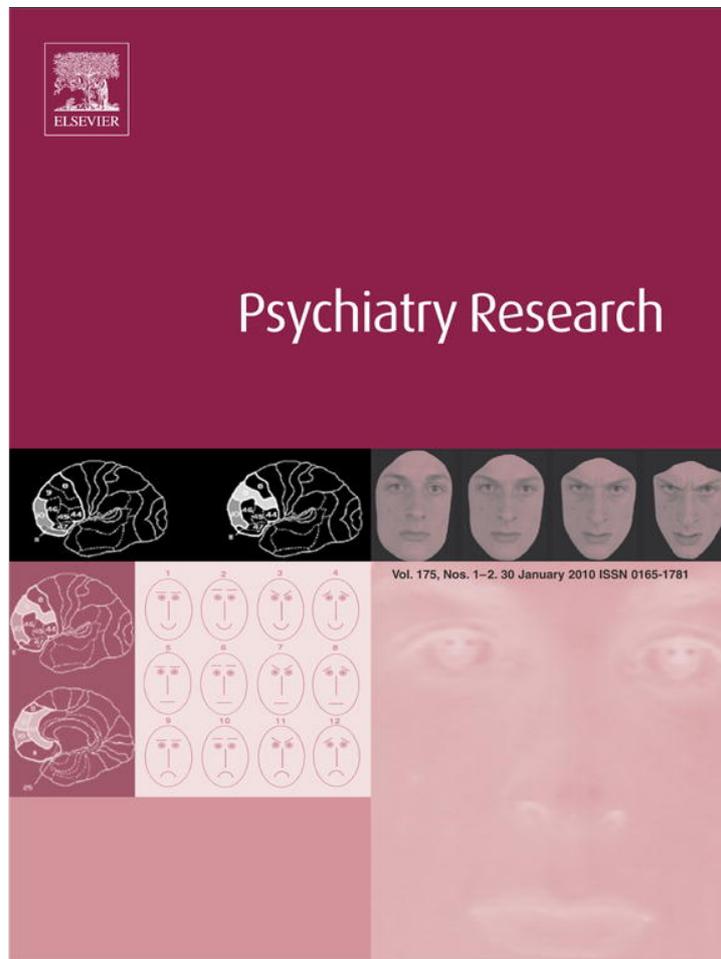


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## Understanding externalizing behavior from children's personality and parenting characteristics

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### ABSTRACT

A total of 946 Japanese children in the 5th to 9th grades and their parents were studied in order to investigate the extent to which parenting characteristics (measured by the Parental Bonding Instrument) and the personality of the child (measured by the junior version of the Temperament and Character Inventory) would be associated with the two aspects of the externalizing problems – aggression and delinquency – of the child (measured by the Child Behavior Checklist). A series of regression analyses demonstrated that (1) aggressive children were higher in Novelty Seeking, and delinquent children were higher in Novelty Seeking and lower in Harm Avoidance, and (2) both aggressive and delinquent children were characterised by low maternal care, paternal over-protection, and low maternal overprotection. A structural equation model confirmed these findings except for the link between the two externalising behaviour scores and the maternal care. Moreover, it was suggested that Novelty seeking of the child would be predicted by low parental care and low paternal and high maternal overprotection. The children's aggression and delinquency could, to some extent, be explainable by their temperament patterns and parental characteristics.

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### 1. Introduction

A developmental approach to juvenile aggressive and delinquent behavior can open many avenues to knowledge. Caspi (2000) and Caspi et al. (2003) demonstrated predictability of adult personality from the behavioural characteristics of 3-year olds in a long-term follow-up study. Aggressive behavior is no exception. Its onset during childhood or early adolescence increases the risk of later criminal behavior, academic failure, and problems in social relationships (Conger et al., 2003). In order for children to achieve early socialization they must obtain control over anger and tolerance for frustrating circumstances. These capacities do not come automatically. Temper tantrums and disruptive reactions to frustration are examples of lack of anger tolerance. By middle childhood, most children have acquired self-control strategies that permit them to manage anger and tolerate frustrating circumstances. However, there are some children who still have great difficulty in regulating their emotions and controlling their impulses.

Systematic individual differences in temperament emerge very early. Some babies are less easy to soothe and have problems adapting to the rhythms of social life. A large body of research suggests that some infants are born with dispositions that favor particular levels of

activity, irritability, and vulnerability to arousal (Bates, 1986; Goldsmith and Campos, 1986; Kagan et al. 1984, 1987; Rothbart and Goldsmith, 1985). Although there are measures of temperaments of infants and toddlers there is a scarcity of temperament measures of school children. Cloninger et al. (1993) presented a model of personality that consists of two elements – temperament and character. Temperament refers to automatic emotional responses to experiences that are moderately heritable and stable throughout life; the four measured temperament dimensions are Novelty Seeking (NS), Harm Avoidance (HA), Reward Dependence (RD), and Persistence (P). Cloninger et al. (1994b) hypothesized that the temperament systems in the brain are functionally organized as independently varying systems for the activation (Novelty Seeking), maintenance (Reward Dependence), and inhibition (Harm Avoidance) of behavior in response to specific classes of stimuli. In contrast, character refers to self-concepts and individual differences in goals and values, which influence voluntary choices, intentions, and the meaning of what is experienced in life. Differences in character are moderately influenced by sociocultural learning and mature in progressive steps throughout life. The three measured character dimensions are Self-directedness (SD), Co-operativeness (C), and Self-transcendence (ST). Each of these aspects of personality interacts with the others to motivate adaptation to life experiences and influence susceptibility to emotional and behavioral disorders. Cloninger et al. (1993) have developed a model of personality that includes seven personality dimensions. From this theoretical consideration was developed a self-report measure – the

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Temperament and Character Inventory (Cloninger et al., 1994a). The original version is for an adult population, but a version for school-children was developed later (Luby et al., 1999).

Using Taiwanese junior high school students, Kuo et al. (2003) reported that delinquent and aggressive behaviours were predicted by high Novelty Seeking score. In a longitudinal follow-up study of children aged 3 to 10, Leech et al. (2003) reported that lower shyness of children predicted delinquent behavior at age 10. In a Swedish longitudinal study, Sigvardsson et al. (1987) maintained that children with the temperament constellation of high Novelty Seeking, low Harm Avoidance, and low Reward Dependence showed more aggressive behavior at age 15 and more violent and delinquent behavior as adults than children with other temperament profiles. These reports suggest that delinquent and aggressive behaviours of adolescents have some temperamental characteristics.

Because the home environment is a main developmental context for children, parental behaviors as they contribute to children's behavior problems have been intensively investigated. Dodge et al. (1994) followed children from kindergarten to grade 3. They reported that children's externalizing behavior scores could be predicted by aspects of the early home environment, such as harsh discipline, lack of maternal warmth, and maternal aggressive values. Examining some 8000 children aged 14 in a prospective study, Bor et al. (2004) reported that delinquency was predicted by marital instability and, to a lesser extent, by parents who displayed low affection and allowed much freedom. A drawback of these past investigations is the lack of focus on father's contribution. Dodge et al. (1994) studied only mothers' attitudes. Bor et al. (2004) combined the data of mothers' and fathers' attitudes. Phares and Compas (1992) reviewed research in all major journals addressing clinical child development published between 1984 and 1992 and found that nearly half of all reported studies involved mothers only. Only one quarter of the remaining studies included father-related material. Another important environment for children's development is the group of peers (e.g., Harris, 1995; Hodges et al., 1997). This issue is, however, beyond the scope of this article but certainly merits further investigations.

Another issue related to the relationship between children's aggressive and delinquent behaviours and sociocultural aspects of parental and temperamental characteristics is the cultural background where the study is conducted. Some authors pointed out the cultural differences of child rearing pattern between the Western and Eastern countries (e.g., Benedict, 1946; Nakane, 1970; Rothbaum et al., 2002). The present report is not an attempt to make a cross-cultural comparison but may provide a reference to such investigations.

Despite the clinical and research importance of children's aggressive and delinquent behaviours, there have been few studies investigating both the children's personality and the parents' rearing styles of fathers and mothers separately in a Japanese population.

This study will address the following questions:

1. Is there any association between children's personality, in particular, their temperament, and externalizing behaviors?
2. Do parental behaviors have any influence on children's externalizing behaviors?
3. Are there any different relations with children's externalizing problems between paternal and maternal parenting styles?

## 2. Methods

### 2.1. Participants

Questionnaires were sent to 50 elementary schools (3094 children from grades 5 and 6) and 14 junior high schools (3465 children) in a rural prefecture in Japan. Of these, 1353 (21%) children – 641 boys and 712 girls – and their mothers and fathers returned the questionnaires. Because we were concerned to minimize the missing child–mother–father triads of the sample, we selected the only triads whose father or mother had filled in 30 or more items out of 33 items which compose externalizing behavior of child. 946 families (70%) met this criterion. The number of items answered on the Child Behavior Checklist (CBCL; Achenbach, 1991) by the father or the mother was as follows: 316 fathers had filled in only 1 item of the CBCL, 1 father 29 items, 97

mothers 1 item, 1 mother 22 items, 1 mother 28 items, and 1 mother 29 items among the 946 triads which met the criterion we set.

Apart from the age and sex of the participants, we did not make enquiries about the social class. This is because the Japanese have no agreeable definition of it that can partly be measured by the job, annual income, educational level and others. Questioning these items was recognized as irreverent and potentially distressing by the ethical committee and thus was discarded.

### 2.2. Measurement

#### 2.2.1. Aggressive and delinquent behaviors of children

Mothers and fathers completed externalizing scales composed of 33 items of the CBCL, which is designed for the parents of 4- to 18-year-olds, to provide information about their children's externalizing problems. Its validity was reported using a large population (Schneck et al., 2001). The externalizing behavior scale of the CBCL consists of two subscales – Aggressive Behavior Score and Delinquent Behavior Score. Externalizing problems refer to aggressive behaviors, hyperactivity, disobedience, low impulse control, displays of anger, and delinquent behavior. Sample items from the Aggressive Behavior scale include: "argues a lot", "is mean to others", "tries to get a lot of attention", and "teases others a lot". Sample items from the Delinquent Behavior scale include: "doesn't feel guilty after doing something he/she shouldn't", "lies or cheats", and "steals at home". Both mothers and fathers were asked to rate the children's externalizing behaviors on a 3-point scale ranging from *not true* to *very true*. The Japanese version of the CBCL was developed by Sakano et al. (1995).

In this study, fathers rated their children as more aggressive ( $n = 946$ ,  $t = 4.21$ ,  $P < 0.01$ ) and more delinquent ( $n = 946$ ,  $t = 4.56$ ,  $P < 0.01$ ) than did mothers. Therefore, we calculated the mean of the father's and mother's scores to obtain the Aggressive Behavior Scale and Delinquent Behavior Scale scores for each child. When the score of either parent was missing, it was substituted by the mean score of 946 subjects.

#### 2.2.2. Personality of children

The Temperament and Character Inventory (TCI; Cloninger et al., 1994a) is a battery of tests designed to assess differences between people in seven basic dimensions of temperament and character. The Japanese translation was conducted by Kijima et al. (1996) and has been used in several studies. There are several versions of this instrument. In this study we used the Junior Temperament and Character Inventory (JTCI). Luby et al. (1999) have confirmed the validity of JTCI for middle childhood population, which suggests that this group can validly report on their own temperament and personality characteristics. Each subscale includes NS; e.g., "sometimes even little things make me lose my temper", HA; e.g., "I get tired and need to rest more than other kids my age", RD; e.g., as a reverse item, "my friends don't know how I'm feeling because I keep my feelings to myself", P; e.g., "I try harder than other kids in school (spend more time on homework, practicing sports or instruments, etc.)", SD; e.g., "I really wish I were older; I would change much about myself", C; e.g., "I usually like other kids even when they are very different from me", and ST; e.g., "sometimes I feel I can predict the future". This inventory was translated with the permission of Professor Cloninger (The Japanese version may be available on request for T.K.). This self-rating inventory has 108 items, each of which is rated on a 3-point scale ranging from *not true* = 0 to *true* = 2. We calculated the JTCI scores of the participants (children themselves) who answered 100 or more items ( $n = 760$ ), and missing values were individually substituted with the mean for that item.

#### 2.2.3. Parenting patterns

The Parental Bonding Instrument (PBI; Parker et al., 1979) 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. Parker et al. (1979) 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) relate to a parental 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) 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" (Parker, 1983; Parker et al., 1979). Subjects rated their parents on a 4-point Likert scale. In this study, we used it as a measure of current perception of the parental characteristics. Children were asked to measure how they perceive their parents' *current* attitudes towards them using the PBI. Such a modification was proposed by Parker et al. (1982). 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) demonstrated that the factor structure of the PBI among a population of the age range same as ours was virtually the same as that among an adult population. We calculated the PBI scores of participants who answered 22 or more items ( $n = 787$ ), and missing values were individually substituted with the mean of that item.

#### 2.2.4. Statistical analyses

First, we correlated the Aggressive Behavior and Delinquent Behavior scores with each of the independent variables. Then we conducted a series of regression analyses on a hierarchical model. Children's Aggressive Behavior and Delinquent Behavior scores were regressed separately on children's demographic variables (sex and grade), followed by a set of the TCI temperament and character scores, and finally on paternal and maternal PBI scores. Because of missing values in some families, the number of families used in the

**Table 1**  
Pearson correlations of children's externalizing behaviors with children's personality ( $n = 778$ ).

	Aggressive behaviors ( $r$ )	Delinquent behaviors ( $r$ )
Novelty seeking	0.14**	0.17**
Harm avoidance	-0.09*	-0.14**
Reward dependence	-0.07	-0.10**
Persistence	-0.05	-0.08*
Self-directedness	-0.03	-0.05
Cooperativeness	-0.14**	-0.14**
Self-transcendence	-0.01	-0.04
Total $R^2$ adjusted	0.026**	0.042**

\* $P < 0.05$ ; \*\* $P < 0.01$ .

analyses is noted separately. Finally, structural equation modelling was used to address the interaction between personality and parenting.

### 3. Results

#### 3.1. Characteristics of the participants

Child's grade (S.D.) was 6.4 (1.4). The number of girls (55.4%) was slightly greater than the number of boys (44.6%). Paternal and maternal ages (S.D.) were 44.1 (4.8) and 41.8 (4.1), respectively. The mean age of fathers was significantly higher than that of mothers ( $t = 15.7$ ;  $P < 0.001$ ). The mean (S.D.) of aggressive behavior scores was 5.46 (3.96) and the mean (S.D.) of delinquent behavior scores was 1.04 (1.11). The Aggressive Behavior and Delinquent Behavior scores were significantly correlated with each other ( $r = 0.70$ ;  $P < 0.01$ ).

#### 3.2. Associations of the externalising behaviours scores with independent variables

The Aggressive Behavior score was correlated with younger age of the father ( $r = -0.21$ ,  $P < 0.01$ ) and mother ( $r = -0.22$ ,  $P < 0.01$ ) as well as the child's grade ( $r = -0.12$ ,  $P < 0.01$ ). The Delinquent Behavior score was correlated with younger age of the father ( $r = -0.11$ ,  $P < 0.05$ ) and mother ( $r = -0.09$ ,  $P < 0.05$ ). Only the Delinquent Behavior score was correlated with the sex of the child (male = 1, female = 2;  $r = -0.10$ ,  $P < 0.01$ ).

Pearson correlations of CBCL scores with JTCI scores and PBI scores were computed among participants who answered 100 or more items of JTCI ( $n = 778$ ) and 22 or more items of PBI ( $n = 787$ ) respectively (Tables 1 and 2). Moreover each of total  $R^2$  adjusted, CBCL being regressed on JTCI and PBI separately, was calculated. In bivariate analyses, both the Aggressive Behavior and Delinquent Behavior scores were correlated with high NS and low HA, low C. In addition, the Delinquent Behavior score was correlated with low RD and low P. The scores of these two externalizing behaviours were correlated with parental overprotection and low parental care except for the Aggressive Behaviour score being correlated with high maternal care. The scores of children's personality and parental characteristics, however, explained only a small portion of the variance of the externalising behaviour scores.

Because we have found that the two externalizing scale scores were predictable from personality and parenting characteristics styles, we

**Table 2**  
Pearson correlations of children's externalizing behaviors with parental rearing ( $n = 787$ ).

	Aggressive behaviors ( $r$ )	Delinquent behaviors ( $r$ )
Father's care	-0.15**	-0.17**
Father's protection	0.20**	0.18**
Mother's care	0.15**	-0.17**
Mother's protection	0.11**	0.11**
Total $R^2$ adjusted	0.044**	0.044**

\* $P < 0.05$ ; \*\* $P < 0.01$ .

**Table 3**  
Predicting aggressive behaviors from personality and parental rearing styles ( $n = 772$ ).

Predictive factors	Aggressive behavior		
	Total $R^2$ adjusted	$R^2$ increase	Standardized beta
1. Demographic factors	0.016	0.016**	
Grade (5–9)			-0.125**
Sex (male = 1, female = 2)			-0.003
2. Personality factors	0.040	0.024**	
Novelty seeking			0.120**
Harm avoidance			-0.032
Reward dependence			0.027
Persistence			0.010
Self-directedness			0.100
Co-operativeness			-0.088
Self-transcendence			0.061
3. Parental rearing factors	0.075	0.035**	
Paternal care			-0.027
Paternal over-protection			0.180**
Maternal care			-0.120*
Maternal over-protection			-0.104*

\* $P < 0.05$ ; \*\* $P < 0.01$ .

performed two regression analyses on the externalizing scale scores separately using all the independent variables. In the first step of the regression, the demographic factors (grade and sex) were entered. The children's TCI scores were entered in the second step. In the third step, the PBI scores were entered (Tables 3 and 4).

The Aggressive Behaviour scores were predicted by the children's grade, high NS, and finally paternal overprotection, maternal care, and low maternal overprotection. The pattern was the same in the Delinquent Behaviour score except for the children's grade losing significance whereas HA predicting it.

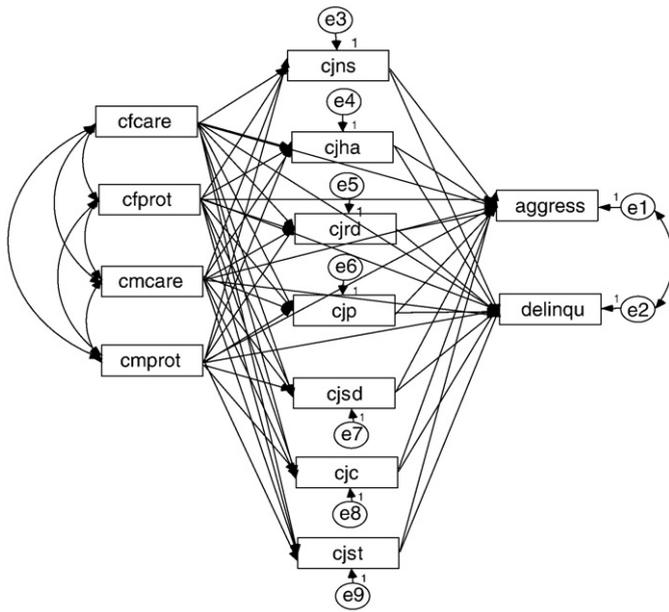
Since we expected that the children's personality would be predicted by the parental characteristics, we performed a structural equation modelling in which the scores of the two externalising behaviours were hypothesised to be influenced by both all the JTCI scores as well as all the PBI scores and the each of scores of the JTCI scales would be predicted by all the PBI scores. We also hypothesised covariance between the error variables of the Aggressive Behaviour and Delinquent Behavior scores (Fig. 1).

After deleting the coefficients without significance, we finally obtained a model depicted in Fig. 2. The goodness of fit was satisfactory; the Goodness-of-fit index was 0.995, the Adjusted Goodness-of-fit index was 0.983, and Root Mean Square Mean of approximation was 0.029. Both Aggressive Behaviour and Delinquent Behaviour scores were influenced by NS whereas only the Delinquent Behaviour scores were influenced by low HA. The scores of the two scales were also influenced by paternal

**Table 4**  
Predicting delinquent behaviors from personality and parental rearing styles ( $n = 772$ ).

Predictive factors	Delinquent behavior		
	Total $R^2$ adjusted	$R^2$ increase	Standardized beta
1. Demographic factors	0.009	0.009**	
Grade (5–9)			-0.059
Sex (male = 1, female = 2)			-0.045
2. Personality factors	0.043	0.034**	
Novelty seeking			0.109*
Harm avoidance			-0.098*
Reward dependence			-0.015
Persistence			-0.047
Self-directedness			0.065
Co-operativeness			-0.030
Self-transcendence			0.040
3. Parental rearing factors	0.071	0.028**	
Paternal care			-0.016
Paternal over-protection			0.162**
Maternal care			-0.126*
Maternal over-protection			-0.103*

\* $P < 0.05$ ; \*\* $P < 0.01$ .



aggress; CBCL aggressive score, delinqu; CBCL delinquent score, cjns; child's Novelty Seeking score, cjha; child's Harm Avoidance, cjrd; child's Reward Dependence, cjp; child's Persistence, cjsd; child's Self Directedness, cjc; child's Co-operativeness, cjst; child's Self Transcendence, cfcare; perceived care from father, cfprot; perceived over-protection from father, cmcare; perceived care from mother, cmprot; perceived over-protection from mother

Fig. 1.

overprotection directly. Among the personality scale scores, only HA was influenced by low parental care, and low paternal and high maternal overprotection (Fig. 2).

4. Discussion

This study has demonstrated that children's externalizing behaviors as observed by their parents can be predicted by both the children's self-report of temperament and perceived rearing. Although significant the size of correlations was low suggesting that the following discussion should take into account possibility that some other factors are linked to children's aggressive and delinquent behaviors.

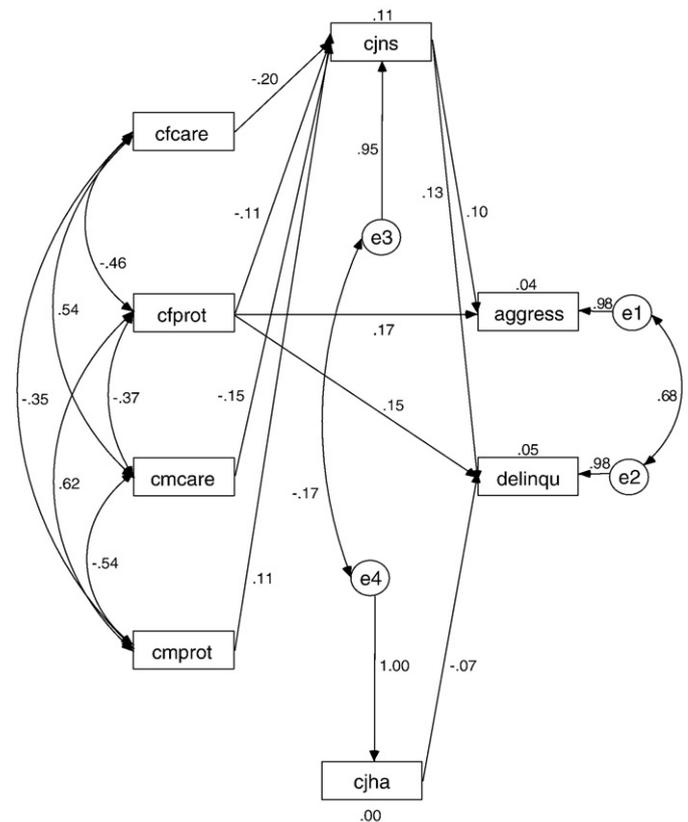
Fathers of this population perceived their children to be more aggressive and delinquent than did the mothers. Achenbach (1991), however, did not find differences between fathers and mothers when reporting children's behavior using the CBCL. Reviewing the literature on the assessment of children's emotional and behavioral problems, Achenbach et al. (1987) noted that the mean *r*s were around .60 between similar informants such as two teachers. They also noted that informants of different types agreed only poorly on the children's behavioral assessment. Other investigators also reported that teachers (or therapists) and parents (or caregivers) perceived the same child as behaving differently (Culp et al., 2001; Verhulst et al., 1994). The agreement between fathers and mothers was reported to be either moderate (Schaughency and Lahey, 1985) or poor (Baker and Heller, 1996; Leblanc and Reynolds, 1989). As compared with fathers, mothers showed better correlation with teachers in terms of assessing children's behavior (Glaser et al., 1997).

The difference between the two parents in terms of externalizing behavior scores in our sample is difficult to interpret. It may be that children behave differently in different situations. The presence of the father may elicit more externalizing behavior. Alternatively, the fathers in this sample may be more sensitive to their children's externalizing behaviors. Mothers generally spend more time with children than fathers.

Thus, mothers are more aware of the whole picture of the child's everyday activities. On the other hand, fathers may be more acutely aware of a few signs of the child's externalizing behavior. In planning family-based early intervention programs when a child has externalizing behavior problems, it seems important to understand how fathers see and react to their children's behavior.

Considering the differences of the CBCL scores rated by fathers and mothers, one may argue that we should not use the means of the externalizing behaviour scores rated by the two parents or the mean substitution in cases where data were missing for one parent and that the scores of the externalising behaviour rated by the two parents separately. We therefore performed the same regression analyses using as the dependent variable the CBCL scores rated by fathers and mothers separately. Standardized beta of some predictor variables (grade, NS, and maternal care for aggressive behaviour scores rated by fathers; NS and maternal care for delinquent behaviour scores rated by fathers; grade and maternal overprotection for aggressive behaviour scores rated by mothers; HA and maternal overprotection for delinquent behaviour scores rated by mothers) that reached the significance level in the original analyses (where the dependent variables were the mean CBCL scores rated by the two parents) lost significance (possibly due, at least partly, to the smaller number of cases usable for analyses) but the basic profiles of the associations between the externalizing behaviour scores and the predictor variables.

The externalizing behaviors of children were characterised by temperament but not by character. Our findings demonstrate that aggressive and delinquent behaviors have slightly different



aggress; CBCL aggressive score, delinqu; CBCL delinquent score, cjns; child's Novelty Seeking score, cjha; child's Harm Avoidance, cfcare; perceived care from father, cfprot; perceived over-protection from father, cmcare; perceived care from mother, cmprot; perceived over-protection from mother

Fig. 2.

correlations with domains of temperament. Aggressive behavior was predicted only by NS, whereas delinquent behavior was predicted by NS and low HA in both the regression analyses and structural equation modelling. Therefore, low HA may be specific to delinquency. Individuals low in HA tend to be carefree, relaxed, daring, courageous, composed, and optimistic even in situations that worry most people. These individuals are described as outgoing, bold, and confident in most social situations. The disadvantages of low HA are related to unresponsiveness to danger, which can lead to foolhardy optimism. It is possible to speculate that low HA predisposes children to socially unacceptable behaviors in general. Kuo et al. (2003) found significant correlations between both Delinquent Behaviour and Aggressive Behaviour scores and NS but no correlation was found between the Externalising Behaviour scores and HA scores. The discrepancy between Kuo et al.'s (2003) and our findings may be due to cultural differences that need further clarification. Because Kuo et al. (2003) used the Tridimensional Personality Questionnaire, which measures only temperament domains, they failed to examine the effects of the character domains on the externalising behaviours. The TCI, which we used, measured both temperament and character thus confirming no association between character and externalising behaviours. Cloninger et al. (1993) maintained that temperament was more constitutionally determined while character reflected personality maturation developed through interpersonal interactions. Twin studies supported a genetic contribution to the appearance of temperament (for review Loehlin et al., 1988). Thus, externalizing behaviors may be rooted in predisposed factors.

Previous studies have reported significant associations between parenting and internalising problems in adult populations (Bemporad and Romano, 1993; Eisemann et al., 1984; Parker, 1981; Parker and Hadzi-Pavlovic, 1982; Perris et al., 1985, 1986; Kitamura et al., 1993; Sato et al., 1997). This study has shown that both aggression and delinquency of children can be predicted by (1) paternal overprotection, (2) low maternal care, and (3) low maternal overprotection (respecting autonomy). The structural equation modelling confirms the link between parental overprotection and the two externalising behaviours. Previous research has suggested that a particularly important feature of effective parenting of adolescents is maintaining a positive relationship and not inhibiting the adolescent's autonomy (Allen et al., 1994). Previous studies of the emotional and social development of children have also placed emphasis upon the children's relationships with their mothers. Our findings suggest the importance of the father in the development of children's externalizing behaviours. The effects of overprotection were reversed in fathers and mothers in regression equations. Externalizing behavior was linked to high paternal overprotection and low maternal overprotection. This finding may be questionable because the structural equation modelling failed to confirm the result.

Of research and clinical interest is the finding that in the structural equation model children's NS was predicted by low parental care and low paternal and high maternal overprotection. This suggests that temperament is determined by the home environment and its effect is specific to the parent's gender. Moreover, the parenting styles potentially influence the children's externalizing behaviour indirectly through the children's temperament development. The interpretation of such mechanism and particularly the gender difference of the parental influence on the development of children's temperament but should deserve future studies.

Some methodological drawbacks are to be noted. We could not obtain any information on the families that did not participate in the present study in order to avoid an invasion of privacy; it cannot be checked to what extent this sample is representative of a Japanese population. Distribution of the questionnaire was left to discretion of the school teachers but we believe that children felt free to answer because they were requested to take it back home, fill it in at home, and return it by post. Parents were requested not to consult each other but we were again unaware whether they followed this instruction.

The data collection was cross-sectional, so qualitative changes in parent-child relationships over time cannot be addressed. Therefore, caution should be exercised in any conclusions drawn. All the findings presented here are therefore correlational and causal arguments should be cared for very much. However, the present study may warrant future longitudinal study on this topic.

Second, children differ greatly in their externalizing behaviors across different settings. Some fight in the home only, others fight at school, and still others fight in both settings. Future studies should take into account the context in which externalizing behavior occurs. Multiple raters are desirable.

Furthermore, although it is obvious that the parenting tasks for a child in the 5th grade differ from those for a 9th grade child, we cannot tell how parenting behavior would be modified by the child's development (e.g., Dix, 1992). It should be noted that demonstrating the modification of children's behavior in response to parenting intervention does not necessarily mean that children's behavioral problems had their origins in disturbed parenting (Bell and Harper, 1977). The interaction of children's temperament and parenting characteristics and psychosocial environment are also challenging topic in child psychiatry and psychology (Frick and Morris, 2004; Zeanah and Fox, 2004).

In short, this investigation has demonstrated possible and differential links of children's aggressive and delinquent behaviors with their temperaments, and their parents' parenting styles.

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