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ORIGINAL PAPER

Intergenerational Transmission of Parenting Style and Personality: Direct Influence or Mediation?

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Abstract In order to examine the relationships between parenting styles and personality traits over generations, a cross-sectional questionnaire study was conducted for fathers and mothers of school-age children of grades 5–9. The parenting styles measured by the Parental Bonding Instrument (PBI) and the personality traits measured by the Temperament and Character Inventory (TCI) were correlated within and between the consecutive generations (the grandparents and the parents for the PBI and the parents and the children for the TCI). A series of structural equation modeling showed that (1) while the parenting styles were transmitted directly from the grandparents to the parents, it was partly mediated by the fathers' Co-operativeness (C) but not so for the mothers, (2) while the personality traits were transmitted directly from the parents to the children, it was only the fathers' parenting styles that mediated C, and (3) the parents' parenting styles had independent effects upon the children's personality traits.

Keywords Parenting style · Personality · Intergenerational transmission · Mediation

Introduction

Parenting styles are important in understanding mental health of children and parents as well as the development of personality (e.g., Benhaminsen et al. 1984; Bowlby 1940; Fukunishi et al. 1992; George and Main 1979; Kendler et al. 1997; Koestner et al. 1991; McCrae and Costa 1988; Mussen et al. 1970; Nakao et al. 2000; Parker 1993; Perris et al. 1983; Richter et al. 2000) and the onset of psychopathology (e.g., Alnas and Torgensen 1990; Eriksson et al. 1986; Heider et al. 2006; Lieb et al. 2000; Parder 1981; Russell et al. 1992; Torgersen 1985). Parenting styles may be transmitted intergenerationally. There have been several studies showing, though not consistently (Ertem et al. 2000; Renner and Slack 2006), that parents who abuse their children are more likely to have been victims of abuse when they were children (Dixon et al. 2005; Muller et al. 1995; Newcomb and Locke 2001; Pears and Capaldi 2001). Although child abuse is a part of child rearing, parenting styles in general have rarely been the focus of the transgenerational studies.

There have been several studies showing that parental styles are, to some extent, genetically determined. However, these studies are usually based on twin samples who observed their parents (Elkins et al. 1997; Kendler 1996; Lichtenstein et al. 2003; Herndon et al. 2005; Neiderhiser et al. 2004; O'Connor et al. 1995; Plomin et al. 1994; Row 1981; Wade and Kendler 2000; Walden et al. 2004) or twin samples who observed themselves as parents (Boivin et al. 2005; Deater-Deckard et al. 2001; Kendler 1996; Losoya et al. 1997; Neiderhiser et al. 2004; Spinath and O'Connor 2003; Perusse et al. 1994; Plomin et al. 1994). Direct transmission of parental styles from one generation to another has been studied in a few investigations. For example, Jefferis and Oliver (2006) have compared mothers of children with conduct problems and normal control mothers in their childrearing cognition and their perceived parenting as a child in the past. They have found that mothers who were given low care and overprotection

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as a child were more likely to show dysfunctional cognitions about their own children. It is, however, still unclear how much parenting styles are transmitted from one generation to another and whether it is transmitted directly or mediated by third variables. A few empirical studies are found in terms of the intergenerational transmission of parenting.

Some investigators have indicated that parenting styles are influenced by certain personality traits. For example, Myers et al. (1999) have reported that people who are low in anxiety and high in defensiveness are more likely to rate their interactions with their fathers more positively. Lichtenstein et al. (2003) have found that maternal warmth toward the child can be predicted by some personality characteristics such as high optimism and humor and low indirect aggression and suspicion and that paternal warmth can be predicted by high optimism, humor, and self-directedness and low indirect aggression. Spinath and O'Connor (2003) have reported that parental over-protectiveness was associated with low openness whereas parental rejection was associated with neuroticism. Because personality is a possible determinant of parenting styles and because, as seen shortly, remembered parenting style is an important determinant of personality, it is feasible to expect that personality mediates the effect of the parenting styles of the first generation on the parenting styles of the second generation.

Personality development is thought of as partly hereditary and partly influenced by environment (Buss et al. 1973; Goldsmith 1983; Loehlin et al. 1988). Thus personality too may be transmitted from one generation to another. A substantial amount of reports have been published on the influence of early environments of personality development. Included as such factors are parental separation (e.g., Kendler et al. 1993; Kitamura and Fujihara 2003; Kitamura et al. 2002), perceived rearing (e.g., Benjaminsen et al. 1984; Kendler et al. 1993; Kitamura and Fujihara 2003; Reti et al. 2002; Ruchkin et al. 1998; Ono et al. 1999; Kitamura et al. 2002; Kitamura and Kishida 2005), child abuse (e.g., Kitamura and Fujihara 2003; Kitamura et al. 2002), and others. However, it has been little studied whether such early environments mediate the effect of the personality of the first generation to the personality of the second generation.

The effects of parenting styles on the children's personality may vary according to the age of the children. For example, the age differences in heritability of personality has been reported rather counter-intuitively that genetic involvement in adult personality change is slight whereas personality change in childhood is governed substantially by genetic factors (Plomin and Nesselroade 1990). However, these studies are mostly based in a twin population. Few studies are based on non-twin populations. We expect that the effects of the parenting styles on the children's personality will be greater if the children are younger and weaker if they have grown up. In this study, we report an investigation of the mode of transmission of the parenting style and personality among a community family population.

Method

Participants

Questionnaires were sent out to 50 elementary schools (3094 children of the grades 5 and 6) and 14 junior high schools (3465 children) of a rural prefecture in Japan. We requested the father, the mother, and the child to return the questionnaire independently. A total of 1591 (24%) families participated in the questionnaire survey. However, the questionnaires were returned by 663 fathers and 889 mothers. Of these at least one patent (father and/or mother) returned the questionnaire in 991 families. Among the fathers who returned the questionnaire 102 (15.4%) of their wives did not return the questionnaire. Among the mothers who returned the questionnaire 328 (36.9%) of their husbands did not returned the questionnaire. We used the data from the both parents only excluding the data from the children.

The mean (SD) age of the fathers was 44.0 (4.9) years and the mean (SD) age of the mothers was 41.5 (4.3). Most of the parents were married or cohabiting. Seven fathers and 21 mothers were separated; 15 fathers and 66 mothers were divorced; and 2 fathers and 14 mothers were widowed. The mean age (SD) of the children was 12.2 (1.7) years. There were 447 boys (45.1%) and 526 girls (53.1%). The gender was unknown for the remaining 18 children (1.8%).

Measurements

Grandparents' and Parents' Parenting Styles

We used the Parental Bonding Instrument (PBI: Parker et al. 1979) as a measure of parental styles. This was originally developed as a measure to assess retrospectively how individual perceived their father's and mother's parenting (separately) before they were aged 16. In this study, we used it as originally indicated for assessing the grandparents' parenting styles rated by the parents. Parker (1983) suggested that the parental contribution to the child's attachment security may be principally influenced by two variables: care and protection. Care items (12 items with a 4-point scale) relate to a parenting style that may range from coldness, indifference and neglect, to affection, emotional warmth, empathy, and reciprocity. This subscale includes

items like "spoke to me with a warm and friendly voice", and "frequently smiled at me." Protection items (13 items with a 4-point scale) define a dimension ranging from parental control and overprotection, intrusion and infantilization to parental allowance, independence, and the development of autonomy. This subscale includes items like "invaded my privacy", and "tried to make me dependent on him." The PBI has been demonstrated to have acceptable validity (Parker 1983). The Japanese version of this scale was developed by Kitamura and Suzuki (1993). Uji et al. (2006) have demonstrated that the factor structure of the PBI among a Japanese population is virtually the same as that reported by Parker (1983). For assessing the parents' current parenting styles, we used the PBI rephrasing the tense of sentences into the present. Such a modification was proposed by Parker et al. (1982). For this, we asked the parent to rate him/herself and also asked him/her to rate his/her spouse's parenting styles. Missing values of the PBI items were substituted with the mean of the item only for those cases with less than 7 items were missing.

Parents' Personality

As the measure of parents' personality we used the Temperament and Character Inventory (TCI: Cloninger et al. 1994). The TCI measures four temperament dimensions (Novelty Seeking (NS), Harm Avoidance (HA), Reward Dependence (RD), and Persistence (P)) and three character dimensions (Self-directedness (SD), Co-operativeness (C), and Self-transcendence (ST)). It is of note that the 125-item version of the adult TCI includes only 5 items for Persistence thus another 5 items were added. For the adult TCI inventories the original true-false response scale was modified into a four-point scale, which has better internal consistency among Japanese populations (Kijima et al. 2000); the four-point scale ranges from 1 ("strongly disagree") to 4 ("strongly agree"). The validity of the temperament subscales of the TCI was confirmed by Cloninger (1987). Reliability and factor validity of the Japanese version of the TCI were reported by Tomita et al. (2000) and Kijima et al. (2000). Missing values of the TCI were substituted with the mean of the item only for those cases with less than 28 items were missing.

Children's Personality

As the measures of personality of the children, we used the Junior TCI Parent Version (JTCI-P: Cloninger 1993) rated by parents. This consists of 108 items with a 4-point scale. Because each parent's rearing attitudes were rated by the parent and his/her spouse, we calculated the mean of these two ratings for further analyses. Missing values of the JTCI-P were substituted with the mean of the item only for those cases with less than 24 items were missing.

Procedure

The set of questionnaires (for the child, father, and mother) was distributed to the student in a class. The student was asked to hand the questionnaires to his/her parents at home. The participants were requested to volunteer in the questionnaire survey and returned the filed in questionnaire using a stamp added envelop directly to the researcher. The questionnaire response was anonymous. However, in order to match the questionnaire from the members of the same household serial number was added on the face sheet.

This research project was approved by the Ethical Committee of Kumamoto University Graduate School of Medical Sciences.

Statistical Analyses

First, we calculated means and SDs of all the variables used in this study. Then we were interested in how the couple agreed with their assessment of their own and partner's parenting style. Therefore we calculated the correlations between the own and the partner's scores of the PBI subscales. As 0-order correlations, we correlated the grandparents' PBI scores with the parents' PBI; the parents' TCI with the children' JTCI-P; the grandparents' PBI with the parents' TCI; the parents' PBI with the children's JTCI-P; and the parents' TCI with the parents' PBI. For these bivariate correlations, significance levels were set at $p < .001$ because of multiple comparisons.

In order to examine the possible mediation of personality for the intergenerational transmission of parenting styles and the possibility of mediation of parenting styles for the intergenerational transmission of personality, we created a series of structural equation models based on a maximum likelihood method. Structural equation models were improved by deleting paths without statistical significance ($p > .05$) until a further reduction in the Akaike Information Criteria (AIC) with 2 or more points would not be available. The fit of each model with the data was examined in terms of chi-squared (CMIN), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). According to conventional criteria, a good fit would be indicated by CMIN/df < 2, GFI > 0.95, AGFI > 0.90, CFI > 0.97, and RMSEA < 0.05; an acceptable fit by CMIN/df < 3, GFI > 0.90, AGFI > 0.85, CFI > 0.95, and RMSEA < 0.08 (Schermelleh-Engel et al. 2003).

All the statistical analyses were conducted using the Statistical Package for Social Science (SPSS) version 14.0 and Amos 6.0.

Results

Psychometric Properties of the Measures

The means and SDs of all the variables used in this study are on Table 1.

Because the parenting styles of parents were measured by themselves and by their spouses, we examined how these two measures were correlated. Both Care and Overprotection scores were significantly correlated between the parents' and their spouses' ratings; the magnitude of the correlations was not very strong ranging from .28 to .41 (Table 2). This suggests that the self-report of the parenting style differs from that by a person who observes it almost everyday at home—the partner. We consider that the ratings made by the partner are more accurate that that made by the parent him/herself. Thus we use the spouse-report of the PBI only in the structural equation models.

The measures of the children's personality were obtained by the two parents. We correlated the two and found that their correlations were significant but again their magnitude was not robust from .30 for Self-transcendence to .57 for Persistence (Table 2). This suggests that the two parents view their child's personality differently. Thus we created the mean of the father's and mother's ratings for each subscale of the TCI for the subsequent analyses.

Correlations Between Parents' and Grandparents' Parenting Styles

As expected, the Care and Overprotection scores were moderately correlated between the fathers (rated by themselves or by their spouses) and their grandfathers and grandmothers (Table 3). The fathers' and mothers' self report of Care and Overprotection were correlated with their grand parents' Care and Overprotection, respectively, except for Overprotection score correlation between the mothers and their grand mothers. The fathers' self report of Care was correlated negatively with their grand parents' Overprotection whereas the fathers' self-report of Overprotection was correlated negatively with their grand parents' Care. These were not the case for the correlations of each of the two PBI subscale scores with the other subscale scores between the mothers and their grand parents.

We consider that the spouse-reports were more accurate for assessing the parenting style of the parents. The Care and Overprotection scores (rated by wives) were significantly correlated between the fathers and their grand parents. This was not the case for the mothers except for

Table 1 Means and SDs of the variables used in the present study

Variables	*n*	M	SD
Paternal grandparents PBI			
Grandfather's care	624	22.7	6.5
Grandmother's care	608	25.7	6.2
Grandfather's overprotection	624	11.9	6.0
Grandmother's overprotection	608	11.6	6.5
Maternal grandparents PBI			
Grandfather's care	808	23.7	7.3
Grandmother's care	827	26.5	6.8
Grandfather's overprotection	808	10.8	6.0
Grandmother's overprotection	827	10.5	6.8
Paternal PBI			
Care self-report	662	25.8	4.9
Care spouse-report	804	26.5	5.7
Overprotection self-report	662	11.1	4.4
Overprotection spouse-report	804	9.7	5.1
Maternal PBI			
Care self-report	883	27.5	4.3
Care spouse-report	630	28.2	4.7
Overprotection self-report	883	10.9	4.6
Overprotection spouse-report	630	11.2	5.0
Paternal TCI			
Novelty seeking	635	25.1	5.8
Harm avoidance	635	31.5	6.8
Reward dependence	635	29.2	5.0
Persistence	635	16.6	3.3
Self-directedness	635	43.5	8.7
Co-operativeness	635	46.4	7.0
Self-transcendence	635	15.7	6.7
Maternal TCI			
Novelty seeking	866	22.3	5.7
Harm avoidance	866	34.3	7.6
Reward dependence	866	31.2	5.3
Persistence	866	16.4	3.7
Self-directedness	866	42.0	9.1
Co-operativeness	866	49.3	7.1
Self-transcendence	866	16.1	7.2
Children's TCI			
Novelty seeking	971	19.9	6.4
Harm avoidance	971	29.6	8.8
Reward dependence	971	15.9	2.8
Persistence	971	9.5	3.3
Self-directedness	971	38.8	7.7
Co-operativeness	971	39.5	6.3
Self-transcendence	971	8.1	3.8

Table 2 The parenting styles and children's personality: correlations between fathers' and mothers' ratings

	Correlation between fathers' and mothers' ratings
Paternal PBI	
Care	.41*** (662)
Overprotection	.28*** (551)
Maternal PBI	
Care	.33*** (544)
Overprotection	.30*** (544)
Children's TCI	
Novelty seeking	.55*** (517)
Harm avoidance	.51*** (517)
Reward dependence	.33*** (517)
Persistence	.57*** (517)
Self-directedness	.42*** (517)
Co-operativeness	.37*** (517)
Self-transcendence	.30*** (517)

( ) the number of cases: * $p < .05$; ** $p < .01$; *** $p < .001$

Overprotection scores of the grand mothers being correlated with the mothers' scores.

These findings suggest that the parenting styles are moderately similar between the two generations usually for fathers and it is the case in mothers only for Overprotection link between the grandmothers and mothers.

Correlations Between Children's and Parents' Personality

Each of the subscales of the TCI and JTCI was moderately correlated between the fathers and mothers and their children except for the mothers' P score (Table 4). In addition, the children's NS scores were correlated with their fathers' low P score and parents' low C scores; the children's HA scores were correlated with their parents' low SD scores; the children's RD scores were correlated with their fathers' low HA scores, and their parents' high SD and C scores; the children's P scores were correlated with their fathers' low HA, and high SD and C scores; the children's SD scores were correlated with their parents' low NS, high RD, and high C scores, and their fathers' low HA and high P scores; and the children's C scores were correlated with their parents' low HA, high RD, and high P scores and their fathers' low NS, and high SD scores. The children's ST scores were correlated with no other TCI subscale scores of the parents. These findings suggest that each of the TCI subscales is moderately similar between two generations. Furthermore it seems that two character subscales—SD and C—are positively correlated with the RD and negatively with NS and HA across the generations.

Correlations Between the Parenting Styles and Personality

A first assumption was that personality was influenced to some extent by how individuals were reared as a child. Thus we examined the grandparents' parenting styles and the parents' personality (Table 5). Most of the fathers' personality subscale scores were correlated with the grandparents' parenting styles. Thus, the fathers' grandparents' high Care and low Overprotection were correlated with the fathers' low NS and HA, and high R, P, SD, and C except for the correlation between paternal NS and their grandfathers' Overprotection. Such correlations were week for the mothers. It was the case only for SD. The other combinations of parental styles and personality partially failed to meet the expectation (Table 4).

We then correlated the parents' current parenting styles to their children's personality (JTCI). Here again we observed a similar trends as observed in between the parents' parental styles and the children's personality (Table 6). Thus the fathers' and mothers' high Care and

Table 3 Correlation between parents' parenting styles and their parents' parenting styles

Upper figure reflects fathers ($n = 612$ for grandfather assessment and $n = 595$ for grandmother assessment), lower figure reflects mothers ($n = 701$ for grandfather assessment and n = 715 for grandmother assessment): * $p < .05$; ** $p < .01$; *** $p < .001$

Bold values indicate the correlation coefficients less than .001

Grand parents' parenting styles	Care self-report	Care spouse-report	Overprotection self-report	Overprotection spouse-report
Care				
Grandfather	**.33*****	**.19*****	**−.18*****	−.10*
	.14***	.13**	−.00	−.06
Grandmother	**.38*****	**.27*****	**−.24*****	**−.18*****
	.17***	.09	−.06	−.11*
Overprotection				
Grandfather	**−.27*****	**−.23*****	**.42*****	**.17*****
	−.11**	−.08	**.13*****	.15**
Grandmother	−.27***	**−.20*****	**.41*****	**.16*****
	−.10**	−.10*	.12**	**.22*****

Table 4 Correlation between children's personality and their parents' personality

Parents' TCI	Children's JTCI						
	NS	HA	RD	P	SD	C	ST
NS	**.23*****	−.00	−.09	**−.19*****	**−.26*****	**−.16*****	.11**
	.15***	−.00	−.05	**−.18*****	**−.16*****	−.08*	.08*
HA	.07	**27*****	**−.15*****	**−.14*****	**−.21*****	**−.20*****	−.07
	.05	**.19*****	−.04	−.06	−.08*	**−.13*****	−.10**
RD	−.11**	−.13**	**.20*****	.09*	**.17*****	**.25*****	−.03
	−.09*	−.09*	**.22*****	.06	**.14*****	**.16*****	.01
P	**−.15*****	−.11**	.13**	**.19*****	**.19*****	**.23*****	.07
	−.06	−.06	.05	.07	.03	**.13*****	.12**
SD	−.11**	**−.18*****	**.26*****	**.17*****	**.34*****	**.17*****	−.13**
	−.08*	**−.17*****	**.13*****	.09*	**.18*****	.10**	−.03
C	**−.25*****	−.13**	**.18*****	**.17*****	**.32*****	**.39*****	−.00
	−.19***	−.12**	**.14*****	.12**	**.17******	**.26*****	.07
ST	−.03	−.03	−.05	.02	−.10*	.10*	**.40*****
	−.05	.01	.03	.05	−.03	.12**	**.27*****

Upper figure reflects fathers ($n = 622$), lower figure reflects mothers ($n = 772$): * $p < .05$; ** $p < .01$; *** $p < .001$

Bold values indicate the correlation coefficients less than .001

low Overprotection was correlated with the children's low NS and HA, and high RD, P, SD, C, and ST. These were virtually the same whether the PBI was measured as a self-report or a spouse-report. Exceptions were the correlations between HA and Care and between RD and Overprotection.

A second assumption was that individuals' parenting styles were determined by their own personality. Thus we correlated the parents' personality with their parenting styles (Table 7). If we took into account only the PBI data reported by the spouses, the fathers' Care was influenced by low NS and high P and C and the fathers' Overprotection was influenced by low C. The mothers' Overprotection was influenced by high HA and low SD and C.

Structural Equation Modeling

Having examined the correlations between parenting styles and personality across and within generations, we then examined whether personality would mediate the intergenerational transmission of parenting styles and whether parenting styles would mediate the intergenerational transmission of personality.

First, we made a model where the grandparents' parenting styles would influence the parents' personality traits that would in turn influence the parents parenting styles. In addition, we expected that the grandparents' parenting styles would directly influence the parents' parenting styles (Fig. 1). Because of significant correlations found in

Table 5 Correlation between parents' personality and their parents' parenting styles

Grandparents' parenting styles	Parents' TCI						
	NS	HA	RD	P	SD	C	ST
Care							
Grandfather	**−.20*****	**−.17*****	**.24*****	**.16*****	**.26*****	**.31*****	.00
	.01	−.11**	**.19*****	.01	**.13*****	.12**	−.00
Grandmother	**−.21*****	**−.18*****	**.24*****	**.22*****	**.21*****	**.36*****	.04
	−.06	**−.13*****	**.24*****	−.02	**.18*****	**.20*****	−.01
Overprotection							
Grandfather	.14**	**.24*****	**−.16*****	**−.18*****	**−.28*****	**−.35*****	.05
	.03	.09*	−.10**	.03	**−.12*****	−.12**	.04
Grandmother	**.20*****	**.24*****	**−.18*****	**−.18*****	**−.32*****	**−.37*****	.13**
	.10**	**.14*****	−.12**	.00	**−.18*****	**−.20*****	.08*

Upper figure reflects fathers ($n = 599$ for grandfather assessment and $n = 588$ for grandmother assessment), lower figure reflects mothers ($n = 787$ for grandfather assessment and n = 806 for grandmother assessment): * $p < .05$; ** $p < .01$; *** $p < .001$

Bold values indicate the correlation coefficients less than .001

Table 6 Correlations between children's personality and parents' parental styles

Parents' parenting styles	Children's JTCI						
	NS	HA	RD	P	SD	C	ST
Care							
Father	**−.34*****	−.10*	**.24*****	**.29*****	**.35*****	**.41*****	−.00
	−.27***	**−.13*****	**.21*****	**.25*****	**.30*****	**.27*****	−.06
Mother	**−.32*****	−.11**	**.22*****	**.28*****	**.34*****	**.34*****	−.01
	−.29***	−.08	**.17*****	**.22*****	**.28*****	**.30*****	.01
Overprotection							
Father	**.20*****	.12**	−.12**	**−.22*****	**−.32*****	**−.27*****	.11**
	.16***	**.16*****	−.05	**−.15*****	**−.24*****	**−.21*****	.09**
Mother	**.20*****	**.24*****	−.13**	**−.25*****	**−.29*****	**−.28*****	.04
	.22***	**.15*****	−.13**	**−.21*****	**−.30*****	**−.28*****	.09*

Upper figure reflects self-report ($n = 650$ for fathers, $n = 866$ for mothers), lower figure spouse-report ($n = 791$ for fathers, n = 619 for mothers): * $p < .05$; ** $p < .01$; *** $p < .001$

Bold values indicate the correlation coefficients less than .001

univariate Pearson product moment correlation coefficients, we posited covariance between the PBI subscale scores between and with in the grandparents as well as within the parents. It is of note that because AMOS does not allow to posit a covariance between endogenous variables we posited covariances between the error variables of such variables (i.e., the parents' TCI and PBI subscale scores). We also speculated the gender difference in this intergenerational transmission so that we depicted the models for the fathers and mothers separately.

For the fathers, the revised model showed that (1) grandfathers' Care reduced fathers' NS and increased fathers' SD, (2) grandfathers' Overprotection reduced fathers' C and ST, (3) grandmothers' Care increased fathers' RD, P, C, and ST, (4) grandmothers' Overprotection increased fathers' NS and ST and reduced fathers' SD, (5) fathers' C increased fathers' Care and reduced fathers' Overprotection, and (6) grandmothers' Care directly increased fathers' Care and reduced fathers' Overprotection (Fig. 2). This model showed a good fit (CMIN/df = 14.48, GFI = .977, AGFI = .947, CFI = .984, and RMSEA = .042). It was suggested that (1) the fathers' C mediated the effects of the grandmothers' Care on the fathers' Care and Overprotection, and (2) the grandmothers' Care directly influenced the fathers' Care and Overprotection.

For the mothers, we performed the same structural equation modeling as the fathers. The revised model showed that (1) grandfathers' Care increased mothers' SD, (2) grandmothers' Care increased mothers' RD and C, (3) grandmothers' Overprotection reduced mothers' SD, (4) grandfathers' Care and grandmothers' Overprotection directly increased mothers' Care and Overprotection, respectively, and (5) mothers' ST reduced mothers' Overprotection (Fig. 3). This model too was a good fit (CMIN/

Table 7 Parents' parenting styles and their personality

Parents' TCI	Parents' parenting styles			
	Care self-report ($n = 623/749$)	Care spouse-report ($n = 532/500$)	Overprotection self-report ($n = 623/749$)	Overprotection spouse-report ($n = 532/500$)
NS	**−.24*****	**−.17*****	**.14*****	−.00
	−.15***	−.05	.06	.04
HA	**−.22*****	−.13**	**.19*****	.07
	−.00	−.05	**.18*****	.09
RD	**.28*****	.14**	**−.21*****	.08
	.18***	.10*	−.08*	−.11*
P	**.28*****	**.16*****	**−.14*****	−.03
	.09*	.10*	.07	−.04
SD	**.25*****	.15**	**−.25*****	−.02
	.08*	.01	**−.16*****	−.07
C	**.39*****	**.26*****	**−.37*****	**−.19*****
	.28***	.14**	**−.23*****	−.15**
ST	−.03	−.02	.09*	−.10*
	.05	.10*	−.07	−.11*

Upper figure reflects fathers, lower figure reflects mothers: * $p < .05$; ** $p < .01$; *** $p < .001$

Bold values indicate the correlation coefficients less than .001

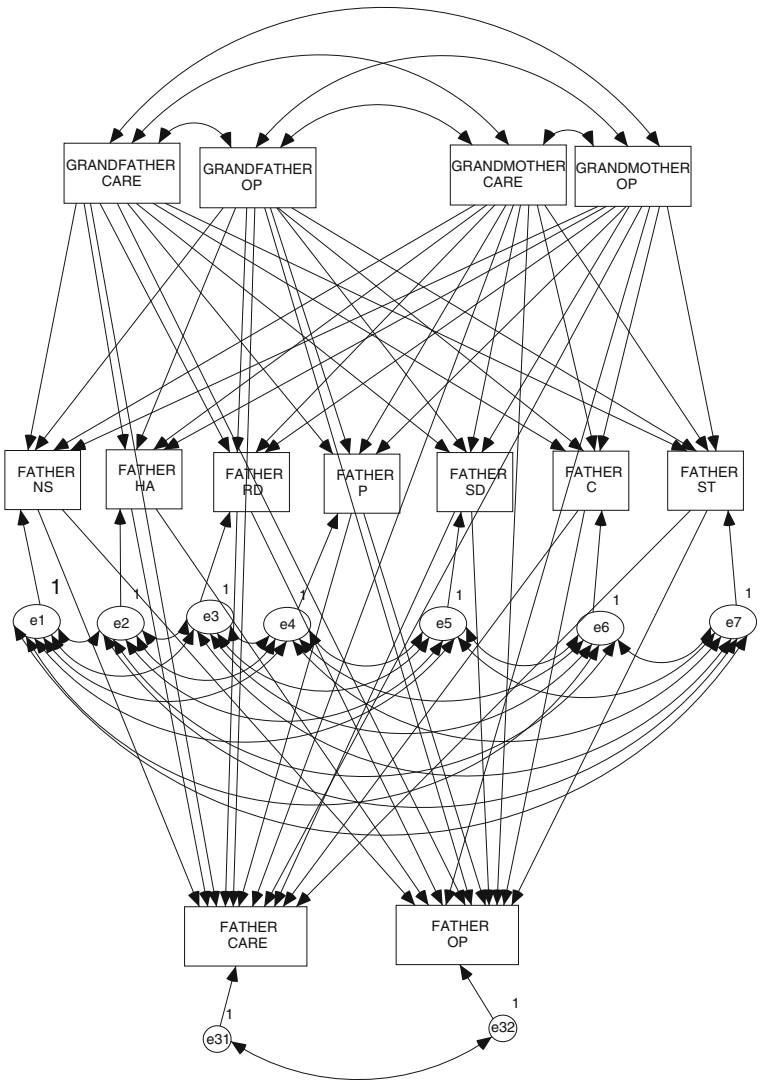

Fig. 1 Model describing the relationships between grand parents' parenting styles and fathers' personality and parenting styles. *OP* Overprotection; *NS* Novelty seeking; *HA* Harm avoidance; *RD* Reward dependence; *P* Persistence; *SD* Self-directedness; *C* o-operativeness; *ST* Self-transcendence

df = 1.43, GFI = .977, AGFI = .956, CFI = .986, and RMSEA = .031). Caution should be exercised but it was suggested that there was no mediation of the mothers' personality between the parenting styles over the two generations but that the mothers' Care was directly influenced by the grandfathers' Care whereas the mothers' Overprotection was directly influenced by the grandmothers' Overprotection.

The next question is the mediation of the intergenerational transmission of personality by the parenting styles. We presumed that all the TCI subscale scores would influence each of the children's' TCI subscales and the parents' PBI subscales and that the parents' PBI subscales would influence each of the children's TCI subscales. We also posited covariances between the TCI subscales or between the error variables if the scales were endogenous variables within the generation if univariate correlations suggested them. Because we speculated the gender difference in this intergenerational transmission we again depicted the models for the fathers and mothers separately (Fig. 4).

For the fathers, the revised model showed that (1) the fathers' NS reduced and the fathers' C increased the fathers' Care, (2) the fathers' C reduced the fathers' Overprotection, (3) the fathers' Care reduced the children's NS and increased the children's RD, P, SD, and C, (4) the fathers' Overprotection increased the children's HA and ST, and reduced SD and C, (5) each of the TCI subscales of the fathers influenced directly its corresponding subscale in the children, (6) the fathers' NS reduced the children's P, SD, and C, and (7) the fathers' C reduced the children's NS (Fig. 5). The model has shown good ft with the data (CMIN/df = 1.91, GFI = .973, AGFI = .941, CFI = .977, and RMSEA = .042). All the TCI subscales were directly transmitted from the fathers to the children whereas C was partly mediated by the fathers' parenting style. In addition, the fathers' parenting styles independently influenced the children's personality, character domains in particular.

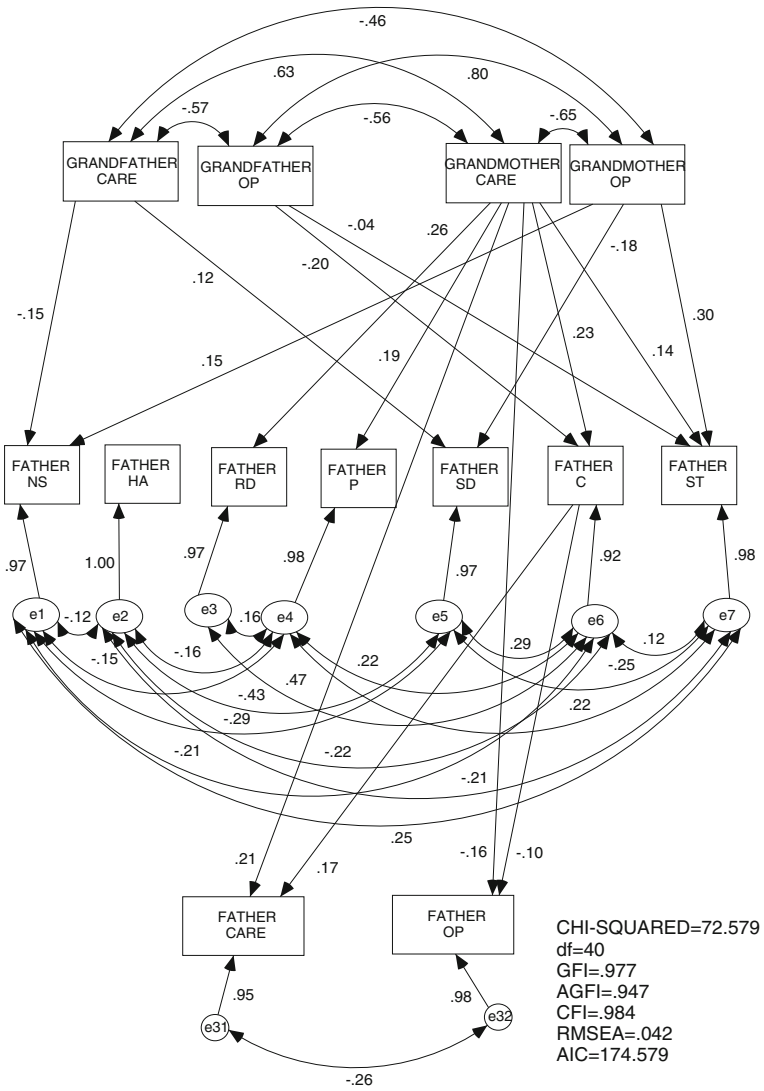

Fig. 2 Revised model describing the relationships between grand parents' parenting styles and fathers' personality and parenting styles. *OP* Overprotection; *NS* Novelty seeking; *HA* Harm avoidance; *RD* Reward dependence; *P* Persistence; *SD* Self-directedness; *C* o-operativeness; *ST* Self-transcendence

The relationships between the mothers' and the children's personality in connection with the mothers' parenting styles were different (Fig. 6). It is only RD and ST that showed direct links from the mothers to the children. None of the TCI subscales were mediated by the mothers' parenting styles. The mothers' parenting styles showed independent influences on the children's personality. Unlike among the fathers, the personality traits were not mediated by the parenting styles among mother-child dyads. This model has shown almost good fit with the data (CMIN/df = 4.12, GFI = .928, AGFI = .878, CFI = .880, and RMSEA = .079).

Because the gender differences of the children may show different patterns in the structural equation modeling, we repeated the same analyses for boys and girls separately (Figures not shown). Similar results were obtained for the boys and girls. However, some paths with smaller magnitude in the analyses using both boys and girls lost their significance.

Discussion

To start with, we should discuss measurement issues. The PBI has been widely used as a measure of the retrospectively perceived parenting styles. Thus it is based on the subjective assessment of the person who was the target child of the parenting involved in the assessment. However, little has been examined about its validity (Parker 1989). For example, Parker (1981) compared the PBI ratings of mothers made by their student children and those made by the mothers themselves. They found that the correlations between these two raters were .44 for the Care and .55 for Overprotection. Similar findings were reported

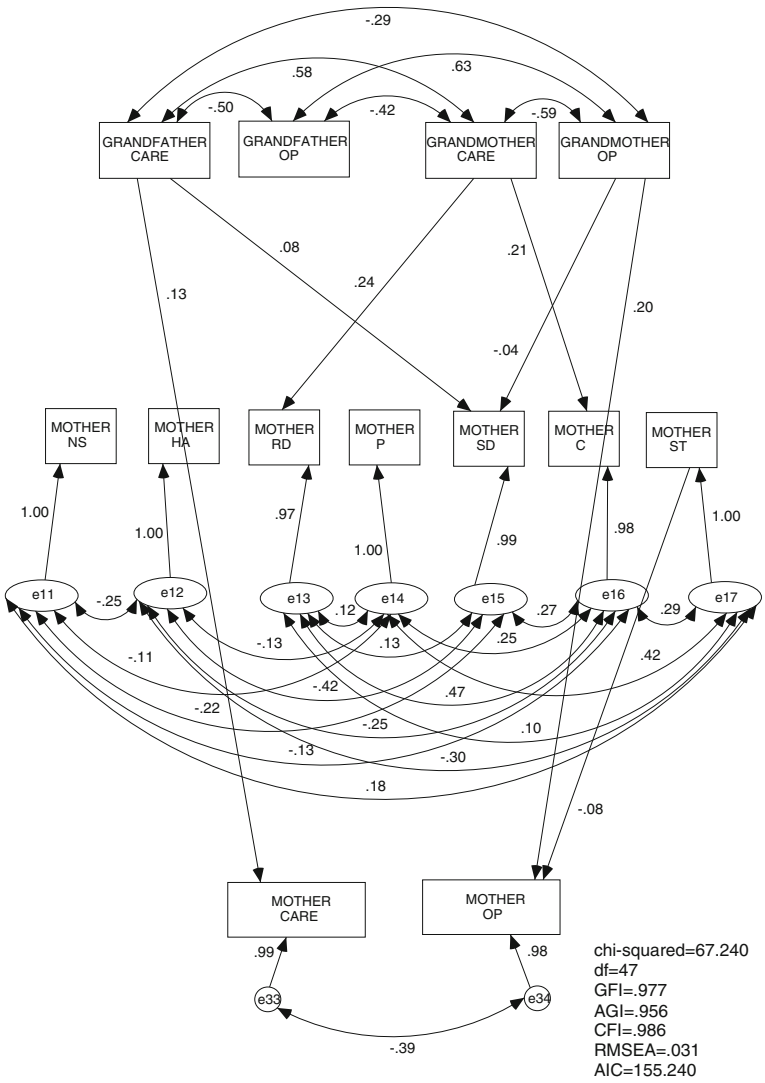

Fig. 3 Revised model describing the relationships between grand parents' parenting styles and mothers' personality and parenting styles. *OP* Overprotection; *NS* Novelty seeking; *HA* Harm avoidance; *RD* Reward dependence; *P* Persistence; *SD* Self-directedness; *C* o-operativeness; *ST* Self-transcendence

by Kitamura and Suzuki (1993) for a Japanese population. The two raters used in this study were fathers (husbands) and mothers (wives) and the correlations of the PBI scores between the two raters were not robust. We are not aware which raters' assessments are near the real parenting behaviors. Direct observation may be necessary to lead to a conclusion of this issue. However, it is feasible to speculate that the parent be it father or mother will report their own parenting styles and their perception of their parents' parenting styles toward the same direction. In fact, in this study, the correlations of the PBI scores between the parent's own ratings and their perception of his/her parents were generally stronger than those between their spouse's ratings and their perception of his/her parents (Table 3). Hence we decided to use the spousal ratings rather than the parents' own ratings as the variables of parenting in the structural equation models.

We used father and mother as two independent raters of children's personality. Here again the correlations between the two raters were not very robust. It may be that parents are inaccurate rates of children's personality. Alternatively, children may behave differently in front of each parent. Personality is thought of as a stable trait but, for example, Shoda et al. (1994) observed that children's intraindividual organization of behavioral variation across situations was enduring but discriminatively patterned. Their behaviors and attitudes were dependent on situations. As a tentative solution we adopted a mean score of each personality trait but this issue awaits further clarification.

A main research question of this study was whether the *parenting styles* would be intergenerationally transmitted and if so, whether it would be mediated by personality. We have shown that the fathers' parenting styles—Care and Overprotection—resemble those of their grandparents. On the other hand, the mothers' parenting styles do not resemble those of their grandparents except for the link between the mothers' Overprotection and their grandmothers' Overprotection. The path models (Figs. 2 and 3)

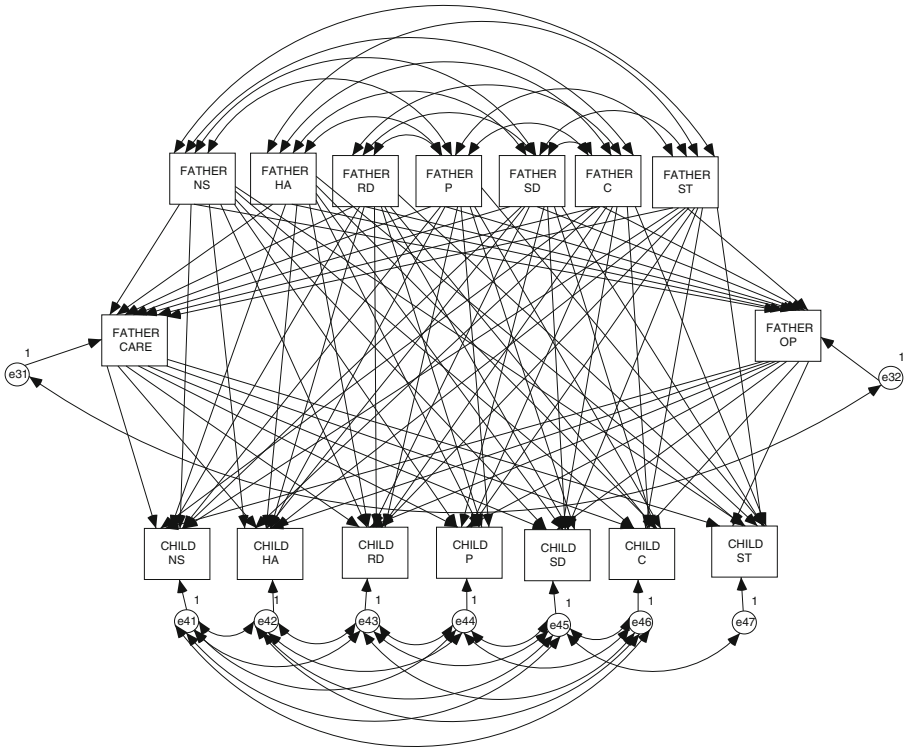

Fig. 4 Model describing the relationships between parents' personality and parenting styles and children's personality. *OP* Overprotection; *NS* Novelty seeking; *HA* Harm avoidance; *RD* Reward dependence; *P* Persistence; *SD* Self-directedness; *C* o-operativeness; *ST* Self-transcendence

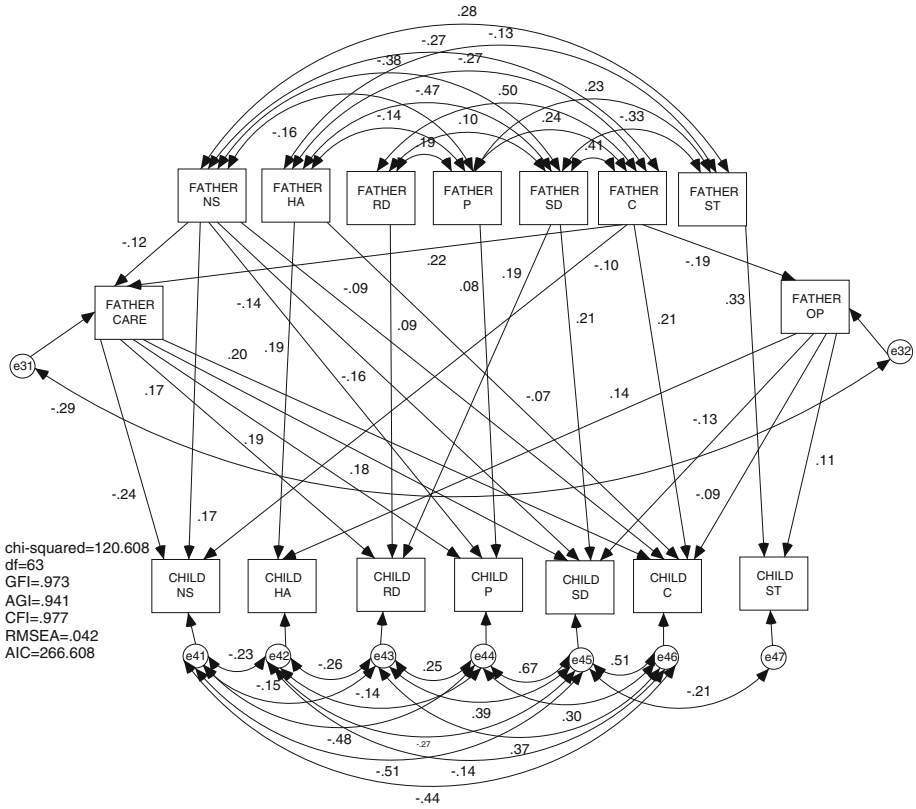

Fig. 5 Revised model describing the relationships between fathers' personality and parenting styles and children's personality. *OP* Overprotection; *NS* Novelty seeking; *HA* Harm avoidance; *RD* Reward dependence; *P* Persistence; *SD* Self-directedness; *C* o-operativeness; *ST* Self-transcendence

also support the possible intergenerational transmission of each parenting style for fathers and mothers. It may be of interest that the direct influence of Care was from the opposite-sex grandparent to the parent (i.e., from the grandmothers to the fathers and from the grandfather to the mothers). The direct influence of Overprotection was only

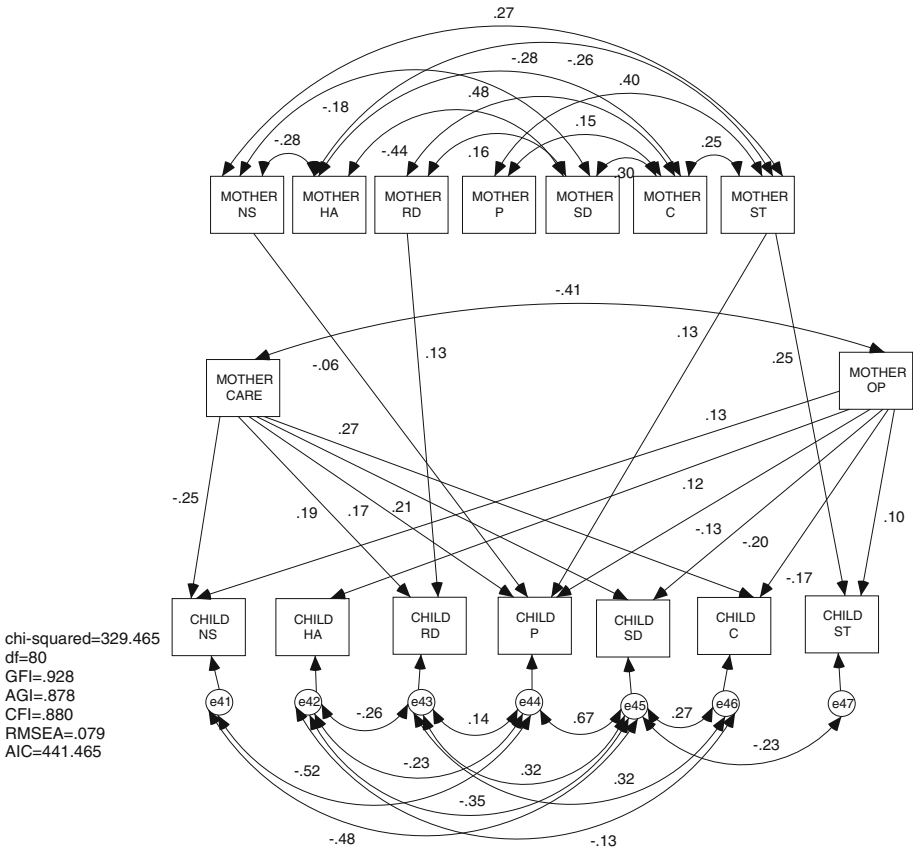

Fig. 6 Revised model describing the relationships between mothers' personality and parenting styles and children's personality. *OP* Overprotection; *NS* Novelty seeking; *HA* Harm avoidance; *RD* Reward dependence; *P* Persistence; *SD* Self-directedness; *C* o-operativeness; *ST* Self-transcendence

toward the mothers from the same-sex grandparents. Furthermore, fathers' Overprotection was directly influenced by the grandmothers' low Care. These findings give us impression that people learn how to become affectionate toward children from the attitudes of the opposite-sex parent whereas only women learn how to respect children's autonomy from those of the same-sex parent. In addition to a discrete factor structure of the two PBI subcategories, the present study suggests a differential mechanism for the development of capacity as a parent.

The path models have also shown that the transmission of the parenting styles from one generation to another are partly mediated by personality traits at least for men. Thus, both Care and Overprotection of the fathers were influenced by high and low C, respectively. And C was influenced by low Overprotection of the grandfathers and high Care of the Grandmothers. The character domains of the TCI reflect people's capacity to interact with the human and non-human environment which forms self-concepts about life goals and values. In particular, C signifies a capacity to identify with and to accept other people. People high in C are described as empathic, tolerant, compassionate, supportive, fair, and principled (Cloninger et al. 1994, p. 26). These are attributes desired for good parenting. Therefore, fathers' desirable parenting pattern—high Care and Low Overprotection—may be partly derived from their character. Mothers are not subject to such personality influences. This gender difference deserves scrutiny in the future.

A second research question was whether *personality* would be transmitted intergenerationally and, if so, whether it would mediated by parenting styles. Each personality trait measured by the TCI of children resembles that of parents in the zero-order correlations. Direct influences from the parents' personality to the children's personality were observed in more TCI personality traits for the fathers rather than for the mothers in the path models (Figs. 5 and 6). In addition to the direct influence from the fathers to the children for each corresponding TCI trait, the fathers' NS, SD, and C influenced other subcategories of personality. Fathers' high NS reduced children's P, SD, and C. Fathers' high C reduced children's NS. For the mother-child dyad, it is only RD and ST that showed direct intergenerational transmission. And the mothers' high NS reduced the children's P while the mothers' high ST enhanced the children's P. Robust hereditary contribution to the temperament—NS, HA, and RD—has been reported (Heath et al. 1994). A recent twin study has shown that in addition to the temperament scales, the character scales are genetically determined to a substantial degree (Ando et al. 2004): The genetic contributions (h^2 from the best fit model) are .34 for NS, .41 for HA, .44 for RD, .00

for P., .49 for SD, .47 for C, and .41 for ST. These figures suggest that both temperament and character subcategories are under the influence of the environment. Little has been systematically studied which environmental factor and how much contributes to the development of personality in comparison with the genetic contribution. The present study has shown that the parenting is such a possible candidate as a direct or mediating factor.

A third research question of this study was whether and how parenting styles would influence children's personality. In the grandparent-parent dyad (Figs. 2 and 3), the parental RD, SD, and C, and the paternal NS and ST were under the influence of the grandparents' parenting styles. Similarly, in the parent-child dyad, almost all the TCI subcategories were under the influence of the parents' parenting styles. These findings suggest that the early environments including perceived parenting contribute to the development of temperament and character. Alternatively, children's temperament and character may elicit parents' behaviors and attitudes toward the children. Moreover, it is possible that the parents' attitudes toward children and the children's personality share the same genetic background. These hypotheses are beyond what the present study can answer. Further studies including adoption parent-child dyads are required to shed more light onto these issues.

Because we had two sets of parent-child dyads—grand parents versus parents and parents versus children, we had an opportunity to compare the magnitudes of correlations between parental parenting styles and children's personality (Tables 5 and 6). It may be seen that parental styles manifest stronger influences on children's NS among the younger dyads (parents versus children) than among the elder dyads (grand parents versus parents). The parental Care also manifest influences on children's SD more strongly among the younger dyads (parents versus children) than among the elder dyads (grand parents versus parents). Thus optimal care styles may reduce children's NS and increase their SD when they are young. In adulthood there appeared a robust gender differences in the effects of the perceived rearing on the personality development. Thus its effects are stronger among men (fathers) than among women (mothers). This gender discrepancy is difficult to interpret but deserves further investigation.

Limitations of the study should be noted. A most important drawback of this study is its cross-sectional nature. Basically the results are correlational rather than causal. In order to overcome this shortcoming we used a path model method but caution should be exercised in interpreting the results. Longitudinal prospective research design such as the Avon longitudinal Study of Parents and Children (e.g., Golding and ALSPAC Study Team 2004; Golding et al. 2001; Pembrey and ALSPAC Study Team 2004) is definitely superior. Cross-sectional studies, for example, cannot distinguish the effects of parenting on children's personality from those of children's personality on their parents' attitudes toward them. For example, children's aggressive behaviors may elicit parents' corporal punishment (temperament model). Or parents' corporal punishment may elicit children's aggressive behaviors (social learning model). Muller et al. (1995) compared these two models using a cross-sectional data on the parents' and children's experiences of corporal punishments and their aggressive behaviors and found that the social learning model fit the data better using path analyses. However, the temperament model may deserve further examination in the link between parenting style and personality before reaching a conclusion.

The assessment of the grandparents' parenting styles is retrospective and thus subject to recall bias despite some evidences to support its reliability (Brewin et al. 1993; Finlay-Jones et al. 1981; Maughan and Rutter 1997; Wilhelm et al. 2005).

Another drawback of this study is its heavy reliance of the self-report of the parents and their partners. Direct observation of the parent-child interaction and child personality at home or in school may give more accurate picture.

The transmission of parenting styles and personality from one generation to another may be direct as suggested in this study. However, it may be mediated factors not studied in this study. For example, Schwerdtfeger and Goff (2007) noted that expectant mothers who had reported their father affectionate were more likely to have better attachment toward the fetus. Good attachment toward the fetus may lead to high care of mothers. There is possibility that child abuse is intergenerationally transmitted via dissociation (Egeland and Susman-Stillman 1996). Parenting styles may be mediated by intrapsychic defense styles. Because parenting styles are linked to child abuse, the latter may mediate the intergenerational transmission of parenting styles (Cohen 1995). These possibilities remain to be investigated in future studies.

Because our sample was a convenient one and the attrition rate of 76% was very high, our participants do not represent the target population in Japan. The attrition rate of epidemiologic studies is usually substantively high in Japan. For example, when Kitamura et al. (1999) conducted an epidemiologic study of mental disorders in a rural area of Japan, 53% of the feasible participants declined. Similarly, Kawakami et al. (2004) reported that 43% of attrition rate in a community population epidemiologic study in Japan. These high attrition rates may be due to stigmatized nature of mental health studies in Japan that were revealed prior to the solicitation (e.g., Sugiura et al. 2000). Therefore, parents who responded to our invitation

may have better relationship with their child. They may also come from stable family.

What are clinical implications of this study? Because child psychopathology should be viewed not solely from children's behaviors but from their interaction with the parents, the present study may give a perspective on how parents rear their child. It is seen from our findings that parents' high Care and low Overprotection are linked to "better" personality traits of the child. This influence seems stronger than the direct one from the parents' personality in particular mothers' personality. Psychoeducation of parenting styles may be a feasible candidate of interventional means.

The parents' attitudes toward their child come partly directly from their grandparents' parenting styles and are partly mediated by high C. If the current parenting styles are constructed partly by the parents' perception of how they themselves were reared, the representation of the past experience regarding the parents may be an important target of therapeutic intervention. For example, infant-parent psychotherapy (IPP: Cicchetti et al. 2006) deals with such parental representation and is shown to reduce insecure adult attachment.

The findings of the direct influence of grandparents' parenting styles and the mediation by personality traits may be used as a tool of predicting the parenting styles. For example, couples who wish to be foster or adopting parents' competency to be a parent may be assessed in advance leading to better quality of life for both the foster/adopting parents and foster children/adoptees.

Despite several drawbacks, the present study has shown the possibilities that both the parenting styles and personality traits are transmitted from one generation to another and in addition to direct effects, this is mediated by each other in some cases. The parenting styles may also have direct influence of personality formation.

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