How Does Parental Motivation Promote Prosocial Behavior? A Study on the Cognitive-Energetic Mechanism and Nudging Based on Evolutionary Adaptiveness

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Abstract

Prosocial behavior refers to actions that benefit others or society, such as cooperation, donation, and helping, and plays an important role in promoting social prosperity, enterprise development, and individual well-being. In recent years, the concept of "nurturing motivation" from evolutionary psychology has been introduced into the management field, providing a new perspective for understanding prosocial behavior. Based on this, this study aims to reveal the "cognitive-energy" mechanism through which nurturing motivation influences prosocial behavior from an evolutionary adaptation perspective, and posits that nurturing motivation promotes prosocial behavior through the mechanisms of "shared cognition" and "hope empowerment" respectively. Specifically, Study 1 employs multiple research methods to investigate the behavioral patterns of how nurturing motivation influences prosocial behavior. Study 2 explores the "cognitive-energy" mechanism of shared cognition and hope empowerment through which nurturing motivation influences prosocial behavior. Study 3, based on the patterns of how nurturing motivation influences prosocial behavior, explores how to nudge individual and organizational prosocial behavior in real-world contexts. We expect that the research findings will facilitate understanding of the cognitive-energy model of how nurturing motivation overcomes constraints on prosocial behavior from an evolutionary adaptation perspective, and also provide important scientific evidence for enhancing prosocial behavior in practice.

Full Text

Preamble

How Does Parenting Motivation Promote Prosocial Behavior? A Cognitive-Energetics Mechanism Based on Evolutionary Adaptation and Nudging Research

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Abstract

Prosocial behaviors—such as cooperation, donation, and helping—play a crucial role in promoting social prosperity, organizational development, and individual well-being. Recently, the concept of "parenting motivation" from evolutionary psychology has been introduced into management research, offering a new perspective for understanding prosocial behavior. Building on this, the present study aims to reveal the "cognitive-energetics" mechanism through which parenting motivation influences prosocial behavior from an evolutionary adaptation perspective. We propose that parenting motivation promotes prosocial behavior through two distinct pathways: "communal cognition"and "hope empowerment." Specifically, Study 1 employs multiple methods to investigate the behavioral patterns of how parenting motivation affects prosocial behavior. Study 2 explores the underlying "cognitive-energetics" mechanisms of communal cognition and hope empowerment. Study 3 examines how to leverage these findings to nudge prosocial behavior in real-world settings. We anticipate that these results will not only advance theoretical understanding of how parenting motivation overcomes the restraining forces on prosocial behavior through a cognitive-energetics model, but also provide important scientific evidence for enhancing prosocial behavior in practice.

Keywords: parenting motivation, prosocial behavior, evolutionary adaptation, "cognitive-energetics" mechanism

1 Introduction

Prosocial behavior refers to actions that benefit others, groups, or society (Zhang Weiwei et al., 2023; Eisenberg & Mussen, 1989; Labroo & Goldsmith, 2021), including cooperation, donation, helping, and resource sharing (Liang et al., 2016; Roux et al., 2015). Throughout human evolutionary history, prosocial behaviors have been vital for species survival, enabling our ancestors to overcome crises such as food shortages and natural disasters through mutual support and cooperation. In contemporary society, promoting prosocial behavior remains critically important. At the national level, it contributes to improving the tertiary distribution system and advancing common prosperity (Yang Fangfang,

2022). At the organizational level, it enhances corporate reputation (Eberle et al., 2013) and boosts employee creativity and productivity (Liao et al., 2022). At the individual level, it improves interpersonal reputation (Gross & De Dreu, 2019) and increases life satisfaction (Falk & Graeber, 2020; Wang et al., 2020).

Despite its significance, research shows that people are not always willing to engage in prosocial behavior due to behavioral constraints such as self-other benefit trade-offs (White et al., 2020). Consequently, how to promote prosocial behavior has become a central concern across behavioral decision-making, management, and psychology, maintaining consistent prominence in top-tier journals worldwide. Previous studies have examined prosocial behavior from multiple angles, including individual factors, social influences, and situational contexts (Sun Qingzhou et al., 2023; Brough et al., 2016; Wu et al., 2022). However, certain real-world instances of prosocial behavior remain unexplained. For example, why did Mark Zuckerberg donate 99% of his Facebook shares to charitable causes after his first daughter' s birth? Why do new parents voluntarily spend time sharing advice on social media to help other new parents? These phenomena call for new theoretical perspectives.

In recent years, researchers have begun introducing "parenting motivation" — a deep-seated motivational mechanism from evolutionary psychology—into management research (Li et al., 2019). Parenting motivation refers to a suite of psychological mechanisms aimed at caring for vulnerable young offspring (Buckels et al., 2015; Griskevicius & Kenrick, 2013), representing a crucial component of human evolutionary adaptation for ensuring offspring survival. Whether individual or corporate decision-makers, most people in society ultimately belong to small family units and share the identity of parents. Parents constitute a substantial proportion of the overall decision-making population (Liang et al., 2023), and either parental role salience or parental mindset can activate parenting motivation. Moreover, even non-parents can have their parenting motivation primed by contextual factors such as advertisements or slogans (Li et al., 2019), subsequently influencing their decisions. Research has shown that parental status affects corporate executives' decisions and that activating parenting motivation influences consumer behavior (Cronqvist & Yu, 2017; Liang et al., 2023). In reality, many prosocial actors are parents (Cakanlar et al., 2023; Mesurado & Richaud, 2017), such as donating in the name of family or giving away unused clothing. Zuckerberg' s post-birth charitable donation illustrates how parental identity activation or parenting motivation priming significantly enhances prosocial tendencies. Based on these observations, we argue that investigating the phenomena, mechanisms, and nudging strategies of parenting motivation' s influence on prosocial behavior is theoretically and practically significant, yet remains unexplored in existing literature.

As an evolutionary product, parenting motivation functions as a fundamental regulatory system that guides human behavior toward offspring survival and genetic propagation, explainable through evolutionary adaptation (Griskevicius & Kenrick, 2013). When environmental opportunities or obstacles rel-

evant to genetic continuation arise, evolutionary adaptation activates to promote opportunity-seeking (e.g., acquiring better living conditions) or obstacle-avoidance (e.g., evading danger) behaviors (Lewis et al., 2017). Existing research has documented avoidance-oriented behavioral changes triggered by parenting motivation, such as increased risk aversion and cautiousness (Schaller, 2018), which protect offspring from potential threats. However, to ensure offspring adaptability, parents must not only secure survival but also enable thriving (Schaller, 2018). Parenting motivation should therefore also drive opportunity-seeking behaviors related to offspring survival, though research in this area remains scarce.

From an evolutionary adaptation perspective, we propose that prosocial behavior, as a potential opportunity-seeking strategy, may be promoted by parenting motivation through distinct "cognitive-energetics" pathways. Cognitive energetics theory posits that behavioral likelihood depends on the relative magnitude of "driving forces" and "restraining forces." Driving forces have both direction and magnitude: direction represents the cognitive desire to engage in a behavior (wanting to act), while magnitude refers to having sufficient energy to perform it (being able to act). Both cognitive and energetic dimensions determine the probability of behavior (Kruglanski et al., 2012). Specifically, parenting motivation may alter cognitive perceptions of relationships with prosocial beneficiaries, fostering communal cognition, while also providing behavioral energy through evolutionarily adaptive emotional empowerment—hope. This study aims to address three key questions: (1) Does parenting motivation affect prosocial behavior? (2) What are the underlying psychological mechanisms? (3) How can parenting motivation be leveraged to nudge prosocial behavior? By exploring these questions, we not only theoretically innovate the cognitive-energetics model of parenting motivation overcoming prosocial constraints, but also provide practical guidance for enhancing prosocial behavior.

2.1 Parenting Motivation from an Evolutionary Adaptation Perspective

Parenting motivation, or the parental care motivational system, comprises psychological mechanisms designed to nurture vulnerable young offspring (Buckels et al., 2015; Griskevicius & Kenrick, 2013; Li et al., 2019). This evolutionary-derived motivation is instinctually encoded in human genes. The theoretical foundation of evolutionary psychology traces back to Darwin' s natural selection theory (Darwin, 1859), with adaptation as its core tenet. Human survival and development represent a series of adaptive processes where organisms must solve adaptive problems related to survival, growth, development, and reproduction (Chisholm et al., 1993). Adaptive problems refer to persistent challenges in human evolutionary history involving opportunities (e.g., potential mates, rich habitats) or obstacles (e.g., fierce predators, food scarcity; Cosmides & Tooby, 2000) for survival and genetic continuation, with adaptation representing the utilization of opportunities and avoidance of obstacles.

According to life-history theory, reproductive fitness requires not only personal survival and reproduction but also ensuring offspring survive to reproductive age (Buckels et al., 2015; Chisholm et al., 1993). Human offspring mature slowly and remain relatively vulnerable during infancy, unable to survive independently for years while being susceptible to injury and illness (Schaller, 2018). Parenting motivation evolved to address this adaptive challenge, becoming essential for reproductive fitness (Geary, 2000). While early research focused primarily on parents (Bornstein, 2005), subsequent studies revealed that parenting motivation is not limited to parents. Although parental status frequently activates parenting motivation and parents may exhibit higher levels than non-parents (Buckels et al., 2015), all adults possess the evolutionary foundation for caregiving (Buckels et al., 2015; Gilead & Liberman, 2014). Environmental cues like Lorenz' s (1943) baby schema can prime parenting motivation in both parents and non-parents (Schaller, 2018), and individual differences in parenting motivation can be measured with validated scales (Buckels et al., 2015).

As a construct within evolutionary psychology, parenting motivation operates as a fundamental regulatory system that modulates behavior toward offspring survival and genetic propagation (Schaller et al., 2017; Tooby & Cosmides, 2015). Research demonstrates several behavioral consequences. First, parenting motivation increases risk aversion and cautiousness. Parents show heightened sensitivity to danger, perceiving threatening individuals as larger in visual experiments (Fessler et al., 2014), and exhibit greater risk avoidance and distrust of strangers when parental roles are salient (Eibach & Mock, 2011). Parenting motivation also influences moral perception and political judgment, with high parenting motivation individuals making harsher moral evaluations of rule violators (Buckels et al., 2015), showing greater sensitivity to moral transgressions (Kerry & Murray, 2018), and expressing stronger disapproval of offensive behavior (Eibach et al., 2009). When primed, individuals display increased aggression and bias against out-groups perceived as threatening (Gilead & Liberman, 2014), and endorse more conservative moral and economic positions (Kerry & Murray, 2018, 2020).

At the social cognition level, parenting motivation alters attention to and interpretation of social cues. High parenting motivation individuals respond more positively to infant faces and favor baby-faced adults (Buckels et al., 2015). When activated, parenting motivation increases perceived connection with others and promotes interdependent self-construal (Li & Gong, 2018). Additionally, it triggers resource investment in offspring, with parents sacrificing personal resources for their children (Canova et al., 2005; Wang Xiaotian, 2007). Parenting motivation also affects savings motives, as parents establish hierarchically ordered saving goals prioritizing child-related emergencies (Canova et al., 2005), and more educated parents save more for children' s college education (Lee et al., 1997). Furthermore, parenting motivation activates resource acquisition behaviors and promotes long-term orientation (Li et al., 2019).

2.2 Prosocial Behavior and Motivational Mechanisms

Prosocial behavior encompasses actions benefiting others, groups, or society (Zheng Xiaoying et al., 2015; Eisenberg & Mussen, 1989; Labroo & Goldsmith, 2021), including helping, sharing valuable resources, charitable donation, volunteering, and rule compliance (Böhm et al., 2018; Liang et al., 2016; Roux et al., 2015). Despite clear benefits to others, people do not always engage in prosocial behavior. However, given its importance for social equity, trust, and cooperation (De Dreu et al., 2022; Goenka & Van Osselaer, 2019), extensive research has investigated its antecedents, spanning individual factors (religiosity, gender, entitlement, morality; Yao Qi et al., 2020; Brough et al., 2016; Reed II et al., 2016; Stavrova & Siegers, 2014), social factors (social class, exclusion, comparison; Sun Qingzhou et al., 2023; Zhang Weiwei et al., 2023; Lee & Shrum, 2012), and situational factors (emotions, framing effects, rewards and punishments; Sun Qian et al., 2023; Basu, 2021; Cavanaugh et al., 2015; Wu et al., 2022).

From an evolutionary adaptation perspective, prosocial behavior appears maladaptive as it depletes individual resources (Xie Xiaofei et al., 2017). According to Darwin' s natural selection theory, traits enhancing survival and reproduction are more likely to be transmitted (Darwin, 1859). Why then do humans engage in prosocial behavior? One explanation involves altruistic motivation—acting out of genuine concern for others' welfare (Batson, 2010). Humans naturally tend to care for those in need (Grant, 2008), and perspective-taking exercises increase understanding of others' situations and subsequent prosocial behavior (Batson & Moran, 1999; Shih et al., 2009). Altruistic motivation also connects to the "warm glow" effect, where donating to charity generates positive emotions or satisfies a desire to help (Imas, 2014; O' Brien & Kassirer, 2019; Supphellen & Nelson, 2001).

Alternatively, prosocial behavior may be self-motivated, driven by expectations of rewards or benefits. These benefits can be direct, such as reciprocal exchanges ("I help you, you help me") or simultaneous self-interest ("I help you while gaining something"). Research shows that monetary or symbolic rewards increase prosocial tendencies, public goods contributions, and donations (Wu et al., 2022; Johnson & Grimm, 2010). Benefits can also be indirect: individuals may seek positive evaluations and good reputations (Berman & Silver, 2022; Bigman & Tamir, 2016), display cooperative traits to gain social advantages (Roux et al., 2015), or expand social networks through prosocial acts (Hamilton et al., 2021). Thus, prosocial behavior can be viewed as a potential resource acquisition strategy yielding mutual aid, rewards, and reputation.

From an evolutionary standpoint, several theories explain prosocial behavior' s adaptive value. Kin selection theory posits that prosocial preferences favor genetically close relatives, thereby benefiting one' s own genes (Nowak, 2006). Parents' unconditional investment in offspring, while resource-depleting, ensures offspring survival and reproduction, ultimately promoting genetic propagation

(Kurzban et al., 2015). This unconditional altruism can generalize to non-kin contexts, prompting pure altruism toward strangers in distress (Preston, 2013). However, this theory primarily explains kin-directed prosociality and cannot specify when such behavior transfers to non-kin situations.

Reciprocal altruism theory explains altruism among non-kin strangers through direct reciprocity: although altruism incurs costs, future reciprocation from beneficiaries can compensate for reduced fitness (Trivers, 1971). This "I help you once, you help me once" arrangement ensures group cooperation, which was essential for overcoming environmental challenges in ancestral societies (Nowak, 2006). The theory' s limitation lies in its inability to account for altruism that receives no direct reciprocation, such as help given to strangers who cannot return the favor.

Costly signaling theory suggests prosocial behavior reliably signals personal qualities (Zahavi, 1975; Xie Xiaofei et al., 2017). Individuals may help others not for direct reciprocation but to gain positive evaluations, build social reputations, or display cooperative traits (Berman & Silver, 2022; Bigman & Tamir, 2016). Men may engage in prosocial behavior to demonstrate desirable qualities to potential mates (Borau et al., 2021). Acquiring social reputation and displaying cooperative traits can increase cooperation opportunities and leadership selection, enhancing evolutionary fitness (Hardy & van Vugt, 2006). This theory is limited to publicly observable prosocial displays.

2.3 The Cognitive-Energetics Mechanism of Parenting Motivation on Prosocial Behavior

Cognitive energetics theory explains behavioral motivation in situations requiring effort or facing obstacles, depicting the dynamic interplay between driving and restraining forces: behavior is likely when driving forces exceed restraining forces (Hockey, 1996; Kruglanski et al., 2012). Driving forces constitute "motivated cognition" with two dimensions: direction (whether one wants to act, reflected in goal identification or expectation) and magnitude (whether one has sufficient behavioral energy; Dunning, 1999). Increases in either dimension enhance overall driving force and behavioral likelihood (Yan & Murray, 2023). Although cognition and energy theoretically operate jointly, research indicates they can function as relatively independent pathways to strengthen behavioral tendencies, particularly when behavioral constraints intensify (Kruglanski et al., 2012).

Given its explanatory power, cognitive energetics theory has been widely applied in management research to explain problem-solving ability, job performance (DeWall et al., 2010), pro-environmental behavior (Yan & Murray, 2023), and leadership effectiveness (Lanaj et al., 2019). Prosocial behavior faces significant restraining forces: it requires personal cost to benefit others (Small & Cryder, 2016), and its outcomes are often ambiguous and uncertain, leaving people unsure whether their actions will make a difference (White et al., 2020).

Despite this, no research has applied cognitive energetics theory to explain how parenting motivation influences prosocial behavior. This study addresses this gap by examining the specific cognitive and energetic pathways through which parenting motivation drives prosocial behavior.

First, parenting motivation influences behavioral cognition. Research shows parenting motivation alters risk perception, making potential dangers seem larger (Fessler et al., 2014), and affects social cognition by eliciting more positive responses to infant faces and baby-faced adults (Buckels et al., 2015). Preliminary work suggests parenting motivation increases perceived connection with others (Li & Gong, 2018). Since the primary constraint on prosocial behavior involves the self-other benefit trade-off (Small & Cryder, 2016), altering relationship perceptions with beneficiaries represents a critical factor. Research demonstrates that perceiving beneficiaries as in-group members increases donation likelihood (Duclos & Barasch, 2014), and viewing relationships as communal rather than exchange-based increases helping behavior (Guo et al., 2022). However, whether parenting motivation affects relationship perceptions with prosocial beneficiaries remains unexplored.

Second, parenting motivation influences behavioral energy. Evolutionary adaptation involves energy allocation: when adaptive problems are detected, evolutionarily adaptive emotions activate as "front-end responses" (Cosmides & Tooby, 2000). These emotions are not merely feelings but energy allocation systems that direct resources toward adaptive behaviors (Cosmides & Tooby, 2000; Keltner et al., 2013). In the classic "fight-or-flight" response, anger provides approach-oriented energy for fighting while fear provides avoidance-oriented energy for fleeing, temporarily suppressing other needs (Carver & Harmon-Jones, 2009; Cosmides & Tooby, 2000). If prosocial behavior represents an adaptive opportunity for offspring survival, what adaptive emotion does parenting motivation trigger to empower subsequent action? This study investigates this question.

2.4 Review of Current Research Status

Although existing research has explored how parenting motivation influences behavior, several limitations remain. First, most studies focus on avoidance-oriented changes, such as increased risk aversion and caution (Sherman et al., 2009; Schaller, 2018). However, humans must not only avoid threats but also secure better opportunities for survival and offspring reproduction (Lewis et al., 2017). To ensure reproductive fitness, parents must promote offspring thriving, not merely survival (Schaller, 2018). Research also shows parenting motivation correlates positively with broad approach motivation (Buckels et al., 2015). Therefore, parenting motivation should drive opportunity-seeking behaviors to create better environments for offspring, yet research on non-monetary resource acquisition (e.g., social resources) remains limited.

Second, research on parenting motivation in management is still nascent, with

only a few studies examining its effects on consumer intertemporal preferences and variety-seeking (Li et al., 2019; Liang et al., 2023). Given the large parental population and ubiquitous parenting motivation cues in daily life, parenting motivation likely has broader impacts on managerial decisions, including prosocial behavior in organizational contexts.

Regarding prosocial behavior research, gaps persist across antecedents, explanatory mechanisms, and evolutionary perspectives. While individual, social, and situational factors have been examined, parenting motivation' s influence remains unstudied. Existing explanations relying on self-interest and altruism motives cannot account for all prosocial behaviors, necessitating new theoretical perspectives. Furthermore, although evolutionary mechanisms have been proposed, theoretical controversies and limitations persist.

Finally, despite cognitive energetics theory' s application to behaviors with restraining forces (e.g., goal pursuit and job performance; Lanaj et al., 2019), no research has examined prosocial behavior from this perspective. This represents a theoretical gap in understanding the cognitive-energetics mechanism of parenting motivation on prosocial behavior. We propose that evolutionary adaptation-based parenting motivation may both alter relational cognition with beneficiaries and activate proximal emotional energy allocation to empower adaptive action.

3 Research Proposal

Addressing the core question of how parenting motivation influences prosocial behavior, this research comprises three progressive studies. Study 1 examines behavioral patterns, Study 2 investigates the cognitive-energetics mechanisms, and Study 3 tests field interventions. Eight experiments are planned across the three studies.

Study 1 uses multiple methods (Study 1a: big data analysis, Study 1b: multi-time-point survey, Study 1c: laboratory experiment) to validate the effect of parenting motivation on prosocial behavior. Since parenting motivation can be activated through parental role salience, measured as a trait, or primed situationally, the three sub-studies respectively manipulate parental role salience (Study 1a), measure parenting motivation traits (Study 1b), and prime parenting motivation situationally (Study 1c) to test whether different sources consistently influence prosocial behavior. Additionally, because prosocial behavior encompasses diverse actions (charitable donation, helping, resource sharing), different measurement approaches will be used to ensure robustness.

Study 2 comprises four sub-studies. Studies 2.1a and 2.1b test the communal cognition mechanism through mediation and moderated mediation designs, respectively, with beneficiary social distance as a moderator (external factor). Studies 2.2a and 2.2b test the hope empowerment mechanism similarly, with moral identity as a moderator (internal factor).

Study 3 conducts field experiments in collaboration with enterprises and charitable foundations (e.g., Tencent Charity Platform), testing whether adding parenting role or baby schema cues to charitable appeals can effectively nudge prosocial behavior. This approach validates external validity while translating theoretical findings into practical applications.

3.1 Study 1: Behavioral Patterns of Parenting Motivation on Prosocial Behavior

Parenting motivation regulates behavior to adapt to offspring survival and genetic propagation (Schaller et al., 2017). When environmental opportunities or obstacles relevant to offspring survival emerge, parenting motivation promotes opportunity utilization and obstacle avoidance to ensure better offspring outcomes (Schaller, 2018). Research demonstrates that parenting motivation increases risk aversion and conservatism (Eibach & Mock, 2011; Fessler et al., 2014; Kerry & Murray, 2020) while also driving opportunity-seeking for offspring survival, such as establishing savings goals (Canova et al., 2005) and actively acquiring resources (Li et al., 2019).

Beyond material resources, parenting motivation may drive individuals to seek social resources more broadly. New parents tend to connect with similar others in online communities (Labroo & Goldsmith, 2021), and parenting motivation primes interdependent self-construal, potentially because interdependence facilitates harmonious group relations essential for caregiving roles (Li & Gong, 2018). Prosocial behavior itself possesses evolutionary adaptiveness as a potential resource acquisition strategy. In harsh ancestral environments, mutual support and prosocial behavior ensured human survival (Nowak, 2006). Although costly, prosocial behavior yields social resources including help, rewards, and reputation. In reciprocal altruism, it brings assistance and rewards (Wu et al., 2022). It also builds reputation and displays desirable traits (Berman & Silver, 2022; Bigman & Tamir, 2016), securing cooperation opportunities and resources (Hardy & van Vugt, 2006). Furthermore, prosocial behavior expands social connections (Hamilton et al., 2021), which individuals actively pursue when seeking to establish social ties (Stenstrom et al., 2018). These resources undoubtedly facilitate genetic continuation and offspring survival. Therefore, if parenting motivation adaptively strengthens opportunity-seeking, it should increase prosocial behavior.

Proposition 1: Parenting motivation promotes prosocial behavior.

3.2 Study 2: The Cognitive-Energetics Mechanism

(1) Cognitive Mechanism: Communal Cognition

Interpersonal relationship theory distinguishes between exchange relationships (where benefits are expected to be reciprocated) and communal relationships (where giving aims to enhance the other' s welfare without explicit price tags,

though givers may hope for similar responses when in need; Clark & Mills, 1993, 2012). Communal relationships have evolutionary significance. Human offspring' s slow maturation and vulnerability require continuous care from kin and group members for survival (Kurzban et al., 2015). In ancestral tribes, communal sharing of unpredictable resources ensured survival and development, making communal relationships essential for human existence (Kelley et al., 2003). Modern society requires considering communal relationships across broader social contexts.

Parenting motivation may lead individuals to adopt communal cognition toward others, particularly when seeking social connections. Communal relationships serve affiliative functions, promoting alliance formation (Cannon & Rucker, 2020). New community residents prefer communal over exchange models to establish neighborly connections (Clark & Mills, 2012). Communal cognition also increases willingness to sacrifice self-interest for prosocial behavior (Guo et al., 2022), with high communal orientation individuals more likely to fairly distribute rewards with friends (Thompson & DeHarpport, 1998) and help homeless people (Bryan et al., 2000).

Proposition 2: Parenting motivation strengthens communal cognition, thereby promoting prosocial behavior.

If this effect stems from parenting motivation' s drive to establish social connections and acquire resources through communal cognition, it should weaken when communal relationships cannot be formed. Social distance may be a key factor. Communal relationships involve expectations of mutual support when needed (Clark & Mills, 2012). While modern society expands the scope for communal relationships beyond ancestral tribes (Pataki et al., 1994), excessively distant social relationships (e.g., global populations) may preclude such expectations. Therefore, beneficiary social distance may moderate the effect, which should be significant at close distance but attenuated at far distance.

Proposition 3: Social distance (far vs. near) moderates the cognitive mechanism. The positive effect of parenting motivation on prosocial behavior is significant at close social distance but weakened at far social distance.

(2) Energetic Mechanism: Hope Empowerment

Evolutionary adaptation involves behavioral energy allocation. When adaptive problems are detected, evolutionarily adaptive emotions activate as "front-end responses" (Cosmides & Tooby, 2000), redirecting energy from secondary needs toward solving critical survival or reproduction challenges (Griskevicius et al., 2009). In the "fight-or-flight" response, anger empowers fighting while fear empowers fleeing (Carver & Harmon-Jones, 2009; Cosmides & Tooby, 2000).

If prosocial behavior represents an adaptive opportunity for offspring survival, parenting motivation should trigger hope as the adaptive emotional response. Hope describes "a yearning for better circumstances combined with belief that

improvement is possible" (Lazarus, 2006). As a cognitive-evaluative emotion, hope requires two conditions: (1) evaluating current circumstances as unsatisfactory and desiring improvement, and (2) believing improvement is achievable (Cohen-Chen et al., 2015; Lazarus, 1999). Snyder (2002) defined hope as a positive motivational state based on (a) agency (goal-directed energy) and (b) pathways (planning to achieve goals). Hope thus provides both behavioral energy and perceived capability to achieve goals. Research confirms hope' s motivational properties energize behavior (Nelissen, 2017; Bury et al., 2020). As an evolutionarily adaptive emotion, hope played a key role in human adaptation to environmental challenges (Bunston et al., 1995). Maintaining hope prevented despair and enhanced adaptive agency, while losing hope could lead to death (Korner, 1970). Given life' s finitude but genes' long-term continuity (Cosmides & Tooby, 2000), parenting motivation' s focus on offspring survival and genetic continuation may generate hope when adaptive opportunities are identified. Previous research has confirmed hope' s positive effect on prosocial behavior (Cavanaugh et al., 2015).

Proposition 4: Parenting motivation enhances hope, thereby promoting prosocial behavior.

If this energetic mechanism operates through hope empowerment, it should weaken when hope is difficult to generate. Hope requires perceiving current circumstances as unsatisfactory and believing improvement is possible (Cohen-Chen et al., 2015; Lazarus, 1999). In prosocial contexts, perceiving an adaptive problem and genetic continuation possibilities may generate hope. However, not everyone perceives prosocial situations as needing improvement. For instance, when seeing homeless individuals, some may not view their circumstances as unsatisfactory or worthy of improvement, thereby blocking hope activation.

Moral identity comprises a self-schema organized around moral traits like fairness, honesty, and kindness (Aquino & Reed II, 2002). The moral system determines judgments of right and wrong and principles about what benefits individuals and society (Reed II et al., 2016). High moral identity individuals are more sensitive to moral imperatives and more likely to act morally (Reed et al., 2007), making them more likely to perceive need for improvement in prosocial situations and view prosocial action as necessary. Low moral identity individuals may be less sensitive to prosocial contexts, hindering hope generation. Therefore, parenting motivation' s hope empowerment effect should be stronger among high moral identity individuals and weaker among low moral identity individuals.

Proposition 5: Moral identity (high vs. low) moderates the energetic mechanism. The positive effect of parenting motivation on prosocial behavior is enhanced among high moral identity individuals and attenuated among low moral identity individuals.

3.3 Study 3: Field Nudging of Parenting Motivation for Prosocial Behavior

Nudging, a novel research approach in behavioral science over the past two decades, employs "soft" methods that neither mandate nor economically incentivize but instead subtly alter choice architecture to produce desired behavioral changes. Nudging is cost-effective, efficient, and preserves individual freedom, offering new solutions to social problems (He Guibing et al., 2018; Li Shu, 2016). Pioneer Richard Thaler received the 2017 Nobel Prize in Economics for this work. Nudging has proven effective in health, environmental protection, social security, education, and charity. Examples include using framing effects with temporal cues to boost retirement savings (Beshears et al., 2021), default options to reduce single-use cutlery (He et al., 2023), temporal and valence information to promote vaccination (Liu Nan et al., 2022), and health goals to nudge health decisions (Geng Xiaowei et al., 2018).

Building on Studies 1 and 2, Study 3 tests whether parenting motivation can nudge prosocial behavior in real-world settings. Using parenting role and baby schema cues in charitable appeals (e.g., donation slogans), we will test intervention effectiveness through field experiments with corporations and charitable foundations (e.g., Tencent Charity Platform). This approach validates external validity while translating theory into observable behavioral change.

Proposition 6: Adding parenting motivation cues can nudge prosocial behavior in real-world contexts.

4 Theoretical Contributions and Significance

As a paramount human behavior, prosocial behavior represents a classic and cutting-edge research topic across disciplines (Xie Xiaofei et al., 2017). Previous studies have examined prosocial promotion from multiple perspectives (Sun Qingzhou et al., 2023; Brough et al., 2016; Stavrova & Siegers, 2014; Cavanaugh et al., 2015; Wu et al., 2022). This study innovatively constructs a cognitive-energetics model of parenting motivation' s influence on prosocial behavior from an evolutionary adaptation perspective [Figure 1: see original paper].

First, this study establishes the behavioral pattern of parenting motivation' s effect on prosocial behavior. As a fundamental regulatory mechanism evolved to drive offspring-survival behavior (Buckels et al., 2015; Griskevicius & Kenrick, 2013), parenting motivation has been studied primarily for its risk-avoidance effects (Fessler et al., 2014; Eibach & Mock, 2011). However, offspring thriving requires more than survival—it demands comprehensive development and social adaptation. In ancestral societies, resource sharing and mutual care were critical for offspring survival (Clark & Mills, 2012). In modern society, parenting motivation may drive individuals to build social connections and acquire social capital across broader networks. Prosocial behavior is a key strategy for establishing social bonds and securing resources, enhancing social status and support (Berman

& Silver, 2022; Bigman & Tamir, 2016; Stenstrom et al., 2018). We propose that parenting motivation drives not only threat avoidance but also proactive prosocial behavior to obtain social resources for offspring development.

Additionally, physiological factors may play a role. Parent-child interactions increase oxytocin levels (Feldman & Bakermans-Kranenburg, 2017), which promotes prosocial behavior (Christ et al., 2016). However, to ensure generalizability beyond parents, this study controls for physiological mechanisms to isolate parenting motivation' s independent behavioral effects.

Second, this study builds a cognitive-energetics model of parenting motivation' s influence on prosocial behavior. Cognitive energetics theory emphasizes the dynamic balance between driving and restraining forces (Hockey, 1996; Kruglanski et al., 2012), where cognition and energy determine driving force magnitude (Dunning, 1999). Prosocial behavior faces clear restraining forces: self-cost for others' benefit (Small & Cryder, 2016) and uncertain outcomes that weaken motivation (White et al., 2020). We propose that parenting motivation' s evolutionary adaptability overcomes these restraints through two pathways:

Cognitive Pathway: Prosocial action requires cognitive motivation (wanting to act). Parenting motivation alters relational cognition with beneficiaries, promoting communal rather than exchange relationships. Communal cognition is evolutionarily adaptive—essential for survival in ancestral societies (Kelley et al., 2003) and for building social connections today (Cannon & Rucker, 2020). When activated, parenting motivation should facilitate perceiving relationships as communal, easing self-other benefit trade-offs. Communal cognition has been shown to enhance prosocial tendencies (Guo et al., 2022). Social distance moderates this pathway: effects should weaken when communal relationships cannot be established, such as with distant others.

Energetic Pathway: Prosocial behavior requires behavioral energy (being able to act). Energy insufficiency is a key constraint, as outcome uncertainty reduces prosocial willingness (White et al., 2020). Evolutionary psychology shows adaptive emotions reallocate energy to address critical challenges (Griskevicius et al., 2009). We propose that genetic continuation possibilities trigger hope, an evolutionarily adaptive emotion (Bunston et al., 1995), which energizes action. Hope prevented despair and enhanced adaptive agency throughout human evolution (Lazarus, 1999). We further hypothesize moral identity moderates this pathway: low moral identity individuals may not perceive prosocial behavior as adaptive, preventing hope activation and weakening parenting motivation' s effect.

This study makes several contributions. First, it identifies parenting motivation as a novel antecedent of prosocial behavior and provides a new theoretical perspective beyond self-interest and altruism motives. While evolutionary drivers like mating motivation have been studied (Borau et al., 2021), parenting motivation' s role remains unexplored. Our opportunity-seeking perspective offers fresh insights into prosocial behavior' s evolutionary origins.

Second, we reveal the specific cognitive-energetics pathways: the "communal cognition" path shows parenting motivation promotes communal relational cognition, contributing to communal relationship theory; the "hope empowerment"path demonstrates how parenting motivation reallocates behavioral energy through hope, revealing a "motivated to help" pathway.

Third, we advance parenting motivation research by shifting focus from avoidance-oriented changes to opportunity-seeking behaviors (prosocial behavior) and by identifying the cognitive-energetics mechanism.

Finally, our field nudging experiments provide practical implications. Organizations can use big data to identify high parenting motivation individuals for targeted appeals, or prime parenting motivation situationally to enhance persuasion effectiveness, thereby boosting charitable participation and social welfare.

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Author Contribution Statement

Liu Nan: Conceptualized the research, designed the study protocol; Liu Nan, Qiu Yuting, Dong Zhiqiang, Li Aimei: Drafted the manuscript; Liu Nan, Qiu Yuting, Dong Zhiqiang, Li Aimei: Revised the final version.

Author contributions can be categorized as: 1) Research proposition and design, including specific ideas or methods; 2) Research implementation, such as conducting experiments or surveys; 3) Data acquisition, provision, and analysis; 4) Manuscript drafting or final revision. Each paper should specify authors' contributions across these dimensions according to their research characteristics.

Some research activities may involve additional contributions that can be specified accordingly. For multi-author papers, each author' s specific contributions across these four aspects must be indicated at the end of the paper.

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