

Intergenerational Latent Solidarity Class and Relationship Quality among Chinese: Implications for Self-reported Health and Well-being

YANG Jingjing^{1,2}; Ariela LOWENSTEIN³; Todd JACKSON^{1,2}; ZHENG Yong^{1,2}

(¹ Key Laboratory of Cognition and Personality (MOE), Southwest University, Chongqing 400715, China)

(² Faculty of Psychology, Southwest University, Chongqing 400715, China)

(³ Center for Research & Study of Aging, The University of Haifa, Israel)

Abstract: The present research aimed to investigate the associations between solidarity and quality of intergenerational relationships between adult children and their parents and their physical and psychological consequences. In Study 1, latent class analysis on the basis of data from Chinese adult children ($N = 1283$) shows that six latent solidarity classes emerged, and results of multinomial logistic regression indicate that the characteristics of both generations affect latent solidarity class and relationship quality. In Study 2, data from 367 Chinese intergenerational dyads (adult child-parent, $N = 734$) were analyzed by actor-partner interaction models, and results indicate that better latent solidarity class (both self and partner) and better relationship quality (self not partner) are associated with both generations' higher well-being, and better latent solidarity class (both self and partner) and better relationship quality (both self and partner) predict both generations' lower distress; generation and gender modulate effects of solidarity class and relationship quality on self-rated health and well-being, whereas interaction and similarity between solidarity classes reported by both generations' also affect well-being and distress.

Key words intergenerational solidarity; relationship quality; health; well-being; latent class analysis; actor-partner interaction models

1 Introduction

Intergenerational relationships between adult children and their parents refers to parent-child relations during a period when the child has become an adult (over 18 years old) and when the parent has become middle-aged or an elderly; thus referring to the parent-child relationship in adulthood (from the perspective of adult children) and parent-child relationship in later life (from the perspective of elderly parents). Intergenerational relationships can be described by two theoretical perspectives: intergenerational solidarity and intergenerational ambivalence. Most studies on intergenerational solidarity have focused on daily dynamic interactions

(Bengtson & Roberts, 1991) between an adult and his or her parent (Greenwell & Bengtson, 1997; Hank, 2007; Iecovicha & Lankri, 2002; Komter & Schans, 2008; Lowenstein, 2007; Lowenstein & Daatland, 2006; Lawton, Silverstein, & Bengtson, 1994). Relationship quality (RQ) is a concept, which evaluates the strength of bonds in relationship research. In the current study, we focused on RQ and intergenerational solidarity class — based on latent class analysis (LCA) — that ties all intergenerational interaction dimensions and presents their different combinations, investigating their implications for self-reported health and well-being of both generations.

1.1 Intergenerational Latent Solidarity Class

Comparing recent studies on intergenerational

Received date: 2012-03-29

This research was supported by the Doctoral Fund of MOE (20120182110001), and the National Key Discipline Project (TR201206-1) of China.

Corresponding author: ZHENG Yong, E-mail: Zhengy@swu.edu.cn

solidarity across cultures allows researchers to probe the actuality of relationships between adults and their parents and influential factors. Intergenerational solidarity model, which contains seven dimensions of parent-child solidarity: association (or contact), affect (or emotion), consensus (or agreement), function (or support), norm (or responsibility), family opportunity structure (or propinquity, etc.), and conflict, is taxonomy for describing sentiments, behaviors, and attitudes in family relations (Bengtson & Roberts, 1991). By combinations of observed variables of the solidarity dimensions, researchers examine the typology structure underlying intergenerational solidarity to characterize intergenerational family relations (Silverstein & Bengtson, 1997). Recent studies, conducted principally in developed Western nations (i.e., in America and Western Europe), have shown that intergenerational solidarity is still strong, and dimensions of solidarity (e.g., associational, functional solidarity, and conflict) are emerging consistently in different nations (Lowenstein, 2007; Lowenstein & Daatland, 2006; Silverstein & Bengtson, 1997; van Gaalen & Dykstra, 2006; Yi & Lin, 2009). However, the strengths of solidarity dimensions vary by country (Lowenstein, 2007; Lowenstein & Daatland, 2006), or the structure and feature of intergenerational latent solidarity class vary across cultures (Silverstein, Gans, Lowenstein, Giarrusso, & Bengtson, 2010; van Gaalen & Dykstra, 2006; Yi & Lin, 2009).

The Intergenerational latent class may differentiate by the characteristics of both generations. For instance, disrupted marriage appears to weaken the intergenerational ties (Silverstein & Bengtson, 1997; van Gaalen & Dykstra, 2006; Yi & Lin, 2009); mothers not fathers tend to have good solidarity class. Homeowners and individuals who have a dependent child in the household tend to be in a bad solidarity class (Silverstein & Bengtson, 1997); additionally, age, income, and family size have an ambiguous influence on intergenerational solidarity (Grundy & Henretta, 2006; Harknett & Knab, 2007; Silverstein & Bengtson, 1997; van Gaalen & Dykstra, 2006). In the current study, we examined the latent solidarity

classes among the Chinese and the effects of the aforementioned and other factors (e.g., rural or urban, the number of daughters).

1.2 Relationship Quality

Relationship quality is affected by characteristics of parents and adult children—the quality of relationships with mothers is usually better than that with fathers, and divorce seems to strain the intergenerational ties, whereas age of a parent is positively associated with the intergenerational RQ (Umberson, 1992). Furthermore, RQ may help us distinguish which latent solidarity class would have a greater strength (van Gaalen & Dykstra, 2006; van Gaalen, Dykstra, & Komter, 2009).

1.3 Intergenerational Relationships Affect Self-reported Health and Well-being

Intergenerational relationship is crucial in the social network and may contribute to physical and psychological outcomes. On the one hand, intergenerational relationships (e.g., emotional exchanges) affect self-reported health (Song, Li, & Zhang, 2006). On the other hand, intergenerational relationships relate to well-being. For instance, functional solidarity (contingent intergenerational exchanges) promotes parents' psychological well-being (Davey & Eggebeen, 1998; Wang et al., 2004). Affectual solidarity (Katz, 2009), normative solidarity (e.g., respect from adult children and filial expectation from parents) (Cheng, 2009; Cheng & Chan, 2006b) and relationship quality (Kang et al., 2003; Pinquart & Sorensen, 2000) are related to higher well-being level. Moreover, instrumental support and normative solidarity may diminish parental depressive symptoms and loneliness (Byers et al., 2008; Shen et al., 2003; Wang et al., 2004), but overdoing or negative exchanges are related to greater psychological distress (August, Rook, & Newsom, 2007; Newsom et al., 2005; Silverstein, Chen, & Heller, 1996). Intergenerational conflict detrimentally affects elderly parents' mental health as well (Katz, 2009; Milkie, Bierman, & Schieman, 2008; Umberson, 1992).

Gender differences emerge for this effect: Fathers with less education who had larger networks

and who perceived available support from a child had fewer health problems (Antonucci, Ajrouch, & Janevic, 2003). Other data suggest that centrality multiple roles and relatedness (e.g., care provider, mother, wife) promote mothers' well-being (Cheng & Chan, 2006a; Suitor, Pillemer, & Sechrist, 2006). Hence, in Study 2, we considered intergenerational solidarity and RQ and gender as determinants in the mixed model predicting self-rated health and well-being and also considered the other main socio-demographic factors as covariates.

1.4 The Present Studies

We examined the actuality of intergenerational relationships from adult children's perspective in Study 1, and demonstrated how latent solidarity class and RQ guide both generations' self-reported health and well-being from both adult children's and parents' perspectives in Study 2. The design for the present research was twofold. First, we tested this model in Mainland China, where there are strong familism and emphasis on family roles compared with Western nations. We analyzed the link between latent solidarity class and RQ and socio-demographic characteristics. Second, We collected dyadic reports of intergenerational relationships and used actor-partner interaction model (APIM) to examine the mutual influence on the physical and mental outcomes, because of "social construction perspective" of relationships, attachment theory and relevant studies argued that the link of single self-reports of relationship with outcomes does not tell us whether the relationship itself contributes to outcomes (Fingerman et al., 2008). In summary, the present research probed the implications of intergenerational latent solidarity class and RQ for self-rated health and well-being among Chinese.

2 Study 1

2.1 Method

2.1.1 Participants

Participants were from a national survey involving 1330 adults (aged 18 to 59 years) from 29 provinces, autonomous regions, and municipalities of mainland China, who were interviewed in February

and March of 2010. These participants completed self-report questionnaires under the instructions of trained interviewers for each person individually. The participants were asked to report on the relationship with a biological parent who was selected according to their choice. By necessity, we excluded the data from 47 adult children who did not answer one or more items and treated them as unproductive. Thus, 1283 adult children were included in the following analyses. The majority of the adult child's age is 18-44 (94.2%) and had a college education (72.7%).

2.1.2 Measures

All items used in the present study were translated from English into Chinese by the first author. Then, we invited a bilingualist to complete back-translations.

Solidarity The intergenerational solidarity items were adapted from an instrument developed by Silverstein and Bengtson (1997). The seven dimensions (i.e., structural, associational, affectual, consensual, functional, normative solidarity and conflict) of the construct are covered by 10 questions as follows (Table 1 Predictor). Geographic distance, frequencies of big family gathering and small family gathering, emotional closeness, similarity of opinions, frequencies of giving and receiving financial /physical /emotional assistances, responsibility for supporting parents and duty for caring for children (even adult), frequency of dispute, argue, be angry or unhappy. Note that normative solidarity is measured as a generalized sense of responsibility for older parents and of parents similar to Silverstein and Bengtson (1997) measure. Additionally, the conflict item was adapted from the research by Clarke et al. (1999) because intergenerational solidarity should include both positive and negative aspects (Bengtson et al., 2002). We scored the answers using dichotomized (i.e., 1 and 0) categories available for LCA.

Relationship quality We measured RQ by using a single item from previous studies (van Gaalen & Dykstra, 2006; van Gaalen, Dykstra, & Komter, 2009). "Taking everything together, how would you describe your relationship with your father/mother

(target parent)?” The answers ranged from 1 = not great to 4 = very good.

Demographic characteristics We measured demographic characteristics of both generations, including, for adult children, gender (female, 45.1%), house ownership (41.7%) and family type or having only one child (13.3%), and for parents, gender (female, 48.4%), house ownership (90.5%), and having daughters (80.8%).

2.2 Results and Analysis

2.2.1 The Distribution and Features of Latent Solidarity Class

Latent class analysis using Mplus 4 program was used to seek the intergenerational latent solidarity class among the Chinese. Several goodness-of-fit measures (e.g., L^2 , AIC, BIC) of latent class model commonly used are provided by Mplus 4 program. According to suggestion by Muthén and Muthén (1998-2007) and Nylund, Asparouhov, and Muthén (2007), parameters of AIC, adjusted BIC, and parametric bootstrapped likelihood ratio test (parametric BLRT) (p -value) were selected to decide the number of latent classes. Given a set of candidate models for the data, the preferred model is the one with the minimum AIC or adjusted BIC value. A low p -value of parametric BLRT indicates that the model with one less class is rejected in favor of the estimated model (Muthén & Muthén, 1998-2007). All three criteria indicated that 6-class model is optimal (AIC = 12862.19, adjusted BIC = 12990.92, parametric BLRT of 6-class (p value) = 0.000, and parametric BLRT of 7-class (p value) = 0.250). Therefore, these adult children are divided into 6 latent solidarity classes, and they have distinct distribution sizes and feature (Table 1). In line with the results of conditional probabilities of latent classes, the six latent solidarity classes were named close-knit, intimate but distant, estranged, tranquil, obligatory, and detached (arranged from large size to small size). Close-knit class has good performance on all solidarity indicators; tranquil class has good solidarity and no conflict except associational (neither big nor small gathering) solidarity; obligatory class has low-level affection, consensus,

and support for parents; intimate but distant class lives far away from parents and has no big family gathering but frequent small gathering and least-level conflict; estranged and detached classes have low intergenerational solidarity. Especially, adult children have very high filial piety to parents; however, many adults may think that parents will devote themselves to child's life after the child has become a grown-up.

A double cross-validation was used to test latent class models, because double cross-validation is greatly to be preferred over single cross-validation (Collins, Graham, Long and Hansen, 1994; Cudeck & Browne, 1983). The data were split randomly into Sample A ($N = 643$) and Sample B ($N = 640$). We tested the latent class models from 2-class to 6-class. Each of the five models was applied to Sample A and to Sample B. Then a double cross-validation was performed, where the models fit in Sample A were applied to Sample B, and vice versa, so that each sample took a turn as a calibration sample and a cross-validation sample. The five models were applied to and cross-validated in the A and B subsamples separately. The lower L^2 was used for cross-validation (Qiu, 2008). Model of 6-class cross-validated best on one sample and cross-validated very well in the other sample (cross-validation on B $L^2 = 420.52$, cross-validation on A $L^2 = 425.00$).

2.2.2 Effects of Socio-demographic Characteristics

Results of the multinomial logistic regression model suggest that daughters tend to have close-knit (Exp (B) = 3.299, $p < 0.001$), tranquil (Exp (B) = 2.330, $p < 0.05$), obligatory (Exp (B) = 3.112, $p < 0.001$), intimate but distant (Exp (B) = 2.518, $p < 0.01$) and not to have detached relationships with their parents. Adult children living in rural areas tend to have close-knit (Exp (B) = 3.112, $p < 0.05$), tranquil (Exp (B) = 4.382, $p < 0.001$), obligatory (Exp (B) = 2.338, $p < 0.05$), and estranged (Exp (B) = 2.019, $p = 0.057$) intergenerational relationships. Adults own no house (Exp (B) = 0.425, $p < 0.01$), parents own no house (Exp (B) = 0.416, $p < 0.05$), and parents with primary education (Exp (B) = 0.109,

$p < 0.05$) have a higher probability to be the detached not the close-knit. Young adult children (18-28 years old) are likely to be in intimate but distant (Exp (B) = 4.931, $p < 0.05$) and estranged (Exp (B) = 4.111, $p < 0.05$). In contrast, adults with primary education also tend to have detached relationships not the intimate but distant (Exp (B) = 0.074, $p < 0.001$) and estranged (Exp (B) = 0.179, $p < 0.01$); however, adults with secondary education tend to have obligatory (Exp (B) = 2.263, $p < 0.05$) not the

intimate but distant (Exp (B) = 0.246, $p < 0.001$) and estranged (Exp (B) = 0.418, $p < 0.05$). Parents with primary (Exp (B) = 0.129, $p = 0.053$) and secondary education (Exp (B) = 0.127, $p < 0.05$) are apt to be the detached not the intimate but distant. Families with no daughters that are likely to have tranquil (Exp (B) = 3.425, $p < 0.05$), intimate but distant (Exp (B) = 2.556, $p = 0.053$). Other socio-demographic variables not mentioned have no significant effect on latent solidarity classes.

Table 1 Latent class analysis of adult child-parent relations (conditional probabilities) ($N = 1283$)

Type	Type 1	Type 2	Type3	Type 4	Type5	Type 6
<i>n</i>	380	146	128	368	189	72
Size (%)	29.6	11.4	10.0	28.7	14.7	5.6
Name Predictor	Close-knit	Tranquil	Obligatory	Intimate but Distant	Estranged	Detached
Residential distance						
In the same city	0.788*	1*	1*	0.075	0.093	0.599
In a different city	0.212	0	0	0.925*	0.907*	0.401
Big family gathering						
At least once a month	1*	0.488	1*	0	0.232	0
Less than once a month	0	0.512	0	1*	0.768*	1*
Small family gathering						
At least once a month	1*	0.547	0.769*	0.924*	1*	0.359
Less than once a month	0	0.453	0.231	0.076	0	0.641*
Emotional closeness						
Very close	0.780*	0.700*	0.079	0.721*	0.155	0
Not close	0.220	0.300	0.921*	0.279	0.845*	1*
Similarity of opinions						
Similar	0.964*	0.665*	0.300	0.915*	0.321	0.143
Different	0.036	0.335	0.700*	0.085	0.679*	0.857*
Provide assistance						
Often	0.710*	0.614*	0.351	0.402	0.290	0.322
Seldom	0.290	0.386	0.649*	0.598	0.710*	0.678*
Receive assistance						
Often	0.896*	0.942*	0.658*	0.928*	0.654*	0.336
Seldom	0.104	0.058	0.342	0.072	0.346	0.664*
Responsibility of adult children						
Support older parents	0.986*	1*	0.882*	0.981*	0.900*	0.932*
Don't support	0.014	0	0.118	0.019	0.100	0.068
Responsibility of parents						
Agree	0.503	0.334	0.448	0.483	0.398	0.332
Disagree	0.497	0.666*	0.552	0.517	0.602*	0.668*
Conflict						
Often	0.058	0	0.271	0.020	0.086	0.258
Seldom	0.942*	1*	0.729*	0.980*	0.914*	0.742*

* Conditional probability > 0.60 .

Results of linear regression indicate that gender ($B = -0.526, p < 0.001$), education ($B = 0.090, p < 0.05$) of adult children and family type (whether there is only one child in the family) ($B = 0.138, p < 0.05$) have significant impacts on quality of intergenerational relationships. This finding suggests that daughters, with higher education, and having one child per family tend to have good intergenerational quality.

3 Study 2

3.1 Method

The actor-partner interdependence model (APIM), proposed by Kenny and colleagues, is a model of dyadic data analysis (Campbell & Kashy, 2002). APIM uses the dyad as the unit of analysis. This model suggests that a person's independent variable score affects both his or her own dependent variable score (known as the actor effect), and his or her partner's dependent variable score (known as the partner effect). The partner effect from the APIM directly models the mutual influence that may occur between individuals involved in a dyadic relationship. Hierarchical linear modeling (HLM) program can be used for multilevel modeling, and it treats the data from two dyad members as nested scores within a two-level model. This approach is also very flexible, allowing the researcher to specify models that contain actor, partner and various types of interaction effects.

3.1.1 Participants

380 dyads of adult children and their parents were recruited for this study. The sampling procedure is similar to that of Study 1 in the same period. In line with the inclusion criteria described above as well as parent-child matching (i.e., the adult child and their parent reported separately, yet they reported about the relationships between them).

3.1.2 Measures

Solidarity and RQ Same measures used in Study 1. It is noted that the parent answered the questionnaires of the parent's edition in which they valued their relationship with the adult child and that the adult child (the target person in the questionnaires of parents' edition) answered the questionnaires of

the adult child's edition in which they assessed their relationship with their parent (the participant who completed the questionnaires of parents' edition).

Self-rated health A global rating of the respondent's health, the following question from previous studies (Antonucci, Ajrouch, & Janevic, 2003; Newsom et al., 2005), "How would you rate your health at the present time?" The answers ranged from 1 = in poor physical condition to 4 = very healthy.

Well-being Six-item measure was used to assess positive well-being. It is composed of an overall rating of a life-satisfaction item and five positive affect items from the research by Diener and Emmons (1984) and Newsom et al. (2005). Participants answered the life satisfaction question "All things considered, how satisfied are you with your life these days?" on an adapted scale ranging from 1 (very unsatisfied) to 10 (very satisfied). The remaining items asked the participants to rate the extent to which five adjectives (happy, joyful, pleased, enjoying myself, and satisfied) described their feelings over the past month, with ratings made on a 5-point scale ranging from 0 (very slightly or not at all) to 4 (very much). Cronbach's alpha for these items in the present study is $\alpha = 0.885$.

Distress Kessler Psychological Distress Scale (K10) was used to assess negative psychological outcome, and it is suitable for mental health measurement (Andrews & Slade, 2001). We measured both well-being and distress because the World Health Organization recommended that positive and negative feelings are key components of psychological functioning (World Health Organization Quality of Life Group, 1998; Fingerman, 2008). Cronbach's alpha for these items in the present study is $\alpha = 0.883$.

3.2 Results and Analysis

Latent class analysis using Mplus 4 program was used again to seek the intergenerational latent solidarity class among Chinese consisting both adult children and their parents. Then, five latent solidarity classes ($AIC = 7847.82$, adjusted $BIC = 7924.67$, parametric BLRT of 5-class model $p = 0.000$ and parametric BLRT of 6 class model $p = 0.167$) were

found. In line with the number of good indicators (conditional probability > 0.60) of solidarity in each class, and we arranged and coded the classes from 1 to 5. The higher value of a latent class refers to more good solidarity indicators they obtained; that is, the higher value of a latent class (the better the latent class), the better is the solidarity. Preliminary analysis indicates that there are reporting discrepancies between generations. Generally, parents reported significant lower solidarity than adult children ($F = 6.078, p < 0.05$) (the number of each class (from 1 to 5): 61, 44, 68, 60, 134, $M = 3.44, SD = 1.49$, for parents; the number of each class (from 1 to 5): 70, 1, 42, 106, 148, $M = 3.71, SD = 1.47$, for adult children). The correlation of latent classes between a parent and his child is small ($r = 0.363, p < 0.001, n = 367$). More specifically, in type 2 parents are the devotees who give and take nothing in return. In order to see the sources of their differences more clearly, we use the multi-sample latent class analysis to present the differences between parents and children performed on the ten indicators (Figure 1). We can find that parents and children have great differences on indicators of functional solidarity (provide assistance and receive assistance) and normative solidarity (responsibility of adults and parents).

Because this study was done in a dyadic fashion, we analyzed the data using the APIM (Campbell & Kashy, 2002) by hierarchical linear modeling (HLM, Version 6.08) to estimate simultaneously actor and partner effects of participants' intergenerational solidarity class and RQ on self-reported health and well-being. For this study, the variables in level 1 included outcomes, within-dyads variables, and mixed predictor variables, and the variables in level 2 included between-dyads variables (Table 2). To make the intercept more interpretable, effect coding was used for generations and the four types of relationships based on gender (i.e., father-daughter, mother-daughter, father-son, and mother-son) and other variables except outcomes were grand mean centered. We conducted three APIM analyses using HLM and self and partner reports in each outcome was separately regressed, and demographic variables (i.e., age, income, education) of both generations were considered as covariates.

Results of HLM analyses (Table 3) indicate that latent solidarity class (both self and partner) and RQ (self but not partner) predict higher levels of well-being, suggesting that both being in a more cohesive intergenerational solidarity class, having better intergenerational RQ, and having a parent/adult child in a more cohesive class are associated with

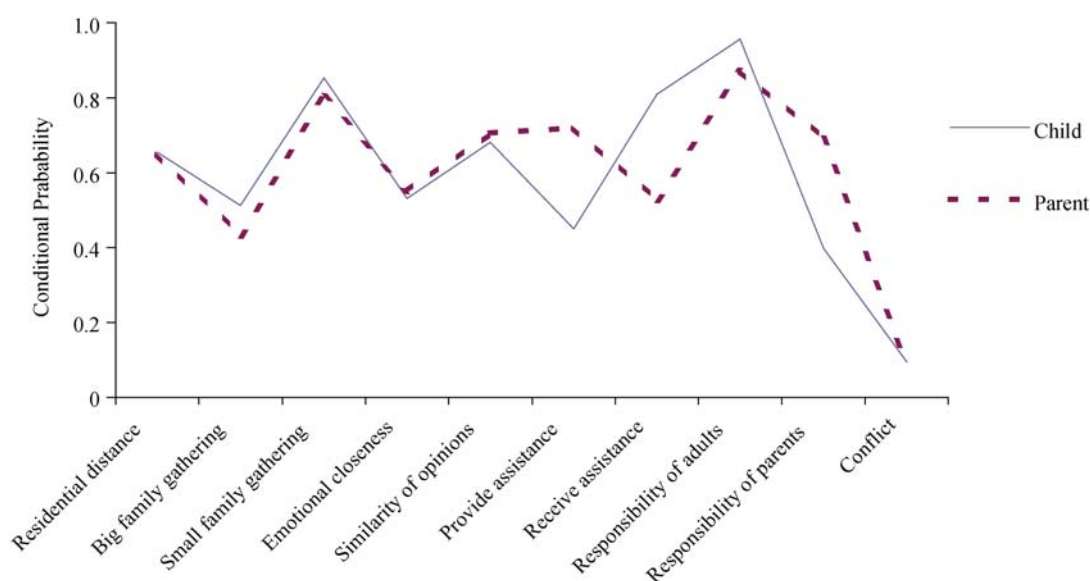


Figure 1 Conditional probabilities of children and parents performed on the ten solidarity indicators

Table 2 Descriptive statistics of level-1 and level-2 variables included in the models

Variable Name	<i>n</i>	<i>Mean</i>	<i>SD</i>	MINIMUM	MAXIMUM
Level-1					
Self-rated health	734	3.08	0.73	1.00	4.00
Well-being	734	22.40	5.89	0.00	31.00
Distress	734	17.27	5.39	10.00	44.00
Generation	734	0.00	1.00	-1.00	1.00
Age	734	2.19	1.08	1.00	5.00
Income	734	1.84	0.94	1.00	5.00
Education	734	2.82	1.16	1.00	5.00
RQ	734	3.29	0.57	1.00	4.00
Solidarity class	734	3.58	1.49	1.00	5.00
Generation × Class	734	0.13	3.87	-5.00	5.00
Generation × RQ	734	-0.01	3.35	-4.00	4.00
Level-2					
Actor RQ × Partner RQ	367	11.01	3.16	2.00	16.00
Actor Solidarity class × Partner Solidarity class	367	13.57	8.46	1.00	25.00
Actor RQ – Partner RQ	367	0.33	0.49	0.00	2.00
Actor Solidarity class – Partner Solidarity class	367	1.02	1.35	0.00	4.00
	<i>n</i>	<i>%</i>			
Father-Daughter relationship	157	21.4			
Mother-Daughter relationship	169	23.0			
Father-Son relationship	212	28.9			
Mother-Son relationship	196	26.7			

Table 3 Results of actor-partner interdependence model analyses in predicting parent and offspring's well-being, distress, and self-rated health from self and partner latent intergenerational solidarity class and relationship quality

Predictors	Well-being			Distress			Self-rated Health		
	<i>b</i>	<i>SD</i>	<i>t-ratio</i>	<i>b</i>	<i>SD</i>	<i>t-ratio</i>	<i>b</i>	<i>SD</i>	<i>t-ratio</i>
Father-Daughter relationship	0.373	0.468	0.798	0.030	0.418	0.071	-0.025	0.053	-0.463
Mother-Daughter relationship	0.270	0.450	0.600	0.146	0.402	0.363	-0.017	0.051	-0.333
Father-Son relationship	-0.015	0.407	-0.038	-0.771	0.363	-2.121*	0.034	0.046	0.745
Generation	-0.546	0.543	-1.006	-0.036	0.561	-0.065	0.078	0.082	0.956
Actor RQ	1.614	0.384	4.206***	-1.542	0.369	-4.179***	0.019	0.051	0.377
Actor Solidarity class	0.743	0.146	5.093***	-0.359	0.139	-2.584**	0.016	0.019	0.834
Partner RQ	0.352	0.384	0.919	-0.958	0.369	-2.595**	0.080	0.051	1.576
Partner Solidarity class	0.565	0.146	3.870***	-0.387	0.139	-2.783**	0.020	0.019	1.071

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

higher-level of well-being. Likewise, latent solidarity class (both self and partner) and RQ (both self and partner) are associated with lower psychological distress scores, indicating more positive intergenerational solidarity and RQ help diminish the negative psychological outcomes. In contrast, neither latent solidarity class nor RQ is associated with self-rated health. Besides, father-son relationships

have a close relationship with a lower distress score.

Note that We identified some significant moderating effects that generation and gender differences in actor and partner effects of class and RQ by entering the effect of generation × class, generation × RQ, relations type × class, relations type × RQ interaction terms separately into each main analysis. However, it does appear that a parent tends

to have lower distress, whereas an adult child tends to have higher distress, with actor's ($b = 0.44, p < 0.01$) and partner's ($b = 0.48, p < 0.001$) latent solidarity class being better. Parent and adult child will have higher well-being ($b = -0.36, p < 0.05$) as the partner is being in greater latent solidarity class, and they will have lower distress as himself or herself reports better RQ ($b = 1.20, p < 0.01$); however, parent's well-being and distress have a greater change rate than those of the child. Parent and child will have higher well-being and lower distress when their self ($b = 0.77, p = 0.055$) and partner ($b = -1.34, p < 0.01$) report better RQ. The parent will have higher well-being, and the child has lower well-being when the partner reports better RQ ($b = -1.15, p < 0.01$)

(Figure 2 A to G).

In addition, the gender of both generations moderates the associations between RQ and physical and psychological outcomes. Father-daughter relationships are significantly different from mother-son relationships in the effects of self-report RQ on well-being (actor effect $b = 0.24, p < 0.05$), distress (actor effect $b = 0.67, p = 0.001$) and self-rated health (actor effect $b = -0.20, p < 0.05$). Mother-daughter relationships are different from mother-son relationships in the effect of self-report RQ on distress (actor effect $b = -3.18, p < 0.01$), and father-son relationships have significant differences in the effect of partner-report RQ on self-rated health (partner effect $b = -0.09, p < 0.05$) (Figure 3 A to D).

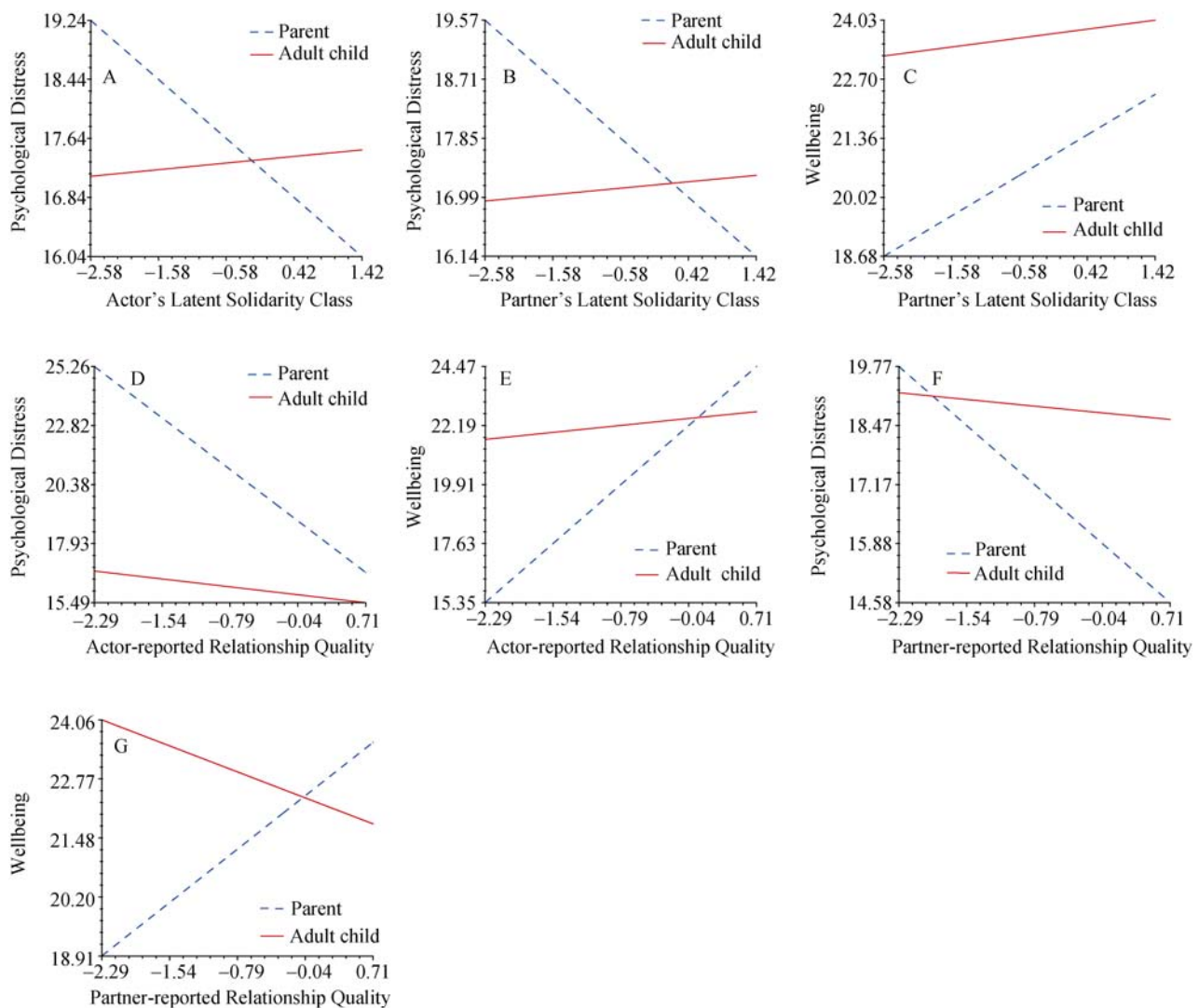


Figure 2 Generation moderates the relationship between latent solidarity class (actor and partner) /relationship quality (actor and partner) and well-being/psychological distress

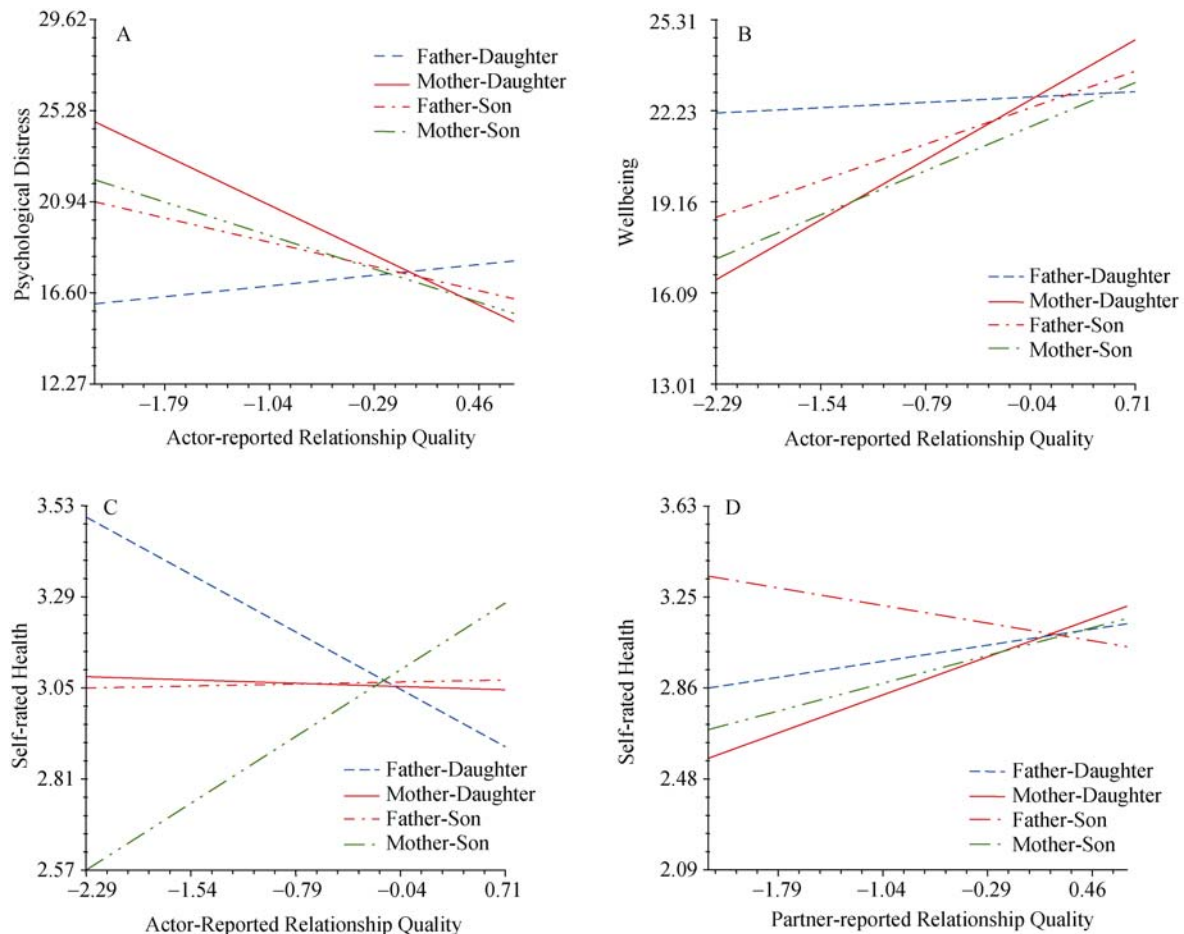


Figure 3 Gender of both generations moderate the relationship between relationship quality (actor and partner) and self-reported health and well-being

Finally, we examined the interactions between the actor and partner effects, such as AP_INTERACTION (here, AP_INTERACTION = A class \times P class, and ARQ \times PRQ). AP_INTERACTION is a product term between the mean-deviated actor and partner components of latent class and RQ (Campbell & Kashy, 2002). When we added this interaction to the main effects models, we found that couples of parent-adult child in which one partner is above average in latent solidarity class and the other generational partner is below average tend to have significantly higher well-being scores ($b = 0.27, p < 0.01$) and lower distress scores ($b = -0.17, p < 0.05$). Another interaction of interest, AP_SIMILARITY, the absolute value of the difference between the two partners' scores for the class or RQ was calculated. We did so and found that

there is a very significant tendency for couples of parent-adult child who are more similar in class to have more distress scores ($b = 0.41, p < 0.05$).

4 Discussion

In this research, we found support for the intergenerational solidarity model and found evidence that latent solidarity class and RQ guide both generations' self-reported health, well-being, and distress.

Results of Study 1 are consistent with previous research and theories, which suggest that intergenerational solidarity is a theoretical framework that has the transcultural applicability (Lowenstein & Daatland, 2006; van Gaalen & Dykstra, 2006). However, there are some important differences in our studies. There emerged 6 latent classes of

intergenerational solidarity among Chinese adult children, and they are close-knit, intimate but distant, estranged, tranquil, obligatory, and detached. On the one hand, Chinese traditional culture requires children to show filial piety, according to The Analects of Confucius, “when parents are alive, children should not travel far away”. Therefore, residential distance between the two generations is an essential indicator of structural solidarity, which affects the opportunities of intergenerational interactions. Then, close-knit, tranquil and obligatory groups live close to their parents, and they may have more opportunities for interactions; the other three groups have worse structural solidarity. Moreover, structural solidarity may affect associational solidarity and functional solidarity most; that is, short residential distance leads to higher probabilities of big family gatherings and providing assistance. Close-knit and obligatory groups tend to have more big family gatherings than intermit but distant, estranged and detached groups. And close-knit and tranquil groups are more likely to provide assistance to parents than estranged and detached groups. On the other hand, close-knit and intimate but distant groups perform best in almost all solidarity indicators, and their only difference is that the latter group lives far from the parents. Especially, tranquil group emerges uniquely in the Chinese sample. They perform well in all solidarity indicators just except associational solidarity, that is, they keep peaceful intergenerational relationships with residential proximity, moderate contacts, no conflict ever, and full responsibility for parents. This group may reveal that the traditional virtue Li (礼, etiquette, courtesy, propriety and rites) helps to build the harmonious family atmosphere and establish good parent-child relationship in Chinese traditional families. The obligatory group performs well in structural, associational and familial solidarities and behaves badly in affectual and consensual solidarities. They simply do the duty they should do and neglect the emotional bonds. Estranged and detached groups have poor performances on solidarity indicators so that they have worse intergenerational relationships.

Worse still, detached group has few contacts and definitely no emotional closeness with their parents.

Characteristics of both generations affect latent solidarity classes and RQ. First, the present findings add to the larger literature on intergenerational relationships by demonstrating those characteristics shift the latent solidarity classes and RQ directly. Second, it has an implication for practitioners that which kind of adults and parents would be more likely to have bad solidarity classes (i.e., obligatory, estranged, and detached) and bad RQ, and should give them more social concern and support in advance. Third, we should note that intergenerational relationships are dynamic and developing because when characteristics change (e.g., adult education), the solidarity class to which they belong would change too.

Results of Study 2 suggest that latent solidarity class and RQ have implications for both generations' self-reported health and well-being. Our findings suggest that their experience and partner's experience of intergenerational solidarity (involving all various dimensions) and RQ alter one's basis for well-being and distress in intergenerational interactions. However, better RQ (self not partner) and better latent solidarity (both self and partner) increased parent and adult children's well-being, better latent solidarity class (both self and partner) and RQ (both self and partner) decreased parents and adult children's distress. First, this reflects that there may be differences between actor's and partner's effect on outcomes. Distinct effect may have a unique function mechanism between them. Actor effect may directly act by recognition and emotional experience, while partner effect may indirectly act by daily family interactions, because a partner's report was unknown to the actor. Second, RQ has one item to assess the overall subjective feeling of intergenerational relationships; instead, solidarity has 10 items cover 7 dimensions in daily family interactions. Hence, partner's report RQ may be perceived more difficultly than solidarity. Third, this result may reflect that the well-being could be less affected by partner's report compared to the distress. It is

possible that negative affect may be more sensitive than a positive one. However, it needs further study to find the exact reason for this phenomenon.

We discovered that generation as well as gender of both generations modulated the effects of self and partner's reported latent solidarity class and RQ on well-being and distress, demonstrating that interactions between generations' (self's and partner's) play a much larger role in one's well-being and distress than previously acknowledged. We could and should know that in a close relationship the mutual perception between each other is a great and direct source of mental health. This gives the theoretical guidance that the practitioners need to pay attention to caring older people from the intergenerational perspectives.

Finally, previous researchers deem that relationships between adult children and parents are basically reciprocal relationships (Lowenstein, Katz, & Gur-Yaish, 2007; Silverstein, Conroy, Wang, Ciarrusso, & Bengtson, 2002) based on intergenerational supports (i.e., functional solidarity), exchanging only one dimension of intergenerational interactions. In contrast, present research demonstrated that discrepancy in a latent solidarity class of both generations' matters to one's well-being and distress. In other words, similar solidarity classes lead to more distress; one partner with above-average latent solidarity class and the other generational partner with below average tend to have higher well-being and lower distress. Hence, such findings suggest that solidarity, that is, the involvement in multiple aspects of interactions in intergenerational relationships, does not always follow the principle of equality and mutual benefit.

Future directions of research on intergenerational relationships should examine generational differences in assessing intergenerational relationships, which we did not show in the present research. For instance, it is probable that the parent values impacts of affectual solidarity most, whereas the adult child regards functional solidarity as important. As a result, these differences may contribute to both generation's perception and well-being. In addition, it would be

worthwhile to include solidarity and ambivalence (another structure of intergenerational relationships) in one study to compare their consequences for individuals' health and well-being (Lowenstein, 2007); we did not do it here because ambivalent reactions may be culturally moderated (Peng & Nisbett, 1999), and it is more troublesome to find suitable measurements for individuals from China. Finally, as articulated by Seiffge-Krenke (1999), intergenerational relationships in childhood and in adolescence may have profound influences of those in adulthood. Therefore, the history of intergenerational relationships should be examined as a potential moderator for shaping the class and RQ, even affecting both generations' physical and psychological outcomes.

5 Conclusion

Overall, the intergenerational solidarity model has good applicability and effectiveness to show that there are six latent solidarity classes among the Chinese from an adult child's perspective. Cultural differences also emerged to show our special traditional virtue and familism norms, and the characteristics of both generations shift the latent solidarity class and RQ. At the same time, latent solidarity class and RQ (both self and partner) have significant implications for both generations' self-reported health and well-being. Additionally, generation and genders and other important interactions may influence these effects.

In conclusion, several limitations to the present study are worth noting. First, the sample size was relatively small compared with the huge adult population. Second, the participants in the present research were not drawn from a random sample. The participants were selected in the interviewers' hometown. Third, as our participants were Chinese only, our results may not be generalizable across other cultures.

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代际团结潜在类别与关系质量对自陈健康及幸福感的影响

杨晶晶^{1,2} Ariela LOWENSTEIN³ Todd JACKSON^{1,2} 郑 涌^{1,2}

(¹ 西南大学认知与人格教育部重点实验室, 重庆 400715) (² 西南大学心理学部, 重庆 400715)

(³ Center for Research & Study of Aging, The University of Haifa, Israel)

摘 要 本研究考察了成年子女与其父母的代际关系中团结和关系质量对代际双方身体和心理结果的影响。研究 1 中, 对中国成年子女 ($N = 1283$) 的潜在类别分析结果显示是六种代际团结类别, 多项逻辑回归表明两代人的特征会影响团结潜在类别和关系质量。研究 2 中, 对 367 对中国成年子女-父母 ($N = 734$) 的报告进行等级线性建模, 行动者-搭档互依模型结果指出好的团结潜在类别 (自我和搭档报告的) 和好的关系质量 (自我报告的) 与两代人的高幸福感相关, 好的团结潜在类别 (自我和搭档报告的) 和好的关系质量 (自我和搭档报告的) 预测了两代人的低心理苦恼; 其中代际和性别调节了团结类别和关系质量对自我报告健康及幸福感的作用, 同时, 两代人团结类别的交互作用和评价的相似性也影响了幸福感和心理苦恼。

关键词 代际团结; 关系质量; 健康; 幸福感; 潜在类别分析; 行动者-搭档互依模型

分类号 R395; B844