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The effects of an old-age allowance programme on intergenerational interactions in Taiwan: Heterogeneous effects by adult children's motives for giving

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Abstract

This study examines the effects of an old-age allowance programme in Taiwan, the Senior Citizens Welfare Living Allowance (SCWLA), on intergenerational financial transfers, living arrangements and contact, as well as the heterogeneity of its effects by adult children's five types of motives for giving: altruism, exchange, reciprocity, affection, and sense of responsibility. Using 2002, 2004, 2005 and 2006 data from the Panel Study of Family Dynamics, we employed a difference-in-difference individual fixed effect model to compare the outcomes across the treatment (aged 65 and older) and comparison groups (aged 55 to 64) before and after the introduction of SCWLA. Our results indicate that SCWLA crowds in intergenerational contact but does not significantly change financial transfers and co-residence patterns. The increase in intergenerational contact is primarily driven by adult children having lower motives for giving. This suggests that old-age allowances may reduce financial entanglement between adult children and older parents and change the social norm by raising "low motivators'" awareness, respect and concern for elderly. Providing public transfer to the elderly should not be hampered by the fear of distorting family support functions.

Keywords: Old-age allowance; Intergenerational interactions; Motives for giving

1. Introduction

Population ageing is a challenge facing many nations around the world, and governments play an increasingly important role in old-age support. Most industrialized Western countries have a long history of establishing the old-age income support systems (Holzmann and Hinz, 2005; Shaver, 1998), whereas most newly-industrialized societies are still developing an old-age income policy (Calvo *et al.*, 2010; Choi and Kim, 2010). One central issue surrounding the introduction or expansion of old-age income programs is the impact on

intergenerational interactions, which is particularly pertinent in the newly-industrialized societies where older adults have traditionally and largely relied on family support in old age. Key questions for assessing the potential costs and benefits of government income support include whether public transfers to the elderly affect material and non-material transfers (e.g. co-residence and contact behaviour) from adult children and whether such effects exert a differential effect dependent on different motives for intergenerational giving.

This study examines the effect of an old-age allowance programme – the Senior Citizens Welfare Living Allowance (SCWLA) – on intergenerational family interactions in Taiwan. Established in 2002, SCWLA targets senior citizens aged 65 or older who are not covered by any social insurance programmes and provides a monthly transfer of NT$ 3,000 (an equivalent of 15% average monthly disposable income per capita). To receive SCWLA, elders must fill out an application form and file their applications at the local city/township office. Although SCWLA is means-tested on the beneficiary's income and assets, eligibility primarily depends on age because the income and asset caps are set at a high level (see Gerardi and Tsai, 2014). In 2011, 837,000 seniors were covered by SCWLA, which accounted for 33.1% of the population aged 65 or older (Directorate-General of Budget, Accounting and Statistics [DGBAS], 2014). While the effect of old-age public transfers on private financial transfers is well studied, little research has utilized a rigorous policy evaluation design to study the effect on living arrangements and non-financial intergenerational interactions.

To provide a more comprehensive picture of the impact of old-age public transfer on intergenerational interactions beyond its effect on financial transfers from adult children, we included another two outcomes: living arrangements and contact behaviour. Living arrangements are a structural form of intergenerational solidarity (Bengtson and Schrader, 1982). Co-residence is the most comprehensive form of informal care provided by an adult child to meet the needs of ageing parents (Johar and Maruyama, 2011). Moreover, in Chinese societies influenced by Confucianism, co-residence with ageing parents has been considered as fulfilling the cultural norm of filial piety ("xiao"). Contact between parents and children is an associational form of intergenerational solidary (Bengtson and Schrader, 1982), and an indicator of strength of the parent-child relationship (Bucx *et al.*, 2008).

Individuals differ in how they respond to a particular policy and the objective of social science research is not only to discover universal law but to understand population heterogeneity (Xie, 2013). To this end, we also investigate the heterogeneous effects by motives for giving. It answers the question of intergenerational interactions motivated by which type of motives were more susceptible to policy change. Different motives for intergenerational giving (e.g. altruism and exchange) will result in different evaluations of the situation, and thus different behavioural responses to policy changes. Previous studies primarily

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focused on the heterogeneous effects in terms of elderly parents and adult children's characteristics, which provides limited insights on the mechanisms underlying intergenerational interactions. This study is a preliminary attempt to measure different types of motives and examine the heterogeneous effect of old-age allowance on intergenerational interactions by different types of motives.

Investigating the effects of various forms of cash transfer programmes on private transfer has been a key area of concern in social policy research (e.g. Garcia and Cuartas, 2020) due to its substantial policy implications. If private and public transfers are close substitutes, old-age public transfer will "have redistributive effects across the population without necessarily increasing the income security of the elderly" (Lee and Lee, 2009, p. 394). However, such examination is not complete without considering the relationship between public financial transfer and non-financial interactions. If a substitution effect also exists between public financial transfer and private non-financial outcomes, this may indicate that public transfer increases independence or isolation among elders and redistributes multiple forms of old-age support from the private to public realms. Contrarily, if intergenerational interactions are unaffected by public financial transfer, providing old-age support should not be hampered by the fear of distorting family support functions. Furthermore, we identified whether the policy effect varies according to motives for giving. Such investigation enriches theoretical knowledge on pathways through which public financial transfer impacts intergenerational interactions.

2. Literature review

2.1 Background

Taiwan has experienced recent rapid population ageing. The proportion of people aged 65 or above has been doubling every 25 years, from 3.5% in 1975 to 14.6% in 2018. The increasing pressure of an ageing population, accompanied by the economic crisis in the late 1990s that worsened the income situation of the poor and the elderly, led to the introduction and expansion of old-age income programmes in Taiwan (Choi and Kim, 2010). In the early 1990s, only privileged occupational groups were covered by social security pension schemes. Around 70% of adults aged 65 or older was not covered by any programs (Fan, 2010). To increase income security for older people, the government introduced several means-tested old-age income protection programmes: the Middle-Low-Income Elderly Allowance (MLIEA), targeting middle and low-income elderly (since 1993); the Older Farmers' Allowance (OFA) that targeted older farmers and later became a universal programme and extend to fishermen (since 1995); and SCWLA (since 2002). As a result of the government's expansion of old-age income support, in 2011, 64.9% of the elderly people aged 65 and

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above were covered by one of these programmes (MLIEA [4.7%], OFA [27.1%], SCWLA [33.1%]; DGBAS, 2014).

2.2. Theory: Motives for giving

Extant theoretical debates on the effects of public transfer on private transfer have mostly focused on financial aspects. Motive, which reflects the underlying reason behind intergenerational interactions, has been used to explain the likely consequence of public transfer on private transfer. "The interest in motives stems from the view that motives are critical for assessing the likely impact of changes in resource conditions (and in the policy measures that create these changes) on transfer behaviour" (Kohli and Künemund, 2003, p. 129). Much of the economic literature uses the altruism and exchange models to explain the motives behind intergenerational transfer. In general, the altruism model suggests the crowding-out effect of public transfer on private transfer (Barro, 1974; Becker, 1974), whereas the exchange model predicts crowding-in (Bernheim *et al.*, 1986; Cox, 1987). According to the altruism model (Barro, 1974), adult children care about their parents' utility and will consider losses or gains in their parents' income when making private transfer decisions. Therefore, public transfer increasing older adults' income is expected to result in crowding-out of private transfer from their adult children. In contrast, the exchange model (Bernheim *et al.*, 1986) suggests that adult children make transfers in exchange for services provided by their parents (e.g. household chores and childcare). Public transfer that increases older adults' income may also boost their opportunity cost of providing services to their adult children. Hence, in order to maintain the flow of service provided by their parents, adult children are expected to provide more transfer.

The sociological literature provides additional perspectives to understand motives of intergenerational giving: reciprocity, love or affection, and sense of responsibility. Reciprocity, in general, assumes that giving creates an obligation to reciprocate (Antonucci and Jackson, 1990). "Adult children and their parents are considered interdependent actors who contemporaneously and dynamically exchange support to each other over the life course" (Silverstein *et al.*, 2012, pp: 1250). The transfer from adult children may be a repayment of their parents' early nurturing. As reciprocity takes place over the life course, not as a one-time transaction, the effect of public transfer on private transfer is ambiguous. Private transfer can also be motivated by love or affection, which is unlikely to be influenced by public transfer (Doty, 1986). Private transfer motivated by sense of responsibility is also unlikely to be affected by public transfer. However, as the government widely assumes increased responsibility for old-age support, the norms of family responsibility may be weakening in the long-term (Künemund and Rein, 1999) and hence may result in individual's weakening sense of responsibility. Therefore, in the long-term, an increase in public transfer

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	Altruism	Exchange	Reciprocity	Love or affection	Sense of responsibility
Crowding-out	√				√ (long-term)
Crowding-in		√			
No change			√	√	√ (short-term)

FIGURE 1. Effect of public transfer on private transfer by motives of intergenerational giving

is likely to crowd-out private transfer motivated by sense of responsibility. Moreover, sociological literature looks beyond financial outcomes and suggests that public transfer to older adults may alleviate financial entanglement and bring an opportunity to develop intergenerational interactions focused on intimacy and closeness (Künemund and Rein, 1999).

In summary, public transfer is likely to crowd-out private transfer if intergenerational giving is motivated by altruism. If the motive is exchange, crowding-in may occur. If intergenerational giving is motivated by love or reciprocity, private transfer is less likely to be affected. Private transfer motivated by a sense of responsibility is also less likely to be affected in the short-term but may be crowded-out over a longer period (Figure 1).

2.3. Empirical evidence

The effect of old-age public transfer on intergenerational interactions

A growing number of studies have examined the financial crowding-out effect of old-age public transfer, although few explicitly address the endogeneity of welfare status (e.g. Chen, 2017; Chuang, 2012). Factors such as preferences for welfare and financial condition are correlated with the probability of older adults' receipt of public and private financial transfer. Studies that do not address the endogeneity of welfare status have limited capacity to identify a causal relationship. Hence, our empirical review includes only studies whose study design tackles endogenous problems (e.g. instrumental variable design, regression discontinuity, and difference-in-difference).

The most commonly investigated outcome in research investigating the effects of old-age public transfer is private financial transfer. These studies either find crowding-out or no significant effect of old-age public transfer on the incidence and level of private financial transfer. In terms of private transfer incidence, Ning *et al.* (2019) reported no significant effect of the New Rural Pension Scheme (NRPS) in China on the likelihood of receiving private transfer from non-coresident adult children. Chen and Tan (2018) also found no significant effect of the Silver Support Scheme, the non-contributory pension in Singapore, on receipt of private cash transfer. Jung *et al.* (2016), in contrast, showed that receiving a public pension crowded-out private transfer from non-coresident adult children and/or siblings of the elderly in South Korea. As for the level of private transfer, Zhang *et al.* (2019) found that NRPS income

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crowded-out approximately 27.9% of the monetary support from adult sons in rural China, whereas Ning *et al.* (2019) reported that the NRPS had no significant effect on transfer amounts from non-coresident children. Studies in South Africa and Mexico also found that public financial transfer to the elderly crowded-out private transfers to them (Jensen, 2004; Juarez, 2009).

In terms of living arrangements, most studies show that old-age public transfer increases the affordability of independent living, thus occasioning a rise in older adults' independent living. In rural China, NRPS reduced the likelihood of elderly people living in an extended family, such as living with adult children, siblings, relatives, or other adults (Chen, 2017; Cheng *et al.*, 2018). Zhang *et al.* (2019) found NRPS decreased the probability of elderly parents living with adult sons by 6.5% but found no significant effect for adult daughters. In the United States, social security income reduced the likelihood of older adults living with others (Engelhardt *et al.*, 2005). Two South African studies (Edmonds et al., 2005; Hamoudi and Thomas, 2014), however, found that pension income resulted in a shift in living arrangements emphasizing the elderly's role in supporting their extended family. Edmonds et al. (2005) found an increased probability of elderly individuals living with young women of childbearing age, whereas Hamoudi and Thomas (2014) revealed a rise in likelihood of co-residing with household members with less human capital.

Few studies have examined the effect of public transfer on non-financial support. Jung et al. (2016) found that although the receipt of a public pension crowded-out financial transfer from adult children and/or siblings in South Korea, it crowded-in non-financial support (informational support or emotional support through communications or visitations), suggesting a shift from financial help to non-financial help from pensioners' family members.

In summary, empirical findings either find a crowding-out or no effect of old-age public transfer on private financial transfer. Some studies suggest that receipt of public transfer increases independent living of the elderly, whereas others find it increases the likelihood of co-residence with more vulnerable household members. Inconclusive evidence is available regarding the effect on non-financial support.

Existing evidence from Taiwan

Studies examining the effect of old-age allowance in Taiwan (Fan, 2010; Gerardi and Tsai, 2014; Lai and Orsuwan, 2009) have mostly focussed on financial outcomes. Overall, they suggest a crowding-out effect on private transfer. Gerardi and Tsai (2014) employed an instrumental variable approach and found that SCWLA reduced the likelihood of older adults receiving monetary transfer from adult children by 37% but increased the probability of intergenerational co-residence. Fan (2010) employed a difference-in-difference approach and

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revealed that one dollar of OFA crowded-out 30-39 cents of private transfer. Lai and Orsuwan (2009) suggested one dollar of public transfer via the means-tested MLIEA displaced 30-50 cents of inter-household transfer.

The heterogeneous effect of old-age public transfer on intergenerational interactions

As individuals differ in how they respond to a particular policy, some studies have investigated the heterogeneity of policy effects in terms of parents' or adult children's characteristics. Most focus on parents' socioeconomic status (SES), revealing mixed results. Jung *et al.* (2016) found that public transfer had a crowding-out effect on private financial help for higher-educated but not for lower-educated elderly in South Korea. In rural China, Ning *et al.* (2019) reported crowding-in on the probability of receiving financial transfer for low-income, crowding-out for middle-income, and no effect for high-income elderly, whereas Zhang *et al.* (2019) found crowding-out on the amount of financial transfer for poor elderly and no effect for non-poor. As for non-financial outcomes, public transfer income only lowered the probability of higher SES (e.g. education and home ownership) elderly co-residing with adult children (Cheng *et al.*, 2018), while crowding-in of non-financial help only affected lower-educated elderly (Jung *et al.*, 2016). Besides parents' SES, Cheng *et al.* (2018) also investigated parent's health status and found that a reduced probability of co-residence with adult children for elderly with better health. For adult children's characteristics, Zhang *et al.* (2019) suggested that public transfer only crowded-out financial transfer and co-residence among sons but not daughters.

Existing studies mainly focus on the heterogeneous effect in adult children and elderly parents' characteristics, which reflect the underlying needs, opportunities and family structure that shape intergenerational interactions. As the theoretical literature suggests, intergenerational interactions are also shaped by different motives for giving that lead to differential behavioural responses to policy change. No studies, however, have empirically tested the theoretical hypotheses. To fill the research gap, this study is a preliminary attempt to utilize a unique data set incorporating measures to capture motives for giving, thus enabling examination of the heterogeneous effect of old-age income allowance policy on intergenerational interactions by adult children's motives for giving.

3. Research objectives, hypotheses, and contribution

The present study investigated the effect of SCWLA on intergenerational financial transfer, co-residence, and contact, and the heterogeneity in its effect by adult children's motives for giving. Figure 2 illustrates the study's theoretical framework.

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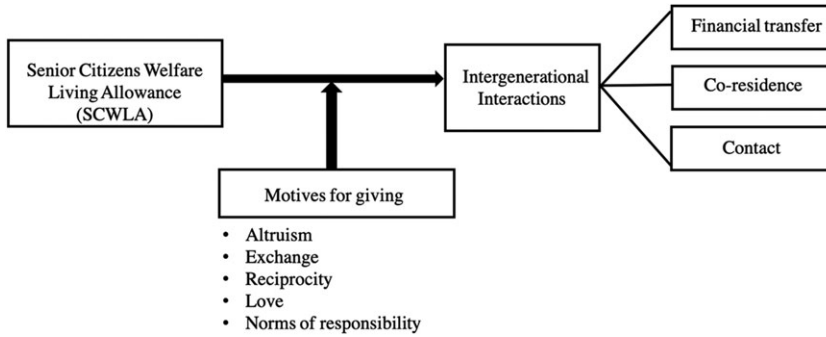

FIGURE 2. Conceptual framework

Extant studies in Taiwan found a crowding-out effect of old-age public transfer on private financial transfer (Fan, 2010; Gerardi and Tsai, 2014; Lai and Orsuwan, 2009), so we hypothesized that SCWLA crowds-out private financial transfer from adult children. Two competing forces impact the co-residence pattern. SCWLA may reduce intergenerational co-residence because the allowance amount (NT$ 3,000) accounts for around 70% of average food consumption of a single-person household and is likely to increase the affordability of independent living. However, intergenerational co-residence has remained common in Taiwan. The share of people aged 65 or older living with their children reduced only slightly from 62.9% in 1991 to 60.2% in 2013 (Ministry of Health and Welfare, 2013), much higher than in other East Asian societies (Lin and Yi, 2011). These persistently stable intergenerational co-residence patterns may be resistant to change. Hence, we hypothesized that SCWLA would not change the intergenerational co-residence pattern. Regarding intergenerational contact, we expected that SCWLA would increase intergenerational contact. Public transfer increases elderly parents' economic independence, which may further reduce financial tensions between them and their adult children, hence creating opportunities for interaction based on intimacy.

We also proposed hypotheses regarding the heterogeneous effects of SCWLA on intergenerational interactions by motives for giving. For adult children motivated by a higher degree of altruism, we expected a more pronounced crowding-out effect of SCWLA on financial transfer. To compensate for reduced financial transfer, the crowding-in effect of contact would also be more pronounced. Adult children motivated by a higher level of exchange consideration would increase support to their parents to maintain the flow of current or future service provided by their parents. Therefore, we expected that SCWLA would crowd-in or would not crowd-out financial transfer, and the crowding-in effect of contact will be more pronounced. For adult children motivated by a higher degree of love, sense of responsibility, or reciprocity, we expected that SCWLA

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TABLE 1. Study hypotheses

	Financial transfer	Co-residence	Contact
Main effect (H1)	Crowd-out (H1.1)	No change (H1.2)	Crowd-in (H1.3)
Heterogeneous effect			
Motivated by altruism (H2)	Crowd-out (+) or no change	No change	Crowd-in (+)
Motivated by exchange (H3)	Crowd-in or no change	No change	Crowd-in (+)
Motivated by reciprocity (H4)	No change	No change	No change
Motivated by love (H5)	No change	No change	No change
Motivated by sense of responsibility (H6)	No change	No change	No change

would not affect their interactions with parents. External policy is unlikely to affect intrinsic motivations, such as love and sense of responsibility, and motives for repayment of parents' early nurturing or investment. For all motives, we did not expect SCWLA to change the intergenerational co-residence pattern. Table 1 summarizes the study hypotheses.

We contribute to the existing literature in several ways. First, theoretically, the coverage of outcomes on non-financial transfer (e.g. co-residence and contact) and financial transfer provides new evidence enriching understanding of the effects of old-age public transfer on the financial, structural and associational forms of intergenerational interactions. Second, we investigate the heterogeneous policy effects by adult children's motives for giving. This enriches theoretical knowledge on pathways through which public financial transfer impacts intergenerational interactions. Third, practically, the examination of non-financial outcomes and heterogeneous effect can improve policymakers' understanding of the costs and benefits of a public old-age financial transfer programme. Fourth, the adoption of rigorous causal identification strategies contributes to understanding the causal relationship between old-age public transfer and intergenerational interactions.

4. Methods

4.1 Data

Data were drawn from the Panel Study of Family Dynamics (PSFD), conducted and maintained by Academia Sinica. The PSFD questionnaire contains rich information on respondents and their parents' socio-economic characteristics and intergenerational interactions. PSFD adopts a three-stage stratified random sampling procedure to generate a representative sample of individuals in Taiwan. We drew data from the 2002, 2004, 2005 and 2006 surveys (individuals born between 1935 and 1964) because only in these years that respondents

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were asked if their parents received social welfare benefit. The sample comprised respondents with at least one living parent. The treatment group comprised respondents with parents aged 65 or older, and the comparison group comprised respondents with parents aged 55-64 years. In order to employ the fixed-effect strategy, only respondents who were interviewed in 2002 (information collected for 2001 prior to the policy change) and then were successfully followed up at least once in subsequent years were included. The final sample consisted of 1,047 individuals (3,689 observations). Of these, 798 observations (21.6%) contained missing values. We used multiple imputation to impute variables with missing values, and ten imputations were created.

4.2 Variables

The dependent variables measured the three aspects of intergenerational interaction – financial transfer, co-residence, and contact. For the financial transfer and contact outcomes, the sample included respondents not co-residing with parents,[1] and for the co-residence outcome, the sample included all respondents. Financial transfer was measured by two variables: whether respondents provided financial transfer to parents ("during the last year, did you provide your parents with any living expenses, petty cash, or red envelope?") and the amount of that transfer ("If yes, what was the monthly amount?"). Co-residence was a binary variable coded as 1 if the respondent was living with at least one parent, and 0 otherwise. Intergenerational contact was measured by the frequency of calls (1=almost never; 2=less than once a month; 3=one to three times a month; 4=once or twice a week; 5=almost every day) and visits (1=almost never; 2=less than 7 times a year; 3=two to three times a month; 4=once or twice a week; 5=almost every day).[2] To capture the respondent's overall contact with their parent(s), we constructed another variable taking the larger value between the frequency of calls and visits. In addition, we included a variable on whether respondents' parents received any social welfare benefit in the previous year to ascertain that our identification strategy captured the surge in SCWLA receipts by elders.

We captured the levels of five motives through a high/low dichotomy for each motive. Respondents were considered to have a high level of: 1) altruism if they answered yes to the prosocial behaviour question: "Did you donate money to charities last year?"; 2) childcare exchange motive if they reported having three or more children; 3) financial exchange motive if they rated four or higher to the question "Was (will) your parents be helpful when you encountered financial difficulties?" with response options of 1 (not helpful at all) to 5 (very helpful); 4) reciprocal motive if their average score to the questions measuring parent's educational investment when the respondent was in junior high school (e.g. extracurricular reading, academic reward, active participation in school activities and visiting teachers) was three or higher. The response options were

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1=never to 4=often;[3] 5) affectionate motive (love) if they claimed to have a very good relationship with their parent(s). The answer ranged from 1 (not good at all) to 5 (very good); 6) sense of responsibility (filial piety) if their reported levels of filial piety were in the top 25 percentile among all respondents. Filial piety was measured by the 9-item Filial Piety Scale (FPS). The short version of the original 52-item FPS scale (Yang *et al.*, 1989) has been widely used to study filial piety in Chinese society (e.g. Chu *et al.*, 2011). Respondents' attitudes on filial piety values were scaled on each item from 1 (not important) to 5 (absolutely important).[4] Due to the lack of direct measures on motives of giving in the PSFD survey, we acknowledged that these indicators can only partially capture the motives we intended to measure.

A set of control variables on respondents' and their parents' characteristics was included. Respondents' characteristics included age, gender, marital status, educational attainment, ethnicity, working status, self-employed status, spouse's working status, monthly earnings, self-rated health status, number of siblings, number of children, number of parents alive, and living distance from parents. Their parents' characteristics included age, educational attainment, self-rated health status, and pension status. County-level characteristics including percentage of the population aged 65 or older, unemployment rate, percentage of low-income population, number of elderly home beds per 10,000 elderly population, and annual disposable income were also controlled. The county-level data were drawn from DGBAS for each respective survey year.

4.3 Empirical strategy

To identify the effect of SCWLA on intergenerational interactions, we employed a difference-in-difference individual fixed effect model (FE-DID). A difference-in-difference design was used to compare intergenerational interactions before and after the introduction of SCWLA among respondents with at least one parent aged 65 or older and those without. An individual fixed effect model accounted for respondents' time-invariant characteristics. Specifically, we estimated:

$$Y_{ijt} = \beta_0 + \beta_1 Treat_{ijt} + \beta_2 Post_t + \beta_3 Treat_{ijt} * Post_t + \gamma X_{ijt} + \rho C_{jt} + \delta_j + \varphi_t + \sigma_i + \varepsilon_{ijt} \quad (1)$$

where the outcome Y_{ijt} is the three aspects of intergenerational interactions – financial transfer, co-residence, and contact – of respondent i living in county j who was surveyed in year t. The dummy variable $Treat_{ijt}$ is equal to one for respondents who had at least one parent above 65 years old. $Post_t$ is an indicator equal to one if the individual was surveyed in 2004 or later. The vector X_{ijt} contains the control variables on respondents' and their parents' characteristics. The

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vector C_{jt} contains the county-level characteristics. County and year fixed effects are captured by δ_j and φ_t, respectively. σ_i represents unobserved individual and county characteristics that are fixed across t. The coefficient of interest, β_3, is the difference-in-difference estimate of the effect of SCWLA on intergenerational interactions.

Our outcomes of financial transfer amounts and contact were conditional on providing financial transfer to older parents and not co-residing with parent(s), respectively. We used a two-stage Heckman model to correct for selection bias. In the selection stage, a probit regression was used to examine the likelihood of non-coresiding with parents (if the outcome was contact) or providing financial transfer (if the outcome was the amount of financial transfer). The inverse Mills ratio, which represents the selection bias, was computed from the selection stage and added as an additional variable to the outcome stage in Eq. (1). We also ran Eq. (1) on sub-samples categorized by the levels of the five motives to estimate the heterogeneous effects of SCWLA on different intergenerational interactions.

5. Results

Table 2.1. presents the summary statistics of the outcome variables by treatment and comparison groups, before and after the introduction of SCWLA. Following implementation of SCWLA, no observable change was evident in family co-residence status. With regard to inter-household financial transfers, we observed an increased proportion of respondents providing financial transfer to older parents yet a decline in the transfer amount for both treatment and comparison groups. The magnitude of change was smaller among the treatment group than among the comparison group. As for contact, only the comparison group showed a minor change in the frequency of calls and visits, and the trend within the treatment group was similar before and after SCWLA implementation.

Table 2.2. presents the summary statistics of motives for intergenerational giving and control variables of the non-coresiding sample surveyed in 2002. Around half of the respondents had donated money in the past year (a higher level of altruism), had three or more children (a higher level of intention to exchange for childcare help), and had parents who were capable of financial help (a higher level of intention to exchange for financial help). Of the respondents, 13.2% had received a higher level of early educational investment from their parents (a higher level of motive to reciprocate their parents' educational investment), 68.3% reported a good relationship with parents (a higher level of love), and 20.4% reported higher scores on the Filial Piety Scale (a higher sense of responsibility). The average age of the elderly parents was 76.7 years, the majority only received primary-school education, and one third were (self-rated) unhealthy. The average age of the respondents was 48.5 years; the majority were

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married, and around half had received secondary or tertiary school education. The characteristics of the full sample (as shown in Appendix I) were mostly similar to those of the non-coresiding sample.

TABLE 2.1. Summary statistics of variables on intergenerational interactions

	Full sample (N=3,689)			
	Parents aged 65 and older		Parents aged 55-64	
	2002	2004-2006	2002	2004-2006
Co-residing with parents (%)	20.1	20.2	31.3	29.6
N	1,015	2,615	32	27
	Non co-residing with parents (N=2,930)			
	2002	2004-2006	2002	2004-2006
Elderly parents receiving public transfer (%)	43.5	72.3	9.1	15.8
Respondents providing financial transfer (%)	68.1	73.1	59.1	68.4
Amount of financial transfer (unit: NT$ 1000)	4.3 (5.1)	3.9 (5.3)	8.5 (13.6)	3.1 (2.7)
Contact	3.8 (0.9)	3.7 (0.9)	4.2 (0.7)	3.9 (0.7)
Call	3.2 (1.2)	3.1 (1.3)	3.7 (1.1)	3.2 (1.1)
Visit	3.2 (1.1)	3.2 (1.1)	3.2 (1.1)	3.6 (1.0)
N	802	2,087	22	19

Notes: The sample is restricted to respondents with at least one parent aged 55 and above.

TABLE 2.2. Summary statistics of variables on motives and control variables

Motives for giving (%)	
Had donated money in the past year (A higher level of altruism)	56.2
Had three or more children (A higher level of motive to exchange for childcare help)	53.8
Parents were capable of financial help (A higher level of motive to exchange for financial help)	48.2
Received more educational investment from their parents when they were in junior high school (a higher level of motive to reciprocate)	13.2
Reported a good relationship with parents (A higher level of love)	68.3
Reported higher scores on the Filial Piety Scale (A higher sense of responsibility)	20.4
Parents' characteristics	
Age	76.7 (7.0)
Education attainment (%)	
Primary school	86.8
High school	8.0
Secondary school	1.9
College	3.3
Unhealthy (%)	29.6

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TABLE 2.2. Continued

Respondents' characteristics	
Age	48.5 (6.6)
Male (%)	36.5
Married (%)	91.1
Education attainment (%)	
Primary school	52.2
Secondary school	26.6
High school	9.5
College	11.8
Ethnicity (%)	
Fuchien	76.8
Hakka	11.4
Mainlander	9.6
Aborigine	2.2
Employed (%)	69.9
Self-employed (%)	1.3
Working spouse	66.5
Monthly earning (unit: NT$ 1000)	32.3 (47.5)
Unhealthy (%)	12.1
Parents alive (%)	
Father alive only	16.3
Mother alive only	38.5
Both parents alive	45.3
Number of siblings	4.6 (1.9)
Number of children	2.7 (1.1)
Living distance from parents (%)	
Walking in ten minutes	18.1
Driving in 30 minutes	30.1
Driving in 30 to 60 minutes	14.4
Driving in 1 to 2 hours	12.5
Driving more than 2 hours or abroad	24.9
County-level characteristics	
Percentage of population aged above 65 (%)	8.7
Percentage of unemployed person (%)	4.6
Percentage of low-income population (%)	0.8
Elderly home beds per 10,000 elderly population	138.6 (70.8)
Annual disposable income	24.6 (4.8)
N	824

Notes: The sample is restricted to respondents with at least one parent aged 55 and older, and not co-residing with parents. The information is based on 2002 PSFD data, the base year preceding the policy change.

Table 3 presents the estimates of SCWLA's effect on intergenerational interactions from the FE-DID model. The FE-DID coefficient of the interactions between post-policy reform and treatment status in column 1 suggest that SCWLA significantly increased the likelihood that elderly parents received public transfer by 13.9%. The direction of coefficients in column 2 and 3 shows that SCWLA increased both the likelihood of elderly parents receiving private financial transfer and the transfer amount. However, the coefficients were not

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TABLE 3. Effect of SCWLA on intergenerational interactions

	Financial transfer			Co-residence	Intergenerational contact		
	Any public transfer	Any private financial transfer	Amount of private transfer		Contact	Visit	Call
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post*treat	0.139 (0.053) **	0.049 (0.072)	3.146 (2.689)	0.035 (0.045)	0.226 (0.100) *	−0.179 (0.123)	0.226 (0.203)
Treat	−0.086 (0.041) *	0.015 (0.062)	−2.798 (2.030)	−0.017 (0.033)	−0.178 (0.095)	0.134 (0.113)	−0.279 (0.144)
2004	0.189 (0.06) **	0.004 (0.075)	−3.481 (2.916)	−0.053 (0.047)	−0.306 (0.111) **	0.099 (0.134)	−0.325 (0.216)
2005	0.190 (0.07) **	0.016 (0.078)	−3.609 (2.826)	−0.131 (0.052) *	−0.251 (0.120) *	0.067 (0.138)	−0.234 (0.231)
2006	0.267 (0.083) **	0.001 (0.084)	−3.012 (2.714)	−0.187 (0.060) **	−0.344 (0.138) *	−0.057 (0.151)	−0.339 (0.256)
Lamda			−7.290 (15.626)		0.354 (1.125)	−0.889 (1.136)	−0.218 (2.043)
Constant	0.916 (0.466) *	1.189 (0.422) **	10.722 (7.141)	−0.029 (0.262)	4.274 (0.792) **	4.006 (0.786) **	2.986 (1.269) *
N	31,960	31,962	22,829	40,236	31,933	31,933	31,926

Notes: The sample is restricted to respondents who had at least one parent aged 55 and older. Each column is a separate regression model. In Models 1 (any public transfer) and 4 (co-residence), we use ordinary least square model and included respondents living with and not living with their elderly parents. In Models 2-3 (any private financial transfer and amount of private transfer) and 5-7 (intergenerational contact), the sample is restricted to respondents not co-residing with their parents. Model 2 is based on ordinary least squares model, and Models 3 and 5-7 are based on Heckman selection models. All models control for respondents' and their parent's characteristics as well as county-level characteristics. Standard errors are shown in brackets. *< 0.05; ** < 0.01

TABLE 4. Heterogeneous effect of SCWLA on intergenerational interactions by motives for giving

	Financial transfer		Co-residence	Intergenerational contact		
	Any financial transfer	Amount of transfer		Contact	Visit	Call
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Donated any money in the past year (altruism)						
High						
Post*treat	−0.075 (0.126)	10.610 (7.429)	0.047 (0.040)	0.024 (0.194)	−0.444 (0.241)	0.084 (0.209)
Low						
Post*treat	0.146 (0.066) *	0.336 (1.127)	0.079 (0.087)	0.425 (0.156) **	0.016 (0.141)	0.823 (0.327) *
Panel B. Number of children (motive to exchange for childcare help)						
High						
Post*treat	0.152 (0.113)	1.605 (0.947)	0.079 (0.087)	0.259 (0.166)	−0.366 (0.207)	0.278 (0.383)
Low						
Post*treat	−0.017 (0.077)	6.188 (5.434)	0.016 (0.036)	0.159 (0.121)	−0.063 (0.141)	0.190 (0.131)
Panel C. Parents capable of financial help (motive to exchange for financial help)						
High						
Post*treat	0.075 (0.129)	8.104 (5.297)	0.010 (0.045)	0.216 (0.151)	−0.362 (0.213)	−0.043 (0.302)
Low						
Post*treat	0.027 (0.064)	1.234 (0.740)	0.070 (0.068)	0.387 (0.140) **	0.118 (0.131)	0.842 (0.296) **
Panel D. Early educational investment from parents (motive to reciprocate)						
High						
Post*treat	0.319 (0.162)	−4.565 (1.749) *	−0.050 (0.090)	0.067 (0.266)	−0.518 (0.268)	−0.005 (0.369)
Low						
Post*treat	0.023 (0.072)	3.427 (2.725)	0.056 (0.048)	0.244 (0.104) *	−0.134 (0.131)	0.246 (0.207)
Panel E. Relationship with parents (love)						
High						
Post*treat	0.091 (0.110)	5.645 (4.236)	0.050 (0.036)	0.164 (0.114)	−0.299 (0.169)	0.127 (0.326)
Low						
Post*treat	0.021 (0.082)	−2.384 (3.515)	0.008 (0.093)	0.287 (0.170)	−0.092 (0.168)	0.363 (0.222)
Panel F. Scores on the Filial Piety Scale (sense of responsibility)						
High						
Post*treat	−0.054 (0.184)	−0.063 (1.210)	0.054 (0.068)	−0.026 (0.200)	−0.383 (0.247)	0.880 (0.512)
Low						
Post*treat	0.082 (0.073)	3.894 (3.341)	0.033 (0.056)	0.270 (0.110) *	−0.151 (0.137)	0.088 (0.210)

Notes: Please see Table 3 for sample and model specifications. Each cell is a separate regression model. Standard errors are shown in brackets. * <0.05; ** < 0.01

statistically significant. The coefficient in column 4 suggests that SCWLA on average increased the likelihood of co-residence, although the coefficient was not statistically significant. The coefficients in column 5 suggest that SCWLA significantly increased the overall contact by 0.226 (on a 5-point scale). The direction of the coefficients in the form of visits and calls were different. As shown in columns 6 and 7, SCWLA reduced the frequency of visits but increased the frequency of phone-calls. However, neither coefficient was statistically significant.

Table 4 presents the FE-DID estimates of the heterogeneous effect of SCWLA on intergenerational interactions by motives for giving. As shown in Panel A, SCWLA significantly increased the likelihood of adult children who did not donate any money in the past year (a lower level of altruism) providing financial transfer to their elderly parents, by 14.6%. SCWLA also significantly increased both contact and call frequency by 0.425 and 0.823, respectively. Panel B shows that the SCWLA's effect on intergenerational interactions did not significantly differ by number of children that respondents had (motives to exchange for childcare help). As shown in Panel C, SCWLA significantly increased contact and calls with parents for adult children whose parents were less capable of financial help (a lower level of motive to exchange for financial help), by 0.387 and 0.842, respectively. Panel D shows that SCWLA crowded-out the amount of financial transfer by 4.565 for respondents who received more educational investment from their parents (a higher level of motive to reciprocate). For those who received less educational investment (a lower level of motive to reciprocate), SCWLA crowded-in the contact by 0.244. Panel E shows that the effect of SCWLA on intergenerational interactions did not significantly differ by the levels of relationship with their parents (levels of love). As shown in Panel F, SCWLA significantly crowded-in contact by 0.270 among adult children who reported lower scores on the Filial Piety Scale (a lower sense of responsibility).

6. Robustness

We conducted a pseudo policy test, assuming 2002-2004 as pre-policy years and 2005-2006 as post-policy years, to ensure our findings were not driven by unobserved trends in outcomes. As Panel A of Table 5 shows, SCWLA did not significantly change any intergenerational interactions, reinforcing our confidence in the main finding that implementation of SCWLA in 2002 increased intergenerational contact.

We also conducted a placebo test to examine the effect of SCWLA on respondents whose parents had already received public transfer (e.g. MLIEA, OFA and Public Assistance) prior to the implementation of SCWLA and those

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TABLE 5. Effect of SCWLA on intergenerational interactions: Pseudo policy and placebo test

	Financial transfer		Co-residence	Intergenerational contact		
	Any financial transfer (1)	Amount of transfer (2)	(3)	Contact (4)	Visit (5)	Call (6)
Panel A. Pseudo policy year=2004						
Post*treat	0.032 (0.099)	1.112 (0.751)	0.011 (0.036)	0.116 (0.081)	0.045 (0.089)	−0.062 (0.158)
Lamda		−8.103 (15.634)		0.254(1.125)	−0.917 (1.135)	−0.356 (2.043)
Constant	1.169 (0.419) **	9.175 (6.997)	−0.045 (0.260)	4.210 (0.786) **	4.134 (0.780) **	2.883 (1.258) *
N	31,962	22,829	40,236	31,933	31,933	31,926
Panel B. Placebo test						
Elderly parents received public transfer in 2002						
Post*treat	0.154 (0.080)	−2.235 (2.589)	0.042 (0.049)	0.134 (0.139)	−0.150 (0.145)	0.004 (0.178)
Lamda		−18.855 (25.941)		−1.471 (1.355)	−1.322 (1.416)	−2.114 (2.420)
Constant	0.990 (0.643)	4.520 (8.840)	0.092 (0.502)	4.272 (1.415) **	4.065 (1.219) **	3.058 (1.959)
N	12,781	9,012	16,400	12,768	12,768	12,767
Panel C. Robustness check						
Elderly parents did not receive any public transfer in 2002						
Post*treat	0.047 (0.088)	4.171 (3.476)	0.035 (0.054)	0.283 (0.115) *	−0.175 (0.145)	0.296 (0.262)
Lamda		8.426 (20.555)		2.483 (1.439)	1.175 (1.515)	1.529 (2.171)
Constant	1.259 (0.559) *	7.471 (9.253)	−0.109 (0.318)	3.517 (1.019) ***	2.987 (1.088) **	2.883 (1.579)
N	19,181	13,817	23,836	19,165	19,165	19,159

Notes: Please see Table 3 for sample and model specifications. Each column in each panel is a separate regression model. Standard errors are shown in brackets.* < 0.05; ** < 0.01

whose parents had not. The former would be less affected by the implementation of SCWLA because SCWLA did not allow recipients to participate in more than one programme simultaneously. Corroborating our assumption, as shown in Panel B and C of Table 5, SCWLA only significantly increased contact (by 0.283) among those whose parents had not received any public transfer prior 2002.

Lastly, we tested the sensitivity of our findings to the definitions of motives. The results are presented in Appendix IV. The sensitivity test on the measurement of motive did not show contradictory evidence against our main findings.

7. Discussion

This paper investigated the effect of an old-age allowance programme – SCWLA – on intergenerational financial transfer, co-residence and contact in Taiwan. Our results indicate that SCWLA crowds-in intergenerational contact but does not significantly change the financial transfer or co-residence patterns. Increased intergenerational contact was primarily driven by adult children who did not donate money in the past year (lower levels of altruism), who reported lower scores on the Filial Piety Scale (lower senses of responsibility), whose parents were less capable of financial help (lower motives to exchange for financial help), and whose parents invested less in their earlier education (lower motives to reciprocate). We interpreted that the crowding-in effects of intergenerational contact among "low motivators" can be driven by reduced financial entanglement between elder parents and adult children and/or SCWLA changes social norms by showing the importance of paying respect to, and concern for, the elderly.

We did not find a crowding-out effect of public transfer on financial transfer, similar to Ning *et al.* (2019)'s and Chen and Tan (2018)'s findings, yet contrary to our hypothesis (H1.1) and findings from previous Taiwanese studies (e.g. Fan, 2010; Gerardi and Tsai, 2014; Lai and Orsuwan, 2009). One explanation on why Fan (2010) and Lai and Orsuwan (2009) found a crowding-out but we did not is because of their focus on either the OFA or the MLIEA, both of which are means-tested programmes targeting lower income elderly. The allowance amount constitutes a larger proportion of income for low-income elders, so we suspect that adult children, whose SES is often correlated with that of their parents, react more strongly to increases in their parents' income. For Gerardi and Tsai (2014)'s study that also studied SCWLA, we replicated their approach using the same data set. However, the instrument was shown to be weak, and we failed to replicate the significant crowding-out effect they reported.

Consistent with our hypothesis (H1.2), SCWLA did not change the co-residence pattern. Although SCWLA may, to some extent, increase elderly parents' financial ability to live independently, the preference for intergenerational

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	Altruism		Exchange		Reciprocity		Love or affectation		Sense of responsibility	
	High	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*
Crowding-out					√ (financial transfer)					
Crowding-in		√ (contact & financial transfer)		√ (contact)		√ (contact)				√ (contact)
No change	√		√				√	√	√	

FIGURE 3. Effect of SCWLA on intergenerational interactions by five types of motives

co-residence remained strong in Taiwan and is hard to change by a public transfer programme. Our findings also support our hypothesis (H1.3) that SCWLA crowded-in intergenerational contact, echoing with Jung *et al.* (2016)'s study showing that public pension crowded-in emotional support in South Korea. SCWLA creates opportunities for intergenerational communication by increasing elderly parents' economic independence and reducing the financial strain between them and their adult children. In other words, SCWLA reduced emotional costs of intergenerational communication.

One contribution of this study is to examine the effects of public transfer on intergenerational interactions by five types of motives (see Figure 3). First, we found that the effect of SCWLA on intergenerational interactions did not differ by affection motive. Consistent with our hypothesis (H5), intergenerational interactions motivated by intrinsic motivations are resilient to external policy changes. Second, the effect of SCWLA on intergenerational interactions was different by motive of altruism. However, contrary to our hypotheses (H2), SCWLA did not crowd-in contact among the higher-level group, but, instead, crowded-in both the amount of financial transfer and contact among the lower-level group. One explanation is that the marginal cost of changing the behaviours of adult children who already have a high level of altruism is high, whereas it is easier to mobilise behavioural change for those whose initial altruism level is low.[5] Hence, highly altruistic adult children have more limited capacity to increase their intergenerational interactions. For those with a lower level of altruism, a large-scale old-age allowance, like SCWLA, may reduce financial entanglement and raise their awareness of the need to respect and show concern for the elderly. The increase in contact frequency among children with a low level of altruism was primarily driven by the rise in calls, which is a behavioural change incurring lower costs than visitation. Third, we also found that the effect of SCWLA differed by sense of responsibility. Although we expected that intergenerational interactions motivated by sense of responsibility would not be changed by a policy in the short-term (H6), the findings suggest that

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SCWLA crowded-in contact among the lower-level group. A similar explanation on the old-age policy reducing financial entanglement and altering social norms also applies here. Fourth, for motives of exchange for help, though we hypothesized a crowding-in effect among the higher-level group (H_3), their intergenerational interactions were not affected by SCWLA. For exchange of childcare help, one explanation could be that grandparents in Taiwan regard childcare assistance as their moral responsibility (Sun, 2008). The increase in income due to the introduction of SCWLA did not reduce their willingness to provide childcare: hence, adult children did not have to increase their support to maintain childcare help from their parents. For exchange of financial help, crowding-in effect on contact was found among the low-level group, which can also be explained by old-age policy shifting social norms and reducing financial entanglement. Fifth, although our hypothesis (H_4) predicted that intergenerational interactions motivated by reciprocity was hard to change by an external policy in the short-term, the results suggest that SCWLA crowded-out the amount of financial transfer provided by adult children with a higher level of reciprocity and crowded-in contact among those with a lower level. Reciprocity can be regarded as a delayed exchange in which adult children repay the past support provided by parents. The high-level group may perceive the implementation of SCWLA as the government assuming some of the responsibilities of old-age support and hence reduce their "repayment" to their parents. The crowding-in effect of contact among the lower-level group can also be explained by the old-age policy reducing financial entanglement and changing social norms.

Our empirical findings have important policy implications. First, when a cash allowance programme for elders is mostly age-based, no substitution between public and private financial transfer to elderly parents was observed. Hence, government should not be hampered by fear of distorting family support functions when considering playing a more active role in old-age financial support. Moreover, an old-age allowance increases intergenerational contacts, potentially through relieving families from financial entanglements and fostering a culture and awareness of old-age support. Second, adult children with different levels of motives respond to policy changes differently. The effects of policy change were less variable by the motivation of love, yet more variable by motives of altruism, exchange for financial help, reciprocity, and sense of responsibility. The rise in intergenerational contact is primarily driven by adult children initially with lower level of motives of altruism, exchanging for financial help, reciprocity and sense of responsibility. The old-age allowance does not weaken family solidarity; instead, it demonstrates the importance of showing respect and concern for the elderly to low-motivated adult children. This is an unintended, but previously overlooked, policy benefit of implementing old-age income support programmes. This study also highlights the importance

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of factoring in divergent behavioural responses from adult children with varying motives to design effective old-age policies. Our study was conducted in Taiwan, one of the Chinese societies in which the cultural norms of filial piety and respect for the aged are upheld (Chow, 2009). Additionally, the share of income devoted to private transfers in Taiwan (5.8%) is much higher compared with OECD countries (0.8%) (Kim and Choi, 2011). Whether the crowding-in effect of intergenerational contact among the "lower motivators" and the null effect among "higher motivators" revealed in Taiwan would hold in other societies with different cultural norms towards the elderly is open to further examination.

Our study is not without limitations. First, limited by the availability of survey questions on the PSFD, several types of motive (e.g. exchange for childcare or financial help; reciprocity) were measured rather indirectly. For example, we assume that parents with a greater number of children need more childcare help from their own parents. Second, we could not examine whether the effect of SCWLA on intergenerational interactions differed between fathers and mothers, because the PSFD did not separately inquire about intergenerational interactions with two parents in 2002. Despite these limitations, the study findings suggest that future studies examining the effects of old-age allowance programmes, or cash transfer programmes in general, should consider non-financial aspects of intergenerational interactions. Moreover, as individuals are often driven by various motives (Schwarz, 2006), future studies should measure multidimensional aspects of motives and examine the heterogeneous effect of old-age allowance and cash transfer programmes by multidimensional and interlinked motives.

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Conflict of Interest

The authors declare that they have no conflict of interest

Supplementary material

To view supplementary material for this article, please visit https://doi.org/10.1017/S0047279421000453

Notes

1 Financial transfer from adult children co-residing with their parents is within-household transfer, whereas the transfer from non co-residing adult children is inter-household transfer. Decision making on intra– and inter-household transfer is different and most of the

existing studies focus on financial transfer among non-coresiding adult children (e.g. Ning *et al.*, 2019); therefore, our estimates were restricted to the non co-residing sample. The results on the full sample can be found in Appendix II.

2 In 2002, respondents were asked a single question about the frequency of calls made to their parents. In the subsequent years (2004, 2005 and 2006), this question was asked for mothers and fathers separately. Therefore, for data from 2004-2006, we compared the calls made to mother and father and took whichever was larger. The same strategy applies to the question on frequency of visiting. As sensitivity analyses, we also coded frequency of call and visit to mother and father based on the mean. The conclusion drawn from these analyses do not differ from our main findings.

3 The question on reciprocity was only asked of respondents who received junior high school or higher education. We coded respondents whose educational attainment was below junior high school as 1 (never).

4 The questions on different types of motives were not asked in each year (except for the number of children), so they were extracted from surveys conducted in different years. Questions on exchange for financial help, reciprocity, love and sense of responsibility were extracted from the 1999 and 2000 surveys. Questions on exchange for childcare help were extracted from the 2002 survey. Questions on altruism were extracted from the 2008 survey. These motivations are relatively time-invariant, so we measured these motivations as a static individual characteristic.

5 As shown in Appendix III, the initial proportion of adult children providing financial transfer, the amount they provided and their contact with elderly parents were higher among the higher-level than the lower-level group.

References

Antonucci, T. C. and Jackson, J. S. (1990). The role of reciprocity in social support. In B. R. Sarason, I. G. Sarason and G. R. Pierce (Eds.), *Social support: an interactional view* (pp.173–198). New York: John Wiley.

Barro, R. J. (1974). Are government bonds net wealth? *Journal of Political Economy*, 82(6), 1095–1117.

Becker, G. S. (1974). A theory of social interactions. *Journal of Political Economy*, 82(6), 1063–1093.

Bengtson, V.L. and Schrader, S. S. (1982). Parents-child relations. In D. J. Mangen and W.A. Peterson (Eds.), *Research instruments in social gerontology*. Vol. 2, 115–128. MN: University of Minnesota Press.

Bernheim, B. D., Shleifer, A. and Summers, L. H. (1986). The strategic bequest motive. *Journal of Labor Economics*, 4(3, Part 2), S151–S182.

Bucx, F., Van Wel, F., Knijn, T. and Hagendoorn, L. (2008). Intergenerational contact and the life course status of young adult children. *Journal of Marriage and Family*, 70(1), 144–156.

Calvo, E., Bertranou, F. M. and Bertranou, E. (2010). Are old-age pension system reforms moving away from individual retirement accounts in Latin America?. *Journal of Social Policy*, 39(2), 223–234.

Chen, X. (2017). Old age pension and intergenerational living arrangements: a regression discontinuity design. *Review of Economics of the Household*, 15(2), 455–476.

Chen, Y. and Tan, Y. J. (2018). The effect of non-contributory pensions on labour supply and private income transfers: evidence from Singapore. *IZA Journal of Labor Policy*, 7(1), 6.

Cheng, L., Liu, H., Zhang, Y. and Zhao, Z. (2018). The heterogeneous impact of pension income on elderly living arrangements: evidence from China's new rural pension scheme. *Journal of Population Economics*, 31(1), 155–192.

Choi, Y. J. and Kim, J. W. (2010). Contrasting approaches to old-age income protection in Korea and Taiwan. *Ageing & Society*, 30(7), 1135–1152.

https://doi.org/10.1017/S0047279421000453 Published online by Cambridge University Press

Chow, N. (2009). Filial piety in Asian Chinese communities. In Kim, B. J. (Ed.), *Respect for the elderly: Implications for human service providers* (pp. 319–323). University Press of America.

Chu, C. C., Xie, Y. and Yu, R. R. (2011). Coresidence with elderly parents: A comparative study of southeast China and Taiwan. *Journal of Marriage and Family*, 73(1), 120–135.

Chuang, J. C. C. (2012). Do social allowance transfers crowd out private transfers? *An analysis of responses among elderly households in Taiwan. International Journal of Social Welfare,* 21(2), 194–202.

Cox, D. (1987). Motives for private income transfers. *Journal of Political Economy*, 95(3), 508–546.

Directorate-General of Budget, Accounting and Statistics (2014). The situation of old-age allowance in Taiwan (in Chinese). https://www.dgbas.gov.tw/fp.asp?xItem=14294&ctNode=2389

Doty, P. (1986). Family care of the elderly: The role of public policy. *The Milbank Quarterly*, 34-75.

Edmonds, E. V., Mammen, K. and Miller, D. L. (2005). Rearranging the family? Income support and elderly living arrangements in a low-income country. *Journal of Human Resources*, 40(1), 186–207.

Engelhardt, G. V., Gruber, J. and Perry, C. D. (2005). Social security and elderly living arrangements evidence from the social security notch. *Journal of Human Resources*, 40(2), 354–372.

Fan, E. (2010). Who benefits from public old age pensions? Evidence from a targeted program. *Economic Development and Cultural Change*, 58(2), 297–322.

Garcia, S. and Cuartas, J. (2020). Can poverty alleviation programs crowd-in private support? Short -and middle-run effects of a conditional cash transfer program on inter-household transfers. *Journal of Social Policy*, 1-22.

Gerardi, K. and Tsai, Y. (2014). The effect of social entitlement programmes on private transfers: New evidence of crowding out. *Economica*, 81(324), 721–746.

Hamoudi, A. and Thomas, D. (2014). Endogenous coresidence and program incidence: South Africa's old age pension. *Journal of Development Economics*, 109, 30–37.

Holzmann, R. and Hinz, R. (2005). *Old-age income support in the 21st century: An international perspective on pension systems and reform*. The World Bank.

Jensen, R. T. (2004). Do private transfers 'displace' the benefits of public transfers? Evidence from South Africa. *Journal of Public Economics*, 88(1-2), 89–112.

Johar, M. and Maruyama, S. (2011). Intergenerational cohabitation in modern Indonesia: filial support and dependence. *Health Economics*, 20(S1), 87–104.

Juarez, L. (2009). Crowding out of private support to the elderly: Evidence from a demogrant in Mexico. *Journal of Public Economics*, 93(3-4), 454–463.

Jung, H., Pirog, M. and Lee, S. K. (2016). Do public pensions crowd out private transfers to the elderly? *evidence from South Korea. Journal of Pension Economics & Finance,* 15(4), 455–477.

Kim, J. W. and Choi, Y. J. (2011). Does family still matter? Public and private transfers in emerging welfare state systems in a comparative perspective. *International Journal of Social Welfare*, 20(4), 353–366.

Kohli, M. and Künemund, H. (2003). Intergenerational transfers in the family: What motivates giving. In V. Bengtson and A. Lowenstein (Eds.), *Global Aging and Challenges to Families (pp.*123–142). New York: Aldine de Gruyter.

Künemund, H. and Rein, M. (1999). There is more to receiving than needing: theoretical arguments and empirical explorations of crowding in and crowding out. *Ageing & Society*, 19(1), 93–121.

Lai, M. S. and Orsuwan, M. (2009). Examining the impact of Taiwan's cash allowance program on private households. *World Development*, 37(7), 1250–1260.

Lee, J. and Lee, Y. (2009). Old-age income security and private transfers in South Korea. *Journal of Aging & Social Policy*, 21(4), 393–407.

Lin, J. P. and Yi, C. C. (2011). Filial norms and intergenerational support to aging parents in China and Taiwan. *International Journal of Social Welfare*, 20, S109–S120.
Ministry of Health and Welfare (2013). *Report of the senior citizen condition survey*. Retrieved from: https://dep.mohw.gov.tw/dos/lp-1767-113.html.
Ning, M., Liu, W., Gong, J. and Liu, X. (2019). Does the New Rural Pension Scheme crowd out private transfers from children to parents? *Empirical evidence from China. China Agricultural Economic Review,* 11(2), 411–430.
Schwarz, M. E. (2006). Intergenerational transfers: An integrative approach. *Journal of Public Economic Theory*, 8(1), 61–93.
Shaver, S. (1998). Universality or selectivity in income support to older people? A comparative assessment of the issues. *Journal of Social Policy*, 27(2), 231–254.
Silverstein, M., Conroy, S. J. and Gans, D. (2012). Beyond solidarity, reciprocity and altruism: moral capital as a unifying concept in intergenerational support for older people. *Ageing & Society*, 32(7), 1246–1262.
Sun, S. H.-L. (2008). Not Just a Business Transaction' The logic and limits of grandparental childcare assistance in Taiwan. *Childhood*, 15(2), 203–224.
Xie, Y. (2013). Population heterogeneity and causal inference. *Proceedings of the National Academy of Sciences*, 110(16), 6262–6268.
Yang, K. S., Yeh, K.H. and Hwang, L. L. (1989). A social attitudinal analysis of Chinese filial piety: Conceptualization and assessment. *Bulletin of the Institute of Ethnology*, 65, 171–22.
Zhang, Z., Luo, Y. and Robinson, D. (2019). Who Are the Beneficiaries of China's New Rural Pension Scheme? Sons, Daughters, or Parents? *International Journal of Environmental Research and Public Health*, 16(17), 3159.

Appendix I. Summary statistics of variables on motives and control variables (full sample)

Motives for giving (%)	
Had donated money in the past year (A higher level of altruism)	53.7
Had three or more children (A higher level of motive to exchange for childcare help)	51.5
Parents were capable of financial help (A higher level of motive to exchange for financial help)	50.8
Received more educational investment from their parents when they were in junior high school (a higher level of motive to reciprocate)	14.4
Reported a good relationship with parents (A higher level of love)	67.9
Reported higher scores on the Filial Piety Scale (A higher sense of responsibility)	22.8
Parents' characteristics	
Age	76.6 (7.1)
Education attainment (%)	
Primary school	87.4
High school	7.6
Secondary school	1.9
College	3.1
Unhealthy	

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Continued

Respondents' characteristics	
Age	48.4 (6.6)
Male (%)	46.2
Married (%)	87.8
Education attainment (%)	
Primary school	50.7
Secondary school	27.6
High school	10.0
College	11.7
Ethnicity (%)	
Fuchien	78.3
Hakka	10.9
Mainlander	8.8
Aborigine	2.0
Employed (%)	72.8
Self-employed (%)	1.4
Monthly earning (unit: NT$ 1000)	34.1 (47.4)
Unhealthy (%)	11.9
Parents alive (%)	
Father alive only	14.8
Mother alive only	40.7
Both parents alive	44.5
Number of siblings	4.6 (1.9)
Number of children	2.6 (1.2)
Living distance from parents (%)	
Walking in ten minutes	18.9
Driving in 30 minutes	31.7
Driving in 30 to 60 minutes	13.7
Driving in 1 to 2 hours	11.9
Driving more than 2 hours or abroad	23.8
County-level characteristics	
Percentage of population aged above 65 (%)	8.8
Percentage of unemployed person (%)	4.5
Percentage of low-income population (%)	7.8
Elderly home bed per 10,000 elderly population	138.2 (72.3)
Annual disposable income	24.5 (4.8)
N	1,015

Notes: The sample is restricted to respondents with at least one parent aged 55 and older. The information is based on 2002 PSFD data, the base year preceding the policy change.

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Appendix II. Effect of SCWLA on financial transfer (full sample)

	Any public transfer	Any private financial transfer	Amount of private transfer
Post*treat	0.097 (0.052)	−0.023 (0.069)	2.236 (2.361)
Treat	−0.039 (0.042)	0.053 (0.053)	−2.297 (1.824)
2004	0.272 (0.057) **	0.090 (0.072)	−3.845 (2.826)
2005	0.286 (0.062) **	0.095 (0.072)	−3.341 (2.684)
2006	0.339 (0.074) **	0.081 (0.076)	−2.607 (2.560)
Lamda			−38.289 (23.145)
Constant	1.195 (0.403) **	1.338 (0.338) **	19.058 (9.137)
N	40,235	40,237	28,548

Notes: The sample is restricted to respondents with at least one parent aged 55 and older. Each column is a separate regression model. In Models 1 (any public transfer) and 2 (any private financial transfer), we use ordinary least squares model, and Model 3 is based on Heckman selection models. All models control for respondents and their parent's characteristics as well as county-level characteristics. Standard errors are shown in brackets. * < 0.05; ** < 0.01

Appendix III. Summary statistics of variables on intergenerational interactions by motives for giving in 2002

	Financial transfer		Co-residence (%)	Intergenerational contact		
	Any financial transfer (%)	Amount of transfer (unit: NT$ 1000)		Contact	Visit	Call
Donated any money in the past year (altruism)						
High	72.5	4.9 (5.9)	17.6	3.8 (0.9)	3.3 (1.1)	3.3 (1.2)
Low	61.5	3.6 (4.4)	25.3	3.7 (1.0)	3.1 (1.2)	3.0 (1.2)
Number of children (motive to exchange for childcare help)						
High	64.3	3.9 (4.8)	17.8	3.7 (0.9)	3.3 (1.1)	3.0 (1.2)
Low	71.9	5.0 (6.0)	25.0	3.9 (0.9)	3.2 (1.1)	3.4 (1.2)
Parents were capable of financial help (motive to exchange for financial help)						
High	69.1	4.5 (5.7)	25.0	3.8 (0.9)	3.3 (1.1)	3.3 (1.2)
Low	68.4	4.4 (5.2)	16.7	3.7 (1.0)	3.1 (1.1)	3.1 (1.2)
Early educational investment from parents (motive to reciprocate)						
High	75.9	6.1 (5.7)	28.0	4.1 (0.8)	3.2 (1.1)	3.8 (1.1)
Low	66.8	4.2 (5.4)	20.2	3.7 (0.9)	3.2 (1.1)	3.1 (1.2)
Relationship with parents (love)						
High	69.7	4.5 (5.5)	20.9	3.8 (0.9)	3.2 (1.1)	3.3 (1.2)
Low	64.7	4.3 (5.1)	22.5	3.7 (1.0)	3.2 (1.1)	3.0 (1.2)
Scores on the Filial Piety Scale (sense of responsibility)						
High	69.0	3.7 (4.6)	29.4	3.8 (1.0)	3.3 (1.1)	3.2 (1.2)
Low	67.7	4.6 (5.6)	19.0	3.8 (0.9)	3.2 (1.1)	3.2 (1.2)

Notes: The sample is restricted to respondents had at least one parent aged 55 and older. Descriptive of financial transfer and intergenerational contacts are based on samples not co-residing with elder parents. The information is based on 2002 PSFD data, the base year preceding the policy change.

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Appendix IV. Heterogeneous effect of SCWLA on intergenerational interactions by motives for giving: Sensitivity analysis on motive variables

	Financial transfer		Co-residence	Intergenerational contact		
	Any financial transfer	Amount of transfer		Contact	Visit	Call
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Number of children (motive to exchange for childcare help)						
High Post*treat	0.042 (0.077)	3.306 (2.921)	0.057 (0.045)	0.236 (0.106) *	−0.219 (0.129)	0.241 (0.213)
Low Post*treat	0.107 (0.107)	−1.078 (1.608)	0.025 (0.128)	−0.037 (0.191)	0.184 (0.140)	−0.114 (0.209)
Panel B. Parents were capable of financial help (motive to exchange for financial help)						
High Post*treat	0.068 (0.103)	3.794 (3.703)	0.002 (0.034)	0.203 (0.128)	−0.325 (0.154) *	0.172 (0.273)
Low Post*treat	−0.026 (0.053)	1.132 (2.152)	0.100 (0.097)	0.328 (0.154) *	0.267 (0.158)	0.349 (0.205)
Panel C. Early educational investment from parents (motive to reciprocate)						
High Post*treat	0.002 (0.121)	8.400 (6.438)	0.032 (0.036)	0.109 (0.199)	−0.379 (0.236)	0.475 (0.393)
Low Post*treat	0.084 (0.080)	0.256 (0.563)	0.046 (0.062)	0.339 (0.099) **	−0.030 (0.140)	0.108 (0.207)
Panel D. Relationship with parents (love)						
High Post*treat	0.034 (0.090)	4.204 (3.362)	0.053 (0.057)	0.201 (0.108)	−0.257 (0.149)	0.227 (0.254)
Low Post*treat	0.087 (0.090)	1.734 (1.480)	−0.070 (0.047)	0.369 (0.247)	0.082 (0.199)	0.270 (0.320)
Panel E. Scores on the Filial Piety Scale (sense of responsibility)						
High Post*treat	−0.012 (0.122)	−0.345 (0.930)	0.039 (0.030)	0.096 (0.140)	−0.375 (0.168) *	0.531 (0.296)
Low Post*treat	0.082 (0.085)	5.224 (4.619)	0.036 (0.081)	0.321 (0.138) *	−0.042 (0.170)	−0.012 (0.269)

Notes: Please see Table 3 for sample and model specifications. Each column in each panel is a separate regression model. Standard errors are shown in brackets.

*<0.05; ** < 0.01.

We tested the sensitivity of our findings to the definitions of motives. We experimented with a less (more) strict cut-off point for the definition of the higher (lower) motivated groups. The cut-off point changed from three to two for number of children (motive to exchange for childcare help), from four to three for whether parents were capable of financial help (motive to exchange for financial help), from three to two for whether received more educational investment from parents when they were in junior high school (motive to reciprocate), from five to four for whether reported a good relationship with parents (love), and from the top 25 to 45 percentile for whether reported a higher scores on the Filial Piety Scale (sense of responsibility). The sensitivity test on the measurement of motive did not show contradictory evidence against our main findings but merely a difference in significance among some higher motivated groups. Specifically, consistent with the main result, the effect of SCWLA on intergenerational interactions did not differ by the reported relationship with parents (motive of love), and it also crowded-in contact among adult children whose parents were less capable of financial help (lower levels of motive to exchange for financial help), whose parents invested less on their earlier education (lower motives to reciprocate) and who reported lower scores on the Filial Piety Scale (lower senses of responsibility). When a less strict cut-off point was applied to form the higher motivated group, the crowding-in effect of SCWLA on contact among respondents with higher number of children (higher motives to exchange for childcare help) became significant at the 5% level. The crowding-out effects on visits became significant at 5% level for respondents who reported higher scores on the Filial Piety Scale (higher senses of responsibility) as well as those whose parents were more capable of financial help (higher levels of motives to exchange for financial help).

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