

# Being Under-Benefited and Perceived Stress in the Relationship Between Aging Parents and Adult Children: The Moderating Role of Empathy

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## Abstract

**Background and Objectives:** Previous studies examining the relationship between being under-benefited and stress among aging parents and their adult children have yielded mixed findings. Few studies have examined whether this positive association can be alleviated by state-level or trait-level factors. Given the positive effects of empathy on interpersonal exchanges, we tested the moderating role of empathy on the relationship between being under-benefited and perceived stress among aging parents and adult children in this 14-day diary study.

**Research Design and Methods:** A sample of 99 pairs of parents ( $M_{age} = 50.01$  years,  $SD_{age} = 4.53$  years; 79.8% female) and children ( $M_{age} = 22.38$ ,  $SD_{age} = 3.49$ ; 85.9% female) were recruited reported their level of being under-benefited in the exchange with their parent/child, perceived stress, and empathy as an affective state on a daily basis for 14 consecutive days, after completing a pretest which measured their trait empathy and demographic information.

**Results:** For both parents and children, the positive under-benefited-stress association was only significant when they reported lower affective empathy on a daily basis. The association between the level of being under-benefited and stress was negative when children reported greater affective empathy on a daily basis. Children reported more perceived stress on the days their parents reported a greater level of being under-benefited. Such association was only significant in children with lower trait empathy. The negative association between children's being under-benefited and parents' perceived stress was only significant in parents with higher trait empathy.

**Discussion and Implications:** These findings highlight the importance of empathy as a daily affect and a trait in the relationship between daily exchanges and mental health in the intergenerational contexts between aging parents and adult children.

**Keywords:** Diary study, Intergenerational relationship, Reciprocity

**Translational Significance:** Intergenerational exchanges between aging parents and adult children have a profound impact on the well-being of both parties and their families. Feeling under-benefited is common in these exchanges. In this 14-day daily study, empathy plays an important role in mitigating the positive association between being under-benefited and perceived stress for both parents and children. Our research offers valuable insights for developing targeted interventions to improve the well-being of both parties and quality of intergenerational relationships. Furthermore, the results of this study could have implications for clinical practice by highlighting the significance of empathy in cultivating positive family dynamics.

Being under-benefited refers to a situation where one gives more than they receive in a relationship (Flynn & Yu, 2021). It is commonly believed that being under-benefited in a relationship should be associated with higher levels of perceived stress (Buunk et al., 1993). However, previous studies examining the relationship between being under-benefited and well-being in the exchanges between aging parents and their adult children have yielded mixed findings. Some studies report a positive association, while others report a negative association or no significant association (e.g., Jiang & Fung, 2022; Liang et al., 2001; Lowenstein et al., 2007).

Understanding this relationship is particularly crucial for the well-being of older adults, as their relationships with family members are the meaningful goals that they value and prioritize in older adulthood (Carstensen, 1992, 2021). Moreover, few studies have examined whether the negative effect of being under-benefited on stress can be mitigated by affective states or personal traits. Empathy, defined as the idea of “trying to sense, perceive, share, or conceptualize how another person is experiencing the world” (Bohar & Greenberg, 1997, p. 419), is considered beneficial in interpersonal interactions as it fosters understanding and positive behaviors (Huo et al.,

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2019, 2021; Oh & Hwang, 2018). Therefore, the relationship between being under-benefited and perceived stress may be moderated by empathy. To this end, we conducted a 14-day daily diary study to clarify the relationship between being under-benefited and stress among aging parents and their adult children and to test the moderating role of empathy in this relationship. Given that empathy can be viewed as both an affective state and a personal trait (Zhao et al., 2021), we tested the moderating roles of empathy as an affective state and a trait, respectively.

### Being Under-Benefited in Intergenerational Relationship

In the context of interpersonal interactions, “reciprocity” refers to balanced and comparable exchanges of care, emotional affection, and practical support (Wan & Antonucci, 2016). Based on the concept of reciprocity, two other patterns of exchange are identified, namely being under-benefited (referring to a situation where one gives more than they receive in the relationship) and being over-benefited (referring to a situation where one receives more than they give in the relationship). The equity theory (Hatfield & Sprecher, 1983) posits that the status of reciprocity in giving and receiving support is considered optimal and beneficial for well-being of both relationship partners. Either being under- or over-benefited in a relationship can induce negative affect. Specifically, being over-benefited is associated with feelings of guilt and perceived dependency, while being under-benefited is associated with feelings of anger and resentment (Lowenstein et al., 2007).

The three patterns of social exchanges (i.e., reciprocity, being under-benefited, and being over-benefited) have been applied to understand intergenerational relationships between aging parents and their adult children (Antonucci et al., 1990; Braun et al., 2018; Jiang & Fung, 2022; Liang et al., 2001). While previous research has predominantly focused on the status of reciprocity as it is considered the ideal state, it is equally essential to investigate how to enhance well-being in situations where an imbalance exists, potentially resulting in adverse relationship consequences, especially when individuals perceive themselves as under-benefited within the relationship. Studies have indicated that perceived imbalance in a relationship is linked to increased conflict and tension (e.g., Bruneau & Saxe, 2012). Therefore, examining the status of being under-benefited and its impact on well-being may facilitate healthier and more positive family interactions. Furthermore, investigating the association between being under-benefited and stress is particularly critical for older adults. According to the socioemotional selectivity theory (Carstensen et al., 2003), maintaining close interactions with their children is one of the most significant emotionally meaningful goals that older adults pursue in late adulthood. This connection is vital for their physical, mental, and cognitive health, as well as their overall quality of life (Carstensen, 2021). However, prior studies have produced conflicting results, with some suggesting that older adults report better well-being when they perceive themselves as under-benefited in their relationship with their children (e.g., Lowenstein et al., 2007), while others have found a negative (e.g., Liang et al., 2001) or no significant relationship (only in parents) (e.g., Jiang & Fung, 2022). To contribute further evidence to the existing literature, we investigated the association between

being under-benefited and perceived stress in the current study.

### Being Under-Benefited and Perceived Stress

While it is generally agreed that reciprocity in relationship exchanges is associated with better well-being in children (e.g., Jiang & Fung, 2022), the findings regarding the relationship between being under-benefited and well-being in parents seem to be mixed (Jiang & Fung, 2022; Liang et al., 2001; Lowenstein et al., 2007). For example, a cross-sectional study conducted with a large sample from five countries found that older adults who reported being under-benefited in their intergenerational exchanges with their children reported the highest level of well-being. This was followed by those who reported a balanced level of reciprocity, while those who reported being over-benefited rated their well-being as the lowest (Lowenstein et al., 2007). Specifically, being an active provider of support was associated with higher life satisfaction, whereas primarily being a recipient of support was associated with lower life satisfaction in older parents (Lowenstein et al., 2007). However, Liang et al. (2001) found that being under-benefited in the intergenerational relationship led to negative interactions. Consistent with these findings, a longitudinal study found that receiving less support from children was associated with more depressive symptoms in old parents (Davey & Eggebeen, 1998). Some recent daily studies have found no association between being under-benefited and well-being in parents. In a daily diary study conducted during the outbreak of the COVID-19 pandemic, Jiang and Fung (2022) found that family role played a role in the relationship between being under-benefited and well-being. Specifically, being under-benefited in the daily exchange was associated with a lower level of positive affect in children, but not mothers. To further examine and clarify the relationship between being under-benefited and well-being indicators, we examined the association between being under-benefited and perceived stress in a daily diary study involving middle-aged and older parents and their adult children in the present study.

### The Moderating Role of Empathy

Empathy is considered an important and beneficial construct in interpersonal exchanges (Huo et al., 2021; Preston & De Waal, 2002). While there is diversity in the definition of empathy, all definitions highlight key components such as the idea of “trying to sense, perceive, share, or conceptualize how another person is experiencing the world” (Bohar & Greenberg, 1997, p. 419). Empathy can be conceptualized as both an affective state, which is the moment-to-moment experiences of empathetic state, and a personal trait that depends on individuals’ capacity to perceive, understand, and empathize with the experiences or perspectives of others, including animals (Zhao et al., 2021). In the current study, we focused on examining the roles of both state and trait empathy for several reasons. First, previous research has posited and empirically supported distinctions between state and trait empathy because phenomena at these different levels may be influenced by, represent, or affect distinct psychological processes (e.g., Tennen et al., 2005; Nezlek et al., 2001; Nezlek et al., 2007). Analyses conducted at the state and trait levels in prior studies have found various results, highlighting the differentiation between state and trait empathy as separate

constructs (Nezlek et al., 2007). Therefore, an increasing number of studies have advocated for simultaneous consideration of constructs as both traits and states to offer a more comprehensive understanding of their roles (Leal et al., 2017; Part et al., 2023). Second, Nezlek et al. (2001) discovered that state empathy, assessed on a daily basis, was linked to fluctuations in daily positive and negative events as well as daily positive and negative affective states. In contrast, trait empathy showed no associations with these changes. Despite these insights, few previous studies have investigated empathy as both a state and a trait in the context of understanding intergenerational exchanges between aging parents and adult children. Our aim is to bridge this gap in the existing literature by focusing on the roles of both state and trait empathy.

We propose that empathy could play a moderating role in the relationship between feeling under-benefited and experiencing perceived stress in the context of intergenerational exchanges between aging parents and adult children for several reasons. First, based on the Perception-Action Model (PAM; Preston & De Waal, 2002), individuals with higher levels of empathy are more skilled at accurately perceiving the emotions and needs of others compared to those with lower levels of empathy. The intergenerational dynamic between aging parents and adult children is often viewed as a mutually beneficial relationship, where both parties contribute equally (Wan & Antonucci, 2016). However, situations where one party feels under-benefited may arise when additional support and assistance are required by their partner. In such instances, individuals who possess a deeper understanding of their partner's emotions, needs, and circumstances may be more inclined to accept the imbalance without experiencing heightened stress. Consequently, a greater level of empathy could potentially buffer the negative effects of being under-benefited on perceived stress. Thus, the association between feeling under-benefited and increased perceived stress is mitigated in this context. Indeed, previous studies have shown that empathy alleviated the impacts of negative situations. For example, in a study among mothers and fathers, Camisasca et al. (2019) found that the positive association between parents' marital dissatisfaction and children's behavioral problems was mediated by lower levels of co-parenting. However, such mediating effect was weaker for parents with lower empathic competency. These findings were explained by the proposition that parents with higher empathic competencies were better equipped to put aside their own dissatisfaction with their partners so as to provide more support to their children. In addition, in a large sample of Chinese parenting couples, Dong et al. (2022) found that the negative association between parenting pressure and marital satisfaction in mothers was weaker when fathers reported a high level of cognitive empathy, suggesting the partner effects of empathy on the relationship between parenting pressure and marital satisfaction.

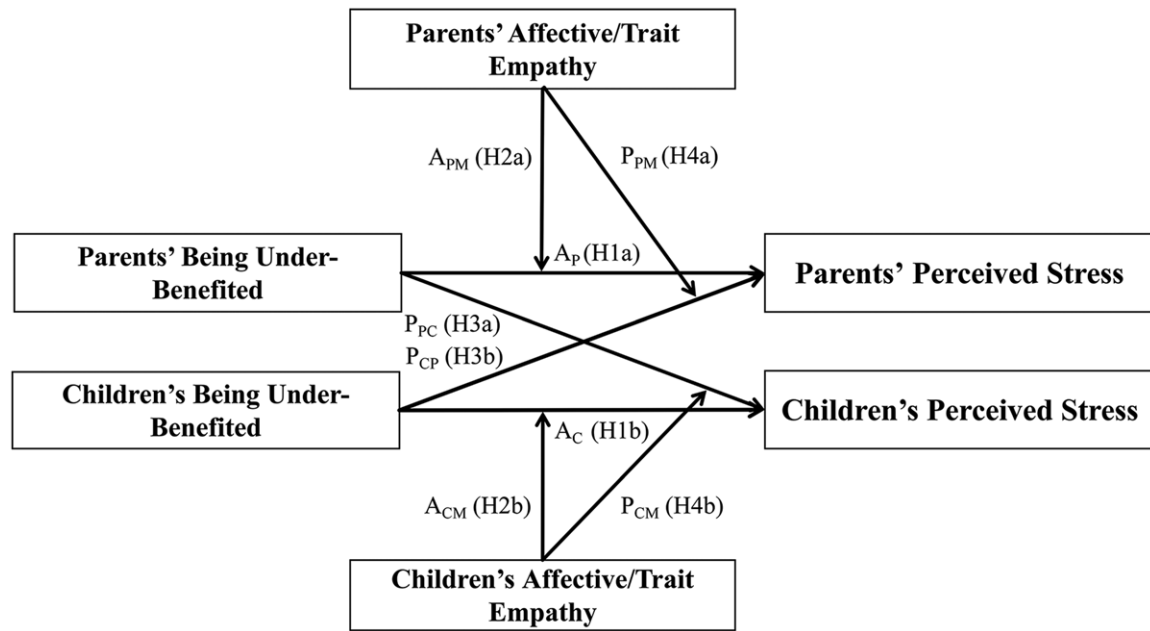
Previous studies among older adults have further demonstrated the adaptive role of empathy in intergenerational interactions with close social partners (e.g., Huo et al., 2019, 2020, 2021). For instance, in the daily experiences and well-being study using experience sampling method, empathy was found to moderate the relationship between interacting with social partners facing major life problems and reduced positive affect. Notably, this association was weaker among older adults with higher levels of trait empathy (Huo et al., 2020). Moreover, trait empathy was found to moderate

the relationship between having tensions with others and affective experiences in older adults. The negative relationship between having tension and positive affect was weaker in older adults with higher trait empathy, especially when older adults were having tension with their close social partners (Huo et al., 2021). Trait empathy also moderated the relationship between providing support and daily affective experiences. Specifically, the negative relationship between providing support and daily positive affect was significant in less empathic older adults, while this association was non-significant in more empathic older adults (Huo et al., 2019). Taken together, these studies provide additional support for the buffering role of empathy on well-being when older adults face challenging situations in interacting with close social partners. While prior studies have predominantly focused on the moderating role of empathy as a trait, its role as an affective state has not been thoroughly examined. As a result, we investigated the moderating influence of both state and trait empathy. Given previous research showing the moderating impact of empathy on both actor and partner effects, our study concentrated on examining both types of effects.

## The Current Study

The current study aims to contribute to the literature both theoretically and methodologically in several ways. First, we aimed to investigate the relationship between the level of being under-benefited and well-being in the context of aging parent–adult children relationships to provide additional evidence for the current inconclusive state of knowledge. Second, few studies have examined whether the negative effects of being under-benefited and well-being, if there are any, may be alleviated or strengthened by individual or daily-level factors. By integrating theories and empirical findings on empathy into the context of intergenerational relationships, we attempted to examine the moderating role of empathy in the relationship between being under-benefited and stress. Third, while previous studies majorly focused on trait empathy (e.g., Huo et al., 2019, 2020, 2021), we differentiated between the roles of trait empathy and affective empathy as a state in our analyses. Fourth, most previous studies in the field of intergenerational relationships between aging parents and adult children have utilized either cross-sectional surveys or daily diary methods with only one partner in the relationship. By conducting a daily diary study involving both parents and children simultaneously, several previous studies have investigated the interactions between aging parents and adult children (e.g., Jiang & Fung, 2022; Jiang et al., 2024). These studies, however, did not test the relationship between being under-benefited and stress. Neither did they focus on the role of empathy. By applying the actor-partner interdependence models (APIMs; Cook & Kenny, 2005) and multilevel analysis (Raudenbush, 2004) in the present study, we aimed at directly testing the relationship between being under-benefited and stress among aging parents and adult children using a more comprehensive perspective.

To address the theoretical and methodological limitations in the literature, we conducted a 14-day daily diary study among 99 pairs of aging parents and their adult children to, first, test the association between daily reciprocity and perceived stress; and second, test the moderating roles of daily and trait empathy on the relationship. Figure 1 illustrates the theoretical model that was tested in the present study. Given



**Figure 1.** The theoretical model.  $A_C$  = The actor effect of children's being under-benefited on their own perceived stress;  $A_{CM}$  = The moderating role of children's empathy on children's actor effect;  $A_p$  = The actor effect of parents' being under-benefited on their own perceived stress;  $A_{PM}$  = The moderating role of parents' empathy on parents' actor effect;  $P_{CM}$  = The moderating role of parents' empathy on children's partner effect;  $P_{CP}$  = The partner effect of children's being under-benefited on parents' perceived stress;  $P_{PC}$  = The partner effect of parents' being under-benefited on children's perceived stress;  $P_{PM}$  = The moderating role of parents' empathy on parents' partner effect.

the dyadic nature of the data and the 14-day daily diary design, we applied the actor-partner interdependence model (APIM) (Cook & Kenny, 2005) and the multilevel regression analysis (Raudenbush, 2004) in data analyses. The Actor-Partner Interdependence Model (APIM) serves as a typical analytical tool for examining dyadic data on two partners, encompassing not only subjective interactions but also the influence of partner effects on the actor (Fan et al., 2024). To better capture the mutual influence of being under-benefited between parents and children, we used APIM in data analysis. Because we collected 14-day diary data from each of the partners, we employed a combination of APIM with multilevel regression analyses.

We hypothesized that:

Being under-benefited in the relationship would be associated with greater perceived stress on a daily basis in both parents (H1a) and children (H1b) (actor effects).

Both empathy as an affective state and a trait would moderate these actor effects (H2). Specifically, the negative associations between one's status of being under-benefited and their own perceived stress would be smaller in those who reported a higher level of affective and trait empathy for parents (H2a-1 for affective empathy; H2a-2 for trait empathy) and children (H2b-1 for affective empathy; H2b-2 for trait empathy).

Partner's perception of being under-benefited in the relationship would be associated with a greater level of their own stress on a daily basis for both parents (H3a) and children (H3b) (partner effects).

Both daily and trait empathy would moderate these partner effects (H4). The negative associations between one's status of being under-benefited and the perceived stress of their partner would be smaller in those who reported a higher level of affective and trait empathy in both parents (H4a-1

for affective empathy; H4a-2 for trait empathy) and children (H4b-1 for affective empathy; H4b-2 for trait empathy).

## Method

### Participants and Procedure

We collected data from 99 pairs of parents and children ( $N_{\text{total}} = 198$ ) in mainland China. All participants were Chinese. The parents were aged from 43 to 69 years ( $M = 50.01$  years,  $SD = 4.53$  years; 79.8% female). The children were aged from 18 to 36 years ( $M = 22.38$ ,  $SD = 3.49$ ; 85.9% female). This study was comprised of two parts: a pretest survey and a daily diary survey. In the pretest survey part, participants were asked to report their demographic information and their level of trait empathy. A reminder was sent to participants who did not complete the pretest within 24 hours after receiving the questionnaire. In the daily diary part, participants reported a daily level of being under-benefited in the relationship, perceived stress, empathy as an affective state, and interaction hours with their mother/children on that day for 14 consecutive days. Reminders containing the URL link of the online questionnaire were sent to the participants individually at 6:00 pm each day. Another reminder message would be sent out to participants at 8 a.m. the next day if participants did not complete the daily survey or have not completed all the items in the daily survey by then. There were no missing values in the pretest survey. In the daily diary survey, daily entries with missing values ( $N = 4$ ) were excluded from the analysis. Each participant received 200 Chinese Yuan (CNY) (approximately US\$28) upon completing the study. Ethical approval was obtained from the Human Research Ethics Committee of the Education University of Hong Kong (Ref Number: 2020-2021-0031).

## Measures

### Measures in the daily survey

#### *Perceived stress*

The 14-item Perceived Stress scale (PSS) (Cohen et al., 1983; Leung et al., 2010) was used to assess participants' perceptions of the subjective level of stress. Sample items of PSS include: "How often have you been upset because of something that happened unexpectedly today?"; "How often have you felt that you were unable to control the important things in your life today?"; "How often have you felt nervous and stressed today?." The within-person level reliability of parents' scale is 0.94, and the between-person level reliability of the scale is 0.93. The within-person level reliability of adult children's scale is 0.88 while the between-person level reliability of the scale is 0.86 (Geldhof et al., 2014). A greater value indicates a higher level of perceived stress.

#### *The level of being under-benefited*

To assess the level of being under-benefited, participants were asked to reflect on their daily interactions with their study partners and rate the extent to which they felt supported on a scale from 1 = "I get much more than I give" to 5 = "I give much more than I get" (Schwarz et al., 2006). A higher score indicates a greater level of being under-benefited.

#### *Empathy as an affective state*

Empathy as an affective state was measured an item under the instructions of the state version of the affect valuation index (Jiang et al., 2024; Tsai et al., 2006). In particular, participants were asked to rate the frequency with that they experienced empathetic feelings on the day using a scale from 1 (never) to 5 (very often). A higher score indicated more frequent experiences of empathy.

#### *Daily interaction hours*

Parents and children were asked to report the number of hours spent interacting with their partners. The average of the reported daily interaction hours between parents and children was included as a covariate in the data analysis.

### Measures in the pretest survey

#### *Trait empathy*

Trait empathy was measured as an item under the instructions of the trait version of the affect valuation index (Jiang et al., 2024; Tsai et al., 2006). In particular, participants were asked to rate the frequency which they experienced empathetic feelings in a typical week using a scale from 1 (never) to 5 (very often). A higher score indicated more frequent experiences of empathy.

#### *Demographic information*

The participants were asked to report their age, gender (0 = female, 1 = male), education level (0 = other, 1 = bachelor's degree or higher), subjective socioeconomic status (on a scale from 1 = lowest to 10 = highest), subjective mental, physical, and cognitive health (on a scale from 1 = very poor to 6 = extremely well), partner status (0 = other, 1 = have a partner), religion (0 = other, 1 = no religion), job status (0 = other, 1 = full-time working), annual personal income (0 = equal or below 30,000 CNY, 1 = above 30,000 CNY; National Average: 22,053 CNY (National Bureau of Statistics of China, 2023)), annual family income (0 = equal or below

50,000 CNY, 1 = above 50,000 CNY; National Average: 39,200 CNY (National Bureau of Statistics of China, 2023)).

### Data Analysis Overview

As the parent-child relationship has a dyadic nature, we adopted the APIMs (Cook & Kenny, 2005) using the lme4 and lmerTest packages in R-studio to test the main hypotheses (Chow et al., 2017). Because it is a 14-day daily study, we used multilevel APIMs to analyze nested data. Being under-benefited, affective empathy, and daily interaction hours were centered by the group mean, while trait empathy was centered by the grand mean. Because age (Scott et al., 2013), gender (Calvarese, 2015), socioeconomic status (Baum et al., 1999), general health (Larzelere & Jones, 2008), job status (Doyle & Hind, 1998), education level (Pascoe et al., 2020), marital status (Coombs & Fawzy, 1982), religion (Park, 2005, p. 200), personal annual income (Quinn et al., 2019), family annual income (Schleider et al., 2015), and daily interaction hours (Jiang & Fung, 2022; Jiang et al., 2024; Milek, 2015) were found to be associated with perceived stress, we included them as covariates in the study. We found that the main patterns of results (i.e., the main effects of being under-benefited on perceived stress, and the moderating roles of affective empathy and trait empathy) remained unchanged after statistically controlling for these variables. Therefore, we report the results of the models with no covariates to maximize the power of analyses.

## Results

On average, parents ( $M = 2.78$ ,  $SD = .95$ ) provided more support to children ( $M = 2.48$ ,  $SD = .89$ ) than the reverse ( $t = 9.03$ ,  $p < .001$ ). In addition, parents ( $M = 3.45$ ,  $SD = 1.15$ ) reported a significantly higher level of affective empathy than children ( $M = 2.83$ ,  $SD = 1.15$ ;  $t = 15.32$ ,  $p < .001$ ). Similarly, parent-reported trait empathy ( $M = 3.83$ ,  $SD = 1.09$ ) was significantly higher than child-reported trait empathy ( $M = 3.11$ ,  $SD = 1.19$ ;  $t = 17.58$ ,  $p < .001$ ). Moreover, children ( $M = 2.83$ ,  $SD = .52$ ) reported a significantly higher level of perceived daily stress than did parents ( $M = 2.59$ ,  $SD = .44$ ;  $t = -13.70$ ,  $p < .001$ ). The average of the parent- and child-reported daily interaction duration, ranging from 0.13 to 23.63 hr ( $M = 2.28$ ,  $SD = 3.60$ ), was included as a covariate. Table 1 shows descriptive and demographic information of the sample.

### The Moderating Role of Empathy as an Affective State

Table 2 shows the results of the association between being under-benefited and perceived stress, and the moderating role of affective empathy in the parent-child dyads.

#### *Actor effects*

Consistent with H1a, parents' being under-benefited was positively associated with their own perceived stress ( $\beta = 0.034$ ,  $p = .007$ , 95% CI = [0.010, 0.059]). Parents reported a greater level of perceived stress on the days they were more under-benefited than usual. Consistent with H2a-1, this association was moderated by parents' affective empathy ( $\beta = -0.038$ ,  $p = .024$ , 95% CI = [-0.070, -0.005]) (Table 2). As illustrated in Figure 2a, the positive association between being under-benefited and perceived stress was significant in parents who reported a lower level of

**Table 1.** Descriptive and Demographic Information of Parents and Children

Variable	Parents ( <i>n</i> = 99)			Children ( <i>n</i> = 99)			Test of Parent– Child Difference	
	<i>M</i>	<i>SD</i>	%	<i>M</i>	<i>SD</i>	%	<i>t</i>	<i>p</i>
<i>Within-person level variables</i>								
The level of being under-benefited	2.78	0.95		2.48	0.89		9.03	<.001
Perceived stress	2.59	0.44		2.83	0.52		-13.70	<.001
Affective empathy	3.45	1.15		2.83	1.15		15.32	<.001
Daily interaction hours	2.32	3.70		2.23	3.67		2.27	.023
<i>Between-person level variables</i>								
Trait empathy	3.83	1.09		3.11	1.19		4.68	<.001
Age	50.01	4.53		22.38	3.49		92.84	<.001
Subjective socioeconomic status	6.10	1.64		6.01	1.41		0.54	.594
Subjective mental health	4.33	0.86		4.15	0.93		1.58	.118
Subjective physical health	4.22	0.88		4.41	0.83		-1.81	.074
Subjective cognitive health	4.09	0.95		4.37	0.86		-2.27	.025
Gender (female)			79.80			85.86		
Education (bachelor or high)			71.72			97.98		
Material status (have a partner)			90.90			36.36		
Personal annual income (above 30,000 CNY)			86.87			20.20		
Family annual income (above 50,000 CNY)			97.98			91.92		
Job status (full-time job)			69.70			15.15		
Religion (no religious belief)			65.66			84.85		

Notes: CNY = The Chinese Yuan; *SD* = standard deviation.

**Table 2.** The Results of the Multilevel Hierarchical Modeling on the Relationship Between Being Under-Benefited and Perceived Stress and the Moderating Role of Empathy as an Affective State

APIM parameters	Parents as the Actors			Children as the Actors		
	Estimate	<i>SE</i>	95% <i>CI</i>	Estimate	<i>SE</i>	95% <i>CI</i>
<i>Moderating role of affective empathy</i>						
Intercept	2.589***	0.036	[2.518, 2.660]	2.824***	0.038	[2.748, 2.900]
Actors' being under-benefited (actor effect)	0.034**	0.013	[0.010, 0.059]	-0.009	0.017	[-0.042, 0.025]
Partners' being under-benefited (partner effect)	0.021	0.013	[-0.005, 0.046]	0.038*	0.016	[0.006, 0.070]
<i>Within-person level moderator</i>						
Daily empathy	-0.068***	0.012	[-0.091, -0.045]	-0.117***	0.015	[-0.147, -0.087]
<i>Within-person level interactions</i>						
Actors' being under-benefited × affective empathy (actor effect)	-0.038*	0.017	[-0.070, -0.005]	-0.093***	0.025	[-0.143, -0.043]
Partners' being under-benefited × affective empathy (partner effect)	0.022	0.019	[-0.014, 0.059]	0.001	0.021	[-0.040, 0.042]

Notes: Unstandardized coefficients are reported. *CI* = confidence interval; *SE* = standard error.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

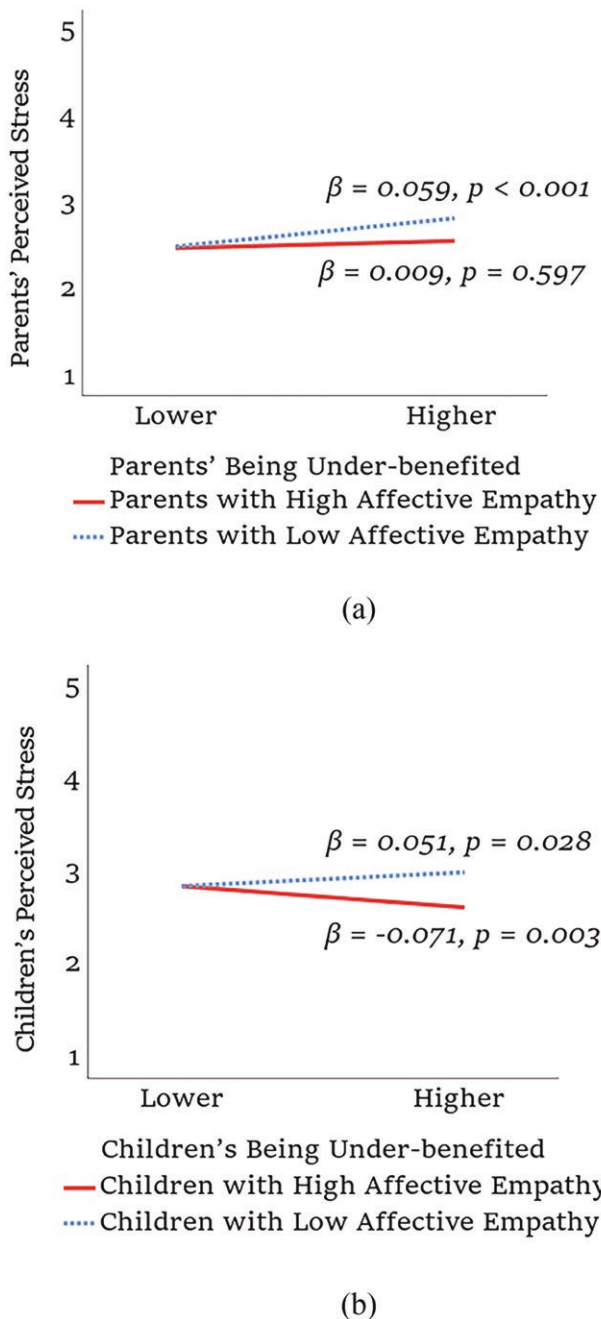
affective empathy (1*SD* below mean) ( $\beta = 0.059$ ,  $p < .001$ , 95% *CI* = [0.026, 0.093]) but not those who reported a higher level of affective empathy (1*SD* above mean) ( $\beta = 0.009$ ,  $p = .597$ , 95% *CI* = [-0.023, 0.040]).

Inconsistent with H1b, the relationship between children's level of being under-benefited and their own perceived stress was not significant ( $\beta = -0.009$ ,  $p = .609$ , 95% *CI* = [-0.042, 0.025]). However, consistent with H2b-1, this association was moderated by children's affective empathy ( $\beta = -0.093$ ,  $p < .001$ , 95% *CI* = [-0.143, -0.043]) (Table 2). As illustrated in Figure 2(b), the relationship between being under-benefited and perceived stress was positive in children who reported a lower level of affective empathy ( $\beta = 0.051$ ,  $p = .028$ , 95%

*CI* = [0.006, 0.097]). However, this relationship was negative in children who reported a higher level of affective empathy ( $\beta = -0.071$ ,  $p = .003$ , 95% *CI* = [-0.118, -0.023]). These results suggest that children who reported lower affective empathy reported greater stress on days when they perceive a greater level of being under-benefited than usual. However, those with higher affective empathy reported less stress on such days.

#### Partner effects

The association between children's being under-benefited and parents' perceived stress was not significant ( $\beta = 0.021$ ,  $p = .112$ , 95% *CI* = [-0.005, 0.046]) (H3a). Neither



**Figure 2.** The moderating roles of (A) parents' and (B) children's empathy as a daily affective state on the relationship between being under-benefited and perceived stress (actor effects). Unstandardized coefficients are reported.

did this relationship moderated by the parents' affective empathy ( $\beta = 0.022, p = .234, 95\% CI = [-0.014, 0.059]$ ) (H4a-1).

Parents' being under-benefited was positively associated with children's perceived stress ( $\beta = 0.038, p = .019, 95\% CI = [0.006, 0.070]$ ), suggesting that children perceived a greater level of stress on the days parents reported a greater level of being under-benefited (H3b). This relationship, however, was not moderated by the children's affective empathy ( $\beta = 0.001, p = .956, 95\% CI = [-0.040, 0.042]$ ) (H4b-1).

### The Moderating Role of Empathy as a Trait

Table 3 shows the results of the association between being under-benefited and perceived stress, and the moderating role of trait empathy in the parent-child dyads.

#### Actor effects

Trait empathy did not moderate the relationship between parents' being under-benefited and their own perceived stress ( $\beta = -0.008, p = .444, 95\% CI = [-0.029, 0.013]$ ) (H2a-2). Neither did children's trait empathy moderate the relationship between being under-benefited and their own perceived stress ( $\beta = -0.018, p = .220, 95\% CI = [-0.046, 0.011]$ ) (H2b-2).

#### Partner effects

Children's trait empathy significantly moderated the relationship between parents' level of being under-benefited and children's perceived stress ( $\beta = -0.051, p < .001, 95\% CI = [-0.079, -0.024]$ ) (H4b-2). Contradictory to our expectation, the positive association was only significant in children of a lower level of trait empathy, ( $\beta = 0.097, p < .001, 95\% CI = [0.052, 0.143]$ ), but not those with a higher level of trait empathy, ( $\beta = -0.024, p = .310, 95\% CI = [-0.070, 0.022]$ ) (Figure 3a). However, parents' trait empathy significantly moderated the positive relationship between children's level of being under-benefited and parents' perceived stress, ( $\beta = 0.030, p = .009, 95\% CI = [0.008, 0.052]$ ) (H4a-2). The positive association between children's level of being under-benefited and parents' perceived stress was nonsignificant in parents with lower trait empathy ( $\beta = -0.010, p = .571, 95\% CI = [-0.045, 0.025]$ ), but it was significant in parents with higher trait empathy ( $\beta = 0.050, p = .007, 95\% CI = [0.014, 0.086]$ ) (Figure 3b).

### Discussion

Although being under-benefited is associated with a greater level of stress (Hatfield & Sprecher, 1983), few studies have examined whether such positive associations may be alleviated by state-level or trait-level factors. Given the positive effects of empathy on interpersonal exchanges, we tested the moderating role of empathy on the relationship between being under-benefited and perceived stress among aging parents and adult children in this 14-day daily diary study. We found that parents reported a greater level of perceived stress on the days that they perceived a greater level of being under-benefited in the daily exchange with their adult children (H1a). This relationship, however, was moderated by parents' affective empathy (H2a-1). Specifically, the positive association between being under-benefited and perceived stress was only significant when parents reported a lower level of affective empathy than usual. Similarly for children, the association between being under-benefited and perceived stress was positive when children reported a lower level of affective empathy than usual, but it was negative when children reported a higher level of affective empathy than usual (H2b-1). Consistent with our hypotheses, these findings suggest the buffering effects of empathy as a daily affect on the negative association between being under-benefited and stress.

In addition, empathy as a trait moderated the partner effects between being under-benefited and perceived stress of the partner. Consistent with our hypothesis (H4a-2), the negative association between children's being under-benefited and parents' perceived stress was only significant in parents with

**Table 3.** The Results of the Multilevel Hierarchical Modeling on the Relationship Between Being Under-Benefited and Perceived Stress and the Moderating Role of Empathy as a Trait

APIM Parameters	Parents as the Actors			Children as the Actors		
	Estimate	SE	95%CI	Estimate	SE	95%CI
<i>Moderating role of trait empathy</i>						
Intercept	2.589***	0.033	[2.523, 2.654]	2.825***	0.038	[2.749, 2.901]
Actors' being under-benefited (actor effect)	0.034**	0.013	[0.009, 0.059]	-0.005	0.018	[-0.040, 0.030]
Partners' being under-benefited (partner effect)	0.020	0.013	[-0.006, 0.046]	0.038*	0.017	[0.005, 0.070]
<i>Between-person level moderator</i>						
Trait empathy	-0.128***	0.030	[-0.189, -0.068]	-0.045	0.032	[-0.109, 0.019]
<i>Cross level interactions</i>						
Actors' being under-benefited × trait empathy (actor effect)	-0.008	0.011	[-0.029, 0.013]	-0.018	0.015	[-0.046, 0.011]
Partners' being under-benefited × trait empathy (partner effect)	0.030**	0.011	[0.008, 0.053]	-0.051***	0.014	[-0.079, -0.024]

Notes: Unstandardized coefficients are reported. APIM = Actor Partner Interdependence Model; CI = confidence interval; SE = standard error.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

a higher level of trait empathy, but not those with a lower level of trait empathy. These findings may be explained by the intergenerational stake hypothesis which argues that parents invest more in their children than vice versa (Bengtson & Kuypers, 1971), and the literature on family roles which argues that parents themselves expect to invest more in the relationships with children than vice versa (Chandra et al., 2005; Pollmann-Schult, 2014). Because parents invest more in the relationship, they may consider the status of being under-benefited as less unpleasant or more acceptable (Jiang & Fung, 2022). Consequently, they may consider the situation in which children are under-benefited as more unpleasant and less acceptable, especially for those parents who are high in trait empathy and can understand others' feelings and situations better. Therefore, parents with a higher level of empathy reported a greater level of perceived stress when children were being under-benefited.

Contradictory to our expectation, the positive association between parents' level of being under-benefited and children's perceived stress was only significant in children of a lower level of trait empathy, but not those with a higher level of trait empathy (H4b-2). This finding may be explained by two possibilities. First, following the logic of intergenerational stake hypothesis, children with a higher level of trait empathy may understand that parents accept the short-term (daily) situations of being under-benefited as more acceptable. Therefore, parents' being more under-benefited on a day was not associated with children's perceived stress in more empathic children. Second, adult children may face more sources of stress (e.g., work and personal development) than parents. One of the reasons that parents provide more support to children than receiving from them is that their children are facing other types of stress during the day. Less empathetic children, compared to their more empathetic counterparts, may have more difficulty managing stress (Cuff et al., 2016). Therefore, children with a lower level of trait empathy reported more stress when their parents were under-benefited to a greater extent.

The current study advances the literature on intergenerational relationships in several aspects. First, based on the equity theory (Hatfield & Sprecher, 1983), we examined the association between being under-benefited and stress on a daily basis in the context of intergenerational relationships

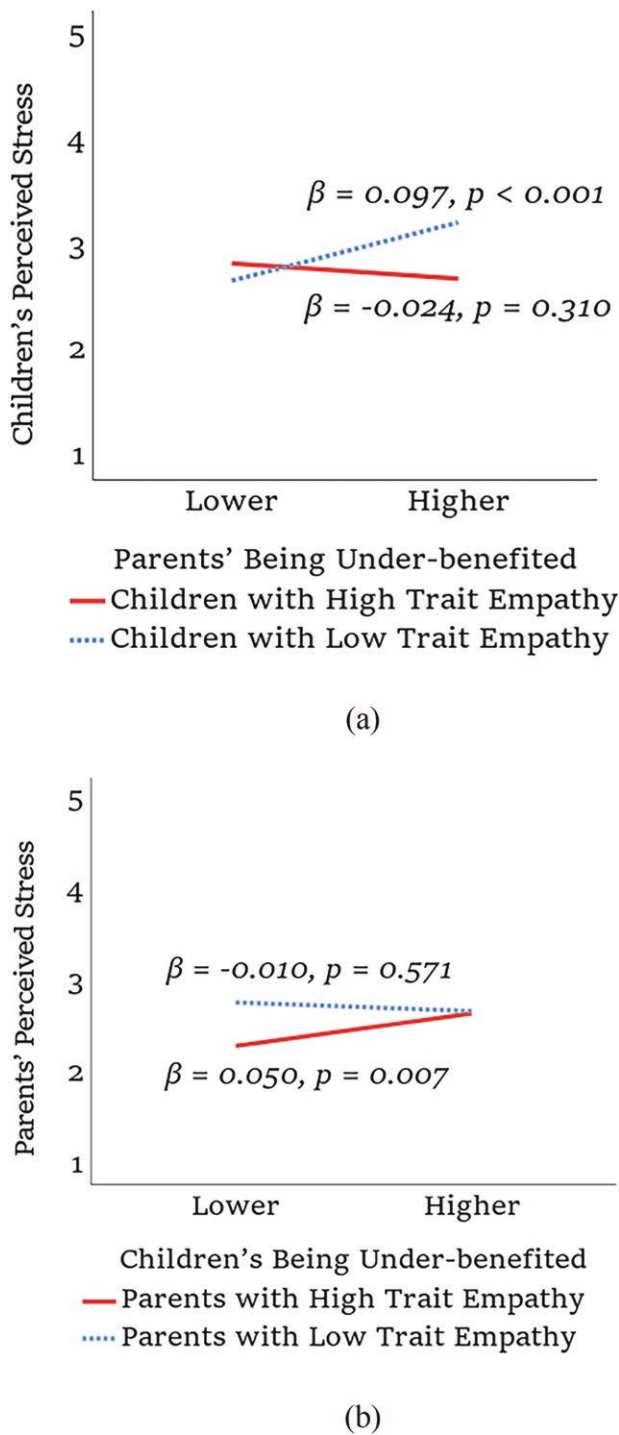
between aging parents and adult children. Our findings provide evidence to the inconclusive literature by supporting the equity theory and the negative association between being under-benefited and mental health in both aging parents and adult children.

Second, we tested the moderating roles of empathy as a daily affective state and a trait. The majority of findings supported the buffering roles of empathy on the relationship between being under-benefited and mental health. Our findings suggest that family roles or to what extent people can accept the status of being under-benefited may impact the moderating effect. Previous studies also highlighted the important role of family obligation in exchanges between family members (Polenick et al., 2015; Stone, 1991). Future studies should further investigate this in the context of understanding the role of empathy in daily exchange.

Third, we tested the moderating roles of two conceptualizations of empathy (as a state and a trait) (Zhao et al., 2021). We observed the moderating role of empathy as a state in the actor effects, but the moderating role of empathy as a trait in the partner effects. It is speculated that actor effects are more immediate and direct, and therefore, they were moderated by the immediate state of empathy (Cook & Snyder, 2005; Li et al., 2021). In contrast, partner effects rely on interpersonal perception between two partners and may take time to manifest. Thus, these effects may depend on long-term interactions and understanding between two partners. Thus, partner effects were moderated by trait-level empathy. Future studies should validate the findings in another sample.

Fourth and methodologically, most of the previous studies in the area of intergenerational exchange rely on retrospective survey which may be biased by memory and salience of the daily events (Fingerman, Kim, Tennant, et al., 2015). Recent studies have started to use the daily diary method to test family exchanges (e.g., Fingerman, Kim, Davis, et al., 2015; Fingerman, Kim, Tennant, et al., 2015; Fung et al., 2020; Li & Jiang, 2021; Polenick et al., 2015). However, most of them, if not all, relied on responses of either parents or children in the relationship (Jiang & Fung, 2022; Jiang et al., 2024). By adopting the APIM and daily diary methods, we investigated the psychological process of both relationship partners (parents and their children) simultaneously. This methodology can be adopted by future studies.





**Figure 3.** The moderating roles of (A) parents' and (B) children's empathy as a trait on the relationship between being under-benefited and perceived stress (partner effects). Unstandardized coefficients are reported.

In addition, the findings have practical implications. Our study suggests that state empathy buffers perceived stress associated with one's own situations of being under-benefited, whereas trait empathy buffers perceived stress associated with their partner's situations of being under-benefited. Researchers and practitioners can consider developing interventions to promote both state and trait empathy to enhance well-being in such circumstances. Previous studies have shown

effective interventions for increasing trait empathy by fostering a growth mindset in empathy and considering empathy as a social norm (Weisz et al., 2021). Additionally, studies have aimed to increase state empathy by encouraging individuals to consider others' thoughts (Sims et al., 2016). However, few interventions have been developed targeting the intergenerational relationship between aging parents and their adult children. Future research may test the effectiveness of these interventions in the context of intergenerational exchange and apply or adapt them to increase empathy, thereby promoting better well-being for both relationship partners.

Despite the strengths, we acknowledge some limitations which may highlight future directions. First, our findings are based on correlational relationships. Future studies should experimentally manipulate empathy (Leong et al., 2015; Miu & Baltes, 2012) and/or the status of being under-benefited (Chuan & Samek, 2014) to validate the findings. Second, we relied on a single item to measure trait and state empathy. Although single items or shorter measures are usually adopted in studies consisting of repetitive surveys, there are various measures on empathy, such as the Interpersonal Reactivity Index (Davis, 1983), Toronto Empathy Questionnaire (Spreng et al., 2009). Future studies should validate the findings using more comprehensive measures. Third, previous studies described three constructs of empathy: cognitive, affective, and behavioral. The cognitive component is the ability to take the perspective of others (perspective taking). The affective component pertains to experiencing the feelings of another person, and the behavioral component refers to communicating the understanding of an emotional experience with and even taking kind actions to show compassionate empathy to another person (Cuff et al., 2016; Lam et al., 2011; MacLeod, 2015). Due to the limitation of our measure, we did not specify different dimensions of empathy, however, it is possible that they may show different moderating effects (Klein Ikkinck & van Tilburg, 1999). Future studies should address this limitation. Fourth, sociocultural factors influence intergenerational interactions between parents and children (Fung & Jiang, 2016; Jiang & Fung, 2019; Jiang et al., 2015). Although the relationship between being under-benefited and well-being has been investigated in various countries, such as the United States (Huo et al., 2021; Liang et al., 2001), Italy (Camisasca et al., 2019), and China (Jiang et al., 2024), few studies have directly compared and contrasted whether the processes may differ by culture. Relatedly, cultural differences in state and trait empathy have also been found (Zhao et al., 2021). Since our study was conducted solely in mainland China and did not include data from other countries, it remains unclear whether these patterns may differ across sociocultural contexts. Future studies should aim to validate these findings by including participants from various countries and cultural backgrounds. Fifth, we included the gender of parents and children as control variables in our analyses. Additional analyses did not find a moderating role of parents' or children's gender on the main patterns of the results. However, previous studies have found gender differences in empathy (Chen et al., 2014), future studies may further validate whether gender may play a role in this process.

### Conclusion

In a 14-day daily diary study among aging parents and their adult children, we found that empathy as a daily

affective state moderated the actor effects between being under-benefited and perceived stress. For both parents and children, their perceived status of being under-benefited was positively associated with their own perceived stress when they reported a lower level of affective empathy than usual. When reporting a higher level of affective empathy, such association was not significant in parents, but was even positive in children. Empathy as a trait moderated the partner effects between being under-benefited and perceived stress of the partner. The negative association between partner's being under-benefited and one's own perceived stress was significant in parents with a higher level of trait empathy and children with a lower level of trait empathy. These findings shed light on the importance of empathy as a daily affect and a trait in the relationship between daily exchanges and mental health in the intergenerational contexts between aging parents and adult children.

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## Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Data Availability

Data of the study is available upon request to the corresponding author. The author acknowledges that this is not a preregistered study.

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