The Influence of Family Emotional Involvement on Self-Stereotypes in Older Adults: A Latent Growth Model Analysis

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Abstract

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Full Text

The Influence of Family Affective Involvement on Aging Self-Stereotypes: An Analysis Based on Latent Growth Modeling

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Abstract

This study employed questionnaire methods to conduct three waves of longitudinal testing over a one-year period with 257 older adults. Using latent growth modeling and cross-lagged regression analysis, we examined the developmental trajectories of family affective involvement and aging self-stereotypes, the relationship between their developmental patterns, and the temporal effects of family affective involvement on aging self-stereotypes. The results revealed that: (1) perceived family affective involvement among older adults showed a linear decline over the one-year period, while aging self-stereotypes exhibited a linear increase; (2) the initial level of family affective involvement negatively predicted both the initial level and growth rate of aging self-stereotypes; (3) the rate of decline in family affective involvement also significantly predicted the growth rate of aging self-stereotypes; and (4) cross-lagged regression analysis further supported the overall negative predictive effect of family affective involvement on aging self-stereotypes. This study provides theoretical support for understanding the family processes underlying the internalization of aging stereotypes and offers practical value for interventions aimed at reducing the internalization of aging stereotypes and improving negative aging self-stereotypes.

Keywords: family affective involvement, aging self-stereotypes, developmental trajectories, latent growth modeling, cross-lagged regression analysis

Introduction

As China' s population aging process accelerates, maintaining physical and mental health in later life and promoting successful aging have become focal concerns for researchers. While aging was once considered an inevitable physiological decline (Masoro, 2005), deepening research has revealed significant cultural variations in health functioning among older adults. Increasingly, researchers recognize that aging represents not merely biological deterioration but also the outcome of altered socio-psychological structures, particularly aging self-stereotypes (Levy, 2003). Levy, Ashman, et al. (2000) proposed that people hold specific beliefs and expectations about older adults as a social group —what we term aging stereotypes. As individuals age, these stereotypes become internalized as self-perceptions of aging, forming aging self-stereotypes. Stereotype embodiment theory (SET) posits that this internalization process often occurs unconsciously throughout the lifespan (Levy, 2009), manifesting significant changes even within relatively short periods (Lysaker et al., 2012). Similarly, the contamination hypothesis suggests that individuals establish negative cognitions about aging early in life, which become incorporated into self-views with age, thereby "contaminating" the self with the negative influences of aging stereotypes (Rothermund & Brandtstädter, 2005). Recent research further indicates that negative self-perceptions of aging demonstrate linear growth trends over extended periods (e.g., eight years) (Zhang et al., 2020). Consequently, as individuals age, their self-stereotypes about aging likely exhibit sustained increases over time, with this trend remaining quite stable even after entering

older adulthood.

As a core component of older adults' self-concept, aging self-stereotypes increase the likelihood that individuals will identify with group stereotypes and engage in stereotype-consistent behaviors, directly influencing their expectations, goals, and behaviors regarding self-development. This represents both a prerequisite and central process through which aging stereotypes affect individual psychological functioning and physiological structures (Kornadt et al., 2017; Westerhof & Wurm, 2015). Empirical research has confirmed that negative aging self-stereotypes correlate closely with accelerated memory decline (Levy et al., 2012), higher incidence of cardiovascular problems (Levy, Hausdorff, et al., 2000), poorer health functioning, and even higher early mortality rates (Levy, Ashman, et al., 2000). Given these significant impacts on health and well-being, researchers have begun examining the specific mechanisms underlying the internalization of aging stereotypes. Levy' s (2009) stereotype embodiment theory suggests that aging stereotypes become self-relevant through physiological, behavioral, and psychological pathways. Among these, the psychological pathway has received the most extensive attention (Fawsitt & Setti, 2017). This pathway primarily involves stereotypes influencing individuals' cognitions about their "possible future selves," ultimately developing into self-fulfilling prophecies (Levy, 2009; Rothermund, 2005). "Possible selves" represent individuals' expectations for their future self-image, often derived from older adults' experiences across various life domains (Kornadt & Rothermund, 2012). These experiences may stem from older adults' awareness of their own health conditions but also frequently depend on their perceptions of evaluations and attitudes from relatives and friends. As family members gradually become older adults' most important social partners and living environment, their dependence on family increases, as does their need for emotional involvement from family members. In this context, perceived family affective involvement likely facilitates processes related to the self-conceptualization of aging stereotypes.

Family affective involvement refers to the degree to which family members care about and value each other' s activities and affairs (Liu & He, 1999). As individuals enter older adulthood, family activities increasingly dominate their later lives, and their need for emotional involvement from family members grows. However, due to insufficient timely attention and responsiveness from family members, older adults' increasing emotional needs often become inversely proportional to their actual perceived levels of family affective involvement, leading to reduced satisfaction with family emotional support (Robinson & Knight, 2005). Specifically, research shows that declining marital quality in later life leads to inadequate emotional involvement from spouses—the most important source of family affective involvement (Kamp Dush et al., 2008). Additionally, as adult children become independent and mature, emotional cohesion between them and their aging parents declines, with frequent intergenerational conflicts threatening positive, high-quality emotional involvement (Fingerman et al., 2008; Silverstein & Giarrusso, 2010). Previous studies also indicate that age-related life events such as retirement, divorce, and widowhood cause sig-

nificant short-term declines in perceived family affective involvement (Hayslip et al., 2015; Utz et al., 2014). Moreover, researchers have found that socio-psychological structures such as family functioning and family support across various age groups often exhibit linear developmental trends over 2–5 years (Dubois et al., 2002; Lorenzo-Blanco et al., 2019). Based on these findings, we hypothesize that perceived family affective involvement among older adults will show a linear declining or deteriorating trend over time.

Despite this anticipated decline, the importance of family affective involvement for older adults' physical and mental health cannot be overstated. As a key characteristic and prerequisite for well-coordinated social interaction and interpersonal relationships (Martens et al., 2014), positive family affective involvement represents higher levels of family emotional support, helping older adults better perceive understanding and encouragement from family members while providing crucial support for coping with stress and successfully adapting to aging (Kwok et al., 2015). Previous research has demonstrated that high-quality intergenerational involvement positively affects a range of social, cognitive, and behavioral processes and activities among older adults (Zotnowski, 2004; Zhang et al., 2010). Conversely, limited emotional involvement among family members has been shown to hinder other domains of family functioning (e.g., family communication or problem-solving) and correlates closely with various health risk factors, including chronic diseases, accident risk, cognitive dysfunction, and frequent experiences of loneliness and depression (Ji et al., 2006).

Building on this literature, researchers have speculated that family affective involvement may play an important role in the internalization of aging stereotypes (Wang & Zhao, 2012). However, no studies have directly examined the effect of older adults' family affective involvement on aging self-stereotypes. Limited related research has found that family relationships and interactions can effectively buffer older adults' negative self-views and protect their physical and mental health (Nelson, 2016). Ramírez and Palacios-Espinosa (2016) also demonstrated that support and reliance from family members can promote older adults' sense of control over aging trajectories and foster positive expectations for physical and mental health. Other studies have found that negative aging stereotypes portray older adults as lacking independence and being highly dependent. Families holding such stereotypes may exhibit excessive concern and protection toward elderly relatives, leading older adults to question their own abilities and deepening their negative self-expectations (Gendron et al., 2016). Based on this literature, we hypothesize that family affective involvement—a key family factor—likely influences aging self-stereotypes. Specifically, the overall level of older adults' family affective involvement may negatively predict their overall level of aging self-stereotypes.

Furthermore, current research lacks exploration of the dynamic developmental trajectories of family affective involvement and aging self-stereotypes within a longitudinal framework, and no studies have examined the relationship between intraindividual changes in average levels of family affective involvement and

aging self-stereotypes over time. In the face of inevitable declines in internal and external resources triggered by aging, initially high-quality family affective involvement has been shown to effectively enhance older adults' emotion regulation and emotional expression control abilities, helping them acquire more mature coping strategies and defensive resources to address various psychological threats and thereby establish more positive self-expectations and maintain stable self-concepts (Hart, 2014; Zhang & Guo, 2017). Conversely, initially low-quality family affective involvement and high levels of social anxiety are often associated with immature defense mechanisms such as passive aggression, suppression, or withdrawal, which become risk factors accelerating the internalization of negative aging stereotypes. Therefore, during the aging process, older adults' initial levels of emotional involvement with family members may negatively predict subsequent developmental changes in aging self-stereotypes.

Similarly, changes in older adults' family affective involvement may influence changes in aging self-stereotypes. Dissipative structure theory emphasizes the important role of external social environments on individual psychological processes through defense mechanisms (Zhang & Guo, 2017). Older adults who perceive rapid declines in family affective involvement are more likely to experience persistent social anxiety, inevitably facing continuous declines in psychological resources such as self-worth, security, and self-efficacy. They also tend to adopt more immature defensive strategies such as avoidance and isolation in family activities, leading to cognitive-affective schema disorganization and instability (Zhang & Guo, 2017), accelerating increases in negative self-expectations, and ultimately hastening the self-conceptualization of aging stereotypes—that is, the development of aging self-stereotypes. In other words, over time, developmental changes in older adults' family affective involvement may negatively predict developmental changes in aging self-stereotypes.

In summary, given that previous research has shown family affective involvement and related concepts to exhibit significant linear decline or growth trends over relatively short periods, and to minimize sample attrition issues in longitudinal research caused by overly long intervals or participant fatigue (Wang & Bi, 2018), this study employed three waves of testing over a one-year period. Using latent growth modeling and cross-lagged regression models, we examined the developmental trajectories of family affective involvement and aging self-stereotypes and the causal relationship between them. Based on our literature review, we propose the following hypotheses for the latent growth models:

H1: Perceived family affective involvement among older adults shows a linear declining trend over time.
H2: Negative aging self-stereotypes among older adults show a linear increasing trend over time.
H3: The initial level of older adults' family affective involvement negatively predicts the initial level of aging self-stereotypes.
H4: The initial level of older adults' family affective involvement negatively predicts changes in aging self-stereotypes.

H5: Developmental changes in older adults' family affective involvement significantly negatively predict developmental changes in aging self-stereotypes.

Finally, using cross-lagged regression analysis to further verify the temporal sequence of the relationship between family affective involvement and aging self-stereotypes, we hypothesize:

H6: Family affective involvement among older adults negatively predicts negative aging self-stereotypes six months later.

Method

Participants This study employed simple random sampling across six medium-sized communities (approximately 10,000 residents each) in Xi' an, with establishment dates ranging from less than 10 years to approximately 30 years. We recruited participants through community committees and public squares, selecting older adults aged over 55 (for women) or 60 (for men), native Chinese speakers, with normal or corrected vision, and without brain disease or cognitive impairment. Additionally, we used snowball sampling, encouraging participants to invite their friends and acquaintances. The first assessment (T1) began in April 2018, with follow-up assessments conducted every six months. In this study, we used three waves of family affective involvement and aging self-stereotype data to construct latent growth models (Wang & Bi, 2018). The first wave yielded 675 valid participants, the second wave (T2) included 377 participants, and the third wave (T3) comprised 257 participants (79 men, 178 women). Detailed background information is presented in Table 1 .

Table 1 Background Information (n = 257)

Variable	Category	n (%)
Gender	Male	79 (30.7%)
	Female	178 (69.3%)
Age, M (SD)		67.27 (7.55)
Education	Primary school or below	99 (38.5%)
	Middle school	101 (39.3%)
	High school or above	57 (22.2%)
Annual Income	¥0-11,999	44 (17.1%)
	¥12,000-35,999	132 (51.3%)
	¥36,000 or above	79 (30.7%)
Self-rated health, M (SD)		3.29 (0.88)

Given the importance of sample size in longitudinal research, we analyzed attrition rates. The attrition rate was 44.1% from Wave 1 to Wave 2 and 31.8% from Wave 2 to Wave 3. We conducted differential tests between participants who dropped out and those who completed all three waves on demographic information, T1 family affective involvement, and T1 aging self-stereotypes. Normality

tests indicated skewed distributions for all demographic variables and T1 measures. Chi-square and Mann-Whitney U tests revealed no significant differences between dropouts and completers in gender ($^2(1) = 3.14$, p = 0.386), age (Z = −0.06, p = 0.952), education ($^2(2) = 0.67$, p = 0.964), annual income ($^2(2) = 1.16$, p = 0.850), or self-rated health (Z = −0.47, p = 0.635). Additionally, no significant differences emerged in T1 family affective involvement (Z = −0.69, p = 0.489) or T1 aging self-stereotypes (Z = −0.50, p = 0.617), indicating that attrition was not systematic.

Measures Family Affective Involvement. We measured perceived family affective involvement using the Affective Involvement (AI) subscale from the Chinese version of the Family Assessment Device (FAD) revised by Liu and He (1999). This subscale comprises seven items (e.g., "In our family, we only look out for each other when it benefits ourselves"). Items were rated on a 4-point scale from "not at all like my family" to "very much like my family." For ease of understanding and subsequent analysis, all items were reverse-scored, with higher scores indicating better quality of emotional involvement among family members. The AI scale has been widely applied across age groups and populations, including older adults (Pace et al., 2014; Hao et al., 2015), and demonstrates stable internal consistency reliability (0.72–0.78) (Epstein et al., 1983; Schuman et al., 2013). In the present study, analyses across three waves consistently showed that removing one item ("When someone is in trouble, others become too involved") improved the overall Cronbach' s α coefficient (from 0.59, 0.66, and 0.69 to higher values). This item likely does not fit our sample well. Therefore, to enhance measurement reliability, we removed it from final analyses. The resulting six-item scale showed Cronbach' s α coefficients of 0.64, 0.72, and 0.70 across the three waves, meeting Ziegel et al.' s (2005) criterion of $\alpha > 0.55$ for social science research. We concluded that the six items demonstrated adequate stability and homogeneity.

To assess the scale's validity, a panel of seven graduate students in social psychology evaluated the items. To simplify the procedure while maximizing validity assessment and avoiding inaccuracies due to raters' limited experience, we first presented the definition of family affective involvement to the panel. We then asked them to select items measuring this construct from a pool mixing AI items with family communication items (e.g., "We are direct with each other; we do not beat around the bush") (12 items total). This task required only discrimination based on definitions, minimizing theoretical background demands while reflecting both content and discriminant validity. All seven raters successfully identified the six AI items, indicating good content and discriminant validity.

Aging Self-Stereotypes. We selected 10 items from the Fraboni Scale of Ageism (FSA) (Fraboni et al., 1990) and Kornadt and Klaus' s (2011) domain-specific aging stereotype scale that best fit Chinese older adults and showed high factor loadings (theoretically more representative of the measured construct). Example items include "I annoy people by repeating the same stories" and "At

work, I have difficulty adapting to change, so I am not as good as younger people," reflecting ageist attitudes and negative evaluations of aging across multiple life domains. These items have been widely used to examine effects of aging self-stereotypes on quality of life, health, and well-being (Bodner & Cohen-Fridel, 2010; Dionigi, 2015; Kornadt et al., 2013) and demonstrate good reliability and validity (Kornadt & Klaus, 2011; Rupp et al., 2005). Items were rated on a 4-point scale from strongly disagree to strongly agree, with higher scores indicating stronger negative aging self-stereotypes. Cronbach' s α coefficients were 0.66, 0.66, and 0.69 across the three waves. The same seven-member graduate student panel assessed validity by selecting aging self-stereotype items from a pool mixing self-concept items (e.g., "I sometimes put off until tomorrow what I should do today") with aging self-stereotype items (20 items total) based on the construct definition. All raters successfully identified the 10 target items, demonstrating good content and discriminant validity.

Data Analysis Strategy We first conducted descriptive statistics and correlation analyses to examine the stability of aging self-stereotypes and family affective involvement and their intercorrelations across time points. Next, we used latent growth modeling (LGM) to examine developmental trajectories and causal relationships. Specifically, we investigated intraindividual and interindividual relationships by: (1) constructing unconditional latent growth models for both constructs using intercepts to represent initial levels and slopes to represent change; (2) building a parallel growth model to examine effects of family affective involvement on aging self-stereotypes; and (3) conducting cross-lagged regression analysis to confirm temporal ordering and overall causal direction. Analyses were performed using SPSS 22.0, Mplus 8.0, and Amos 24.0. Latent growth and cross-lagged models used maximum likelihood robust (MLR) estimation because Kolmogorov-Smirnov tests indicated skewed distributions for both variables across waves. MLR has been shown to outperform other methods for non-normal data (Bandalos, 2014). Considering the degree of non-normality and missing data (Dong & Peng, 2013), we retained only participants with complete data across all three waves. Model fit was evaluated using ^{2}, df, CFI ($>$ 0.90), GFI ($>$ 0.90), TLI ($>$ 0.90), RMSEA ($<$ 0.08), and SRMR ($<$ 0.08) (Hu & Bentler, 1999).

Results

Common Method Bias To assess common method bias across the three waves, we conducted Harman' s single-factor test. Results showed that the first factor explained 20.77%, 21.03%, and 19.51% of variance respectively, all below the 40% threshold (Podsakoff et al., 2003), indicating minimal common method bias.

Descriptive Statistics and Correlations Means, standard deviations, and correlation matrices for the three waves are presented in Table 2 . From T1 to T3, perceived family affective involvement showed an overall declining trend, while

aging self-stereotypes increased. Moreover, family affective involvement and aging self-stereotypes were significantly negatively correlated across all waves (r = −0.38 to −0.16, ps < 0.01).

Table 2 Means, Standard Deviations, and Correlation Matrix

Variable	M (SD)	1	2	3	4	5	6
1. T1 Family Affective Involvement	15.30 (2.96)	–					
2. T2 Family Affective Involvement	15.29 (3.18)	0.51***	–				
3. T3 Family Affective Involvement	14.74 (3.07)	0.32***	0.35***	–			
4. T1 Aging Self-Stereotypes	19.85 (3.62)	−0.30***	−0.21***	−0.16**	–		
5. T2 Aging Self-Stereotypes	20.96 (4.66)	−0.30***	−0.31***	−0.21***	0.55***	–	
6. T3 Aging Self-Stereotypes	21.40 (4.30)	−0.20***	−0.24***	−0.38***	0.29***	0.30***	–

Note: $p \leq 0.05$; $\boldsymbol{p \leq 0.01}$; $p \leq 0.001$. The same applies below.

Unconditional Latent Growth Models Family Affective Involvement. We constructed a linear unconditional latent growth model for family affective involvement (Figure 1 [Figure 1: see original paper]) to examine its change trajectory. Fit indices (Table 3) indicated good model fit. Results (Table 4) showed the intercept—representing initial level—was 15.34 (SE = 0.18, $p < 0.001$), significantly greater than zero. Family affective involvement declined linearly across the three waves (slope = −0.25, SE = 0.11, p = 0.019), supporting H1. Both intercept variance ($\sigma^2 = 6.62$, SE = 1.17, $p < 0.001$) and slope variance ($\sigma^2 = 1.15$, SE = 0.52, p = 0.027) were significant, indicating systematic interindividual differences in initial levels and rates of change. The intercept and slope correlated significantly (r = −0.67, $p < 0.001$), suggesting that older adults with higher initial levels experienced steeper declines.

Aging Self-Stereotypes. We constructed a linear unconditional latent growth model for aging self-stereotypes. Fit indices (Table 3) indicated good model fit. The intercept was 19.84 (SE = 0.23, $p < 0.001$), significantly greater than zero. Aging self-stereotypes increased linearly across waves (slope = 0.84, SE = 0.15, $p < 0.001$), supporting H2. Both intercept variance ($\sigma^2 = 13.86$, SE = 2.31, $p < 0.001$) and slope variance ($\sigma^2 = 3.03$, SE = 0.96, p = 0.002) were significant, indicating systematic interindividual differences. The intercept and

slope correlated significantly (r = −0.72, p < 0.001), indicating that higher initial levels were associated with slower growth rates (Table 4).

Table 3 Fit Indices for Linear Unconditional Latent Growth Models

Model	^{2}/df	RMSEA
Family Affective Involvement		
Aging Self-Stereotypes		

Table 4 Parameter Estimates for Latent Growth Models

Construct	Intercept	Slope	Intercept Variance	Slope Variance	Correlation
Family Affective Involvement	15.34***	−0.25*	6.62***	1.15*	−0.67***
Aging Self-Stereotypes	19.84***	0.84***	13.86***	3.03**	−0.72***

Parallel Growth Model To examine the relationship between family affective involvement and aging self-stereotypes, we constructed a parallel growth model (Figure 2 [Figure 2: see original paper]) using family affective involvement intercepts and slopes to predict aging self-stereotype growth. The model fit well: $^2(7) = 11.04$, p = 0.320, CFI = 0.99, TLI = 0.97, RMSEA = 0.05, SRMR = 0.03.

In the parallel growth model, family affective involvement intercept significantly predicted aging self-stereotype intercept ($\beta = -0.40$, SE = 0.12, p = 0.001), supporting H3: lower initial family affective involvement corresponded to higher initial aging self-stereotypes. Additionally, family affective involvement intercept negatively predicted aging self-stereotype slope ($\beta = -0.55$, SE = 0.26, p = 0.034), supporting H4: lower initial levels predicted faster growth in aging self-stereotypes. Finally, family affective involvement slope negatively predicted aging self-stereotype slope ($\beta = -0.85$, SE = 0.32, p = 0.009), supporting H5: steeper declines in family affective involvement predicted steeper increases in aging self-stereotypes.

To further test causality and potential bidirectional effects, we estimated a competing model with aging self-stereotypes predicting family affective involvement. Results showed that aging self-stereotype intercept did not significantly predict family affective involvement slope ($\beta = -0.30$, SE = 0.28, p = 0.283), indicating that aging self-stereotypes did not predict changes in family affective involvement.

Cross-Lagged Regression Analysis While latent growth modeling captures dynamic characteristics, cross-lagged regression analysis further examines lead-lag relationships and strengthens causal arguments (Martens & Haase, 2006). This approach controls for autoregressive effects and is considered optimal for examining "pure" directional effects (Preacher, 2015). Increasingly, researchers advocate integrating multiple methods for robust causal inference (Curran & Bollen, 2001; de Stavola et al., 2006; Pakpahan et al., 2017). Cross-lagged analysis requires testing four models: (1) a baseline autoregressive model M1; (2) a model M2 adding paths from X to Y; (3) a competing model M3 adding paths from Y to X; and (4) a full model M4 including all paths (Figure 3 [Figure 3: see original paper]).

Model fit indices and chi-square difference tests are presented in Table 5 . M2 and M4 showed better fit than the autoregressive model M1, with significant chi-square differences ($\Delta\,^2(2) = 16.61$, $p < 0.001$; $\Delta\,^2(4) = 20.91$, $p < 0.001$), while M3 did not differ significantly from M1 ($\Delta\,^2(2) = 5.68$, $p = 0.058$). Comparing M2 and M4 revealed no significant difference ($\Delta\,^2(2) = 4.30$, $p = 0.116$). Path analysis showed that in M4, T1 aging self-stereotypes did not significantly predict T2 family affective involvement ($\beta = -0.06$, SE = 0.05, $p = 0.297$), nor did T2 aging self-stereotypes predict T3 family affective involvement ($\beta = -0.11$, SE = 0.04, $p = 0.072$). Based on parsimony, M2 was selected as the final model.

The final model (Figure 4 [Figure 4: see original paper]) showed that T1 family affective involvement significantly negatively predicted aging self-stereotypes six months later ($\beta = -0.16$, SE = 0.09, $p = 0.004$). Similarly, T2 family affective involvement negatively predicted T3 aging self-stereotypes ($\beta = -0.18$, SE = 0.08, $p = 0.004$), supporting H6.

Table 5 Model Fit Indices

Model	RMSEA	Comparison	$\Delta\,^2$	p
M1 vs. M2			16.61	< 0.001
M1 vs. M3			5.68	0.058
M1 vs. M4			20.91	< 0.001

Together, latent growth modeling and cross-lagged regression analyses support the predictive effect of family affective involvement on aging self-stereotypes but not the reverse, indicating a stable directional relationship.

Discussion

Development of Perceived Family Affective Involvement Our findings reveal that perceived family affective involvement declines continuously in later life. As age increases, older adults inevitably face more negative events such as

the loss of spouses and relatives. Physical functional limitations often accompany psychological distress and daily inconveniences, directly increasing needs for family emotional involvement. However, because available emotional support and involvement from family members are relatively limited and cannot fully meet older adults'growing needs (Cheng, 2016), perceived emotional involvement levels decline. Additionally, results show a strong negative correlation between initial level and rate of decline: older adults with higher initial family affective involvement experienced faster declines, while those with lower initial levels showed slower declines. This may occur because older adults with high initial involvement derive greater pleasure from family interactions (Charles & Piazza, 2007) and have higher expectations for emotional support, which increases sensitivity to actual involvement levels and creates an inverse relationship between expectations and perceived involvement (Cheng, 2016), ultimately accelerating decline. For those with low initial involvement, the pleasure derived from family interactions is already limited, as are their expectations, resulting in slower perceived declines under the same external circumstances.

Development of Aging Self-Stereotypes Consistent with our hypotheses, aging self-stereotypes increased across the three waves. Stereotype embodiment theory posits that stereotypes internalize throughout the lifespan (Levy, 2009). Children initially acquire age-related stereotypical beliefs from cultural contexts. As they age, defensive strategies against these stereotypes decrease, leading to continuous self-relevance of aging stereotypes. Moreover, while negative aging stereotypes may harm older adults long-term (e.g., damaged relationships), they often benefit younger individuals short-term (e.g., workplace priority), leading to acceptance in youth (Levy, 2009). However, upon entering older adulthood, these stereotypes become self-relevant and exert negative effects. Difficulties with reemployment, increased negative evaluations from relatives and friends, and more frequent medical services reinforce the self-relevance of aging stereotypes in social activities (Moberg & Nelson, 2003). Rothermund' s (2005) five-year longitudinal study also showed that aging stereotypes continuously integrate into older adults' current and future self-views, helping explain the growth of negative aging self-stereotypes over time.

Furthermore, the strong negative correlation between intercept and slope indicates that individuals with higher initial aging self-stereotype levels showed slower growth rates, while those with lower initial levels exhibited steeper increases. This may reflect that individuals with high initial levels more frequently encounter social hostility and discrimination, leading to more rejection and avoidance behaviors that reduce direct exposure to stereotype self-relevance. Conversely, those with fewer negative self-stereotypes may be more unprepared when encountering negative age-related attitudes, expanding and accelerating the adverse effects of aging stereotypes.

Effects of Family Affective Involvement on Aging Self-Stereotype Development Our results show that initial family affective involvement neg-

atively predicts initial aging self-stereotype levels. Lower initial involvement corresponds to more negative initial aging self-stereotypes. Family affective involvement serves as an important protective factor for older adults' health (Yu et al., 2008). Facing inevitable declines in internal and external resources, high-quality family affective involvement can enhance emotion regulation and expression control, helping older adults develop mature coping strategies and defensive resources to address psychological threats and establish positive future self-expectations (Hart, 2014; Zhang & Guo, 2017). Conversely, low-quality involvement often accompanies family members'negative attitudes and evaluations of older adults' capabilities (e.g., sensory function, memory, work performance), which may cause older adults to question their own feelings, thoughts, and experiences, promote marginalization within the family, and increase expectations of loneliness, thereby elevating negative aging self-stereotypes (Sue, 2004).

Additionally, initial family affective involvement influences growth rates in aging self-stereotypes throughout the study period. Lower initial involvement predicted faster growth, while higher initial levels predicted slower growth. Dissipative structure theory provides insight into this relationship. The theory suggests that individuals develop psychological defense mechanisms through emotional interactions with caregivers from infancy and subsequent relationships to maintain stable internal cognitive-affective schemas and regulate self-views (Siefert & Porcerelli, 2015; Zhang & Guo, 2017). For older adults, aging brings increased risks of negative life events. To mitigate associated negative emotions, they must mobilize internal resources and defensive strategies (Hart, 2014). Initially perceiving low family affective involvement undermines security and self-worth, increasing the likelihood of maladaptive, immature defense mechanisms (Gerber & Wheeler, 2009; Malone et al., 2013). These strategies prompt older individuals to escape relationships, deny others' significance, and retreat into isolation to maintain self-evaluation. However, such immature defenses only function temporarily; as psychological systems become destabilized and internal resources deplete, internalization of negative stereotypes accelerates (Yu et al., 2008). In contrast, high family affective involvement enhances self-efficacy and emotion regulation, fostering more adaptive, mature defensive strategies (Zhou et al., 2020) that protect against aging stereotypes long-term.

Finally, the rate of decline in family affective involvement predicted the growth rate of aging self-stereotypes. Faster declines corresponded to faster increases in aging self-stereotypes, while slower declines predicted slower internalization. Dissipative structure theory explains this finding: stable family affective involvement helps older adults mobilize internal and external resources more effectively when facing aging stereotypes, employing mature defensive strategies to maintain stable self-views and personality structures (Hart, 2014). Conversely, rapid declines weaken psychological defenses, trigger persistent social anxiety, accelerate self-efficacy loss, and increase negative self-expectations, ultimately leading to rapid growth in negative aging self-stereotypes.

Cross-lagged regression analysis further clarified the temporal sequence: fam-

ily affective involvement negatively predicted aging self-stereotypes six months later, but not vice versa. These results support our causal inferences and align with previous research (Kornadt & Rothermund, 2012; Sue, 2004) showing that high-quality family affective involvement enhances emotion regulation and fosters positive aging self-stereotypes, while low involvement promotes marginalization and loneliness expectations, increasing negative aging self-stereotypes.

Limitations and Future Directions This study has several limitations. First, all variables were measured via self-report questionnaires. Although we assured anonymity to promote honest responding, questionnaire methods have inherent subjective biases that may affect responses. Future research should employ implicit measures or combine physiological and neuroimaging indicators in laboratory settings for more objective data. Second, sample size is crucial in longitudinal designs. To maintain acceptable retention rates, we used six-month intervals, though we cannot confirm this as optimal for observing developmental changes. Additionally, while extensive literature suggests linear changes for psychological constructs over short follow-up periods—and our results assume linear development—three time points can only fit linear latent growth models (Wang & Bi, 2018) and may not capture long-term trends. Future research should extend follow-up duration and increase measurement occasions to reveal more precise developmental effects and inter-variable relationships.

References

Bandalos, D. L. (2014). Relative performance of categorical diagonally weighted least squares and robust maximum likelihood estimation. *Structural Equation Modeling, 21*(1), 102–116.

Bodner, E., & Cohen-Fridel, S. (2010). Relations between attachment styles, ageism and quality of life in late life. *International Psychogeriatrics, 22*(8), 1353–1361.

Charles, S. T., & Piazza, J. R. (2007). Memories of social interactions: Age differences in emotional intensity. *Psychology and Aging, 22*(2), 300–309.

Cheng, S. -T. (2016). Self-perception of aging and satisfaction with children' s support. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 72*(5), 782–791.

Curran, P. J., & Bollen, K. A. (2001). The best of both worlds: Combining autoregressive and latent curve models. In L. M. Collins & A. G. Sayer (Eds.), *New methods for the analysis of change* (pp. 107–135). American Psychological Association.

de Stavola, B. L., Nitsch, D., dos Santos Silva, I., McCormack, V., Hardy, R., Mann, V., ···Leon, D. A. (2006). Statistical issues in life course epidemiology. *American Journal of Epidemiology, 163*(1), 84–96.

Dionigi, R. A. (2015). Stereotypes of aging: Their effects on the health of older adults. *Journal of Geriatrics, 2015*.

Dong, Y. R., & Peng, C. -Y. J. (2013). Principled missing data methods for researchers. *Springerplus, 2*(1), 1-17.

Dubois, D. L., Burk-Braxton, C., Swenson, L. P., Tevendale, H. D., Lockerd, E. M., & Moran, B. L. (2002). Getting by with a little help from self and others: Self-esteem and social support as resources during early adolescence. *Developmental Psychology, 38*(5), 822-839.

Epstein, N. B., Baldwin, L. M., & Bishop, D. S. (1983). The McMaster family assessment device. *Journal of Marital and Family Therapy, 9*(2), 171-180.

Fawsitt, F., & Setti, A. (2017). Extending the stereotype embodiment model: A targeted review. *Translational Issues in Psychological Science, 3*(4), 357-369.

Fingerman, K. L., Pitzer, L., Lefkowitz, E. S., Birditt, K. S., & Mroczek, D. (2008). Ambivalent relationship qualities between adults and their parents: Implications for the well-being of both parties. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 63*(6), 362-371.

Fraboni, M., Saltstone, R., & Hughes, S. (1990). The Fraboni Scale of Ageism (FSA): An attempt at a more precise measure of ageism. *Canadian Journal on Aging, 9*(1), 56-66.

Gendron, T. L., Welleford, E. A., Inker, J., & White, J. T. (2016). The language of ageism: Why we need to use words carefully. *The Gerontologist, 56*(6), 997-1006.

Gerber, J., & Wheeler, L. (2009). On being rejected: A meta-analysis of experimental research on rejection. *Perspectives on Psychological Science, 4*(5), 468-488.

Gordon, S. (2020). Ageism and age discrimination in the family: Applying an intergenerational critical consciousness approach. *Clinical Social Work Journal, 48*(2), 169-178.

Hao, Y. X., Hao, X. J., & Chen, C. X. (2015). Family function and its influencing factors among urban and rural elderlies in Hebei province. *Chinese Journal of Public Health, 31*(2), 149-152.

Hart, J. (2014). Toward an integrative theory of psychological defense. *Perspectives on Psychological Science, 9*(1), 19-28.

Hayslip, B., Blumenthal, H., & Garner, A. (2015). Social support and grandparent caregiver health: One-year longitudinal findings for grandparents raising their grandchildren. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 70*(5), 804-812.

He, Q. L., Yu, L., & Ma, J. L. (2013). Review and prospect of aging stereotype. *Advances in Psychological Science, 21*(3), 495-505.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55.

Ji, J., Sun, R., Geng, Q., & Kang, M. L. (2006). Effect of family function on depression of the elderly. *China Journal of Health Psychology, 14*(4), 432–433.

Kamp Dush, C. M., Taylor, M. G., & Kroeger, R. A. (2008). Marital happiness and psychological well-being across the life course. *Family Relations, 57*(2), 211–226.

Kornadt, A. E., & Klaus, R. (2011). Contexts of aging: Assessing evaluative age stereotypes in different life domains. *Journals of Gerontology, 66*(5), 547–556.

Kornadt, A. E., & Rothermund, K. (2012). Internalization of age stereotypes into the self-concept via future self-views: A general model and domain-specific differences. *Psychology and Aging, 27*(1), 164–172.

Kornadt, A. E., Voss, P., & Rothermund, K. (2013). Multiple standards of aging: Gender-specific age stereotypes in different life domains. *European Journal of Ageing, 10*(4), 335–344.

Kornadt, A. E., Voss, P., & Rothermund, K. (2017). Age stereotypes and self-views revisited: Patterns of internalization and projection processes across the life span. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 72*(4), 582–592.

Kwok, S. Y. C. L., Cheng, L., & Wong, D. F. K. (2015). Family emotional support, positive psychological capital and job satisfaction among Chinese white-collar workers. *Journal of Happiness Studies, 16*(3), 561–582.

Levy, B. R. (2003). Mind matters: Cognitive and physical effects of aging self-stereotypes. *The Journals of Gerontology: Series B, 58*(4), 203–211.

Levy, B. R. (2009). Stereotype embodiment: A psychosocial approach to aging. *Current Directions in Psychological Science, 18*(6), 332–336.

Levy, B. R., Ashman, O., & Dror, I. (2000). To be or not to be: The effects of aging stereotypes on the will to live. *OMEGA-Journal of Death and Dying, 40*(3), 409–420.

Levy, B. R., Hausdorff, J. M., Hencke, R., & Wei, J. Y. (2000). Reducing cardiovascular stress with positive self-stereotypes of aging. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 55*(4), 205–213.

Levy, B. R., Zonderman, A. B., Slade, M. D., & Ferrucci, L. (2012). Memory shaped by age stereotypes over time. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 67*(4), 432–436.

Liu, P. Y., & He, M. T. (1999). Family assessment device. In X. Wang, X. Wang, & H. Ma (Eds.), *Rating Scales for Mental Health* (pp. 149–152). Chinese Mental Health Journal.

Lorenzo-Blanco, E. I., Meca, A., Piña-Watson, B., Zamboanga, B. L., Szapocznik, J., Cano, M. Á., ···Schwartz, S. J. (2019). Longitudinal trajectories of family functioning among recent immigrant adolescents and parents: Links with adolescent and parent cultural stress, emotional well-being, and behavioral health. *Child Development, 90*(2), 506–523.

Lysaker, P. H., Tunze, C., Yanos, P. T., Roe, D., Ringer, J., & Rand, K. (2012). Relationships between stereotyped beliefs about mental illness, discrimination experiences, and distressed mood over 1 year among persons with schizophrenia enrolled in rehabilitation. *Social Psychiatry and Psychiatric Epidemiology, 47*(6), 849–855.

Malone, J. C., Cohen, S., Liu, S. R., Vaillant, G. E., & Waldinger, R. J. (2013). Adaptive midlife defense mechanisms and late-life health. *Personality and Individual Differences, 55*(2), 85–89.

Martens, M. A. W., Janssen, M. J., Ruijssenaars, W. A., & Riksen-Walraven, J. M. (2014). Introducing an intervention model for fostering affective involvement with persons who are congenitally deafblind. *Journal of Visual Impairment and Blindness, 108*(1), 29–41.

Martens, M. P., & Haase, R. F. (2006). Advanced applications of structural equation modeling in counseling psychology research. *The Counseling Psychologist, 34*(6), 878–911.

Masoro, E. J. (2005). Are age-associated diseases an integral part of aging? In E. J. Masoro & S. N. Austad (Eds.), *Handbook of the Biology of Aging* (pp. 43–62). Elsevier.

Moberg, D. O., & Nelson, T. D. (2003). Ageism: Stereotyping and prejudice against older persons. *Contemporary Sociology, 32*(5), 563–565.

Nelson, T. D. (2016). Promoting healthy aging by confronting ageism. *American Psychologist, 71*(4), 276–282.

Pace, U., Zappulla, C., Guzzo, G., Di Maggio, R., Laudani, C., & Cacioppo, M. (2014). Internet addiction, temperament, and the moderator role of family emotional involvement. *International Journal of Mental Health and Addiction, 12*(1), 52–63.

Pakpahan, E., Hoffmann, R., & Kröger, H. (2017). Statistical methods for causal analysis in life course research: An illustration of a cross-lagged structural equation model, a latent growth model, and an autoregressive latent trajectories model. *International Journal of Social Research Methodology, 20*(1), 1–19.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature

and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903.

Preacher, K. J. (2015). Advances in mediation analysis: A survey and synthesis of new developments. *Annual Review of Psychology, 66*(1), 825–852.

Ramírez, L., & Palacios-Espinosa, X. (2016). Stereotypes about old age, social support, aging anxiety and evaluations of one' s own health. *Journal of Social Issues, 72*(1), 47–68.

Robinson, S. G., & Knight, B. G. (2005). Influence of neuroticism, ethnicity, familism, and social support on perceived burden in dementia caregivers: Pilot test of the transactional stress and social support model. *The Journals of Gerontology: Series B, 60*(6), 331–334.

Rothermund, K. (2005). Effects of age stereotypes on self-views and adaptation. In W. Greve, K. Rothermund, & W. Dirk (Eds.), *The adaptive self: Personal continuity and intentional self-development* (pp. 223–242). Hogrefe.

Rothermund, K., & Brandtstädter, J. (2005). Age stereotypes and self-views in later life: Evaluating rival assumptions. *International Journal of Behavioral Development, 27*(6), 549–554.

Rupp, D. E., Vodanovich, S. J., & Credé, M. (2005). The multidimensional nature of ageism: Construct validity and group differences. *Journal of Social Psychology, 145*(3), 335–362.

Schuman, S. L., Graef, D. M., Janicke, D. M., Gray, W. N., & Hommel, K. A. (2013). An exploration of family problem-solving and affective involvement as moderators between disease severity and depressive symptoms in adolescents with inflammatory bowel disease. *Journal of Clinical Psychology in Medical Settings, 20*(4), 478–485.

Siefert, C., & Porcerelli, J. H. (2015). Object relations theory and personality disorders: Internal representations and defense mechanisms. In S. K. Huprich (Ed.), *Personality disorders: Toward theoretical and empirical integration in diagnosis and assessment* (pp. 203–224). American Psychological Association.

Silverstein, M., & Giarrusso, R. (2010). Aging and family life: A decade review. *Journal of Marriage and Family, 72*(5), 1039–1058.

Sue, D. W. (2004). Whiteness and ethnocentric monoculturalism: Making the "invisible" visible. *American Psychologist, 59*(8), 761–769.

Utz, R. L., Swenson, K. L., Caserta, M., Lund, D., & DeVries, B. (2014). Feeling lonely versus being alone: Loneliness and social support among recently bereaved persons. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 69*(1), 85–94.

Wang, J., & Zhao, X. (2012). Family functioning and social support for older patients with depression in an urban area of Shanghai, China. *Archives of Gerontology and Geriatrics, 55*(3), 574–579.

Wang, M. C., & Bi, X. Y. (2018). *Latent variable modeling using Mplus*. Chongqing University Press.

Westerhof, G. J., & Wurm, S. (2015). Longitudinal research on subjective aging, health, and longevity: Current evidence and new directions for research. *Annual Review of Gerontology and Geriatrics, 35*(1), 145–165.

Yu, Y., Chamorro-Premuzic, T., & Honjo, S. (2008). Personality and defense mechanisms in late adulthood. *Journal of Aging and Health, 20*(5), 526–544.

Zhang, H. J., & Ma, Y. Z. (2002). Mental health and family function of elderly regularly participating community activity. *Chinese Mental Health Journal, 16*(3), 172–174.

Zhang, W., & Guo, B. -Y. (2017). Resolving defence mechanisms: A perspective based on dissipative structure theory. *The International Journal of Psychoanalysis, 98*(2), 457–472.

Zhang, X., Kamin, S. T., Liu, S. Q., Fung, H. H., & Lang, F. R. (2020). Negative self-perception of aging and mortality in very old Chinese adults: The mediation role of healthy lifestyle. *The Journals of Gerontology: Series B, 75*(5), 1001–1009.

Ziegel, E. R., Hatcher, L., & Stepanski, E. (2005). A step-by-step approach to using the SAS system for univariate and multivariate statistics. *Technometrics, 37*(4), 471.

Zotnowski, K. M. (2004). *The role of intergenerational involvement on physiological, cognitive, and affective health of the elderly: As a culminating experience*. California State University, Northridge.

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