *Asian Bus Manage*, *20*, 456–464. https://doi.org/10.1057/s41291-020-00133-z

[34] Hofgaard, L. S., Nes, R. B., & Røysamb, E. (2021). Introducing two types of psychological resilience with partly unique genetic and environmental sources. *Scientific reports*, *11*(1), 8624. https://doi.org/10.1038/s41598-021-87581-5

[35] Kannangara, C. S., Allen, R. E., Waugh, G., Nahar, N., Khan, S., Rogerson, S., & Carson, J. (2018). All That Glitters Is Not Grit: Three Studies of Grit in University Students. *Frontiers in psychology*, *9*, 1539. https://doi.org/10.3389/fpsyg.2018.01539

[36] Kaye-Kauderer H. P., Levine J., Takeguchi Y., Machida M., Katz C. (2019). Post-traumatic growth and resilience among medical students after the march 2011 disaster in fukushima, Japan. *Psychiatric Q.* 90, 507–518. 10.1007/s11126-019-09646-z

[37] Kahn, W. A., Barton, M. A., Fisher, C. M., Heaphy, E. D., Reid, E. M., & Rouse, E. D. (2018). The geography of strain: Organizational resilience as a function of intergroup relations. *Academy of Management Review, 43*(3), 509–529.

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

[39] Lakoff, G. & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to western thought*. New York, NY: Basic Books.

[40] Lee, A. & Ji, L. (2014). Moving away from a bad past and toward a good future: Feelings influence the metaphorical understanding of time. *Journal of Experimental Psychology: General*, *143*(1), 21-26. https://psycnet.apa.org/doi/10.1037/a0032233

[41] Li, H. (2020). Will it really happen? Disambiguating of the hypothetical and real ''Next Wednesday's meeting'' question in Mandarin speakers. *Lingua*, *237*, 1–12. https://doi.org/10.1016/j.lingua.2020.102806

[42] Li, H, & Cao, Y. (2020). Move with the Flow: Metaphorical Perspectives on Time in Chinese Taoists and Atheists. *The International Journal for the Psychology of Religion*. 10.1080/10508619.2020.1825174

[43] Loermans, A. C., de Koning, B. B., & Krabbendam, L. (2019). Agency and time representation in English and Dutch speakers. *Journal of Language and Social Psychology, 38*(3)*,* 353–375. http://dx.doi.org/10.1177/ 0261927X18824619

[44] Luo, W., Zhong, B. L., & Chiu, H. F. (2021). Prevalence of depressive symptoms among Chinese university students amid the COVID-19 pandemic: a systematic review and meta-analysis. *Epidemiology and psychiatric sciences*, *30*, e31. https://doi.org/10.1017/S2045796021000202

[45] Maheshwari, A. & Jutta, V. (2020). Study of relationship between optimism and resilience in the times of COVID-19 among university students. *International Journal of Indian Psychology*, *8*(3), 1539-1550. 10.25215/0803.157

[46] Margolies, S. O. & Crawford, E. L. (2008). Event valance and spatial metaphors of time. *Cognition and Emotion*, *22*(7), 1401–1414. https://doi.org/10.1080/02699930701810335

[47] Masten A. S. (2014). *Ordinary Magic: Resilience in Development.* New York, NY: Guilford Press.

[48] Matlock, T. (2004a). The conceptual motivation of fictive motion. In G. Radden & R. Dirven (Eds.), *Motivation in grammar* (pp. 1-28). Amsterdam, The Netherlands: John Benjamins.

[49] Matlock, T. (2004b). Fictive motion as cognitive simulation. *Memory & Cognition*, *32*, 1389–1400. https://doi.org/10.3758/BF03206329

[50] Matlock, T. (2010). Abstract motion is no longer abstract. *Language and Cognition*, *2*(2), 243–260. https://doi.org/10.1515/langcog.2010.010

[51] Matlock, T., Holmes, K. J., Srinivasan, M., & Ramscar, M. (2011). Even abstract motion influences the understanding of time. *Metaphor and Symbol*, *26*, 260–271. https://doi.org/10.1080/10926488.2011.609065

[52] Matlock, T., Ramscar, M. & Boroditsky, L. (2005). On the experiential link between spatial and temporal language. *Cognitive Science*, *29*, 655–664. https://doi.org/10.1207/s15516709cog0000_17

[53] Mei, S. T. L & Ni, A. O. Z., & Sivaguru, S. & Cong, C. W. (2021). Social Support, Resilience, and Happiness in Response To COVID-19. *Journal of Cognitive Sciences and Human Development*, *7*, 134–144. 10.33736/jcshd.2882.2021.

[54] McDonnell, S., & Semkovska, M. (2020). Resilience as mediator between extraversion, neuroticism, and depressive symptoms in university students. *Journal of Positive Psychology and Wellbeing*, *4*(1), 26–40.

[55] McGlone, M. S., & Harding, J. L. (1998). Back (or forward?) to the future: the role of perspective in temporal language comprehension. *Journal of Experimental Psychology: Learning Memory and Cognition*, *24*(5), 1211–1223. https://psycnet.apa.org/doi/10.1037/0278-7393.24.5.1211

[56] McGlone, M. S., & Pfiester, R. A. (2009). Does Time Fly When You're Having Fun, or Do You?: Affect, Agency, and Embodiment in Temporal Communication. *Journal of Language and Social Psychology*, *28*(1), 3-31. https://doi.org/10.1177/0261927X08325744

[57] Mofatteh M. (2020). Risk factors associated with stress, anxiety, and depression among university undergraduate students. *AIMS public health*, *8*(1), 36–65. https://doi.org/10.3934/publichealth.2021004

[58] Moore, K. E. (2014). *The Spatial Language of Time*. Amsterdam: John Benjamins Press.

[59] Oshio, A., Taku, K., Hirano, M., & Saeed, G. (2018). Resilience and Big Five personality traits: A meta-analysis. *Personality and Individual Differences*, *127*, 54-60.

[60] Richmond, J., Wilson, J. C., & Zinken, J. (2012). A feeling for the future: How does agency in time metaphors relate to feelings? *European Journal of Social Psychology*, *42*(7), 813–823. https://doi.org/10.1002/ejsp.1906

[61] Rossouw, P. J., & Rossouw, J. G. (2016). The predictive 6-factor resilience scale: Neurobiological fundamentals and organizational application. *International Journal of Neuropsychotherapy*, *4*(1), 31-45. http://dx.doi.org/10.1244/ijnpt.2016.0031-0045

[62] Rothe-Wulf, A., Beller, S., & Bender, A. (2015). Temporal frames of reference in three Germanic languages: Individual consistency, interindividual consensus, and cross-linguistic variability. *Quarterly Journal of Experimental Psychology*, *68*(5), 917-939. doi:10.1080/17470218.2014.970205

[63] Ruscher, J. B. (2011). Moving forward: The effect of spatiotemporal metaphors on perceptions of grief. *Social Psychology*, *42*(3), 225–230.

[64] Sato, M., & Bergen, B. K. (2013). The case of the missing pronouns: Does mentally simulated perspective play a functional role in the comprehension of person? *Cognition, 127*(3), 361–374. https://doi.org/10.1016/j.cognition.2013.02.004

[65] She, R., Yang, X., Lau, M., & Lau, J. (2020). Psychometric properties and normative data of the 10-item Connor-Davidson Resilience Scale among Chinese adolescent students in Hong Kong. *Child psychiatry and human development*, *51*(6), 925–933. https://doi.org/10.1007/s10578-020-00970-1

[66] Sisto, A., Vicinanza, F., Campanozzi, L. L., Ricci, G., Tartaglini, D., & Tambone, V. (2019). Towards a Transversal Definition of Psychological Resilience: A Literature Review. *Medicina (Kaunas, Lithuania)*, *55*(11), 745. https://doi.org/10.3390/medicina55110745

[67] Vos, L. M. W., Habibovic, M., Nyklíček, I., Smeets, T., & Mertens, G. (2020). Optimism, Mindfulness, and Resilience as Potential Protective Factors for the Mental Health Consequences of Fear of the Coronavirus. *Psychiatry Research*, 113927. https://doi.org/10.1016/j.psychres.2021.113927

[68] Wang, L., Shi, Z., Zhang, Y., & Zhang, Z. (2010). Psychometric properties of the 10-item Connor-Davidson Resilience Scale in Chinese earthquake victims. *Psychiatry and clinical neurosciences*, *64*(5), 499–504. https://doi.org/10.1111/j.1440-1819.2010.02130.x

[69] Wei, J., Gong, Y., Wang, X., Shi, J., Ding, H., Zhang, M., Kang, C., Yu, Y., Wang, S., Shao, N., Chen, L., & Han, J. (2021). Gender differences in the relationships between different types of childhood trauma and resilience on depressive symptoms among Chinese adolescents. *Preventive medicine*, *148*, 106523. https://doi.org/10.1016/j.ypmed.2021.106523

[70] Wu, Y., Yu, W., Wu, X., Wan, H., Wang, Y., & Lu, G. (2020). Psychological resilience and positive coping styles among Chinese undergraduate students: a cross-sectional study. *BMC psychology*, *8*(1), 79. https://doi.org/10.1186/s40359-020-00444-y

[71] Ye, Z. J., Qiu, H. Z., Li, P. F., Chen, P., Liang, M. Z., Liu, M. L., Yu, Y. L., Wang, S. N., & Quan, X. M. (2017). Validation and application of the Chinese version of the 10-item Connor-Davidson Resilience Scale (CD-RISC-10) among parents of children with cancer diagnosis. *European journal of oncology nursing: the official journal of European Oncology Nursing Society*, *27*, 36–44. https://doi.org/10.1016/j.ejon.2017.01.004

[72] Yu, N. (1998). *The contemporary theory of metaphor: A perspective from Chinese*. Amsterdam: John Benjamins Press.

[73] Zhan, H., Zheng, C., Zhang, X., Yang, M., Zhang, L., & Jia, X. (2021). Chinese College Students' Stress and Anxiety Levels Under COVID-19. *Frontiers in psychiatry*, *12*, 615390. https://doi.org/10.3389/fpsyt.2021.615390

[74] Zhao, Y. J., Jin, Y., Rao, W. W., Li, W., Zhao, N., Cheung, T., Ng, C. H., Wang, Y. Y., Zhang, Q. E., & Xiang, Y. T. (2021). The prevalence of psychiatric comorbidities during the SARS and COVID-19 epidemics: a systematic review and meta-analysis of observational studies. *Journal of affective disorders*, *287*, 145–157. https://doi.org/10.1016/j.jad.2021.03.016

[75] Zheng, W., Liu, Y., Liu, C., Chen, Y.-H., Cui, Q., & Fu, X. (2019). The influence of event valence and emotional states on the metaphorical comprehension of time. *Front. Psychol. 10*, 410. https://doi.org/10.3389/fpsyg.2019.00410

[76] Zimbardo, P. G. & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual differences metric. *Journal of Personality and Social Psychology*, *77*(6), 1271–1288. https://doi.org/10.1037/0022-3514.77.6.1271