The Positive Role of Multidimensional Psychological Time Perspective in Intergroup Helping Behavior: Feasibility, Diversity, and Adaptability

Authors: Chen Lanshuang, Wang Zhen, Guan Jian, Guan Jian

Date: 2025-07-11T00:00:00+00:00

Abstract

Amidst escalating global intergroup conflicts, psychological time frameworks represent a novel pathway for facilitating intergroup helping behavior, capable of effectively mitigating social conflicts and promoting resource redistribution. Compared to conventional single time points, constructing a multidimensional model of psychological time perspective based on cognitive and affective dimensions through expanding multiple time points may more effectively promote intergroup helping behavior. Specifically, the model first examines four perspectives—temporal perception orientation, mental time travel, temporal comparison processes, and temporal attitudes—and elucidates the feasibility of its facilitation of intergroup helping behavior through a dual-system framework at both individual and collective levels. Second, drawing upon relevant theories (Continuity Motivation Theory, Meaning Maintenance Model, Temporal Comparison Theory, and Broaden-and-Build Theory), it clarifies the differential mechanisms through which multidimensional psychological time perspectives facilitate intergroup helping behavior via intrinsic processes such as self-continuity, sense of meaning in life, self-esteem, and gratitude. Then, it reveals the moderating roles of factors including age, psychological distance of events, regional tightness-looseness culture, and objective socioeconomic status. Finally, it proposes that future research should, while attending to emotional valence, intergenerational descendant perspectives, and cultural differences, distinguish types of intergroup helping behavior and construct a multidimensional matching model for directionally promoting intergroup helping behavior.

Full Text

The Positive Effects of Multidimensional Psychological Time Perspectives on Intergroup Helping Behaviors: Feasibility, Variability, and Contextual Adaptability

CHEN Lanshuang, WANG Zhen, GUAN Jian
Department of Social Psychology, School of Sociology, Nankai University, Tianjin 300071, China

Abstract:
In the current context where global intergroup conflicts are increasingly prominent, psychological time frames represent a novel pathway to facilitate intergroup helping behavior, effectively mitigating social conflicts and promoting resource redistribution. Departing from conventional approaches that consider only a single time point, this study endeavors to extend analysis across multiple time points. By constructing a multidimensional model from a psychological time perspective that integrates cognitive and emotional dimensions, this study aims to effectively enhance individuals' intergroup helping behaviors. Specifically, the model encompasses four perspectives: time orientation, mental time travel, temporal comparison processes, and time attitude. It systematically elucidates the feasibility of their impacts on intergroup helping behavior at both individual and collective levels. Meanwhile, based on relevant theories (continuity motive theory, meaning maintenance model, temporal comparison theory, and broaden-and-build theory), this paper clarifies the differential mechanisms through which multidimensional psychological time perspectives facilitate intergroup helping behavior via internal mechanisms such as self-continuity, meaning in life, self-esteem, and gratitude. In addition, this paper reveals the contextual adaptability of factors including age, psychological distance from events, regional tightness-looseness culture, and objective socioeconomic status. Future research should, while focusing on emotional valence, the intergenerational descendant perspective, and cultural differences, differentiate types of intergroup helping behaviors and construct a multidimensional adaptation model specifically aimed at promoting intergroup helping behaviors.

Keywords: intergroup helping behavior, multidimensional psychological time perspectives, time orientation, mental time travel, temporal comparison processes, time attitude

---

Time is not merely an objective physical measurement but a psychological force that shapes individual behavior, group interactions, and social cognition. In recent years, with the development of time psychology, researchers have gradually recognized that human behavioral decision-making is influenced not only by immediate situations or static cognition but is also inseparable from individuals' perceptions, preferences, and attitudes toward past, present, and future time (Bi & Qi, 2022; Li et al., 2025). For instance, in decision-making regarding

intergroup helping behavior, studies have found that Chinese people' s unique time perception, which emphasizes both the past and future orientation, can significantly predict their willingness to provide monetary and temporal assistance to outgroups (Guan & Zhou, 2024). Intergroup helping behavior refers to altruistic actions where helpers, as members of a particular group, proactively provide material or non-material assistance to outgroup members, involving various forms such as time, effort, empathy, or money (Wright & Richard, 2010). As an important manifestation of prosocial behavior—the latter broadly referring to a series of helping, cooperative, and sharing behaviors beneficial to others or society (Eisenberg et al., 2016)—intergroup helping behavior specifically denotes individuals' prosocial actions toward outgroups (Wright & Richard, 2010). In the current era of accelerated globalization and frequent intergroup conflicts, intergroup helping behavior has become a core issue at the intersection of social psychology and positive psychology, serving as a crucial prosocial decision-making behavior that alleviates social problems and promotes resource redistribution.

Previous research has primarily approached this topic from theoretical perspectives such as intergroup contact theory, social identity theory, and the empathic altruism hypothesis, exploring ways to increase individuals' willingness to engage in intergroup helping behavior by reducing intergroup prejudice and enhancing emotional connections (Destro et al., 2024; Rambaud et al., 2021). However, few studies have examined the positive role of psychological time frameworks in this context. Moreover, existing research and theories have predominantly explained how to influence individuals'intergroup helping behavior from static and singular perspectives (Destro et al., 2024; Rambaud et al., 2021), with scarce investigation from dynamic perspectives on how psychological time affects intergroup helping behavior. Psychological time frameworks not only integrate previously studied single time orientations (such as historical memory and future imagination) but also dynamically combine past, present, and future according to temporal continuity (Hao et al., 2023), systematically constructing a practical model of how multidimensional psychological time perspectives influence intergroup helping behavior from cognitive and emotional angles, thereby providing references for resource allocation and intervention strategies. Therefore, exploring the impact of psychological time perspectives on intergroup helping behavior is significant, as it not only enriches the application scenarios of psychological time frameworks but also expands new pathways for promoting intergroup helping behavior.

Nevertheless, current research on psychological time perspectives and intergroup helping behavior exhibits three main limitations. First, most studies focus on a single psychological time perspective (such as emphasizing time orientation or time attitude) (Juhl & Biskas, 2023; Juhl et al., 2020), lacking systematic integration of multidimensional psychological time perspectives. Researchers cannot flexibly adopt psychological time frameworks according to research purposes and needs, nor can they explore optimal psychological time perspectives. Compared to single time dimensions, integrating multiple perspectives—including time ori-

entation, mental time travel, temporal comparison processes, and time attitude —from cognitive and emotional dimensions not only systematically clarifies the focus of each dimension but also organizes combinations of past, present, and future time points, thereby expanding application models of psychological time frameworks (Baldwin & Lammers, 2016; Mello et al., 2013; Stephan & Sedikides, 2024). More importantly, integrating multidimensional psychological time perspectives helps clarify the internal mechanisms through which each framework influences intergroup helping behavior, which is crucial for researchers to flexibly select frameworks, deeply compare advantages and limitations of different perspectives, and enrich pathways for promoting intergroup helping behavior.

Second, existing research emphasizes individual-level psychological time frameworks while neglecting the unique role of collective time perspectives. Collective past (memory) and collective future are independent of and separable from individual-level self-past and self-future (Guo & Lü, 2021; Peng & Wang, 2023), meaning that previous individual-level research cannot be directly extrapolated to collective time perspectives, necessitating in-depth investigation. Moreover, collective time perspectives constitute indispensable temporal representations in daily life. For example, collective memory positively contributes to national identity and forging a sense of community for the Chinese nation (Guan & Guo, 2020; Peng & Wang, 2023), suggesting its potential positive impact on intergroup helping behavior. Therefore, combining individual and collective psychological time frameworks will facilitate a comprehensive understanding of their differential effects on intergroup helping behavior.

Third, research has not thoroughly explored the internal mechanisms and boundary conditions of how psychological time perspectives influence intergroup helping behavior, lacking practical application guidance and urgently requiring targeted strategic solutions. Based on these limitations, this paper attempts to construct a comprehensive conceptual model of multidimensional psychological time perspectives, involving four perspectives—time orientation, mental time travel, temporal comparison processes, and time attitude—to explore how they shape intergroup helping behavior from both cognitive and emotional dimensions. This model analyzes the feasibility of individual and collective psychological time perspectives influencing intergroup helping behavior from the temporal nodes of past, present, and future, and reveals differential mechanisms and boundary conditions based on relevant theoretical foundations. In summary, this paper examines the positive effects of the multidimensional psychological time model on intergroup helping behavior from three aspects—feasibility, variability, and contextual adaptability—aiming to overcome the limitations of traditional single-dimensional approaches and form a multidimensional adaptation model for promoting intergroup helping behavior (Figure 1 [Figure 1: see original paper]).

1.1 Time Orientation

Time orientation refers to the manifestation of individuals' thought and behavioral preferences along the temporal dimension, specifically indicating the allocation of attention and relative importance attached to each time period (past, present, or future) (Mello et al., 2013; Shipp et al., 2009). Since time orientation can be divided into past, present, and future orientations, it can be categorized at the individual level as self-past, self-present, and self-future, corresponding to individuals' preferences for their own past, present, and future time periods (Hao et al., 2023; Mello et al., 2022). Beyond the individual angle, time orientation also exists at the collective level as collective past, collective present, and collective future, referring to individuals' relative preferences for their group' s past, present, and future time periods (Peetz & Wohl, 2019). At the collective level, researchers have focused primarily on collective past and collective future. Collective past, or collective memory, represents shared memories among group members, specifically referring to collective history, customs, and behavioral norms (Guan & Guo, 2020; Peng & Wang, 2023). Collective future directs temporal perspective toward events yet to occur, specifically referring to future group development and collective events (Guo & Lü, 2021). Both individual and collective time orientations are closely related to individuals' psychology and behavior (Guan & Zhou, 2024; Guo & Lü, 2021).

Time orientation holds significant importance for individuals' intergroup helping behavior. At the individual level, self-past orientation is typically activated through nostalgia manipulation and recall methods, generally showing that stronger past orientation predicts more positive prosocial behavior (Fang & Chang, 2019; Juhl & Biskas, 2023; Juhl et al., 2020). A recent study also found that activating individuals' past orientation, particularly among ethnic minority groups, significantly enhances their willingness to provide monetary and temporal assistance to other ethnic groups (Guan & Zhou, 2024). Self-future orientation is generally activated through methods such as imagining future lives of one' s descendants (Engle-Friedman et al., 2022), writing letters to the future (Vlasceanu et al., 2024), or presenting textual materials, typically demonstrating that stronger future orientation increases individuals' willingness to invest time and money in supporting environmental policies (Li et al., 2018). At the collective level, Behler et al. (2021) found that collective nostalgia can activate individuals' outgroup attitudes, subsequently influencing their prosocial behavior toward outgroups. Additionally, research from the national collective level has discovered that collective future is closely related to individuals' attention to climate change and support for environmental policies (Zhu et al., 2020). Based on these findings, it can be inferred that both past and future orientations may promote intergroup helping behavior to varying degrees.

1.2 Mental Time Travel

Mental time travel refers to the ability of individuals, based on subjective time perception and through the collaborative function of self-awareness and episodic

memory, to project their psychological states into the past or future (Corballis, 2013; Stephan & Sedikides, 2024). This ability enables humans to actively recall past events or simulate future scenarios. At the physiological level, mental time travel is closely related to the hippocampus within the default mode network (Corballis, 2013). Mental time travel emphasizes psychological travel between two time points, possessing directionality with clear departure and destination points, specifically referring to the process of projecting from one time point to another. Bai et al. (2009), when examining mental time travel directed from present to past and from present to future, revealed that mental time travel occurs between present and past as well as between present and future. It can be specifically categorized into four patterns: self-present to self-past, self-past to self-present, self-present to self-future, and self-future to self-present. Current research primarily focuses on mental time travel between present and future. For example, Christensen et al. (2024) found that mental time travel from future to present can increase individuals' saving intentions and behaviors by reducing uncertainty about destinations, whereas travel from present to future does not exhibit this positive effect. Mental time travel involves not only the individual level but also collective perspectives such as collective memory and collective future (Guo & Lü, 2021). Michaelian and Sutton (2019) propose that individual and collective mental time travel are relatively independent, with collective mental time travel referring to individuals' projection from their group' s present back to collective past or toward collective future. Corresponding to individual mental time travel patterns, the directionality of collective mental time travel can be further subdivided into four types: "collective present to collective future," "collective future to collective present," "collective past to collective present," and "collective present to collective past." These classifications help researchers more deeply understand the differential impacts that mental time travel in different directions may have on intergroup helping behavior.

Overall, mental time travel demonstrates positive effects on individuals' intergroup helping behavior. On one hand, mental time travel from present to future can promote self-affirmation, guide individuals to focus on valuable life goals, and subsequently stimulate meaningful prosocial behavior (Stephan & Sedikides, 2024). Cernadas Curott et al. (2022) found that mental time travel from present to future is closely related to individuals' prosocial behavior, with individuals who have experienced mental time travel being more likely to implement helping behaviors and participate in prosocial activities more actively. On the other hand, mental time travel from present to past can not only directly improve intergroup contact intentions and reduce intergroup prejudice (Turner & Stathi, 2023) but also promote prosocial behavior by enhancing individuals' self-esteem, sense of meaning, and sense of control (Stephan & Sedikides, 2024). Current research has primarily revealed the positive effects of some individual mental time travel patterns on intergroup helping behavior, with minimal exploration of the relationship between collective mental time travel and intergroup helping behavior. However, collective-level mental time travel can not only promote individuals' collective identity (Michaelian & Sutton, 2019) but also make indi-

viduals more likely to engage in behaviors with positive significance for others and society (Guo & Lü, 2021). Therefore, future research should combine both individual and collective mental time travel perspectives and deeply explore the relationships between the four travel patterns and intergroup helping behavior along with their internal mechanisms.

1.3 Temporal Comparison Processes

Temporal comparison process refers to the psychological process through which individuals compare present time with future or past time, emphasizing the direct comparison of environments or event outcomes between two time points (Baldwin & Lammers, 2016; Stanley et al., 2021). Unlike static presentations of single time orientations or psychological travel between two time points, temporal comparison processes involve direct comparisons of situations or event outcomes between two psychological time points. Through visual presentations such as images showing dynamic contrasts between present and future or present and past, individuals can more intuitively and vividly perceive changes and differences in things across time periods. Collective temporal comparison processes focus on comparisons between two time points at the collective level, whereas individual temporal comparison processes concern comparisons of the self across two time points, with the main distinction being whether collective situations or individual circumstances are being compared (Baldwin & Lammers, 2016; Wolff & Möller, 2022). Baldwin and Lammers (2016), in their research on how temporal narrative frames affect individuals' attitudes toward climate change, first introduced the narrative strategy of collective temporal comparison processes. Their results indicated that only when presenting narrative strategies comparing collective present with past time (e.g., "Looking back at our country's past···there were fewer vehicles on the roads") did conservatives demonstrate more positive environmental attitudes and greater willingness to take practical measures to address climate change. Temporal comparison processes have focused primarily on collective-level temporal contrasts, such as collective present versus collective past and collective present versus collective future (Baldwin & Lammers, 2016; Stanley et al., 2021), exploring impacts on individuals' pro-environmental attitudes and behaviors by manipulating comparisons of national traffic conditions and overall environments across time points. However, temporal comparison processes should not only focus on collective temporal perspectives but also consider individual temporal comparison processes, examining how comparisons between self-present and self-future or self-past influence behavior and attitudes. According to temporal comparison theory, individuals compare their present with their past or future, thereby adjusting their feelings and behaviors (Wolff & Möller, 2022). Thus, both individual and collective temporal comparison processes, as important temporal framework strategies, positively influence individual behavioral decision-making and attitudinal intentions.

In current research, this temporal framework has been applied mainly in the pro-environmental policy domain, with an emphasis on collective temporal com-

parison processes (Ferres et al., 2025; Herberz et al., 2023). Although few studies have directly examined the relationship between temporal comparison processes and intergroup helping behavior, existing research demonstrates that collective temporal comparison processes positively affect individuals' pro-environmental attitudes and behaviors (Baldwin & Lammers, 2016; Stanley et al., 2021). For example, Herberz et al. (2023) found that conservative groups are more willing to support environmental protection policies under collective past priming frames, providing a reference basis for how collective temporal comparison processes might promote intergroup helping behavior. At the individual level, existing research has concentrated on exploring how temporal comparison processes influence self-concept construction and consumption decisions (Taylor & Carlson, 2025; Wolff & Möller, 2022), with minimal application to intergroup helping behavior. Exploring the relationship between temporal comparison processes and intergroup helping behavior could not only enrich the application domain of individual temporal comparison processes but also broaden pathways for facilitating intergroup helping behavior. Therefore, future research should deeply investigate this relationship.

1.4 Time Attitude

Time attitude refers to individuals' emotional experiences and attitudinal feelings toward past, present, and future time, encompassing six dimensions: past-positive, past-negative, present-positive, present-negative, future-positive, and future-negative (Li & Lü, 2022; Li et al., 2021; Worrell et al., 2013). The influence of time attitude on individual psychology and behavior primarily manifests along positive and negative dimensions. Positive time attitudes, such as positive feelings toward past, present, or future time, often predict higher well-being, lower psychological distress (Tejada-Gallardo et al., 2021), less procrastination (Li & Lü, 2022), and better academic performance (Fang et al., 2024). Conversely, negative time attitudes correlate negatively with mental health levels (Tejada-Gallardo et al., 2021) and positively with academic procrastination (Li & Lü, 2022). Existing research has focused mainly on individual time attitudes, examining individuals' emotional experiences regarding their own past, present, and future, while paying less attention to collective time attitudes—individuals' emotional experiences and attitudes toward collective past, present, and future (Ionescu et al., 2024; Reyna et al., 2022). Moreover, relevant research on collective time attitudes has concentrated primarily on policy support willingness (Reyna et al., 2022) and national future attitudes (Ionescu et al., 2024), with minimal exploration of their relationship with intergroup helping behavior. Therefore, future research should continue examining individuals' emotional attitudes toward collective past, collective present, and collective future to enrich the application domain of collective time attitudes, while also covering groups across more age ranges to comprehensively explore how individual and collective time attitudes among full-age samples affect intergroup helping behavior.

Individuals' positive or negative attitudes toward self-past, self-present, and self-

future influence their intergroup helping behavior to varying degrees. Specifically, negative attitudes toward self-past can trigger differentiated prosocial behavioral tendencies: individuals who hold negative attitudes toward their self-past due to traumatic experiences may exhibit hindered resource-sharing willingness, thereby reducing prosocial behavior (Nowakowska et al., 2024), whereas individuals who develop negative attitudes toward self-past due to regret may experience increased altruism (Lu et al., 2022). Notably, most current research finds that positive time attitudes promote individual behavior. For instance, positive attitudes toward self-past facilitate pro-environmental behaviors such as choosing green hotels (Zeng et al., 2024); positive attitudes toward self-present can stimulate generous donation and helping behaviors (Nowakowska, 2023); and positive imagination of self-future scenarios also promotes prosocial behavior (Lu et al., 2021; Gaesser et al., 2017). In other words, positive individual time attitudes generally facilitate intergroup helping behavior, while negative time attitudes exert differentiated effects. Whether individuals' positive and negative attitudes toward collectives similarly influence intergroup helping behavior warrants in-depth exploration in future research to further reveal the positive role of collective time attitudes.

1.5 Summary

In summary, the four psychological time perspectives, based on cognitive and emotional dimensions, extend from single time points (e.g., time orientation) to multiple time points (e.g., mental time travel, temporal comparison processes, and time attitude), demonstrating their feasibility in promoting intergroup helping behavior. Each perspective has distinct emphases, collectively constructing a multidimensional psychological time perspective model for facilitating intergroup helping behavior. Specifically, time orientation emphasizes individuals' attentional preferences for specific temporal nodes (Mello et al., 2013); mental time travel involves directed temporal projection between two time points based on self-awareness and emotional memory (Bai et al., 2009; Stephan & Sedikides, 2024); temporal comparison processes dynamically contrast situations and event outcomes between two time points, focusing on the comparison process itself (Baldwin & Lammers, 2016; Stanley et al., 2021); and time attitude highlights individuals' positive or negative emotions toward temporal nodes (Li & Lü, 2022; Worrell et al., 2013). Notably, existing research has only preliminarily explored the relationship between multidimensional psychological time perspectives and intergroup helping behavior (see Table 1), with several shortcomings. For example, studies on time orientation, mental time travel, and time attitude have predominantly adopted individual perspectives (Christensen et al., 2024; Juhl et al., 2020), whereas temporal comparison process research has mostly conducted differential comparisons from collective perspectives (Baldwin & Lammers, 2016; Stanley et al., 2021). Additionally, few studies have systematically analyzed how the six dimensions of time attitude differentially affect intergroup helping behavior (Zeng et al., 2024). Therefore, future research should adopt empirical studies from dual perspectives of individual and collective psychological time to

explore relationships with intergroup helping behavior, differential effects, and internal mechanisms.

Table 1 Relevant Research on Multidimensional Psychological Time Perspectives Influencing Intergroup Helping Behavior

Perspective	Level	Study	Effect Size
Time orientation and intergroup helping behavior	Individual	Li et al., 2018	d = 0.50
	Individual	Fang & Chang, 2019	$\beta = 0.41$
	Individual	Juhl et al., 2020	$\beta = 0.43$
	Individual	Guan & Zhou, 2024	$^{2} = 0.083$
	Individual	Juhl & Biskas, 2023	$\beta = 0.29$
	Collective	Zhu et al., 2020	$\beta = 0.28$
	Collective	Behler et al., 2021	d = 0.82
Mental time travel and intergroup helping behavior	Individual	Cernadas Curott et al., 2022	d = 0.13
	Individual	Christensen et al., 2024	B = 0.19
	Individual	Turner & Stathi, 2023	$\beta = 0.344$
	Individual	Stephan & Sedikides, 2024	B = 0.16
Temporal comparison processes and intergroup helping behavior	Collective	Baldwin & Lammers, 2016	B = 0.54
	Collective	Stanley et al., 2021	$^{2} = 0.230$
	Collective	Herberz et al., 2023	Z = 3.651
	Collective	Ferres et al., 2025	B = 0.90
Time attitude and intergroup helping behavior	Individual	Gaesser et al., 2017	$\beta = -0.12$

Perspective	Level	Study	Effect Size
	Individual	Lu et al., 2022	$\beta = 0.154$
	Individual	Nowakowska, 2023	
	Individual	Nowakowska et al., 2024	
	Individual	Zeng et al., 2024	
	Individual	Lu et al., 2021	

2.1 Common Features of Multidimensional Psychological Time Perspectives Influencing Intergroup Helping Behavior

The influence of multidimensional psychological time perspectives on intergroup helping behavior shares three main similarities. First, there is cross-perspective consistency in temporal frameworks, as all four perspectives revolve around the "past, present, and future" time dimension (Li & Lü, 2022; Christensen et al., 2024; Mello et al., 2013), emphasizing the impact of time points on individuals' intergroup helping behavior. Second, all four perspectives involve both individual and collective angles, exhibiting dual-level analysis. For instance, time orientation encompasses both individual temporal extension from "self-past to self-future" and group historical connection involving "collective past to collective future" (Guo & Lü, 2021; Peng & Wang, 2023); mental time travel includes both individual projection across personal life courses and collective-level historical reconstruction and future imagination (Michaelian & Sutton, 2019). This dual-level analysis not only enriches the influence of psychological time frameworks on intergroup helping behavior but also enables comparison of differential effects between individual and collective psychological time. Third, under certain conditions, multidimensional psychological time perspectives can positively influence individuals' intergroup helping behavior, showing convergent behavioral promotion. For example, preference for future orientation, mental time travel from present to future, temporal comparison processes between present and future, and positive attitudes toward self-future can all promote individuals' intergroup helping behavior willingness to varying degrees (Guan & Zhou, 2024; Cernadas Curotto et al., 2022; Stanley et al., 2021).

2.2 Differential Mechanisms of Multidimensional Psychological Time Perspectives Influencing Intergroup Helping Behavior

Beyond these connections—cross-perspective consistency in temporal frameworks, dual-level analysis, and convergent behavioral promotion—differences exist among the perspectives, primarily manifested in their mechanisms of influence on intergroup helping behavior.

2.2.1 Time Orientation and Self-Continuity Time orientation emphasizes individuals'cognitive tendencies and preferences for specific time points. Its internal mechanism influencing intergroup helping behavior is closely related to self-continuity. Self-continuity represents the cognitive sense of consistency and connection between self-past, self-present, and self-future (Sedikides et al., 2023). Collective self-continuity reflects the cognitive sense of consistency and connection between collective past, collective present, and collective future (Sedikides et al., 2023). Current research has focused mainly on collective past orientation, suggesting that collective past (collective memory) can influence individuals' collective self-continuity (Maoulida et al., 2021). Collective self-continuity is closely related to individuals' behavioral decisions regarding outgroups (Maoulida et al., 2021), particularly because future collective self-continuity can increase prosocial intentions and behaviors toward outgroups by reducing anxiety and outgroup prejudice (Simić et al., 2025). In summary, existing research provides preliminary evidence for the mediating role of self-continuity. Future research should systematically employ diverse research designs (such as priming manipulations and longitudinal tracking) to explore the mediating roles of individual self-continuity and collective self-continuity from both individual and collective time orientation perspectives, especially examining relationships between collective present, collective future, and collective self-continuity to deeply understand the complex role of self-continuity.

2.2.2 Mental Time Travel and Meaning in Life Mental time travel emphasizes directed psychological travel between two time points, with meaning in life potentially mediating the relationship between mental time travel and intergroup helping behavior. The meaning maintenance model proposes that humans possess a meta-motivation to maintain cognitive coherence and restore meaning, achieving meaning system reconstruction through symbolic connections within spatiotemporal frameworks (Heine et al., 2006; King & Hicks, 2021). According to this theory, mental time travel involves dual connections of time and place. When individuals recall the past or imagine the future from the present, they may experience positive or negative emotions that trigger meaning construction processes. Based on the internal motivation to compensate for or maintain meaning in life, this strengthens social connections and increases altruistic behavior. This suggests that mental time travel may promote intergroup helping behavior by increasing individuals' meaning in life.

The mediating effect of meaning in life has been validated through two empirical pathways. On one hand, mental time travel significantly and positively predicts individuals' meaning in life (King & Hicks, 2021). For example, in survey research, Yuan et al. (2024) analyzed 1,543 adolescents and found that mental time travel from present to past significantly negatively predicted meaning in life, whereas travel from present to future significantly positively predicted adolescents' meaning in life. In cognitive neuroscience research, Chen et al. (2023) used functional magnetic resonance imaging to reveal that mental time travel paradigms can trigger individuals' meaning-making processes and promote their

search for meaning in life. Big data research has drawn similar conclusions, showing that mental time travel recalling the past or envisioning the future triggers individuals' meaning construction, thereby enhancing meaning in life and positive emotions (Chen et al., 2025). On the other hand, meaning in life positively predicts individuals' intergroup helping behavior (Chang et al., 2024; Zhang et al., 2024). For instance, Li et al. (2020) surveyed 961 university students and found that meaning in life significantly positively predicted prosocial behavior: university students with higher meaning in life were more willing to participate in volunteer activities involving donations. Based on these findings, existing research suggests the potential mediating mechanism of meaning in life between individual mental time travel and intergroup helping behavior, though future research still needs to provide direct empirical verification. Notably, no studies have yet explored the relationship between collective mental time travel and intergroup helping behavior and its internal mechanisms. Future research should also examine from a collective perspective whether the mediating role of meaning in life similarly applies to collective mental time travel, providing a comprehensive understanding of the internal mechanisms through which individual and collective mental time travel influence intergroup helping behavior.

2.2.3 Temporal Comparison Processes and Self-Esteem Temporal comparison processes emphasize the dynamic contrast between two different psychological time points, with self-esteem potentially serving as the internal mechanism linking temporal comparison processes to intergroup helping behavior. Temporal comparison theory emphasizes that when individuals compare self-present with self-past or self-future, it triggers self-improvement motivation, expecting continuous progress and growth over time, thereby forming positive evaluations and higher self-esteem levels (Taylor & Carlson, 2025). According to this theory, temporal comparison processes trigger individuals' self-esteem levels by contrasting future or past with present, stimulating internal drive for self-development and collective development, expecting improvement and enhancement, and consequently promoting intergroup helping behavior. It can be inferred that temporal comparison processes may influence intergroup helping behavior by affecting self-esteem.

The mediating role of self-esteem can be divided into individual self-esteem and collective self-esteem. At the individual level, Brunot and Juhel' s (2012) research revealed that temporal comparison processes between self-present and self-future positively predict individual self-esteem levels. Moreover, individual self-esteem significantly and positively predicts prosocial behavior (Yang et al., 2025; Pandey et al., 2025; Sung & Lee, 2021). At the collective level, researchers comparing collective past (5 years ago) and collective future (5 years later) with collective present found that temporal comparison processes between collective future and collective present positively correlate with collective self-esteem (de la Sablonnière et al., 2009), and collective self-esteem significantly and positively predicts individuals' altruistic behavior (Zhou et al., 2023), volunteer activities, donations, and blood donation (Gong et al., 2021). Current research

has provided empirical evidence for temporal comparison processes influencing self-esteem and self-esteem influencing prosocial behavior, suggesting that temporal comparison processes may affect individuals' intergroup helping behavior through self-esteem. Given that intergroup helping behavior is not only a prosocial behavior but also an important positive behavior promoting friendship and cooperation between groups (Eisenberg et al., 2016), future research urgently needs to explore the mediating mechanisms of individual self-esteem and collective self-esteem between temporal comparison processes and intergroup helping behavior to deeply understand the internal mechanisms at play.

2.2.4 Time Attitude and Gratitude Time attitude emphasizes individuals' emotional experiences toward past, present, and future, focusing on positive and negative attitudes toward temporal dimensions. Time attitude may influence intergroup helping behavior through gratitude. The broaden-and-build theory emphasizes the importance of positive emotions for individual behavior, proposing that after experiencing positive emotions, individuals can expand cognitive flexibility, accumulate supportive resources, and give back to society, thereby promoting long-term stable development and a virtuous cycle of prosocial behavior (Fredrickson, 2001). According to this theory, positive time attitudes —such as past-positive, present-positive, and future-positive—can trigger gratitude experiences, subsequently motivating individuals to engage in intergroup helping behavior. Conversely, negative time attitudes—such as past-negative, present-negative, and future-negative—may reduce or hinder gratitude tendencies, thereby affecting intergroup helping behavior. Thus, individuals' emotional attitudes toward past, present, and future may stimulate gratitude toward life time, consequently promoting active participation in intergroup helping behavior.

Individual time attitude is closely related to gratitude (Burzynska-Tatjewska, Stolarski, et al., 2022; Mróz & Lasota, 2024). A cross-sectional study found that negative attitudes toward past significantly negatively predicted gratitude, while positive attitudes toward past and future significantly positively predicted gratitude (Przepiorka & Sobol-Kwapinska, 2021). Another longitudinal study using cross-lagged analysis found that past-positive significantly positively predicted gratitude, while gratitude did not affect past-positive, revealing that positive attitudes toward past are antecedents of gratitude (Burzynska-Tatjewska, Matthews, et al., 2022). Additionally, gratitude significantly predicts prosocial behavior. Rambaud (2021) found that gratitude can not only reduce prejudice toward outgroups but also increase willingness to help outgroups. In ecologically valid situational simulations, Oguni and Ishii (2024) discovered that individuals' gratitude traits can stably promote prosocial behavior even in uncertain environments. Based on longitudinal tracking data, research has found that individual gratitude can positively predict prosocial behavior six months or even one year later (Yang et al., 2021; Zhu et al., 2024). Based on these findings, individual time attitude promotes intergroup helping behavior by influencing gratitude. Existing research has primarily adopted an individual time attitude perspective,

with minimal exploration of how collective time attitudes influence intergroup helping behavior and scarce empirical research systematically examining gratitude' s mediating role across the six time dimensions. Future research should not only verify gratitude's mediating role between individual and collective time attitudes and intergroup helping behavior but also test the broaden-and-build theory. Furthermore, negative time attitudes (such as past regret) may also influence intergroup helping behavior by triggering individuals' fairness and social norm tendencies (Lu et al., 2022). Therefore, future research should continuously explore other potential mechanisms and theoretical foundations to achieve a more comprehensive understanding of the relationship between psychological time perspectives and intergroup helping behavior. Simultaneously, it is necessary to explore mediating variables through experimental manipulations and longitudinal tracking to verify the explanatory weight of each mechanism and clarify the optimal mechanism.

Table 2 Differences and Connections Among Multidimensional Psychological Time Perspectives Influencing Intergroup Helping Behavior

Perspective	Key Characteristics	Theoretical Basis	Mediating Mechanism
Time orientation	Emphasizes cognitive tendencies and preferences for specific time points	Continuity motive theory	Self-continuity
Mental time travel	Emphasizes directed psychological travel between two time points	Meaning maintenance model	Meaning in life
Temporal comparison processes	Emphasizes dynamic contrast of content presented between two time points	Temporal comparison theory	Self-esteem
Time attitude	Emphasizes positive or negative feelings toward time points	Broaden-and-build theory	Gratitude

Cross-perspective consistency in temporal frameworks (all involve past, present, and future); **Dual-level analysis** (individual and collective levels); **Behavioral promotion convergence** (positive effects of perspectives on intergroup helping behavior)

3 Contextual Adaptability of Multidimensional Psychological Time Perspectives Influencing Intergroup Helping Behavior

Although the four psychological time perspectives all promote intergroup helping behavior, this does not mean the positive effects occur equally under all conditions. Rather, only by flexibly adopting corresponding practical strategies according to different situational conditions and individual characteristics can the maximum effect of multidimensional time perspectives on intergroup helping behavior be achieved. According to ecological systems theory, individuals are nested within a series of mutually influential environmental systems and interact with their environment during development to achieve better growth and development (Bronfenbrenner, 1999; Mizokawa & Komiya, 2014). The influence of multidimensional psychological time perspectives on intergroup helping behavior may also be affected by multiple factors across time systems (e.g., age), microsystems or mesosystems (e.g., psychological distance from events), macrosystems (e.g., regional tightness-looseness culture), and exosystems (e.g., objective socioeconomic status). For example, age reflects the developmental course of individual life and is a representative variable of time systems, closely related to time orientation (Mello et al., 2022). Psychological distance from events involves individuals' subjective perceptions of social environments including temporal, spatial, and social distance (Trope & Liberman, 2010), with its proximity potentially affecting the relationship between mental time travel and prosocial motivation (Colás-Blanco et al., 2022). Regional tightness-looseness culture, as a core element of macrosystems, may lead to differences in group behavior across different cultural atmospheres (Gelfand et al., 2011). Objective socioeconomic status determines the external resources individuals can access and is an important representation of exosystems, with its level being closely related to time attitude and prosocial behavior (Andreoni et al., 2021; Xiao et al., 2023). Thus, age, psychological distance from events, regional tightness-looseness culture, and objective socioeconomic status may moderate the relationship between multidimensional psychological time perspectives and intergroup helping behavior.

3.1 Age and Time Orientation The promoting effect of time orientation on intergroup helping behavior shows significant generational differences. Socioemotional selectivity theory posits that individuals' openness to future time perception declines with age. Young people, perceiving future time as unlimited, tend to select future-oriented goals (such as transgenerational altruism), while middle-aged and older adults, with heightened awareness of limited future time, prioritize present-oriented goals (such as immediate emotional experiences and social legacy shaping) (Carstensen, 2006). According to this theory, different age groups develop characteristic time orientation tendencies due to differences in life stages, social roles, and psychological needs. Activating targeted time orientations is necessary to maximize the promotion of individuals' intergroup helping behavior. Currently, numerous studies have revealed complex relationships between time orientation and age. For example, Mello et al. (2022) sur-

veyed 1,659 participants across age groups and found that adolescents and young adults prefer self-future, while middle-aged and older adults prefer self-present. Additionally, Anderson et al. (2022) investigated Japanese citizens' perceptions of Japanese society' s past, present, and future, revealing generational differences in collective past, collective present, and collective future: young people believe collective future (e.g., future technological innovation, convenience facilities) will be better than the present, while older adults believe collective present' s material standards and public safety are superior to collective future. These findings indicate that both individual and collective time orientations are closely related to age, showing consistent generational patterns—younger individuals tend toward self-future and collective future, while older individuals prefer self-present and collective present.

Individuals' focus in time orientation gradually shifts from future orientation to present orientation with increasing age (Carstensen, 2006; Mello et al., 2022). To promote active participation in intergroup helping behavior, future research should implement specific interventions for different age groups. For adolescents and young adults, interventions could use virtual reality technology to simulate future scenarios, write letters to future selves, or leave letters for descendants (Vlasceanu et al., 2024) to activate self-future and self-descendant orientations. Collective future and collective descendant orientations could be activated by imagining collective life scenarios 10 or 100 years later or performing future fluency tasks (Guo & Lü, 2021), thereby enhancing self-continuity and stimulating legacy motivation to promote intergroup helping behavior. For middle-aged and older adults, interventions could present the "immediately visible impact" of current behaviors to focus attention on self-present and collective-present, satisfying immediate emotional needs (Anderson et al., 2022) and facilitating active participation in intergroup helping behavior.

3.2 Psychological Distance and Mental Time Travel The influence of mental time travel on intergroup helping behavior may vary depending on psychological distance. Psychological distance refers to individuals' subjective perception of "nearness" or "farness" regarding events, objects, or people based on cognitive, social, and emotional dimensions, involving temporal distance, spatial distance, and social distance (Trope & Liberman, 2010). Construal level theory posits that psychological distance directly affects how individuals represent information: when psychological distance is more remote, individuals' construal levels are higher, focusing more on abstract essences, purposes, and meanings of events or people; when psychological distance is closer, construal levels are lower, with greater focus on concrete details (Trope & Liberman, 2010). According to this theory, under different psychological distances, individuals exhibit different attentional tendencies and cognitive processing styles when engaging in mental time travel, resulting in varying degrees of intergroup helping behavior. Among the various dimensions of psychological distance, research on the moderating role of temporal distance is most extensive. For example, Vazeou-Nieuwenhuis (2018) explored the role of temporal distance between mental time

travel and meaning in life by manipulating high psychological time travel (from present to one year later) and low psychological time travel (from present to one week later), finding that more distant temporal distance in mental time travel increased meaning in life. Similar results have been found in cognitive neuroscience research, where distant temporal distance in mental time travel enhances prosocial motivation by activating brain regions related to episodic simulation and self-referential processing, thereby strengthening the vividness and emotional involvement of mental simulation (Colás-Blanco et al., 2022). Additionally, research indicates that the interaction between temporal distance and social distance significantly predicts individuals' health-related prosocial behavior (Hu et al., 2023). In summary, current research has primarily focused on the moderating role of distant temporal distance between individual mental time travel and intergroup helping behavior. Future research should further investigate the moderating effects of single or interactive psychological distances —including temporal, spatial, and social distance—between individual and collective mental time travel and intergroup helping behavior.

Based on the above theoretical foundations and empirical research, future advocacy for intergroup helping behavior and other public services can establish multi-level psychological distance strategies. At the information content level, emphasize long-term social benefits rather than immediate returns (e.g., "protecting the ecological environment and social resources for future generations") (Guan & Chen, 2024). In presentation methods, adopt mental time travel with longer temporal distance to enhance meaning in life (Vazeou-Nieuwenhuis, 2018). In scenario construction, use timeline extension technologies (such as augmented reality) to help individuals immerse themselves in mental time travel from present to future (Zlomuzica et al., 2018). The synergistic application of these strategies is expected to systematically promote the occurrence and maintenance of intergroup helping behavior by enhancing individuals' meaning in life.

3.3 Regional Tightness-Looseness Culture and Temporal Comparison Processes The effect of temporal comparison processes on intergroup helping behavior may be moderated by regional tightness-looseness culture. Regional tightness-looseness culture refers to the strength of social norms and punishment for deviant behavior within a region (e.g., state, province), reflecting the cultural atmosphere within a country (Lu et al., 2017; Gelfand et al., 2011). Compared to other cultural dimensions (e.g., individualism-collectivism), regional tightness-looseness culture focuses primarily on internal cultural differences within the same country (Harrington & Gelfand, 2014), can be predicted through social behavior, and enables differentiated regional divisions within countries (Lu et al., 2017; Gelfand et al., 2011). Tightness-looseness theory posits that different social norm strengths produce cultural atmospheres that affect individuals' group behavior, providing theoretical support for the moderating role of regional tightness-looseness culture (Gelfand et al., 2011). Although few studies have directly examined this moderating effect, research has found that closely

related values (Lu et al., 2017; Waytz et al., 2019) moderate the relationship between temporal comparison processes and pro-environmental behavior. For example, Baldwin and Lammers (2016) found that for conservatives who tend to comply with norms, emphasize order, obedience, and collective goals, temporal comparisons between present and past better promote pro-environmental behavior. This suggests that regional tightness-looseness culture may moderate the relationship between temporal comparison processes and intergroup helping behavior. In tight cultures emphasizing strict norms, collective order, and traditional authority, individuals tend to obey collective arrangements, gradually shaping more conservative ideologies, making present-past temporal comparison processes more likely to trigger intergroup helping behavior (Baldwin & Lammers, 2016). In loose cultures emphasizing freedom, criticism, and pluralistic innovation, individuals perceive weaker threats and develop more open and free value orientations, making present-future temporal comparison processes more likely to promote intergroup helping behavior (Gelfand et al., 2011).

Different regions exhibit varying norm enforcement intensities. For example, significant regional tightness-looseness cultural differences exist among the 50 U.S. states (Harrington & Gelfand, 2014) and among China' s 31 provinces and municipalities (Chua et al., 2019). Future practical applications could consider implementing targeted, refined measures based on specific regional tightness-looseness cultural atmospheres. Tight culture regions use traditional authority and collective order as bonds, shaping group behavior through dense normative networks (Dimant et al., 2025; Smith, 2017). Accordingly, in tight culture regions, the effectiveness of temporal comparison processes may depend on symbolic awakening of traditional values, using present-past temporal comparison processes to activate individuals' identification with clan mutual aid memories and local cultural symbols, transforming intergroup helping behavior into a moral practice of maintaining cultural continuity. Loose culture regions emphasize pluralistic tolerance and open freedom (Lu et al., 2017; Gelfand et al., 2011), using present-future temporal comparison processes to stimulate individual or collective self-esteem levels, thereby facilitating intergroup helping behavior.

3.4 Time Attitude and Objective Socioeconomic Status Objective socioeconomic status, as an important social stratification variable, may influence the relationship between time attitude and intergroup helping behavior. Objective socioeconomic status (measured by income, education level, wealth, and occupational prestige) not only reflects individuals' material resources and capital reserves but is also closely related to their ability to cope with negative emotions and unexpected risks (Wang et al., 2023). Time attitude is generally divided into positive and negative attitudes toward past, present, and future. Positive time attitudes can promote individuals' intergroup helping behavior to some extent, transcending objective socioeconomic status. According to broaden-and-build theory, positive time attitudes generate positive emotions that help accumulate resources to give back to society (Fredrickson, 2001). When individuals possess positive time attitudes, regardless of their objective socioeconomic status, they

may actively participate in intergroup helping behavior. Conversely, the influence of negative time attitudes on intergroup helping behavior may be affected by objective socioeconomic status.

Specifically, for individuals with high socioeconomic status, even when they hold negative evaluations and feelings toward self or collective time (regret about the past or pessimism about the future), their resource redundancy (such as financial security and social support networks) can buffer the inhibitory effect of negative time attitudes on intergroup helping behavior, and they may even be willing to invest more time and energy in prosocial behavior (Andreoni et al., 2021; Wang et al., 2021). However, for individuals with low socioeconomic status, resource scarcity intensifies survival pressure, potentially solidifying negative time attitudes into a cognitive framework of "inability to change," further inhibiting their willingness to share resources across groups (He et al., 2023; Xiao et al., 2023). Thus, the level of objective socioeconomic status affects the degree to which time attitudes facilitate intergroup helping behavior.

Future practical applications can construct stratified strategies. First, actively promote intergroup helping activities to groups with higher objective socioeconomic status, transforming individuals' negative time attitudes into social responsibility motivation, and stimulating reputation and altruistic motivations in individuals with positive time attitudes to promote intergroup helping behavior (Liebe et al., 2022; Suss, 2023). Second, for groups with lower objective socioeconomic status, ensure they receive structural support (such as educational opportunities and social security), provide growth and development space for individuals with positive time attitudes, and enhance their probability of providing genuine help (He et al., 2023; Xiao et al., 2023). Simultaneously, combine individual psychological construction with social resource provision to intervene in individuals' negative time attitudes, gradually cultivating positive attitudes toward past, present, and future to promote intergroup helping behavior.

In summary, based on socioemotional selectivity theory, construal level theory, tightness-looseness culture theory, and broaden-and-build theory, age, psychological distance from events, regional tightness-looseness culture, and objective socioeconomic status may moderate the relationship between multidimensional psychological time perspectives and intergroup helping behavior (Baldwin & Lammers, 2016; Carstensen, 2006; Trope & Liberman, 2010; Xiao et al., 2023). Notably, although the moderating effects of these four variables have theoretical support, direct empirical evidence is lacking, suggesting that future research should use diverse research designs to verify these moderating effects. Furthermore, these four moderating variables may not be the only boundary conditions. Future research could consider other variables in environmental systems based on ecological systems theory (such as family and peer microsystem factors; community and neighborhood exosystem factors), examine individual factors like gender (Olsson et al., 2021) and social identity (Gavreliuc et al., 2021), and explore immediate situational factors like intergroup conflict intensity (Hasan-Aslih et al., 2020) to deeply investigate the optimal boundary conditions for how

multidimensional psychological time perspectives influence intergroup helping behavior.

4.1 Attending to Emotional Valence in Psychological Time Perspectives

The multidimensional psychological time perspectives discussed in this paper all emphasize the impact of temporal nodes on intergroup helping behavior while generally neglecting the emotional valence contained within temporal nodes —that is, the positive or negative emotions associated with temporal nodes (Ionescu et al., 2024; Ozdes, 2021). Ozdes (2021) found that temporal nodes often contain positive or negative events experienced by individuals, thereby evoking positive or negative emotions. In recent years, Ionescu et al. (2024) have gradually attended to the emotional valence of psychological time, manipulating positive and negative emotions in collective past to explore their impact on future thinking. Clarifying the relationship between psychological time frameworks and emotional valence will help understand which psychological time frameworks can maximally promote individuals' intergroup helping behavior. However, current research on emotional valence in psychological time remains scarce. Specifically, time orientation represents preference for a particular time point without distinguishing whether that preference involves identification with positive events or avoidance of negative events (Guan & Zhou, 2024; Mello et al., 2013). Mental time travel focuses on psychological projection between two time points without clarifying emotional state differences between departure and destination points (Christensen et al., 2024). Temporal comparison processes emphasize dynamic contrasts between two time points but do not define whether comparison content involves positive or negative situations (Baldwin & Lammers, 2016; Stanley et al., 2021). Although time attitude encompasses individuals' emotional attitudes toward past, present, and future (Li & Lü, 2022; Worrell et al., 2013), it neglects the coexistence of negative evaluations and positive events within the same time dimension (e.g., whether individuals with negative attitudes toward self-past might be promoted to engage in intergroup helping behavior due to positive events in self-past). Therefore, future research should consider emotional valence based on existing psychological time frameworks and comprehensively explore the interactive effects of psychological time perspectives and emotional valence on intergroup helping behavior.

4.2 Exploring the Intergenerational Power of "Descendants"

"Descendants" represent a special symbol in future time, a future representation closely connected to individuals. Whether self-descendants or collective descendants, they represent intergenerational inheritance in some sense. Compared to vague future time categories, "descendants" may more easily affect individuals' self-continuity and legacy motivation, influencing their intergroup helping behavior and prosocial attitudes (Engle-Friedman et al., 2022; Wang et al., 2020). This paper has only generalized "descendants" into vague future time categories

within multidimensional psychological time perspectives, failing to highlight the important role of "descendants." Incorporating "descendants" as a special temporal node and symbolic symbol into psychological time frameworks can not only construct a more complete psychological time model but also deeply explore the impact of "descendants" on intergroup helping behavior. Existing research has activated individuals' self-descendant time orientation through methods such as imagining descendants' lives or writing letters to future descendants (Li et al., 2025; Shrum, 2021). Future research could expand to include intergenerational mental time travel from self-present to self-descendants, intergenerational temporal comparisons between self-past childhood and self-descendant childhood, and individuals' positive and negative time attitudes toward self-descendants, exploring the relationship between these "descendant" psychological time perspectives and intergroup helping behavior. For example, current research has discovered the positive power of "descendants" : responsibility toward descendants is closely related to individuals' prosocial behavior (Nestik et al., 2019); writing letters to future generations can enhance pro-environmental behavior (Vlasceanu et al., 2024); imagining descendants can reduce intergenerational conflict and promote rational allocation of sustainable resources (Hara et al., 2019). These positive outcomes suggest that future research urgently needs to deeply explore the effect of "descendants" on intergroup helping behavior and its boundary conditions.

4.3 Examining Cross-Cultural Influences on the Relationship Between Multidimensional Psychological Time Perspectives and Intergroup Helping Behavior

Different national cultures (e.g., Eastern vs. Western) may influence the relationship between multidimensional psychological time perspectives and intergroup helping behavior. Taking individual time orientation as an example, research shows that individuals in collectivist cultural backgrounds prefer past orientation, value past experiences, and often learn from history; whereas those in individualist cultural backgrounds prefer present and future orientations (Hao et al., 2023). Additionally, individualist culture emphasizes independence and autonomy, with individuals in such cultures tending toward linear, unidirectional time perspectives that focus on efficiency and future planning; collectivist culture emphasizes collective harmony and wholeness, with individuals tending toward cyclical, multidirectional time perspectives that focus on connections between past, present, and future (Ji et al., 2023; Ji et al., 2001). In other words, culture is closely related to psychological time perspectives (Hao et al., 2023; Ji et al., 2023) and may even interact to influence intergroup helping behavior (Juhl & Biskas, 2023; Juhl et al., 2020). Future research could explore this by compiling or revising measurement methods for psychological time across different national cultures, further comparing how individual and collective multidimensional psychological time perspectives influence intergroup helping behavior across different cultural backgrounds, helping researchers more comprehensively understand cultural influences on the relationship between mul-

tidimensional psychological time perspectives and intergroup helping behavior, and enriching research in this field from a cross-cultural perspective.

4.4 Considering Types of Intergroup Helping Behavior

This paper has primarily 梳理 d the potential effects of various sub-dimensions of psychological time perspectives on intergroup helping behavior without distinguishing categories of intergroup helping behavior. Based on helping methods, Nadler and Halabi (2006) divide intergroup helping behavior into autonomy-oriented help and dependency-oriented help. The former emphasizes providing problem-solving tools to help-seekers so they can independently solve problems—"teaching them to fish"—while the latter emphasizes providing complete solutions to directly solve problems— "giving them a fish" (Nadler & Halabi, 2006). Additionally, Van Leeuwen (2017) divides intergroup helping behavior into strategic-motivated help and prosocial-motivated help based on motivational perspective. The former focuses on ingroup needs and interests, driven by "self-interest" motives, while the latter emphasizes outgroups' actual needs, driven by "altruistic" motives. Since intergroup helping behavior has multiple types, do psychological time perspectives differentially influence them? Research has found that although future time orientation significantly predicts autonomy-oriented helping behavior, it does not affect dependency-oriented helping behavior (Chernyak-Hai & Halabi, 2018). This means that when examining the positive effects of psychological time perspectives, considering only a single type of intergroup helping behavior may reduce the accuracy of relevant conclusions. Given that few studies have examined the relationship between psychological time perspectives and types of intergroup helping behavior, future research could deeply explore how multidimensional psychological time perspectives influence different types of intergroup helping behavior and their internal mechanisms based on decision-making contexts of "teaching to fish vs. giving a fish" or motivational perspectives of "self-interest vs. altruism," helping to clarify motivational and methodological differences in individuals' implementation of intergroup helping behavior. Furthermore, considering that the cost of intergroup helping behavior can influence individuals' willingness to engage in it (Sierksma, 2018), future research could also categorize intergroup helping behavior into monetary help and temporal help based on cost types, exploring its relationship with multidimensional psychological time perspectives to further enrich relevant research and reveal the importance of intergroup helping behavior types.

4.5 Constructing a Multidimensional Adaptation Model for Promoting Intergroup Helping Behavior

The optimal boundary conditions for time orientation, mental time travel, temporal comparison processes, and time attitude influencing intergroup helping behavior are often limited to specific situations or groups (Baldwin & Lammers, 2016; Mello et al., 2022; Vazeou-Nieuwenhuis, 2018; Xiao et al., 2023). Given this, practical applications should flexibly and targetedly employ psychological

time frameworks to meet the needs of different populations and diverse situations (Anderson et al., 2022; Wang et al., 2021). Future research could integrate these factors to form a multidimensional adaptation model encompassing the effects and differential comparisons of each psychological time perspective on intergroup helping behavior across different groups and situations. For example, to enhance a group's intergroup helping behavior, researchers could theoretically use this multidimensional adaptation model to identify the group' s age, objective socioeconomic status, and regional tightness-looseness culture, then based on psychological distance from events, precisely determine the optimal psychological time framework through comparative analysis to directionally promote its intergroup helping behavior. As the saying goes, "A single flower does not make spring; a hundred flowers in full bloom bring spring to the garden."Only by exploring the influence of psychological time perspectives on intergroup helping behavior from multiple dimensions can genuine promotion be achieved.

References

Bai, W., Wang, M., & Yan, X. (2009). The development of children' s mental time travel. *Advances in Psychological Science*, *17*(5), 983–989.

Bao, H., Cai, H., & Luo, Y. (2019). Identity motivation: Concept, measurement, and psychological effects. *Psychological Science*, *42*(4), 971–977.

Bi, C., & Qi, H. (2022). The role of time perception in intertemporal decision-making: A new exploration of temporal decision models. *Advances in Psychological Science*, *30*(5), 1106–1118.

Chang, B., Huang, J., Lin, P., & Fang, J. (2024). Caring for oneself, caring more for others: The "altruistic" mechanism of self-compassion. *Psychological Development and Education*, *40*(3).

Fang, J., & Chang, B. (2019). The relationship between nostalgia and prosocial behavior: A mediated moderation model. *Psychological Development and Education*, *35*(3), 303–311.

Guan, J., & Guo, Q. (2020). Sharing, reshaping, and identification: The social psychological logic of collective memory transmission. *Journal of Nanjing Normal University (Social Science Edition)*, *(5)*, 69–79.

Guan, J., & Hang, N. (2021). Cognition, emotion, will, and behavior: Four dimensions integrated to forge a strong sense of community for the Chinese nation. *Nankai Journal (Philosophy and Social Sciences Edition)*, *(6)*, 53–67.

Guan, J., & Zhou, M. (2024). Orientation and breadth: The significance of time perception for forging a strong sense of community for the Chinese nation. *Journal of Northwest Normal University (Social Science Edition)*, *61*(5).

Guan, J., & Chen, S. (2024). Framing effects boost forging a strong sense of community for the Chinese nation—Based on construal level and psychological

distance perspectives. *Journal of Ethnology*, *15*(4), 1-11.

Guo, Q., & Lü, H. (2021). A new orientation of future psychological time: Collective future thinking. *Psychological Science*, *44*(1), 184-190.

Hao, H., Lü, H., & Huang, X. (2023). Chinese people' s past, present, and future: An interpretation based on time psychology. *Psychological Research*, *16*(4), 300-309.

Ji, L., Wu, Y., & Yang, Y. (2023). The breadth of time perception among Chinese people. *Acta Psychologica Sinica*, *55*(3), 421-434.

Li, A., Ke, Z., Yao, X., Zhu, Q., & Sun, H. (2025). Decision-making mechanisms and nudging strategies for intergenerational cooperation: A theoretical perspective integrating temporal discounting and social discounting. *Advances in Psychological Science*, *33*(1), 136-145.

Li, A., Wang, H., Sun, H., Xiong, G., & Yang, S. (2018). The nudging effect of "long-term planning" : Pregnancy and environmental intertemporal decision-making. *Acta Psychologica Sinica*, *50*(8).

Li, L., Ye, B., Ni, L., & Yang, Q. (2020). The influence of family intimacy on college students' prosocial behavior: A moderated mediation effect. *Chinese Journal of Clinical Psychology*, *28*(1), 178-180.

Li, X., & Lü, H. (2022). The relationship between adolescents' time attitude and academic procrastination: The mediating role of achievement motivation. *Psychological Science*, *45*(1), 47-53.

Li, X., Mao, Y., Lü, H., & Wang, Y. (2021). Reliability and validity test of the Chinese version of the Time Attitude Scale. *Chinese Journal of Clinical Psychology*, *29*(2), 375-379.

Liu, Y., Yang, Z., Wang, Y., Chen, Y., & Cai, H. (2018). Future self-continuity and its impact on individual psychology and behavior. *Advances in Psychological Science*, *26*(12).

Lu, J., Chen, H., & Yue, G. (2017). Tightness-looseness culture: A new dimension in cross-cultural psychology research. *Advances in Psychological Science*, *25*(5), 887-902.

Lu, L., Wang, C., & Ren, J. (2021). How people imagine the future: The impact of future episodic thinking on individual psychology and behavior. *Advances in Psychological Science*, *29*(6).

Peng, J., & Wang, C. (2023). Collective memory: The psychological dimension of forging a strong sense of community for the Chinese nation. *Guangxi Ethnic Studies*, *(2)*, 71-83.

Wang, S., Liu, Q., & Jiang, W. (2023). Measurement and research manipulation of socioeconomic status: Current status and issues—Based on research in the field of psychology. *Psychological Research*, *16*(1), 12-20.

Wen, F., & Zuo, B. (2019). The concept, cues, and influencing mechanisms of social categorization. *Psychological Science*, *42*(2), 395–401.

Yang, J., Li, K., Zheng, W., & Guo, S. (2025). How can people "love all universally" ? The promoting mechanism of Confucian ethical spirituality on college students' prosocial behavior. *Chinese Journal of Clinical Psychology*, *1*, 66–70.

Zhang, L., Wuyun, T., & Jin, T. (2024). The influence of proactive personality on college students' online altruistic behavior: The mediating role of online positive feedback and meaning in life. *Psychological Science*, *47*(5), 1246–1253.

Zhu, T., Li, L., Wen, F., Zuo, B., Ju, Y., & Long, J. (2024). The psychological effects of common ingroup identity and its influencing factors. *Psychological Science*, *47*(2).

Anderson, D., Shimizu, H., & Massam, W. (2022). Generational differences between younger and older Japanese adults in perceptions of society from retrospective, current, and future time perspectives. *Psychologia*, *64*(1), 69–93.

Andreoni, J., Nikiforakis, N., & Stoop, J. (2021). Higher socioeconomic status does not predict decreased prosocial behavior in a field experiment. *Nature Communications*, *12*(1), 4266.

Baldwin, M., & Lammers, J. (2016). Past-focused environmental comparisons promote proenvironmental outcomes for conservatives. *Proceedings of the National Academy of Sciences*, *113*(52), 14953–14957.

Behler, A. M. C., Cairo, A., Green, J. D., & Hall, C. (2021). Making America great again? National nostalgia' s effect on outgroup perceptions. *Frontiers in Psychology*, *12*, 555667.

Bronfenbrenner, U. (1999). Environments in developmental perspective: Theoretical and operational models. In S. L. Friedman & T. D. Wachs (Eds.), *Measuring environment across the life span: Emerging methods and concepts* (pp. 3–28). Washington, DC: American Psychological Association Press.

Brunot, S., & Juhel, J. (2012). Social and temporal comparisons, self-esteem, and job-search activity among long-term unemployed people. *Annee Psychologique*, *112*(2), 197–226.

Burzynska-Tatjewska, B., Matthews, G., & Stolarski, M. (2022). Seeking causality in the links between time perspectives and gratitude, savoring the moment and prioritizing positivity: Initial empirical test of three conceptual models. *International Journal of Environmental Research and Public Health*, *19*(8), 4776.

Burzynska-Tatjewska, B., Stolarski, M., & Matthews, G. (2022). Do time perspectives moderate the effects of gratitude, savoring and prioritizing positivity on well-being? A test of the temporal match-mismatch model. *Personality and Individual Differences*, *189*, 111501.

Carstensen, L. L. (2006). The influence of a sense of time on human development. *Science*, *312*(5782), 1913–1915.

Cernadas Curotto, P., Sander, D., d' Argembeau, A., & Klimecki, O. (2022). Back to the future: A way to increase prosocial behavior. *PLOS ONE*, *17*(8), e0272340.

Chen, Y., Ma, J., Zhu, H., Peng, H., & Gan, Y. (2023). The mediating role of default mode network during meaning-making aroused by mental simulation between stressful events and stress-related growth: A task fMRI study. *Behavioral and Brain Functions*, *19*(1), 12.

Chen, Y., Zheng, L., Ma, J., Zhu, H., & Gan, Y. (2025). The mediating role of meaning-making in the relationship between mental time travel and positive emotions in stress-related blogs: Big data text analysis research. *Journal of Medical Internet Research*, *27*, e63407.

Chernyak-Hai, L., & Halabi, S. (2018). Future time perspective and interpersonal empathy: Implications for preferring autonomy- versus dependency-oriented helping. *British Journal of Social Psychology*, *57*(4), 793–814.

Christensen, K. L., Hershfield, H. E., & Maglio, S. J. (2024). Back to the present: How direction of mental time travel affects similarity and saving. *Journal of Consumer Research*, *51*(4), 761–774.

Chua, R. Y. J., Huang, K. G., & Jin, M. (2019). Mapping cultural tightness and its links to innovation, urbanization, and happiness across 31 provinces in China. *Proceedings of the National Academy of Sciences*, *116*(14), 6720–6725.

Colás-Blanco, I., Mioche, J., La Corte, V., & Piolino, P. (2022). The role of temporal distance of the events on the spatiotemporal dynamics of mental time travel to one' s personal past and future. *Scientific Reports*, *12*(1), 2378.

Corballis, M. C. (2013). Mental time travel: A case for evolutionary continuity. *Trends in Cognitive Sciences*, *17*(1), 5–6.

de la Sablonnière, R., Tougas, F., & Perenlei, O. (2009). Beyond social and temporal comparisons: The role of temporal inter-group comparisons in the context of dramatic social change in Mongolia. *The Journal of Social Psychology*, *149*(1), 71–91.

Destro, C. L., Rullo, M., Telesca, G., & Visintin, E. P. (2024). Supporting Ukrainian refugees: Examining intergroup contact, empathy and European identity in promoting helping behaviours. *Journal of Community & Applied Social Psychology*, *34*(5), e2869.

Dimant, E., Gelfand, M., Hochleitner, A., & Sonderegger, S. (2025). Strategic Behavior with Tight, Loose, and Polarized Norms. *Management Science*, *71*(3), 2245–2263.

Eisenberg, N., VanSchyndel, S. K., & Spinrad, T. L. (2016). Prosocial Motivation: Inferences From an Opaque Body of Work. *Child Development*, *87*(6),

1668–1678.

Engle-Friedman, M., Tipaldo, J., Piskorski, N., Young, S. G., & Rong, C. (2022). Enhancing environmental resource sustainability by imagining oneself in the future. *Journal of Environmental Psychology*, *79*, 101746.

Fang, L., Liu, T., Zhang, T., & Liu, S. (2024). Effect of time attitude on academic performance of high school students: A moderated mediation model. *Current Psychology*, *43*(42), 32961–32975.

Ferres, E. A. G., Van Berkel, L., Baldwin, M., & Lammers, J. (2025). Temporal comparisons shape system justification processes. *Political Psychology*, *46*(3), 654–672.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, *56*(3), 218–226.

Gaesser, B., DiBiase, H. D., & Kensinger, E. A. (2017). A role for affect in the link between episodic simulation and prosociality. *Memory (Hove)*, *25*(8), 1052–1062.

Gavreliuc, A., Gavreliuc, D., & Semenescu, A. (2021). Beyond the façade of generosity—Regional stereotypes within the same national culture influence prosocial behaviors. *PLOS ONE*, *16*(5), e0250125.

Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., ··· Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. *Science*, *332*(6033), 1100–1104.

Gong, X., Ye, Z., Liu, B., Yu, S., & Yan, Y. (2021). How does social currency influence prosocial behavior? The role of collective self-esteem and communication network heterogeneity. *Frontiers in Psychology*, *12*, 672505.

Hara, K., Iwasa, Y., & Tsujimoto, M. (2019). Intergenerational conflict and concordance in the climate change dilemma: A theoretical analysis of intergenerational time horizon and risk perception. *Journal of Theoretical Biology*, *462*, 161–169.

Harrington, J. R., & Gelfand, M. J. (2014). Tightness–looseness across the 50 united states. *Proceedings of the National Academy of Sciences - PNAS*, *111*(22), 7990–7995.

Hasan-Aslih, S., Shuman, E., Pliskin, R., van Zomeren, M., Saguy, T., & Halperin, E. (2020). With or without you: The paradoxical role of identification in predicting joint and ingroup collective action in intergroup conflict. *European Journal of Social Psychology*, *50*(6), 1334–1343.

He, L., Tan, C.-S., Pung, P.-W., Hu, J., Tang, H.-B., & Cheng, S.-M. (2023). The role of parental rejection and poverty in the development of prosocial behavior among left-behind adolescents in rural China. *Children and Youth Services Review*, *155*, 106847.

Heine, S. J., Proulx, T., & Vohs, K. D. (2006). The meaning maintenance model: On the coherence of social motivations. *Personality and Social Psychology Review*, *10*(2), 88–110.

Herberz, M., Brosch, T., & Hahnel, U. J. J. (2023). The impact of perceived partisanship on climate policy support: A conceptual replication and extension of the temporal framing effect. *Journal of Environmental Psychology*, *86*, 101972.

Hu, S., Boman, C. D., & Warner, B. R. (2023). Waiting for a match: Mitigating reactance in prosocial health behavior using psychological distance. *Health Communication*, *38*(4), 753–764.

Ionescu, O., Tavani, J. L., & Collange, J. (2024). A preliminary experimental test of the crossed influences between the valence of collective memory and collective future thinking. *Memory*, *32*(2), 129–142.

Ji, L. J., Nisbett, R. E., & Su, Y. (2001). Culture, change and prediction. *Psychological Science*, *12*(6), 450–456.

Juhl, J., & Biskas, M. (2023). Nostalgia: An impactful social emotion. *Current Opinion in Psychology*, *49*, 101545.

Juhl, J., Wildschut, T., Sedikides, C., Diebel, T., Cheung, W., & Vingerhoets, A. J. J. M. (2020). Nostalgia proneness and empathy: Generality, underlying mechanism, and implications for prosocial behavior. *Journal of Personality*, *88*(3), 485–500.

King, L. A., & Hicks, J. A. (2021). The science of meaning in life. *Annual Review of Psychology*, *72*(1), 561–584.

Liebe, U., Schwitter, N., & Tutić, A. (2022). Individuals of high socioeconomic status are altruistic in sharing money but egoistic in sharing time. *Scientific Reports*, *12*(1), 10831.

Lu, T., Liang, D., Hong, M., & Sun, J. (2022). Regret now, compensate it later: The benefits of experienced regret on future altruism. *Frontiers in Psychology*, *13*, 840809.

Maoulida, H., Tavani, J. L., & Urdapilleta, I. (2021). When past group events and identities define the present: Effect of perceived collective continuity on defensive behaviors of the French in-group. *Journal of Pacific Rim Psychology*, *15*, 1–14.

Mello, Z. R., Barber, S. J., Vasilenko, S. A., Chandler, J., & Howell, R. (2022). Thinking about the past, present, and future: Time perspective and self-esteem in adolescents, young adults, middle-aged adults, and older adults. *British Journal of Developmental Psychology*, *40*(1), 92–111.

Mello, Z. R., Finan, L. J., & Worrell, F. C. (2013). Introducing an instrument to assess time orientation and time relation in adolescents. *Journal of Adolescence*, *36*(3), 551–563.

Michaelian, K., & Sutton, J. (2019). Collective mental time travel: Remembering the past and imagining the future together. *Synthese*, *196*(12), 4933–4960.

Mizokawa, A., & Komiya, A. (2014). Social ecology and theory of mind. *Psychologia*, *57*(2), 133–151.

Mróz, J., & Lasota, A. (2024). The relationship between meaning in life, forgiveness, and gratitude among Polish adults: The mediating role of time perspective. *Journal of Beliefs & Values*, 1–25.

Nadler, A., & Halabi, S. (2006). Intergroup helping as status relations: Effects of status stability, identification, and type of help on receptivity to high-status group' s help. *Journal of Personality and Social Psychology*, *91*(1), 97–110.

Nestik, T. A., Dmitrieva, U. A., Kuznetsova, O. E., Larina, G. N., & Nikolaev, E. L. (2019). The responsibility of the individual to the previous and future generations: A theoretical and empirical study. *Voprosy Psikhologii*, *(3)*, 29–33.

Nowakowska, I. (2023). Age, frequency of volunteering, and Present-Hedonistic time perspective predict donating items to people in need, but not money to combat COVID-19 during lock-down. *Current Psychology*, *42*(20), 17329–17339.

Nowakowska, I., Rajchert, J., & Jasielska, D. (2024). Prosocial sharing with organizations after the COVID-19 pandemic: A longitudinal test of the role of motives for helping and time perspectives. *PLOS ONE*, *19*(9), e0310511.

Oguni, R., & Ishii, C. (2024). Gratitude promotes prosocial behavior even in uncertain situation. *Scientific Reports*, *14*(1), 14379.

Olsson, M. I. T., Froehlich, L., Dorrough, A. R., & Martiny, S. E. (2021). The hers and his of prosociality across 10 countries. *British Journal of Social Psychology*, *60*(4), 1330–1349.

Ozdes, A. (2021). How did I do it then? How will I do it later? A theoretical review of the impact of mental time travel on decision-making processes. *New Ideas in Psychology*, *62*, 100869.

Pandey, M., Dwivedi, K., & Behera, N. (2025). Self-esteem mediates the effect of yoga-induced mindfulness on adolescents' emotional and behavioral problems and pro-social behavior. *Youth & Society*, 1–27.

Peetz, J., & Wohl, M. J. A. (2019). Perceiving time through group-based glasses: Collective temporal orientation. *British Journal of Social Psychology*, *58*(3), 609–629.

Przepiorka, A., & Sobol-Kwapinska, M. (2021). People with positive time perspective are more grateful and happier: Gratitude mediates the relationship between time perspective and life satisfaction. *Journal of Happiness Studies*, *22*(1), 113–126.

Rambaud, S. (2021). Positive intergroup interdependence, prejudice, outgroup stereotype and helping behaviors: The role of group-based gratitude. *International Review of Social Psychology*, *34*(1), 10.

Reyna, C., Harris, K., Bellovary, A., Armenta, A., & Zarate, M. (2022). The good ol' days: White identity, racial nostalgia, and the perpetuation of racial extremism. *Group Processes & Intergroup Relations*, *25*(3), 81–103.

Sedikides, C., & Wildschut, T. (2022). Nostalgia across cultures. *Journal of Pacific Rim Psychology*, *16*, 1–16.

Sedikides, C., Hong, E. K., & Wildschut, T. (2023). Self-continuity. *Annual Review of Psychology*, *74*, 333–361.

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.

Shrum, T. R. (2021). The salience of future impacts and the willingness to pay for climate change mitigation: An experiment in intergenerational framing. *Climatic Change*, *165*(1–2), 1–18.

Sierksma, J. (2018). Costs of helping only influence children' s intention to help ethnic out-group peers. *Journal of Experimental Child Psychology*, *173*, 85–99.

Simić, A., Sacchi, S., & Perugini, M. (2025). Our ways will not change: Future collective continuity increases present prosocial considerations. *British Journal of Social Psychology*, *64*(1), e12847.

Smith, P. B. (2017). Cultural Values Versus Cultural Norms as Predictors of Differences in Helping Behaviors and in Emotion Regulation: A Preliminary Nation-Level Test Related to the Leung-Morris Model. *Management and Organization Review*, *13*(4), 739–766.

Stanley, S. K., Klas, A., Clarke, E. J. R., & Walker, I. (2021). The effects of a temporal framing manipulation on environmentalism: A replication and extension. *PLOS ONE*, *16*(2), e0246058.

Stephan, E., & Sedikides, C. (2024). Mental time travel as self-affirmation. *Personality and Social Psychology Review*, *28*(2).

Sung, H., & Lee, H. (2021). The effect of flight attendants' self-leadership on prosocial service behavior: The mediating effect of self-esteem and the moderating effect of coaching. *International Journal of Tourism and Hospitality Research*, *35*(11).

Suss, J. H. (2023). Higher income individuals are more generous when local economic inequality is high. *PLOS ONE*, *18*(6), e0286273.

Taylor, A., & Carlson, J. (2025). Comparing who we are to who we could be: How future self-images influence consumer choices. *Psychology & Marketing*, 1–

17.

Tejada-Gallardo, C., Blasco-Belled, A., & Alsinet, C. (2021). Feeling positive towards time: How time attitude profiles are related to mental health in adolescents. *Journal of Adolescence*, *89*(1), 84–94.

Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review*, *117*(2), 440–463.

Turner, R. N., & Stathi, S. (2023). Nostalgic intergroup contact and intergroup relations: Theoretical, empirical, and applied dimensions. *Current Opinion in Psychology*, *51*, 101585.

Vazeou-Nieuwenhuis, A. (2018). Connecting the dots from a distance: Does mentally traveling through space and time increase searching for life' s meaning? *The Journal of Positive Psychology*, *13*(2), 165–173.

Vlasceanu, M., Doell, K. C., Bak-Coleman, J. B., Todorova, B., Berkebile-Weinberg, M. M., Grayson, S. J., Patel, Y., Goldwert, D., Pei, Y., Chakroff, A., Pronizius, E., van den Broek, K. L., Vlasceanu, D., Constantino, S., Morais, M. J., Schumann, P., Rathje, S., Fang, K., Aglioti, S. M., ···Van Bavel, J. J. (2024). Addressing climate change with behavioral science: A global intervention tournament in 63 countries. *Science Advances*, *10*(6), 5778.

Wang, Y., Tian, H., Sarigöllü, E., & Xu, W. (2020). Nostalgia prompts sustainable product disposal. *Journal of Consumer Behaviour*, *19*(6), 570–580.

Wang, Y., Yang, C., Zhang, Y., & Hu, X. (2021). Socioeconomic status and prosocial behavior: The mediating roles of community identity and perceived control. *International Journal of Environmental Research and Public Health*, *18*(19), 10321.

Waytz, A., Iyer, R., Young, L., Haidt, J., & Graham, J. (2019). Ideological differences in the expanse of the moral circle. *Nature Communications*, *10*(1), 4389.

Wolff, F., & Möller, J. (2022). An individual participant data meta-analysis of the joint effects of social, dimensional, and temporal comparisons on students' academic self-concepts. *Educational Psychology Review*, *34*(4), 2569–2608.

Worrell, F. C., Mello, Z. R., & Buhl, M. (2013). Introducing English and German versions of the Adolescent Time Attitude Scale. *Assessment*, *20*(4), 496–510.

Wright, S. C., & Richard, N. T. (2010). Cross-group helping: Perspectives on why and why not. In S. Stürmer & M. Snyder (Eds.), *The psychology of prosocial behavior: Group processes, intergroup relations, and helping* (pp. 311–335). Blackwell.

Xiao, S. X., Korous, K. M., Hewitt, S. L., & Nguyen, D. (2023). Family economic pressure and early adolescents' prosocial behavior: The importance of considering the types of prosocial behavior. *Journal of Adolescence*, *95*(6), 1220–1231.

Yang, Y., Kong, X., Guo, Z., & Kou, Y. (2021). Can self-compassion promote gratitude and prosocial behavior in adolescents? A 3-year longitudinal study from China. *Mindfulness*, *12*(6), 1377–1386.

Yuan, M., Yin, Y., Liu, J., & Sang, B. (2024). Adolescent mental time travel predicting meaning in life: The potential mediating role of self-continuity. *Journal of Adolescence (London, England.)*, *97*(3), 675–686.

Zeng, X., Kralj, A., Nimri, R., & Li, Y. (2024). Past reflection and future selection: A study of green hotel choices. *International Journal of Hospitality Management*, *122*, 103880.

Zhou, Z., Wang, Y., Zheng, Y., & Liu, S. (2023). Effects of brand community social responsibility: Roles of collective self-esteem and altruism. *Journal of Brand Management*, *30*(4), 347–366.

Zhu, J., Hu, S., Wang, J., & Zheng, X. (2020). Future orientation promotes climate concern and mitigation. *Journal of Cleaner Production*, *262*, 121212.

Zhu, N., Li, C., Ye, Y., Zhang, L., & Kong, F. (2024). Longitudinal effect of gratitude on prosocial behavior among young adults: Evidence from the bi-factor model of gratitude. *Journal of Happiness Studies*, *25*(1–2), 3.

Zlomuzica, A., Woud, M. L., Machulska, A., Kleimt, K., Dietrich, L., Wolf, O. T., Assion, H.-J., Huston, J. P., De Souza Silva, M. A., Dere, E., & Margraf, J. (2018). Deficits in episodic memory and mental time travel in patients with post-traumatic stress disorder. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, *83*, 42–54.

Note: Figure translations are in progress. See original paper for figures.