The Concept of Time Poverty and Its Impact on Well-Being: A Scarcity Theory Perspective

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Abstract

Time poverty is a pervasive experience of having insufficient time in daily life that undermines individuals' physical and mental health and well-being. At present, the conceptual structure of time poverty remains ambiguous, research conclusions regarding its relationship with well-being are inconsistent, and there is a dearth of causal evidence and mechanistic understanding. This project aims to elucidate the conceptualization of time poverty, construct a multidimensional theoretical model, develop a corresponding multidimensional measurement scale, and establish a national time poverty database; grounded in scarcity theory, investigate the impact of time poverty on individual and interpersonal well-being and the potential mediating role of excessive productivity orientation; and based on the spillover-crossover model, explore the effects of time poverty on family well-being and its underlying mechanisms.

Full Text

The Connotation of Time Poverty and Its Impact on Well-Being: A Scarcity Theory Perspective

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Abstract: Time poverty refers to the pervasive sensation of having insufficient time in daily life, which threatens physical and mental health as well as overall well-being. Currently, the conceptual structure of time poverty remains unclear, and its relationship with well-being is inconsistent across studies, lacking causal evidence and a comprehensive understanding of underlying mechanisms. This project aims to clarify the connotation of time poverty, construct a multidimensional theoretical model, develop a corresponding measurement scale, and establish a national database of time poverty in China. Grounded in scarcity theory, we investigate the impact of time poverty on individual and interpersonal well-being, examining the potential mediating role of over-productivity orientation. Additionally, based on the spillover-crossover model, we explore the effects of time poverty on family well-being and its underlying mechanisms.

Keywords: time poverty, well-being, over-productivity orientation, scarcity theory, spillover-crossover model
Classification Code: B849: C93

1. Problem Statement

In recent years, internet buzzwords such as "996" and "007" reflecting work schedules have sparked intense public debate, indicating unprecedented concern about time poverty among Chinese citizens. Over the past three decades, the "pervasive sensation of having insufficient time in daily life," known as time poverty (Perlow, 1999), has become one of the most common experiences in contemporary society.

Time poverty exerts numerous negative effects, threatening physical health and interpersonal relationships. It encourages unhealthy lifestyle choices (Urakawa et al., 2020; Venn & Strazdins, 2017; Li et al., 2015) and correlates closely with physical health problems, including sleep quality issues (Zuzanek, 2004). It also negatively impacts mental health, frequently associated with higher levels of depressive symptoms (Roxburgh, 2004) and poorer emotional well-being (Gärling et al., 2016). Furthermore, time poverty damages interpersonal relationships by leaving individuals with insufficient time to build intimate connections (De Sousa et al., 2018). However, previous research has predominantly approached time poverty from the perspective of excessive work hours, neglecting other critical features such as time intensity and quality. Therefore, this study seeks to clarify and integrate the various dimensions of time poverty, construct a multidimensional theoretical model, and thereby enrich and deepen research in this domain.

In recent years, China's per capita national income has continued to rise. However, the accompanying increase in working hours and deterioration of physical health may diminish the happiness benefits of income growth (Diener & Seligman, 2004; Graham & Pettinato, 2002). Well-being (happiness) represents individuals' overall evaluation of their lives, comprising a broad set of cognitive evaluations and emotional experiences (Diener et al., 2009). Personal well-being,

as a comprehensive life assessment, encompasses both interpersonal and family domains. Existing research has produced inconsistent conclusions regarding the relationship between time poverty and individual well-being, largely due to the conflation of related concepts. Focusing on chronic perceived time scarcity often reveals negative outcomes, such as lower well-being (Gärling et al., 2016; Rudd, 2019) and work-life satisfaction (Kasser & Sheldon, 2009), and higher stress levels (Lehto, 1998; Zuzanek, 2004). When examining discretionary time, the relationship follows an inverted U-shape (Sharif et al., 2018, 2021). When focusing on acute work stress rather than chronic pervasive feelings, results show either positive correlations (Garhammer, 2002) or non-significant linear relationships (Widmer et al., 2012). Moreover, few studies have explored the relationship between time poverty and interpersonal or family well-being. Therefore, this study aims to integrate the concept of time poverty and investigate its effects on personal, interpersonal, and family-level well-being and underlying mechanisms, which holds significant practical importance for protecting physical and mental health and improving quality of life and well-being.

Time-use surveys are crucial for informing national policy development. The 20th Party Congress report emphasizes "improving people's well-being and enhancing quality of life." While material wealth is often considered a key factor in enhancing well-being, the renowned Easterlin Paradox suggests that although short-term national happiness trends align with economic development, the long-term space for happiness improvement through economic growth is limited (Easterlin, 1974; Easterlin et al., 2010). Therefore, considering only income is insufficient when examining factors influencing well-being. Both time and money are scarce resources, and income increases may lead to time poverty, creating a shortage of time resources needed to convert income into well-being. Consequently, establishing a national time poverty database in China can help understand citizens' time-use patterns, explore the impact of time poverty on daily activities, and provide important insights for policy interventions targeting time-poor populations.

In summary, this study proposes to construct a multidimensional theory of time poverty, establish a Chinese time poverty database, and explore the current state of time poverty in China, its relationship with well-being, and the underlying mechanisms. Clarifying the essence of time poverty and revealing its impact patterns on well-being can inspire people to adopt effective strategies to alleviate time poverty and its negative effects on well-being.

2.1 Theories and Measurement of Time Poverty

The concept of time poverty was first introduced by Vickery (1977). Subsequently, Douthitt (2000) updated Vickery's time-income two-dimensional poverty model using 1985 American Time Use Survey data, after which time poverty began to receive widespread research attention.

2.1.1 Dimensional Perspectives on Time Poverty

(1) Time Length Perspective

Most researchers define time poverty as spending excessive time on work or household maintenance, resulting in discretionary time falling below a certain threshold (Williams et al., 2016). Understanding time poverty caused by excessive work hours requires first classifying and recording people's time use, then establishing thresholds for time poverty.

Scholars have proposed different time classification standards, including time dichotomy, the daily activity triangle model (Gershuny, 2011), and the four-category time framework (Ås, 1978). The most widely accepted approach is time dichotomy, which integrates different time modules into two categories: work time (including paid work and unpaid work such as housework) and discretionary time (total daily or weekly hours minus work time) (Williams et al., 2016).

Time poverty thresholds can be established using either absolute or relative approaches. Absolute threshold setting assumes a minimum standard of time allocation for essential activities to maintain basic living standards. However, due to substantial subjectivity and lack of uniform, stable standards, this approach is rarely applied in actual research (Ås, 1978; Harvey & Mukhopadhyay, 2007). Relative threshold setting connects to overall societal living standards, with scholars typically using 60% of the median discretionary time as the cutoff (Burchardt, 2008; Williams et al., 2016). This approach offers greater operational feasibility and has been more widely adopted (Ishii & Urakawa, 2014; Kalenkoski & Hamrick, 2013).

Research from the time-use length perspective typically relies on large-scale national survey data. Time diary methods are commonly employed in such surveys, requiring respondents to continuously and detailedly record all activities during a 24-hour or longer observation period, along with location and whether others were present (Gershuny, 2011).

(2) Time Intensity Perspective

To date, most researchers have defined and measured time poverty based on work hours. However, despite declining trends in actual time spent on paid and unpaid work (such as housework), subjective feelings of time insufficiency have increased (Gershuny, 2005), with increased work intensity potentially explaining this discrepancy. Time intensity depends on the amount of tasks to be completed per unit time, emphasizing the speed of task completion and the fast pace and rush caused by short intervals between tasks. Dapkus (1985) emphasized the importance of time rhythm, suggesting that the effects of fast pace and high work intensity likely differ from those of long work hours. Consequently, researchers have begun examining time poverty caused by work intensity, life pace, and feelings of rush (Banwell et al., 2005; Strazdins et al., 2016; Li & Huang, 2013).

Regarding measurement, Kasser and Sheldon's (2009) Material and Time Afflu-

ence Scale includes items measuring pace and rush (e.g., "I feel that everything is hectic," "I am able to live at a leisurely pace"). Forsythe and Bailey's (1996) Perceived Time Poverty Scale also incorporates "fast pace" measurements (e.g., "The pace of my life is fast"). Many national time-use surveys have added questions about time-use intensity and "rush" (e.g., "How often do you feel pressed for time?" "How frequently do you feel rushed?") (Robinson & Godbey, 2010; Strazdins et al., 2016).

(3) Time Quality Perspective

Some researchers have begun emphasizing time poverty caused by low-quality work time. Time quality depends on (a) whether one has large blocks of uninterrupted work time, (b) whether one has personal autonomy over time (e.g., ability to work at one's own pace and schedule tasks according to personal preferences and rhythm), and (c) temporal synchronization with others' rhythms (Reisch, 2001). Mattingly and Blanchi (2003) identified time fragmentation and time contamination as markers of low time quality. Time fragmentation refers to available time being scattered into numerous short segments, while time contamination describes being distracted by another task while engaged in one. Perlow's (1999) nine-month field study of software engineering teams demonstrated that constant interruptions were a significant cause of time poverty, while improved time quality reduced time poverty and substantially enhanced performance.

2.1.2 Holistic Perspective on Time Poverty

Beyond examining time poverty through separate dimensions of length, intensity, and quality, some scholars have directly measured the overall feeling of time insufficiency formed after comprehensively considering various aspects of time use (Giurge et al., 2020; Rudd, 2019). This subjective experience includes both cognitive awareness of time shortage and the accompanying experience of rushed life pace (Szollos, 2009). Researchers emphasize that this feeling of time insufficiency and rush is pervasive, encompassing insufficient work time, family responsibilities, housework time, and leisure time—a truly diffuse sensation (Gärling et al., 2016; Kleiner, 2014; Whillans et al., 2017). In terms of measurement, Kasser and Sheldon's (2009) scale includes items measuring subjective perceptions of time sufficiency (e.g., "I have enough time to do what I need to do") and rush experiences (e.g., "My life is too rushed"). Forsythe and Bailey's (1996) scale similarly measures feelings of "not enough time" (e.g., "I never seem to have enough time to do the things I want to do").

2.2 Effects of Time Poverty on Well-Being and Mechanisms

Well-being, also termed subjective well-being, reflects people's evaluations of their lives and has long attracted public and research attention due to its close connection with daily life.

Despite extensive research on subjective well-being, disagreement persists re-

garding its specific components. Diener et al. (2009) proposed that subjective well-being can be defined as people's overall evaluation of their lives, forming a conceptual hierarchy with multiple components at different levels. In this hierarchical structure, secondary structures include two sub-components: emotional experience and cognitive evaluation. Emotional experience comprises positive affect and negative affect, while cognitive evaluation includes domain satisfaction and overall life satisfaction. Domain satisfaction reflects cognitive evaluations of specific life domains, including work, marriage, health, and leisure, whereas overall life satisfaction represents a comprehensive assessment of life quality after weighing different domains, encompassing contentment, meaning, and achievement.

Consensus is similarly lacking on how to define personal, interpersonal, and family well-being. Depending on research contexts and purposes, the connotations of these constructs often depend on measurement content (Tint & Weiss, 2016). Based on the conceptual hierarchy of subjective well-being, we posit that personal well-being represents an overall satisfaction judgment about one's own life, corresponding to overall life satisfaction in the structural model. Interpersonal and family well-being represent evaluations of interpersonal and family domains, respectively, which are weighted and integrated into personal well-being (Diener et al., 2009). Interpersonal well-being is defined as subjective well-being experienced in social and interpersonal relationships, with Ryff and Singer (2000) describing it as feelings of friendship, intimacy, fulfillment, and pleasure experienced in interactions with significant others (spouses, parents, children, colleagues, friends). Family well-being represents the manifestation of personal well-being in the family domain; in this study, we focus specifically on marital satisfaction within the family domain.

2.2.1 Time Poverty and Individual Well-Being

Previous research on the effects of time poverty and related concepts on well-being has revealed positive, negative, inverted U-shaped, or non-significant linear relationships, yielding no consistent conclusions. Table 1 summarizes major inconsistent findings.

Table 1 Summary of Research on the Relationship Between Time Poverty (and Related Concepts) and Well-Being

Relationship with Well-Being	Concept	Studies
Positive	Work time pressure	Garhammer (2002)
Non-significant linear	Work time pressure	Widmer et al. (2012)

Relationship with Well-Being	Concept	Studies
Negative	Perceived time scarcity	Rudd (2019); Strazdins et al. (2016); Teuchmann et al. (1999); Gärling et al. (2016); Kasser & Sheldon (2009); Lehto (1998); Zuzanek (2004)
Negative	Rush, urgency	Browne et al. (2022); Gärling et al. (2016); Ng et al. (2009); Ruppanner et al. (2019)
Inverted U-shaped	Discretionary time	Sharif et al. (2018, 2021)

A review of existing research reveals that inconsistent findings primarily stem from the conflation of time poverty-related concepts. When the core concept focuses on acute work time pressure (rather than the chronic, diffuse feeling of time insufficiency addressed in this project), results show either positive correlations (Garhammer, 2002) or non-significant linear relationships (Widmer et al., 2012). Acute time pressure is a specific, momentary phenomenon, and its positive relationship with well-being likely occurs because acute work time pressure focuses individuals on immediate tasks, with resulting goal completion enhancing positive emotions. For non-significant findings, work time pressure can generate both negative stress (distress) and positive stress (eustress). When individuals perceive their resources as insufficient for task demands, they likely experience negative stress; conversely, when they believe their resources can meet demands and find tasks interesting, they experience positive stress. These opposing effects may cancel each other out, resulting in non-significant relationships between acute work time pressure and well-being.

When time poverty measurement focuses on discretionary time, research reveals an inverted U-shaped relationship (Sharif et al., 2018, 2021). From insufficient to moderate discretionary time, well-being increases with more discretionary time;

however, from moderate to excessive discretionary time, further increases do not enhance and may even reduce well-being. Time poverty concerns precisely the first half of this curve—insufficient discretionary time—where time poverty negatively correlates with well-being.

When time poverty is defined as chronic perceived time quantity insufficiency, it consistently predicts negative outcomes, such as reduced well-being (Gärling et al., 2016; Rudd, 2019), increased depression (Strazdins et al., 2016), stress (Lehto, 1998; Zuzanek, 2004), emotional exhaustion (Teuchmann et al., 1999), and lower work-life satisfaction (Kasser & Sheldon, 2009). When the core concept focuses on excessive time intensity manifested as rush and urgency, findings are predominantly negative. Research shows that excessive time intensity leads to health-damaging behaviors, impedes goal achievement, exacerbates stress symptoms (headaches, muscle pain, gastrointestinal discomfort, sleep problems, anxiety) (Gärling et al., 2016), and negatively predicts well-being (Browne et al., 2022; Gärling et al., 2016; Ng et al., 2009; Ruppanner et al., 2019).

2.2.2 Time Poverty and Interpersonal/Family Well-Being

Time significantly influences interpersonal and family relationships (Aaker et al., 2011; Hamermesh, 2020). Interpersonally, quality relationships require time to develop (De Sousa et al., 2018). Within families, shared time provides the foundation for emotional interaction and communication between partners (Bakker et al., 2009; Bakker & Demerouti, 2013).

Unfortunately, few studies have examined the effects of time poverty on interpersonal and family well-being. Regarding interpersonal well-being, one qualitative study indicated that time poverty makes it difficult for people to build relationships (De Sousa et al., 2018) and reduces willingness to share knowledge when feeling time-pressured (Connelly et al., 2014), potentially preventing individuals from deriving well-being from social interactions. Concerning family well-being, no direct empirical evidence demonstrates the impact of time poverty on family well-being. Only indirect evidence suggests potential negative effects: for instance, more time spent at work correlates with lower family involvement (Doherty & Carlson, 2003), increased work-family conflict (Bakker et al., 2009), and even higher likelihood of marital dissolution (Raley & Sweeney, 2020). For dual-earner families, the matching degree of time poverty between spouses may threaten marital stability (Poortman, 2005).

2.3 Literature Review and Critique

Time poverty has attracted increasing scholarly attention in recent years. However, as an emerging field, research remains limited in several ways. First, while many studies define and measure time poverty from the length perspective, understanding from intensity and quality perspectives remains insufficient. Although researchers acknowledge that length, intensity, and quality represent three independent sources of time poverty, they have only proposed correspond-

ing measurement items without explicitly distinguishing the three dimensions (Banwell et al., 2005; Roxburgh, 2004). Measuring overall time poverty feelings is straightforward but weakens its multidimensional nature, obscures different types of time poverty arising from various sources, and hinders targeted interventions. Therefore, clarifying the connotation and dimensions of time poverty and developing a comprehensive measurement tool encompassing all three dimensions represents an urgent problem for future research.

Second, China lacks national data reflecting citizens' time poverty and well-being evaluations. To objectively capture national time-use patterns, China's National Bureau of Statistics conducted its first China Time Use Survey (CTUS) in 2008. However, CTUS only measures the length dimension, employs cross-sectional rather than longitudinal design, and does not measure well-being or other outcome variables. These three limitations restrict research on time poverty in China.

Finally, existing research shows inconsistent conclusions about the relationship between time poverty and individual well-being, with scarce research on interpersonal and family well-being and extremely limited exploration of underlying mechanisms. Only Gärling et al. (2016) found that time insufficiency and rush reduce emotional well-being by impeding goal achievement and exacerbating stress symptoms (headaches, muscle pain, gastrointestinal discomfort, sleep problems, anxiety), but without providing deeper theoretical explanations. Exploring the mechanisms through which time poverty affects individual, interpersonal, and family well-being can help understand why the chronic feeling of "never having enough time" threatens personal happiness and harmonious relationships with friends and family, and can inform scientific approaches to mitigating these negative effects.

Based on these limitations, this paper constructs a model of multidimensional time poverty's effects on multi-level well-being and mechanisms, aiming to provide references for individual and policy decision-making.

3. Research Plan

This project adopts length, intensity, and quality perspectives on time poverty to construct a multidimensional theoretical model and examine its relationship with multi-level well-being and underlying mechanisms through a series of studies. Specifically, we propose four studies: Study 1 develops a three-dimensional theoretical model of time poverty and creates both holistic and dimensional measurement tools. Using these tools, Study 2 will establish China's first multidimensional time poverty database, delineate national time poverty thresholds, and understand the current situation, causes, and trends of time poverty across different populations. Studies 3 and 4, based on the Chinese time poverty database, will analyze the effects of each time poverty dimension on individual, interpersonal, and family well-being, and further explore underlying mechanisms from a scarcity theory perspective.

3.1 Study 1: Multidimensional Time Poverty Theory Construction and Measurement Development

This study adopts the commonly used definition of time poverty as "a pervasive sensation of having insufficient time in daily life" (Perlow, 1999). Integrating three perspectives from time poverty research, this project proposes a multidimensional time poverty theory, positing that excessive work time length, intensity, and low quality jointly contribute to feelings of time poverty. Following Burda et al.'s (2013) definition of "total work time" as the sum of market work time and unpaid housework time, this project focuses on total work time (including paid and unpaid work, hereafter referred to as "work time") in defining and measuring time poverty.

(1) Necessity of Work Time Length as a Dimension
Current time poverty research predominantly emphasizes the length dimension, defining time poverty as spending excessive time on work or household maintenance, resulting in discretionary time below a threshold (Williams et al., 2016). From the perspective of Conservation of Resources theory (Hobfoll, 1989), work time represents an energy depletion process; excessive work time increases time poverty, while discretionary time serves as an energy recovery process. Insufficient discretionary time hinders energy recovery and intensifies feelings of time poverty.

However, current research overemphasizes work time length while neglecting time poverty arising from work time intensity and quality. Studies show that among people whose discretionary time falls below established time poverty thresholds, only 56.4% report experiencing time poverty; conversely, among those who report experiencing time poverty, only 51.7% actually fall below the discretionary time threshold (Venn & Strazdins, 2017). From signal detection theory perspective, these results indicate that diagnosing time poverty based solely on work time length leads to false positives (identifying non-time-poor individuals as time-poor) and false negatives (failing to identify genuinely time-poor individuals).

(2) Necessity of Work Time Intensity as a Dimension
Increased work time intensity has become characteristic of contemporary market societies. When people report feeling time-poor, they may refer not only to length but also to intensity of time experience. Technological advancement and emphasis on efficiency require completing more tasks in less time. To keep pace with others or save time for other activities, people rush through tasks or multitask (Southerton, 2003). Reports of chronic time poverty have increased even as many people work fewer hours (Robinson & Godbey, 2005). Reduced work hours have not created feelings of having more time because people do more per hour and work faster—in other words, they experience increased time intensity.

Time length and intensity are relatively independent. People may work long hours with high intensity or long hours with low intensity ("goldbricking"), and

these cannot substitute for each other. Therefore, the intensity dimension is necessary in time poverty research.

(3) Necessity of Work Time Quality as a Dimension

Time quality refers to the usability of time as a resource. Frequently interrupted, fragmented time makes it difficult for individuals to become deeply involved in their work, leading to perceived and actual work time extension and time poverty.

Work time quality provides unique information independent of length and intensity. Burchardt (2008) noted that calculating time lengths by category does not reflect time quality itself. First, higher time quality means deeper cognitive involvement. High-level cognitive engagement accompanied by "flow" allows people to focus on the present and lose track of time, thereby alleviating fatigue from long work hours (Csikszentmihalyi, 1997; Nakamura & Csikszentmihalyi, 2014) and potentially shortening perceived work duration (Droit-Volet & Meck, 2007; Wenke & Haggard, 2009). Lower time quality means shallower cognitive involvement, which hinders appreciation of work meaning, triggers irritability, and may lengthen perceived work duration (Wittmann et al., 2015). Second, higher time quality directly improves work efficiency, creating a virtuous cycle that reduces work hours. Lower quality means lower efficiency, forcing people to extend work hours and creating a vicious cycle of time poverty. Third, after high-quality work time, shorter leisure time suffices for recovery, reducing leisure time demand and alleviating time poverty. Conversely, negative work experiences from low-quality time require longer leisure time for recovery (Mühlenmeier et al., 2022), increasing leisure time demand and intensifying time poverty.

Interactions may exist among work time length, intensity, and quality. Specifically, the same work time length may produce different time poverty perceptions due to varying intensity; high-intensity work likely creates greater time poverty than low-intensity "goldbricking," suggesting potential interaction effects between dimensions. With fixed work time length, high time quality reduces time poverty by promoting high-level cognitive engagement and reducing leisure time demand, while low time quality leads to shallow work involvement and increased leisure time demand, intensifying time poverty—indicating interaction between length and quality. With fixed work time intensity, fragmented, interrupted low-quality time prevents cognitive engagement and reduces efficiency; similarly, when people cannot control interruptions and segmentation, needing to complete more tasks in less time rapidly increases time poverty feelings—indicating interaction between intensity and quality. Finally, when all three dimensions co-occur, their combined effect may exceed the simple sum of individual dimension effects, suggesting three-way interaction.

In summary, this project proposes a multidimensional time poverty theory, positing that work time length, intensity, and quality jointly determine overall time poverty feelings, with interactions among the three dimensions. Based on this, we hypothesize that the relationship among the three dimensions and

overall time poverty follows equation (a), where Y represents the overall feeling of time insufficiency, X_1 represents work time length, X_2 represents work time intensity, and X_3 represents work time quality. β_0 is the constant term; β_1, β_2, β_3 are weights for each dimension; β_4, β_5, β_6 are weights for two-way interactions; β_7 is the weight for the three-way interaction; β (i = 1, 2, ..., 7) represents the average change in Y for a one-unit change in X while holding other independent variables constant; and is the random error term.

$$Y = \beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_1X_2+\beta_5X_1X_3+\beta_6X_2X_3+\beta_7X_1X_2X_3+\varepsilon \quad \text{equation (a)}$$

We will fit the model using data from a large-scale, nationally representative social survey conducted for this project, determining regression coefficients using ordinary least squares.

The multidimensional time poverty model has several characteristics: (1) The three dimensions may have unequal predictive weights for overall time poverty, and different populations may exhibit different time poverty patterns (e.g., length-dominated, intensity-dominated, or quality-dominated poverty). (2) Relationships between the three dimensions and overall time poverty are not simply linear but may involve interaction effects. For example, excessive length and intensity may produce amplified combined effects (X_1X_2 in the equation), potentially further strengthened by low time quality ($X_1X_2X_3$), multiplying time poverty feelings. (3) The multidimensional model can identify multidimensional time poverty groups. Using equation (a), we will construct indifference surfaces (Figure 1 [Figure 1: see original paper]), where different points on the same surface have different combinations of the three dimensions but produce identical time poverty feelings. Following the literature's use of 60% of median discretionary time as the poverty threshold, we will use 60% of medians for length, intensity, and quality as dimensional thresholds, substituting them into the equation to obtain the overall time poverty threshold. By plotting indifference surfaces and assuming surface (b) as the overall time poverty threshold interface, groups corresponding to points below this interface on surface (c) will be identified as multidimensional time poverty groups. By considering multiple factors causing time poverty feelings (length, intensity, quality), this approach will identify poverty groups more accurately than single-dimension approaches (e.g., length only), enabling more targeted interventions and policy support.

Figure 1 Schematic Diagram of Multidimensional Time Poverty Indifference Surface

To construct the multidimensional time poverty theoretical model, this study will develop holistic and dimensional measurement tools, creating an initial item pool for measuring work time length, intensity, quality, and overall time poverty based on existing measures and this project's definitions.

3.2 Study 2: Construction of Chinese Time Poverty Database and Analysis of National Time Poverty Characteristics

The separability of time poverty's three dimensions suggests that different populations may experience varying degrees of poverty across dimensions. Factors such as dual-earner status, single parenthood, female gender, low-income status, and high regional economic inequality will become risk factors for time poverty (Qi & Dong, 2018; Szollos, 2009). For example, regionally, economically developed areas and higher-income families and individuals may reduce work time length (e.g., unpaid housework) by purchasing time-saving services. At the family level, individuals with identical time lengths may experience different time quality due to social roles; for instance, Australian women have more daily leisure time than men but shorter maximum leisure episodes, indicating more fragmented leisure (Bittman & Wajcman, 2000). Therefore, substantial heterogeneity exists in time poverty's three dimensions across populations, making it important to explore specific time poverty patterns in different groups to propose targeted adjustment strategies.

Study 2 will use the measurement tools developed in Study 1, leveraging existing large-scale database platforms in China to establish a national time poverty database, determine time poverty indifference surfaces and multidimensional time poverty groups, and incorporate individual basic information (gender, age, income, education, occupation, family structure, child-rearing status [number and age], household registration) and regional economic development and inequality levels to depict the combinatorial characteristics of time poverty across dimensions in the Chinese population and portray the current situation and temporal trends of time poverty in China.

3.3 Study 3: Social Survey Investigation of Time Poverty's Effects on Well-Being

This project examines the effects of time poverty on well-being and underlying mechanisms through cross-sectional and longitudinal tracking data from a scarcity theory perspective. Scarcity refers to the feeling of "having" less than "needing" (Mullainathan & Shafir, 2013; Shah et al., 2012). Scarcity theory posits that resource scarcity leads to a scarcity mindset, which subsequently affects psychology and behavior (De Bruijn & Antonides, 2022; Mani et al., 2013), focusing attention on scarce resources while neglecting other considerations.

As a resource, time is also subject to scarcity (Mullainathan & Shafir, 2013). Based on scarcity theory, time poverty means time resource scarcity, which similarly causes individuals to focus more on time considerations while ignoring other consequences, such as communication with others or task-related growth. Due to time scarcity, individuals experiencing chronic time poverty tend to use time resources more efficiently in daily work and life. This tendency to accomplish more work in less time is called over-productivity orientation (Keinan & Kivetz, 2011).

We propose that over-productivity orientation has two aspects: (1) over-emphasizing efficiency—rushing to complete more tasks in less time; and (2) over-emphasizing productivity—expecting to achieve more progress and results in limited time.

From the work time length perspective, excessive time spent on work or household maintenance leads to discretionary time falling below thresholds. However, discretionary time is crucial for daily life, providing opportunities for relaxation and recovery beyond work and serving as an important source of life value and well-being. Therefore, when people realize that too much time is occupied by work, leaving insufficient discretionary time, they tend to accelerate work speed to improve productivity and free up more discretionary time. From the work time intensity perspective, facing numerous tasks in short periods, improving work efficiency seems an effective solution to complete tasks on time. From the work time quality perspective, external interference and time fragmentation require frequent attention switching, reducing work involvement and efficiency. Faced with original work tasks, people must improve efficiency and work faster to reduce interruption possibilities during task completion and ensure original plans remain on schedule. Therefore, we propose that increased work time, greater intensity, and poorer quality all lead to over-productivity orientation.

Proposition 1: Time poverty positively predicts over-productivity orientation.

Chronic time poverty-induced over-productivity orientation negatively impacts well-being. Excessive focus on efficiency and results causes time-poor individuals to neglect growth and experience during activities, concentrating instead on outcomes. While over-efficiency and over-productivity orientations can improve performance, they weaken intrinsic motivation (Deci, 1971) by shifting attention from activity enjoyment to results, treating work merely as a "task" and tool for obtaining benefits (Ryan & Deci, 2000; Kruglanski et al., 1972). This phenomenon also exists in non-work domains; focusing on "productivity" during leisure leads people to enrich their "entertainment resumes" rather than immersing themselves in and enjoying activities (Keinan & Kivetz, 2011), undoubtedly reducing enjoyment and personal well-being.

Second, the "productivity mode" also exists in interpersonal and family interactions. Previous research has focused on how interpersonal relationships affect organizational productivity (Omunakwe et al., 2018; Love et al., 2021), but productivity orientation also influences attitudes toward interpersonal relationships. We propose that because work more easily provides feelings of accomplishment (Hahn et al., 2012), productivity focus concentrates attention on work domains where productivity is salient, advancing quantifiable progress while reducing the perceived importance of leisure time and decreasing emotional support behaviors (such as care and sharing) toward spouses, parents, children, colleagues, and friends that are not easily quantified. Additionally, focusing on efficiency and results may "workify" interpersonal activities (Etkin, 2016)—treating interactions with partners like task completion—which may cause individuals to exhibit more time-oriented behaviors (e.g., rushing) in relationships (Briker et

al., 2021) while neglecting relationship-oriented behaviors that maintain harmony, thereby reducing interpersonal and family well-being.

Proposition 2: Over-productivity orientation negatively predicts individual, interpersonal, and family well-being.

Based on the above propositions and scarcity theory, this project proposes that chronic time poverty leads individuals to prioritize time as an important consideration across life domains, adopting time-saving, efficiency-pursuing approaches that result in over-productivity orientation. This efficiency-focused mindset causes people to emphasize activity progress and outcomes, making it difficult to experience activity enjoyment, while devaluing relationship maintenance and family investment, thereby reducing personal, interpersonal, and family well-being.

Proposition 3: Time poverty negatively predicts personal, interpersonal, and family well-being through over-productivity orientation.

3.4 Study 4: Family Perspective on Time Poverty's Effects on Family Well-Being

In daily life, people often attribute time poverty to excessive work pressure while neglecting pressure transmission from intimate others. Spouses typically have more communication opportunities, closer emotional connections, and more mutual influence on behaviors, emotions, and feelings. Therefore, we propose that time poverty's effects on marital well-being differ from individual and general interpersonal levels.

The spillover-crossover model posits that job demands affect individuals' stress responses, which can spill over to affect responses in the family domain; these responses then transmit between spouses through communication and emotional exchange, creating crossover effects (Bakker & Demerouti, 2013). We focus on relationship-oriented interactions during couples' discretionary time, proposing that time poverty experienced by one spouse during work time (including paid and unpaid work) leads to over-productivity orientation, which spills over into discretionary time. Continuing this orientation during partner interactions reduces marital interaction quality, affecting both spouses' family well-being. This over-productivity orientation expressed in couple interactions then crosses over to the partner, similarly causing over-productivity orientation in the partner and reducing both spouses' family well-being. Therefore, examining spillover-crossover effects between spouses is necessary at the family level.

Proposition 4: Time poverty experienced during work time positively affects individuals' over-productivity orientation, which spills over into discretionary time and crosses over to partners, positively affecting partners' over-productivity orientation and negatively affecting both spouses' family well-being.

We plan to conduct three short-term longitudinal studies based on seven consecutive natural days, using experience sampling methods with dyadic couple

designs to examine short-term fluctuation effects of time poverty on family well-being and the mediating role of over-productivity orientation.

4. Theoretical Construction and Innovation

In contemporary society, time poverty has gradually become a universal experience, hindering quality of life and well-being improvements. However, research on chronic, diffuse time poverty is scarce compared to short-term time pressure. Within limited time poverty research, conceptualizations often focus solely on work time length, intensity, or quality, neglecting time poverty as a holistic cognition and experience comprising multiple specific dimensions. Although research shows negative effects of time poverty on personal, interpersonal, and family well-being, exploration of potential mediators is lacking, and special effects of time poverty in family contexts have rarely been examined. This study integrates three perspectives on time poverty, constructs a multidimensional theoretical model, and examines mechanisms affecting multi-level well-being from a scarcity theory perspective. The theoretical contributions include:

First, constructing a multidimensional time poverty theoretical model. Although previous research indicates that excessive work time length, high intensity, and low quality can independently cause time poverty (Banwell et al., 2005; Mattingly & Blanchi, 2003; Williams et al., 2016), time allocation between work and leisure, task quantity, and completeness characteristics often coexist and interact. Therefore, constructing an integrated three-dimensional model of work time length, intensity, and quality—with interactions among them—and developing a multidimensional measurement scale provides a more complete understanding of time poverty and offers a theoretical framework and measurement tool for accurately assessing individual time poverty status.

Second, establishing a Chinese time poverty database. Time-use patterns are influenced by both personal autonomy and demographic characteristics, particularly gender, occupation, income, region, and family structure, which significantly affect time allocation across activity types. Therefore, this project constructs a nationally representative time poverty database, examining multiple demographic variables and incorporating longitudinal tracking of distributions and dynamic changes in dimension-dominated time poverty across social groups. This provides empirical evidence on sources and trends of time poverty among Chinese populations and forms a foundation for subsequent policy recommendations and interventions.

Third, constructing mechanisms through which time poverty affects multi-level well-being. Scarcity theory suggests that resource scarcity causes people to focus attention on scarce resources while neglecting other aspects (Mullainathan & Shafir, 2013; Shah et al., 2012). Therefore, based on scarcity theory, this project constructs a mechanism whereby time poverty's three dimensions affect multi-level well-being through over-productivity orientation. Specifically focusing on the family domain, we examine spillover and crossover effects of time pressure

on family well-being, which not only enhances the explanatory power of multidimensional time poverty but also provides important insights for marriage and family research.

Overall, this project clarifies the connotation of time poverty, constructs a multidimensional theoretical model, and explores its effects on personal, interpersonal, and family well-being and underlying mechanisms, thereby deepening theoretical research in the time poverty field. As time poverty becomes ubiquitous in modern society, threatening quality of life and physical and mental health, developing multidimensional measurement tools can provide individuals with self-assessment instruments to identify sources of time poverty and enable targeted self-improvement, holding important practical implications. Furthermore, clarifying sources and mechanisms of time poverty's effects can provide organizations and governments with references for optimizing procedures and systems to save citizens' time costs, offering important and broad guidance for policymakers seeking to enhance public well-being.

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