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Bridging the Digital Divide: Childhood Social Relationships and Mobile Payment Use Among Chinese Middle-Aged and Older Adults

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Abstract

This research accordingly examines the effect of childhood social relationships on the use of mobile payment and e-money among Chinese middle-aged and older adults from a life course perspective and tests the mediation role of social activities in such a path with the Karlson–Holm–Breen (KHB) method. The findings support that good childhood community relationships, peer relationships, and close relationships positively affect mobile payment and electronic money use when people enter middle and old age. These effects are significantly mediated by social activities in later life. The findings make marginal contributions to life course theory (LCT), with practical implications for individuals, commercial enterprises, governments, and societies in their efforts to facilitate a society that promotes the digital inclusion of middle-aged and older adults.

Keywords

childhood social relationships, mobile payment, electronic money, life course theory, China

What this paper adds

- Childhood experiences of good community relationships, peer relationships, and close relationships can positively impact people's adoption of mobile payment and electronic money.
- The results remain almost unchanged throughout different sex and residence subpopulations.
- Social activities in later life can mediate the relationship between childhood social relationship and electronic payment behavior.

Applications of study findings

- People should form an integral view of wellbeing, social relationships, and economic behaviors throughout life. A long-term life course perspective helps people make choices that are better for themselves and their families.
- Business and financial institutions can offer more reliable services and space aimed at optimizing access to resources of forming good community and interpersonal interactions at all ages, especially for children, generating returns in the long run while also producing positive externalities for the society.
- It is recommended that governments promote human capital and socioeconomic participation of the public by paying more attention to children's social relationships. Social activity involvement of people entering middle and old age is also noteworthy for the public officials.

Introduction

Population aging, despite being a global concern, also provides an opportunity to the world both in the present and in the future (Guo & Zheng, 2018). China, the most populous nation in the world, also is the country with the largest older population. The multiple needs of older adults entail huge potential markets, and one that has not been well explored is access to smart living-related services such as mobile payment.

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In China's current society, mobile payment plays an increasingly important role in financial transactions, given the widespread use of mobile devices and users' needs for convenience and efficiency (Yang et al., 2012). As the world's largest market for mobile payment, China has a much higher penetration rate of mobile payment (77% in 2016) than the United States (48%), the UK (47%), and Japan (27%) (Huang et al., 2020). A total of 853 million people have used mobile payment as of December 2020 in China, accounting for 86.5% of all mobile internet users (CNNIC, 2021).

Research has found that internet use is positively associated with a healthier lifestyle (Peng & Chan, 2020) and people's wellbeing (Xu & Huang, 2020). In addition to the health-related benefits, the adoption of a full life cycle perspective is of great significance for reducing the digital divide. However, it seems that older adults have been left behind in cyberspace, especially the cashless craze in China. We can obtain an outline of this predicament from the outlook of internet use, which is a prerequisite of mobile payment among Chinese older adults. According to the 45th China Statistical Report on Internet Development, adults aged 60 and above are the main demographic group of non-netizens, accounting for 46.0% of all non-netizens as of December 2020 (CNNIC, 2021).

Previous studies have examined age inequality in mobile payments. Li et al. (2020) reported that the mean rate of mobile payment use for those under age 25 was 11 times the rate for those aged 65 and older in the United States. In China, Alipay and WeChat are the most popular electronic platforms for mobile payment, replacing cash and credit cards in many places and becoming the main payment methods in many settings. In an emerging smart society, being unable to utilize technologies, especially those related to personal finance, effectively excludes a sizable portion of middle-aged and older adults from multiple aspects of society life. Digital isolation can hinder their normal lives, especially during the COVID-19 pandemic.

From a life course perspective, the economic behaviors and outcomes of adults may be intricately shaped by experiences and circumstances in earlier life. For example, a previous study suggests that neighborhood disadvantages during childhood increase joblessness and reduce income in adulthood (Alvarado, 2018). Some studies indicate that childhood adversities contribute to achievements in later life, such as an increased likelihood of becoming an entrepreneur (Cheng et al., 2021; Drennan et al., 2005). Regarding economic behaviors, childhood experiences with nature affect sustainable food consumption in adulthood (Molinario et al., 2020), while adverse childhood experiences such as household abuse increase the risk of excessive alcohol consumption behaviors for adults (Loudermilk et al., 2018). Some studies have found that negative events in childhood have a negative impact on adults' addiction behaviors of intelligent technology use (Kibitov et al., 2020). The existing literature is mainly concerned with the effects of childhood relationships and experiences on career outcomes and particular consumption behaviors, but few studies focus on the economic decision of adopting an emerging financial technology. Additionally, not enough attention is given to the mediation of later life experiences.

In view of the aforementioned state of research, the objective of this study is to empirically test the effect of childhood social relationships and the online economic behaviors of Chinese middle-aged and older adults, as well as to explore the mediating role of social activities in later life.

Literature Review and Hypothesis Development

Previous studies have analyzed the acceptance of information technology from the perspective of behavioral sciences (Dahlberg et al., 2008), psychological theories (Handarkho & Harjoseputro, 2020) and demographic and socioeconomic factors (Li et al., 2020). In particular, factors related to the adoption of mobile payment are recommended to be analyzed thoroughly, especially in several countries (Dahlberg et al., 2008; Dahlberg et al., 2015).

From the consumers' side, studies have associated the adoption and usage of mobile payment and e-money with emotions (Verkijika, 2020), trust (Gao & Waechter, 2017), habits (Jia et al., 2020), etc. Other studies analyze the accelerators and impediments of mobile payment adoption from the merchants' side (Moghavvemi et al., 2021). For Chinese middle-aged and older adults, concerns about security and perceived risks, limitations in understanding, and ability to use are noted as the main barriers to mobile payment use (Li, 2010).

Noticeably, prior research places more emphasis on factors from the present rather than from one's past. Although technology changes quickly in a rapidly developing society, people are likely to face their own "technology gap" in every era, which indicates that difficulties may be determined not only by current factors but also by the "acceptance of concerns or behavior inertia" formed by accumulated factors over a long period of time. Additionally, few empirical studies have investigated the potential pathways through which characteristics of early life experiences drive or inhibit the adoption of mobile payment. A lifecourse perspective in the study of mobile payment behaviors is much needed.

According to the World Health Organization (WHO, 2015), children need adults and peers to spend time playing with them and giving them love, affection, and appreciation. On the basis of life course theory (LCT), childhood relationships can shape people's lives even years later. Previous studies have focused more on the effects of early experiences on later health, education, and career outcomes (Chen et al., 2017; Seal et al., 2009). Based on increasing levels of intimacy, ranging from peripheral to private, we categorize childhood social relationships as community relationships, peer relationships, and close relationships. Less attention has been given to both early social relationships and later economic behaviors. Therefore, we are particularly concerned with how nonfamily ties,

including community relationships, peer relationships, and close relationships, affect online payment choices. Considering that electronic payment, which is widely used in China, is a comparatively mature and convenient operation, we will adopt mobile payment use and e-money use to measure people's online economic behaviors.

Childhood Social Relationships and the Use of Mobile Payment and E-money in Later Life

Peripheral relationships, such as relationships with neighbors, acquaintances, or communities, can be characterized as "weak ties" (Granovetter, 1973), a form of bridging social capital that is crucial for gaining access to external resources (Putnam, 2001). From this theoretical perspective, it is conceivable that being part of a supportive and inclusive community during childhood increases exposure to different ideas, innovations, and changes. Good community relationships can therefore lay the foundation for people to be willing to accept new ways of life, including economic activities to which they have never been exposed. To this end, we hypothesize:

H1: Good childhood community relationships are positively associated with increased use of mobile payment in middle and old age.

Friendship plays a crucial role in young people's lives (Felmlee et al., 2018). Strong personal ties can exert positive impacts on academic performance (Vaquera & Kao, 2006), and people's ability to learn and adapt to new things may be systematically improved. Salubrious peer friendships also can improve people's mental health by mediating a sense of belonging (Ueno, 2004), which implies that social integration can help people develop kind feelings about others, and trust and positive attitudes make people more willing to accept new forms of payment and currency. Thereby, we develop the following hypothesis:

H2: Good childhood peer relationships are positively associated with increased use of mobile payment in middle and old age.

Peer and close relationships, which measure the "quantity" and "quality" of friendships, respectively, can facilitate the development of the ability and willingness for people to adapt to a new kind of economic behavior. A close relationship is closer and deeper than a peer relationship. The former can provide children with an environment where they can express and play more freely, which is conducive to their brain development and can foster good social behaviors (Berndt, 1982). Feelings of social anxiety can be reduced by both peer crowd affiliations and positive qualities in best friendships (La Greca & Harrison, 2005). Good psychological development and behavioral cultivation lay a foundation for accepting mobile payments in adulthood. Therefore, we propose the following hypothesis:

H3: Close childhood relationships are positively associated with increased use of mobile payment in middle and old age.

Mediating Role of Social Activities in Later Life

Companionship and love from neighbors and friends are important to a child's development. The interpersonal skills and psychological state developed in childhood can affect their willingness and ability to participate in social activities, and as people enter adulthood, they enrich their lives, gain social support, and develop connections with their friends, family members, and the wider world by participating in various activities. These activities may provide them with the willingness and ability to adopt new technologies such as mobile payment and e-money. Several previous studies have analyzed the effect of childhood experience on social activities, behaviors and networks in later life (Giovanna, 2016) as well as the incentives for people to use mobile payment by engaging in social activities (Hossain et al., 2020). These findings provide the underpinnings for taking social activities as a mediating variable through which a portion of the effect may be transferred from childhood social relationships to economic behaviors in middle and old ages. With it, we can test whether social activities in later life can develop mechanisms that increase advantages for those who had good social relationships in early life and disadvantages for those who did not. Taking these factors into account, we postulate the following hypothesis:

H4: Social activities in later life mediate the association between childhood social relationships and use of mobile payment in middle and old age.

Analytical Framework

In summary, we focus on childhood social relationships to identify how early social ties of varying intimacy levels affect people's use of mobile payment and e-money both directly and indirectly. On the one hand, in addition to family ties, childhood social relationships are conducive to people's cognitive and noncognitive ability development, which could all potentially affect economic and social behaviors in later life, including electronic payment practice. On the other hand, good social bonds also can prompt people's motivation and ability to participate in social activities, which can provide people with incentives and circumstances for adults to use mobile payments. The analytical framework of this paper is shown in Figure 1.

Data and Methods

Sample and Data Source. To test our hypotheses, we obtained the individual-level data from the fourth wave of the China Health and Retirement Longitudinal Study (CHARLS)

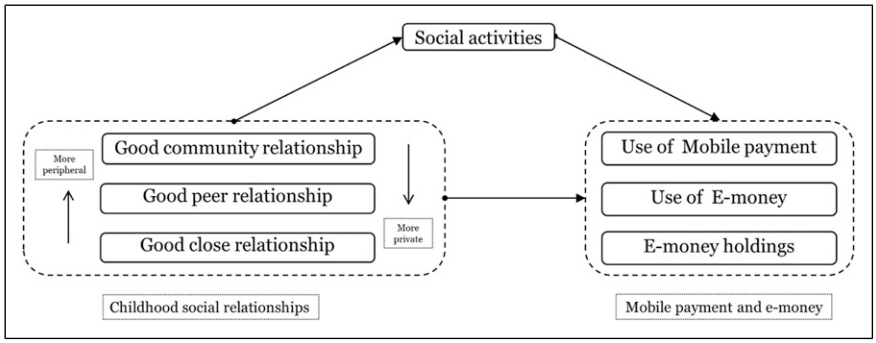

Figure 1. Analytical framework.

completed in 2018, combined with the CHARLS Life History Survey released in 2014. The CHARLS is a longitudinal survey conducted since 2011 that aims to collect a wide range of information on Chinese people aged 45 and above, from socioeconomic status to health conditions, with methods of international comparability (Zhao et al., 2020). CHARLS was approved by the Ethics Review Committee of Peking University (IRB00001052-11015), and all participants signed informed consent when filling out the questionnaire.

In CHARLS Wave 4, information about mobile payment and electronic money use was collected for the first time, with a total of 19,817 interviewees from 28 provinces, 150 counties/districts, and 450 villages/urban communities (Zhao et al., 2020). For our analysis, we derived 12,882 individuals aged 45 years and above with complete childhood social relationship information from the 2014 Life History Survey and later life characteristics, including electronic money information, from the fourth wave. Additional details of the survey design, including the sampling method, can be found in the previous work of the CHARLS team (Zhao et al., 2014). The characteristics of the analyzed samples are shown in Table 1.

Measures

Dependent Variable. The current mobile payment use, e-money use, and e-money holdings of the respondents were set as the dependent variables in this study. Mobile payment use was measured as a binary variable (yes = 1, no = 0) based on answers to the question "Do you use mobile payments, such as Alipay and WeChat pay?" E-money use was set as binary (yes = 1, no = 0), and the e-money holdings (yuan, measured with the logarithm transformation) was set as continuous. Both variables were generated from the question "How much electronic money do you have currently, including the money in the WeChat Wallet and Alipay's balance, etc.?"

Independent Variable. We took childhood social relationships as the independent variable. Four binary variables were generated based on the respondents' answers to the questions in the CHARLS Life History Survey. According to the questions "Were the neighbors of the place where you lived as a child willing to help each other out? Is it very willing to, somewhat willing to, not very willing to or not willing to?", we generated the variable *"good community relationship"* to measure the childhood interpersonal closeness of the communities of the respondents. The former two answers were encoded as yes (=1), while the latter two were recoded as no (=0). We measured the childhood social connection with peers of the respondents by generating the variable *"good peer relationship"* according to their responses to the question "When you were a child, did you often have a group of friends that you felt comfortable spending time with? Is it often, sometimes, not very often or never?" We recoded the former two options as yes (=1) and the latter two answers as no (=0). Childhood social ties with good friends were measured by the variable "*good close relationship,*" which was generated according to the question "When you were a child, did you have a good friend (yes = 1, no = 0)?"

Mediating Variables. Participation in offline social activities during later life was adopted as a mediating variable and set as continuous, which was measured by the number of the following activities in the most recent month: interacting with friends, playing Mahjong, chess, cards or going to a community club, providing help to family, friends or neighbors who do not live with the respondents, going to a sport, social or other kind of club, taking part in a community-related organization, doing voluntary or charity work, caring for a sick or disabled adult who does not live with the respondents, and attending an educational or training course.

Control Variables. To control for confounding factors, we adjusted for some demographic, socioeconomic, and childhood characteristics that may affect the relationship between the independent and dependent variables suggested by the literature (Alabdan & Sulphey, 2020; Li et al., 2020; Oyelami et al., 2020). The participants were categorized by sex (male = 1, female = 0), ethnicity (Han Chinese = 1, minority = 0), residence according to China's household registration system (rural = 1, urban = 0), marital status (single = 1, living with a spouse = 0), living status (living with offspring = 1, not living

Table 1. Sample Characteristics (n = 12,882).

Characteristics	Total sample	Good community relationship		Good peer relationship		Good close relationship	
		Yes	No	Yes	No	Yes	No
Sex, *n* (%)							
Male	6148 (47.73)	5655 (91.98)	493 (8.02)	5086 (82.73)	1062 (17.27)	3407 (55.42)	2741 (44.58)
Female	6734 (52.27)	5931 (88.08)	803 (11.92)	5315 (78.93)	1419 (21.07)	3722 (55.27)	3012 (44.73)
Age (years), mean (sd)	60.99 (9.53)	60.60 (9.38)	64.47 (10.09)	60.12 (9.30)	64.61 (9.60)	59.33 (9.30)	63.04 (9.41)
Ethnicity, *n* (%)							
Han Chinese	11,891 (92.31)	10,690 (89.90)	1201 (10.10)	9552 (80.33)	2339 (19.67)	6493 (54.60)	5398 (45.40)
Minority	991 (7.69)	896 (90.41)	95 (9.59)	849 (85.67)	142 (14.33)	636 (64.18)	355 (35.82)
Residence, *n* (%)							
Rural	10,337 (80.24)	9199 (88.99)	1138 (11.01)	8125 (78.60)	2212 (21.40)	5390 (52.14)	4947 (47.86)
Urban	2545 (19.76)	2387 (93.79)	158 (6.21)	2276 (89.43)	269 (10.57)	1739 (68.33)	806 (31.67)
Marital status, *n* (%)							
Single	1644 (12.76)	10,190 (90.67)	1048 (9.33)	9233 (82.16)	2005 (17.84)	6341 (56.42)	4897 (43.58)
Living with a spouse	11,238 (82.74)	1396 (84.91)	248 (15.09)	1168 (71.05)	476 (28.95)	788 (47.93)	856 (52.07)
Living status, *n* (%)							
Living with offspring	5360 (41.61)	4838 (90.26)	522 (9.74)	4364 (81.42)	996 (18.58)	3098 (57.80)	2262 (42.20)
Not living with offspring	7522 (58.39)	6748 (89.71)	774 (10.29)	6037 (80.26)	1485 (19.74)	4031 (53.59)	3491 (46.41)
Education, *n* (%)							
Primary school and below	8266 (64.17)	4425 (95.86)	191 (4.14)	4202 (91.03)	414 (8.97)	3177 (68.83)	1439 (31.17)
Middle school and above	4616 (35.83)	7161 (86.63)	1105 (13.37)	6199 (74.99)	2067 (25.01)	3952 (47.81)	4314 (52.19)
Working status, *n* (%)							
Employed	8596 (66.73)	7780 (90.51)	816 (9.49)	7036 (81.85)	1560 (18.15)	4839 (56.29)	3757 (43.71)
Unemployed	4286 (33.27)	3806 (88.80)	480 (11.20)	3365 (78.51)	921 (21.49)	2290 (53.43)	1996 (46.57)
Region, *n* (%)							
Western	3362 (26.10)	4291 (90.85)	432 (9.15)	3977 (84.20)	746 (15.80)	2711 (57.40)	2012 (42.60)
Central	4797 (37.24)	4344 (90.56)	453 (9.44)	3923 (81.78)	874 (18.22)	2605 (54.30)	2192 (45.70)
Eastern	4723 (36.66)	2951 (87.78)	411 (12.22)	2501 (74.39)	861 (25.61)	1813 (53.93)	1549 (46.07)
Annual household income per capita, *n* (%)							
Above median	6443 (50.02)	5960 (92.50)	483 (7.50)	5546 (86.08)	897 (13,92)	4021 (62.41)	2422 (37.59)
Below median	6439 (49.98)	5626 (87.37)	813 (12.63)	4855 (75.40)	1584 (24.60)	3108 (48.27)	3331 (51.73)
Self-reported health, *n* (%)							
Healthy	9527 (73.96)	8698 (91.30)	829 (8.70)	7898 (82.90)	1629 (17.10)	5457 (57.28)	4070 (42.72)
Unhealthy	3355 (26.04)	2888 (86.08)	467 (13.92)	2503 (74.61)	852 (25.39)	1672 (49.84)	1683 (50.16)
Childhood experience of hunger, *n* (%)							
Having sufficient food	4199 (32.60)	3903 (92.95)	296 (7.05)	3573 (85.09)	626 (14.91)	2652 (63.16)	1547 (36.84)
Not having sufficient food	8683 (67.40)	7683 (88.48)	1000 (11.52)	6828 (78.64)	1855 (21.36)	4477 (51.56)	4206 (48.44)
Number of social activities, mean (sd)	0.83 (1.05)	0.86 (1.07)	0.60 (0.89)	0.90 (1.08)	0.55 (0.87)	0.99 (1.15)	0.64 (0.89)

with offspring = 0), education (primary school and below = 1, middle school and above = 0), working status (employed = 1, unemployed = 0), region (western = 1, central = 2, eastern = 3), annual household income per capita (above median = 1, below median = 0), self-reported health at the time of the survey (healthy = 1, unhealthy = 0), and childhood experience of hunger (having sufficient food = 1, not having sufficient food = 0). Age at the time of the survey was set as a continuous variable.

Empirical Strategy

We estimated the influence of childhood social relationships on mobile payment use, e-money use, and e-money holdings in middle and old age by the following steps. All analyses were completed via STATA 16.0 software (MP version 16.0, StataCorp LLC, USA).

First, we adopted the chi-square test and t test to roughly inspect the relationship. Second, we used Logistic regression models to estimate the impact of childhood social relationships on mobile payment use and e-money use with control variables. Assumptions for Logistic regression models are satisfied, as the Box–Tidwell method confirms the linear relationships between age (the only continuous variable) and both the logit conversion value of mobile payment use and e-money use. Then, as the variable of e-money holdings has many zeros and is skewed to the right, the Tobit model is suitable for the censored data. We employed Tobit regression models to calculate the effect of social relationships and e-money holdings with confounders controlled. A robust estimator of variance was applied.

Third, instead of the classic approach of analyzing indirect effects advocated by Baron and Kenny (1986), which is more suitable for linear models and later was challenged by scholars in some aspects (Preacher & Hayes, 2004), we obtained the Karlson–Holm–Breen (KHB) method to test the mediating effect of social activities on the association between childhood social relationships and payment behaviors. The KHB method does well at estimating the total, direct and indirect effects of linear and especially nonlinear probability models and produces unbiased and more intuitive results (Breen et al., 2013; Karlson & Anders, 2011; Karlson et al., 2012).

Fourth, we performed a series of sensitivity analyses considering the robustness of the results. Firstly, people with better childhood social relationships may have preferable family socioeconomic conditions per se. To address this self-selection problem, we performed propensity score weighting (PSW). We calculated the propensity scores[1] and used standardized mortality ratio weighting (SMRW) to adjust the observation samples with the group of better childhood social relationships as the "standard population" (Sato & Matsuyama, 2003). The ATT (average treatment effect on the treated) was adopted, which can better capture the average intervention effect of good childhood social interactions. We further used the stable weights with the proportion of the target population adjusted (Hernan et al., 2000). Besides, we put the interacting variables of childhood social relationships with sex and residence into the model to explore whether the effect differs in different subpopulations. Finally, given the three key independent variables of interest are correlated with each other, we put them in separate models to analyze respective pure effects. In order to examine the roles of different childhood social relationships, we also put them all together in the same model.

Table 2. Chi-Square Test and t-Test for Childhood Social Relationships and Use of Mobile Payment, Use of E-money and E-money Holdings in Middle and Old Age (n = 12,882).

Variable	Use of mobile payment (%)	Use of e-money (%)	E-money holdings (mean)
Total sample	7.57	12.13	0.76
Good community relationship			
Yes	97.85	96.42	0.82
No	2.15	3.58	0.26
X^2/t	72.88	82.49	8.96
P	<0.001	<0.001	<0.001
Good peer relationship			
Yes	95.28	94.11	0.89
No	4.72	5.89	0.22
X^2/t	143.44	204.59	14.03
P	<0.001	<0.001	<0.001
Good close relationship			
Yes	81.64	79.21	1.11
No	18.36	20.79	0.34
X^2/t	295.22	409.95	20.39
P	<0.001	<0.001	<0.001

Note. E-money holdings are measured in yuan and taken natural logarithm form.

Results

Descriptive Analysis

The proportions of people who had good childhood community relationships, peer relationships, and close relationships were 89.94%, 80.74%, and 53.34%, respectively. The proportions of middle-aged and older adults who use the internet and mobile phones were 13.10% and 12.46%, respectively. From Table 2, we can see that the utilization rates of mobile payment and e-money among middle-aged and older adults were 7.57% and 12.13%, respectively. The mean natural logarithm of average current e-money holdings was 0.76. The average age was 60.99, and 80.24% of middle-aged and older adults had a rural residence, which can partially explain the low usage of mobile payment and electronic money. This utilization rate is much lower than the rate (76.9%) among general adults in China, according to a previous study (Huang et al., 2020). Obviously, the market for middle-aged and older adults still has much room for improvement, given that mobile payment has been quite popular in China.

Table 2 also presents the results of chi-square tests and t tests of mobile payment options and behaviors by childhood social relationships. We can see that those whose neighborhoods were helpful, who had good friends in quantity and close friends in quality in childhood, have a higher probability of using mobile payment and e-money as well as higher holdings of e-money.

Main Estimates

The results of Logistic regressions and Tobit regressions are presented in Table 3 (detailed regression results with covariates can be seen in Supplement Appendix Tables 1–3). We found that childhood social relationships significantly affect mobile payment use in middle and old age, and the effect remains whether the relationship is peripheral or private. People who lived in communities with residents who were accommodating to people (all $p < 0.05$), had good partnerships (all $p < 0.001$) and enjoyed great friendships (all $p < 0.001$) in childhood were more likely to use mobile payment and e-money and hold higher amounts of electronic currency. This supports Hypotheses H1, H2, and H3. Good social ties can positively influence people's acceptance of new payment approaches.

Table 3. Regressions of Childhood Social Relationships and Use of Mobile Payment, Use of E-money and E-money Holdings in Middle and Old Age (n = 12,882).

Variable	Use of mobile payment			Use of e-money			E-money holdings		
	B	SE	Ps-R^2	B	SE	Ps-R^2	B	SE	Ps-R^2
Good community relationship	0.81***	0.24	0.28	0.41**	0.16	0.27	1.45*	0.65	0.14
Good peer relationship	0.62***	0.17	0.28	0.57***	0.12	0.27	2.19***	0.50	0.15
Good close relationship	0.60***	0.09	0.29	0.61***	0.07	0.26	2.68***	0.30	0.15

Note. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ All models estimated using robust standard errors. Adjusted by sex, age, ethnicity, residence, marital status, living status, education, working status, region, annual household income per capita, self-reported health, and childhood experience of hunger.

Table 4. The Mediating Role of Social Activities between Childhood Social Relationships and Use of Mobile Payment, Use of E-money and E-money Holdings in Middle and Old Age (n = 12,882).

Path	Total effect	Direct effect	Indirect effect	Mediation proportion (%)
Good community relationship → social activities → mobile payment	0.83**	0.78**	0.04***	4.82
Good peer relationship → social activities → mobile payment	0.58**	0.50**	0.08***	13.79
Good close relationship → social activities → mobile payment	0.57***	0.47***	0.09***	15.79
Good community relationship → social activities → e-money	0.40*	0.36*	0.04***	10.00
Good peer relationship → social activities → e-money	0.55***	0.48***	0.07***	12.73
Good close relationship → social activities → e-money	0.60***	0.52***	0.08***	13.33
Good community relationship → social activities → e-money holdings	1.36*	1.21†	0.16***	11.51
Good peer relationship → social activities → e-money holdings	2.00***	1.72***	0.28***	14.00
Good close relationship → social activities → e-money holdings	2.53***	2.21***	0.32***	12.65

Note. †$p < 0.1$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$. All models estimated using robust standard errors. Adjusted by sex, age, ethnicity, residence, marital status, living status, education, working status, region, annual household income per capita, self-reported health, and childhood experience of hunger.

Table 5. Propensity Scores Weighted Regression of Social Activities Between Childhood Social Relationships and Use of Mobile Payment, Use of E-money and E-money Holdings in Middle and Old Age (n = 12,882).

	Use of mobile payment		Use of e-money		E-money holdings	
Variable	Non-stabilized weight	Stabilized weight	Non-stabilized weight	Stabilized weight	Non-stabilized weight	Stabilized weight
Good community relationship	0.80**	0.82**	0.45**	0.45*	1.80*	1.55*
	(0.26)	(0.27)	(0.17)	(0.18)	(0.76)	(0.74)
Good peer relationship	0.58**	0.60**	0.65***	0.65***	2.71***	2.51***
	(0.20)	(0.20)	(0.14)	(0.14)	(0.58)	(0.57)
Good close relationship	0.53***	0.53***	0.52***	0.52***	2.33***	2.31***
	(0.11)	(0.11)	(0.08)	(0.08)	(0.34)	(0.34)

Note. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$. Robust standard errors are shown in parentheses. Adjusted by sex, age, ethnicity, residence, marital status, living status, education, working status, region, annual household income per capita, self-reported health, and childhood experience of hunger. Column 2, 4, and 6 are weighted by standardized mortality ratio weighting (SMRW) while Column 3, 5, and 7 are further weighted by SMRW with stabilized weight.

Moderating Effects

Table 4 outlines the total, direct and indirect effects via the KHB method. The size and direction of the total effect of each variable was basically consistent with the results of the regressions mentioned above. The results reveal that the mediation effect of current social activities exists on the link between childhood relationships and mobile payment and e-money holdings in middle and old age. Hypothesis H4 was supported. The mediating role can explain 4.82%, 13.79%, and 15.79% of the effect of community relationships on the use of mobile payment, use of e-money and e-money holdings, respectively. The mediation proportion of social activities among peer relationships, close relationships, and electronic payment behavior is approximately 13%.

Sensitivity Analysis

The propensity score weighted regression results are presented in Table 5. The coefficient and significance of community relationships, peer relationships and close relationships are approximately in line with the baseline results, with the distribution of confounding variables in the "treatment" group and "control" group tending to be consistent by PSW. This verified the robustness of our findings of the beneficial effects of childhood peripheral and private relationships on electronic payment behaviors.

Furthermore, we examined sex and residence heterogeneity (Supplement Appendix Table 4). Except that female can benefit more from close relationships than male in regard to the use of mobile payment (interaction for $p < 0.01$), no significant marginal effects of childhood social connections are found across different sex and residence populations (all interactions for $p > 0.1$), which means that the results remain almost unchanged throughout different subpopulations.

Finally, we put three key variables together in the same model (Supplement Appendix Table 5). The results are similar other than the effect of childhood community relationship on e-money holdings is no longer statistically significant. This may show that more private childhood social relationships are more important in view of the e-money savings.

Discussion

In terms of childhood social relationships, all three kinds of childhood social relationships can provide children with more powerful support, which may prepare people for the acceptance of new modes of payment. A study showed that children identified relationships as the heart of communities (Bessell, 2017). Briggs et al. (2015) found that children's internalizing and externalizing behavior problems were correlated with community adversity. Our findings support the importance of childhood inclusive community relationships providing people with trust and mutual support, which also can benefit people's online payment behaviors later in life. Our results also show that having a wide circle of friends and having good friends in childhood can both significantly increase the likelihood that people use mobile payments and electronic money as adults. Early life relationships provide important social support and opportunities for physical activities for children, which can influence their health behaviors (Umberson et al., 2010), psychological health (Tian et al., 2019), and cognitive performance (Fritsch et al., 2005) in later years, providing good physical and mental conditions for people to pay by mobile phone.

Moreover, childhood social relationships can influence economic behaviors through social activities. On the one hand, living in a helpful neighborhood and playing with friends during childhood can stimulate creativity and promote teamwork. People also can release stress and express emotions by bonding with neighbors and friends. This virtuous circle can confirm people's confidence to participate in social activities in later life. On the other hand, participation in more activities can increase the chance of middle-aged and older adults being influenced by others to use electronic payment

and to encounter situations that require electronic currency. Participation in multiple social activities may have a subtle positive effect on their willingness to adopt new kinds of business approaches. Some studies have pointed out that there are strong positive associations between social activities and the subjective wellbeing, cognitive function, and life satisfaction of older adults (Bae & Kim, 2021; Ohemeng et al., 2020). The above factors also lay a good physical and mental foundation for middle-aged and older adults to use mobile phone payment. In sum, we can see that childhood social relationships can not only affect online payment behavior directly but also influence electronic trading behavior indirectly via social activities.

This study is subject to some limitations. First, our sample was limited to middle-aged and senior Chinese people who lived in a society with rapid aging and the high-speed development of e-commerce. Due to these particular circumstances, attempts to generalize our findings for people in middle and old age from different countries or districts should be made with caution. Second, we derived the key independent variables from available questions measuring childhood social relationships, and this measurement attempt may be biased. Third, we inspected the mediating effect of offline social activities. However, online social networking is different from offline social engagement, since the former shows that individuals are open to technology. Future research can evaluate other possible online influencing paths.

Conclusion

Our research indicates the positive effects of childhood social relationships on middle-aged and older adults' economic behaviors. We found that childhood experiences of good community relationships, peer relationships, and close relationships can positively impact people's adoption of new lifestyles, including the use of mobile payment and electronic money. This paper provides implications on how to bridge the digital divide of middle-aged and old adults since early life in China, which may be applicable to other similar settings facing digital finance reforms against a background of population aging.

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Supplemental Material

Supplemental material for this article is available online.

Notes

1. The control variables for calculating propensity scores are sex (male or female), ethnicity (Han Chinese or minority), residence (rural or urban), childhood health status (confined to bed or home for a month or more because of a health condition before 15 years old or not), education of mother (primary school and below or middle school and above), education of father (primary school and below or middle school and above), working status of mother before 17 years old (employed or unemployed), working status of father before 17 years old (employed or unemployed), political identity (either one parent is a party member or neither), marriage status of parents before 17 years old (married or divorced), and childhood experience of hunger (having sufficient food or not).

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