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Goodness-of-fit in center day care: relations of temperament, stability, and quality of care with the child's adjustment

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Abstract

In this study, the concept of 'goodness-of-fit' between the child's temperament and the environment, introduced by Thomas and Chess [Temperament and Development, Brunner/Mazel, New York, 1977], is applied within the setting of center day care. Mothers and primary professional caregivers of 186 children, aged 6–30 months, participated in this study. The child's problem behaviors were assessed with the CBCL Teacher Report Form [Achenbach, T.M., Guide for the Caregiver–Teacher Report Form for Ages 2–5, Department of Psychiatry, University of Vermont, Burlington, VT, 1997]. The child's socio-emotional well-being in day care was measured with the Leiden Inventory for the Child's Well-Being in Day Care. The Infant Characteristics Questionnaire measured the child's temperament. Children with an easier temperament showed less internalizing and total problem behavior and more well-being. The results suggest that for children with a more difficult temperament, several parallel care arrangements interfere with the process of adapting to the day care setting. Also, our results indicate that in the group of children with greater availability of trusted caregivers, a more easy-going temperament was associated with more well-being. The association between temperament and well-being was not found in the group of children with less access to trusted caregivers. © 2004 Elsevier Inc. All rights reserved.

Keywords: Center day care; Temperament; Child's adjustment; Stability in care

1. Introduction

In this study, the concept of 'goodness-of-fit' between the child's temperament and the environment, introduced by Thomas and Chess (1977), is applied within the day care setting. Only few studies have addressed the role of a child's temperament in day care. In these studies, teachers' perception of children's temperament is sometimes found to be associated with their adjustment to day care as perceived by the

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same teachers (Klein, 1991; Zajdeman & Minnes, 1991), whereas mothers' perception of their children's temperamental characteristics did not predict adjustment to day care (NICHD Early Child Care Research Network, 1998; Zajdeman & Minnes, 1991). Hagekull and Bohlin (1995) found that parents' report of toddlers' irritability is a predictor of later externalizing behaviors as perceived by both parents and day care teachers.

In various studies, young children's difficult temperament was a precursor of both later externalizing behavior, such as attention problems or antisocial behavior, and later internalizing behavior, such as anxiety and fear (for reviews see Campbell, 1995; Rothbart & Bates, 1998; Seifer, 2000). A pattern of linkage appears to exist between specific early temperament scales and specific kinds of later behavior problems (Rothbart & Bates, 1998). In particular, subdimensions of distress to novelty and irritable distress more often showed associations with internalizing behavior, whereas subdimensions of resistance to control or manageability more often showed associations with externalizing behavior. In this study, we will explore whether differences in temperament are associated with a young child's adjustment to day care.

In addition to our focus on the child's problem behavior in day care, we will also examine infants' and toddlers' well-being in day care. When entering center day care, young children should feel comfortable in the presence of caregivers. It will help them to cope with challenges they might encounter in the day care setting. The concept of well-being can be defined as the degree to which a child feels at ease with his or her caregivers, and it also includes how comfortable the child is in the physical setting of the center and with the other children in the group. This concept is derived from an earlier study (Van IJzendoorn, Tavecchio, Stams, Verhoeven, & Reiling, 1998a) and elaborates on positive dimensions of a child's adjustment to day care. The measure of young children's socio-emotional well-being in day care is not meant to assess stage-salient developmental tasks or specific skills and it is therefore likely to be especially useful in a group of very young children with varying ages. Based on research that shows that a child's temperament affects the child's socio-emotional functioning, the first hypothesis we want to explore in our study is:

H1. A child's more difficult temperament is associated with more problem behavior and less well-being in the day care setting.

We need to bear in mind that certain so-called problem behaviors may be age-appropriate, reflecting developmental changes or age-related conflict (Campbell, 1995; Koot, 1993), e.g. defiance and non-compliance can be seen partly as age-appropriate behavior for toddlers as the child is struggling with a need for autonomy. So, in assessing problem behavior in very young children caution is needed when defining certain behaviors as maladaptive. Yet, we assume broad band factors of problem behavior to be important indicators of the child's adjustment to a day care setting. Several studies have shown a relatively high degree of stability of broad band factors of externalizing and internalizing problem behavior, from preschool to middle childhood (Lavigne et al., 1998; Mesman & Koot, 2001; see also Campbell, 1995, for an overview). This stability of problem behavior was even found in a study comprising children as young as 18 months (Mathiesen & Sanson, 2000). In a population-based sample, Mathiesen and Sanson (2000) found moderate test-retest reliability from 18 to 30 months of age for externalizing and internalizing behavior scales. They also reported considerable stability in factor structure across age.

The goodness-of-fit hypothesis refers to the idea that the implications of a child's temperamental profile depend to a large extent on the consonance between the child's behavioral style, on the one hand, and the

properties of the social environment and its expectations on the other (Thomas & Chess, 1977). In the same way, poorness-of-fit involves discrepancies between environmental opportunities and the child's temperamental characteristics, resulting in maladaptive functioning. A difficult temperament may have different implications for the child's adjustment depending on the way in which different (social) contexts deal with elevated levels of reactivity or irritability. For example, in cultures in which regular sleep patterns are not predominant or required, temperamental irregularity in sleeping patterns may interfere to a lesser extent with harmonious parent–child relationships than in cultures in which parents demand rigid sleeping schedules (Super & Harkness, 1986).

Several studies tested the goodness-of-fit hypothesis in the context of the family (Kochanska, 1995; Mangelsdorf, Gunnar, Kestenbaum, Lang, & Andreas, 1990; Patterson & Sanson, 1999; see for reviews: Bates, 1989; Rothbart & Bates, 1998), but only a few investigations into goodness-of-fit in other child care contexts have been conducted (Carey & McDevitt, 1995). Interactions between temperament and day care characteristics may be crucial in understanding differences in the child's well-being and problem behavior. For example, Hagekull and Bohlin (1995) found that temperamentally easy toddlers showed reduced aggressiveness at 4 years of age when they experienced higher quality of care, whereas difficult children did not demonstrate reduced aggressiveness in high-quality care settings. Children with a 'difficult' or reactive temperament may be more vulnerable to lower quality day care and less stability in care than children with an 'easy' temperament. Therefore, we expect characteristics of the day care setting to be experienced differently by children with a more difficult or an easier temperament. Structural dimensions of quality of child care, such as child–caregiver ratio, and aspects of caregiver stability have been found to predict the quality of care provided and the child's socio-emotional development (Clarke-Stewart, Gruber, & Fitzgerald, 1994; NICHD Early Child Care Research Network, 1998; Phillips, 1987). Lower child–caregiver ratios were associated with more positive caregiving as well as with more social competence, more social adjustment and caregiver–child relationships of higher quality. Children experiencing more caregiver stability in the day care setting had more secure relationships with their caregivers (Barnas & Cummings, 1994; Howes & Hamilton, 1992; Raikes, 1993) and showed higher degrees of social competence (Howes & Hamilton, 1993). In this study, we will elaborate on a child's daily experiences of stability in care and explore whether this kind of stability in care is also related to the child's adjustment. Two aspects of daily stability will be included. *Caregiver availability* describes the degree to which trusted caregivers are available for the child every day. A child may be cared for by different caregivers within a single day, due to rotating shifts of caregivers or participation in activities in other rooms with other caregivers. *Arrangement stability* describes the number of concurrent arrangements. For example, after a day at the center, some children go to another care arrangement before going home. Child–caregiver ratio and experiences of daily stability in care may both contribute as environmental factors to the explanation of differences in the child's adjustment to the day care setting. We expect that:

H2. Lower child–caregiver ratios, more caregiver availability and more arrangement stability are related to greater well-being in the day care setting and less problem behavior.

H3. Child–caregiver ratio, caregiver availability, and arrangement stability in care will act as moderating factors in the relation between a difficult temperament and less positive adjustment. Lower child–caregiver ratios, more caregiver stability and more arrangement stability will reduce the association between temperament and a child's adjustment. In the same vein, higher child–caregiver ratios, less caregiver availability,

and less arrangement stability will increase the association of a difficult temperament with the child's well-being and problem behavior.

In a survey study in 113 day care centers, we explore the three hypotheses concerning the role of temperament and day care characteristics in a child's adjustment to day care.

2. Method

2.1. Participants

The mothers and primary professional caregivers of 186 children (48% female), aged 6–30 months ($M = 18.6$ months, $S.D. = 6.88$), participated in this survey study. The children were enrolled in 113 different day care centers, each child attending a separate group.

2.1.1. Recruitment

An exhaustive list of 1004 day care centers in three provinces of the Netherlands (Noord-Holland, Zuid-Holland, Utrecht) was compiled through the following agencies: Chambers of Commerce, Area Health Authorities, municipalities, provincial information centers for day care, and several national child care organizations. From this list 140 centers were randomly selected and invited to participate in this study. Mothers and professional caregivers from 119 centers (85%) completed the questionnaires. The directors of the day care centers were asked to select two groups. In each group they were asked to select a child born on or very close to a specific birth date in order to prevent them from choosing the most popular or most salient child or parent. In addition to this randomly selected subsample of centers, we recruited centers offering 'non-standard hours child care,' such as extended day care and/or flexible scheduling. These centers were contacted to increase the variance in daily stability in care. The above-mentioned agencies identified 18 day care centers throughout the whole country offering 'non-standard hours child care.' These centers met one or more of our criteria for inclusion: extended opening hours of minimally 12 h up to 24 h per day, weekend care, or provision of flexible care scheduling. Mothers and professional caregivers from 14 flexible centers (78%) completed the questionnaires. The directors of these centers applied the same procedure for selecting target children, except that in each center three children from three different groups were selected.

Questionnaires were sent to the primary professional caregivers and mothers of 302 children and completed by 231 caregivers (76%) and 240 mothers (79%). The completed questionnaires provided information on 257 children (85%) in total. In our final sample of 186 children, we included only those children for whom complete information from both caregiver and mother was available and who fell in the correct age range ($n = 162$ in the random subsample of children and $n = 24$ in the 'flexible' subsample).

2.1.2. Non-response

In order to test the potential influence of non-response we compared gender and age of $N = 186$ children in our final sample with gender and age of the non-respondent group ($N = 45$, after eliminating children not in the appropriate age range). Differences in age and gender between respondents and non-respondents were not significant (for gender: $\chi^2(1, n = 231) = 2.21, p = 0.14$; for age: $t(229) = -1.12, p = 0.26$). Unfortunately, we were not able to check differences in non-response with regard to

mother's or caregiver's characteristics because we asked the directors of centers to select mothers and caregivers.

2.2. Procedure

Questionnaires were distributed to parents and professional caregivers through the management of the centers. Each participant returned the completed questionnaire directly to the university in a pre-stamped envelope.

2.3. Measures

2.3.1. Temperament (*Infant Characteristics Questionnaire*)

The Infant Characteristics Questionnaire (ICQ; Bates, Freeland, & Lounsbury, 1979) was selected to assess the child's temperament as perceived by the mother. The ICQ consisted of 33 7-point Likert-type items including a general 'key' item asking directly for the overall degree of difficulty the child presents for the parent. The ICQ contained a strong general temperament component, namely 'difficultness,' on which 17 items loaded highly. Cronbach's alpha was 0.87 for 'temperamental difficultness.' The mean score for this scale was computed ($M = 3.16$, $S.D. = 0.65$). A high score on the scale indicated that the child had more difficulty adapting to novelty and showed more irritable distress (no items concerning resistance to control loaded highly on the temperamental difficultness component).

2.3.2. *Leiden Inventory for the Child's Well-being in Day Care (LICW-D)*

The child's well-being in day care was measured with a set of 28 6-point Likert-type items for professional caregivers. Four aspects of well-being in day care were included in the Inventory: general well-being, well-being in the presence of caregivers, with group members and within the physical care setting. The Inventory was adapted from the Well-Being Scale used in a previous Leiden Day Care Study (Van IJzendoorn et al., 1998a). The dimensionality of the adapted version of the LICW-D was examined using Principal Components Analysis (PCA). A randomly selected subset of 90 children was used for exploring the structure of the data and the results were replicated in a second subset of 96 children. The 12 items correlating significantly with the 'key' item 'This child enjoys attending the day care center' were included in the analysis. The solution with one principal component fitted the data most adequately. The internal consistency was satisfactory: Cronbach's alpha was 0.81. The mean score on the 12 items was computed, after reversing half of the items, with higher scores indicating more well-being in day care ($M = 4.86$, $S.D. = 0.51$).

2.3.3. *Child Behavior Checklist*

The professional caregiver assessed the child's internalizing, externalizing, and total problem behaviors using the CBCL Teacher Report Form (CBCL-TRF/2–5). Achenbach (1992, 1997) documented satisfactory validity of this instrument. Koot (1993) validated the CBCL Parent Report Form in a large Dutch sample of 24–48 months old children. Koot also provided us with the Dutch translation of the CBCL-TRF/2–5 for use in this day care study. Recently, Achenbach and Rescorla (2000) reported the validation of the CBCL-TRF/2–5 for younger children (18 months up) in day care settings using the same set of items. Achenbach and Rescorla (2000) reported age differences for only one item of the externalizing behavior scale (older children more often lied and cheated) and for none of the items of the

internalizing behavior scale. In our study, professional caregivers completed the CBCL-TRF/2–5 for 150 children (47% female) from 12 to 30 months of age. Cronbach's alphas were high: 0.85 for internalizing behavior, 0.93 for externalizing behavior, and 0.94 for total problem behavior. Because the CBCL is not validated for children under the age of 18 months, a subsample of 93 children, aged 18–30 months will be used in our analyses concerning internalizing behavior, externalizing behavior and total problem behavior. The scale for internalizing behavior consisted of the mean score on 34 3-point Likert-type items. The scale for externalizing behavior consisted of the mean score on 40 items and the total problem scale of 99 items. The mean scores on internalizing behavior ranged from 0.00 to 1.10 ($M = 0.19$, $S.D. = 0.21$), scores on externalizing behavior ranged from 0.00 to 1.45 ($M = 0.33$, $S.D. = 0.28$), and scores on total problem behavior ranged from 0.00 to 0.93 ($M = 0.25$, $S.D. = 0.19$).

2.3.4. *Leiden Inventory for Daily Stability in Center Care (LIDS)*

The child's experience of daily stability in the day care setting was measured with a set of 6-point Likert-type items for professional caregivers. The Inventory focused on the child's daily experiences of stability, in particular caregiver stability and stability of the caregiving environment, and was developed especially for this study. De Schipper, Van IJzendoorn, & Tavecchio (2004, in press) reported on the construction of the different scales. For this study, we used two scales: *daily caregiver availability* and *daily arrangement stability*. The first scale consisted of seven items about the availability of trusted caregivers, especially in stressful situations. One of the items of this scale is: 'When this child is sad, there's always a trusted caregiver around to sooth him.' The second scale was composed of three items indicating the number of care arrangements for the child in addition to center day care. One of the items of this scale is: 'This child attends several child care arrangements in the course of a single day (reversed).' Cronbach's alphas were 0.72 for caregiver availability, and 0.68 for care arrangement stability. Mean scores for each scale were computed, after reversing two items of the first and two items of the second scale. A higher score on each scale indicated that the child experienced more daily stability.

2.3.5. *Child–professional caregiver ratio*

The child–professional caregiver ratio was assessed in the questionnaire for professional caregivers. Average child–caregiver ratio in the group was 3.8 ($S.D. = 0.96$) with a minimum of 1.4 and a maximum of 7.0. In the Netherlands, the child–caregiver ratio is regulated by law. For example, in groups with children aged 0–12 months, the maximum ratio allowed is 4 and in groups with children aged 36–48 months, the maximum ratio allowed is 8:1.

2.3.6. *Background variables*

Family Socio-Economic Status (SES) was based on the educational and professional level of both the mother and father. The resulting SES-score makes use of the sample specific factor loadings and standard deviations of these four variables (see Brandis & Henderson, 1970). Children came from lower-middle to middle-upper class families ($M = 4.88$, $S.D. = 1.12$ on a scale from 1 to 6). Only three children came from lower SES families. Average age of entry was 5.58 months ($S.D. = 4.32$) with a minimum of 2 and a maximum of 24 months. Average number of mornings or afternoons attending the center ('half-days') per week was 5.32 ($S.D. = 1.70$), which is comparable to 21–27 h per week, with a minimum of 2 half-days and a maximum of 10 half-days.

2.4. Statistical analyses

First, we computed the bivariate correlations between child adjustment variables, characteristics of child, family, and day care. Second, the hypotheses presented in Section 1 were explored in a multivariate approach using hierarchical regression for each child adjustment measure. To explore the moderating effects of care characteristics following the goodness-of-fit hypotheses, we included the interactions between the child's temperamental difficultness and each stability scale and child–caregiver ratio and the child's temperamental difficultness in the regression after the original variables, using a product-term of the standardized variables (Aiken & West, 1991; Cohen & Cohen, 1983). Care characteristics and the child's temperament interact in accounting for variance in the child's adjustment when over and above any additive combination of their separate effects, they have a joint effect (Cohen & Cohen, 1983). Third, the interaction effects were explored by post hoc comparisons of associations either within each group of children experiencing lower ratios/higher stability versus higher ratios/lower stability, or within each group of children perceived by their mothers as more difficult versus less difficult, using a median split to define both groups.

3. Results

3.1. Gender, age, and SES differences in temperament and child adjustment variables

Table 1 presents the means and standard deviations for boys and girls for temperament, the child's well-being and the three problem behavior scales. Gender differences were examined using *t*-tests. No gender differences were found for temperamental difficultness nor for the child's well-being in day care. Gender differences were found for the three behavior scales. Boys showed more internalizing, externalizing, and total problem behavior than girls.

Pearson correlations of temperament, well-being, and the behavior scales with age and SES are presented in Table 2. Temperament was moderately associated with age of the child. Older children had higher scores on the temperament scale. No association was found between age and the child's well-being and

Table 1
Means and standard deviations of temperament and child adjustment variables for boys and girls

	Boys		Girls		<i>t</i> -value
	<i>M</i>	S.D.	<i>M</i>	S.D.	
Age 6–30 months (<i>N</i> = 186)					
Temperament	3.16	0.65	3.16	0.66	0.06
Well-being	4.81	0.52	4.92	0.48	–1.43
Age 18–30 months (<i>N</i> = 93)					
CBCL intern.	0.24	0.24	0.14	0.15	2.38*
CBCL extern.	0.40	0.33	0.25	0.21	2.71**
CBCL total	0.30	0.22	0.19	0.15	2.92**

* *p* < 0.05.

** *p* < 0.01.

Table 2
Pearson correlations between background variables, temperamental difficultness, child care characteristics, and child adjustment variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Gender ^a															
2 Age	0.03														
3 Socio-Economic Status	0.06	−0.14													
4 Age of entry	−0.21**	0.32***	−0.02												
5 No. of half-days	0.14*	0.01	0.20**	−0.13											
6 Temperament	0.00	0.27***	−0.03	0.05	−0.06										
7 Child–professional caregiver ratio	−0.02	0.32***	0.06	0.04	0.00	0.01									
8 Caregiver availability	0.01	0.00	0.02	−0.05	−0.06	0.00	−0.07								
9 Arrangement stability	0.21**	−0.11	0.07	−0.09	0.14	−0.07	−0.11	0.15*							
10 Diff. × ratio	−0.18	−0.03	0.04	0.015*	0.11	−0.05	−0.01	−0.17*	−0.05						
11 Diff. × caregiver availability	−0.06	−0.07	−0.04	0.03	−0.08	−0.09	0.10	−0.23**	−0.11	−0.07					
12 Diff. × arrangement stability	0.01	0.05	−0.10	0.12	−0.11	0.03	0.05	−0.12	0.04	0.13	0.11				
13 Well-being	0.10	−0.03	0.01	−0.03	0.12	−0.21**	−0.02	0.21**	0.25**	0.07	−0.18*	0.07			
14 CBCL intern.	−0.24*	0.04	0.11	0.04	0.02	0.26*	−0.06	−0.01	−0.34**	−0.06	0.21*	−0.34**	−0.61***		
15 CBCL extern.	−0.27**	−0.03	0.12	0.01	0.07	0.11	−0.09	−0.06	0.01	0.02	0.05	−0.08	−0.03	0.42***	
16 CBCL total	−0.29**	0.00	0.13	0.00	0.08	0.22*	−0.10	−0.06	−0.14	−0.02	0.11	−0.18	−0.34**	0.78***	0.88***

Note. $N = 93$ for correlation with CBCL scales, $N = 186$ for correlations between other measures.

^a 0 = boy, 1 = girl.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

problem behavior. SES was not associated with difficult temperament, the child's well-being or the child's problem behavior.

3.2. *Exploring child adjustment to day care: a multivariate approach*

Table 2 presents the bivariate correlations of child adjustment variables with characteristics of child, family, and day care. In Section 1, we presented three hypotheses for explaining differences in the child's problem behavior and well-being in day care. In this section, these hypotheses were explored using a hierarchical regression approach in which variables were entered in three or four blocks for each child adjustment variable: gender, child temperament, child care characteristics, and three interaction terms. Before introducing child care characteristics in the equation, the child's gender and his temperament were entered in the first and second step, because these variables are assumed to be primary causes for explaining differences in children's adjustment. In the third step, arrangement stability, caregiver availability and child–professional caregiver ratio were entered in the equation. In the fourth step, the interactions between the stability scales and temperament, and the interaction between child–caregiver ratio and temperament were included, using a product-term of the standardized variables for each interaction. In order to reduce the number of independent variables, the fourth step included only those interaction terms that were significant in a preliminary series of regressions in which each interaction term was added separately in the fourth step. In addition, we excluded most background variables from the regression analyses as they were not associated with any of the child's adjustment variables in bivariate analyses (see Table 2: age of the child, SES of the family, age of entry, number of half-days attending the center). Each regression included five to six independent variables, so the ratio of subjects to independent variables was at least 31:1 in the regression with the child's well-being in day care as the dependent variable, which is adequate in case of an expected moderate effect size (Tabachnick & Fidell, 1996). The ratio in the regressions with problem behavior as the dependent variable was at least 15:1, which is close to Tabachnick and Fidell's criterion.

3.2.1. *Children's well-being in day care*

Table 3 presents the results of a hierarchical regression analysis in which children's well-being in day care was the dependent variable. Three variables and one interaction term contributed significantly to the equation. Temperament was associated with the child's well-being in day care. Children who were perceived by their mothers as more difficult, were reported by their caregivers as being less satisfied and happy in center day care. Two aspects of day care stability proved to be relevant for the well-being of children. Fewer switches in care arrangement and greater availability of a trusted caregiver were associated with greater well-being of children in the day care setting. The interaction between temperament and availability of a trusted caregiver was significant. In the group with greater availability of trusted caregivers (scoring at or above the median split), children with an easier temperament showed more well-being ($r(110) = -0.37, p < 0.001$), whereas in the group of children with less availability of trusted caregivers, the association between temperamental difficultness and well-being was absent ($r(72) = 0.10, p = 0.41$). Overall, all variables explained 15% of the variance of the child's well-being in day care.

3.2.2. *Children's behavior*

The results of three multiple hierarchical regression analyses in which children's internalizing, externalizing and total problem behavior were the dependent variables are presented in Table 4. For these

Table 3

Multiple hierarchical regression analysis of gender, temperamental difficultness, and child care characteristics on the child's well-being in day care ($N = 186$)

	Variables	<i>B</i>	S.E. <i>B</i>	β	<i>R</i>	<i>R</i> ²	<i>R</i> ² inc.	<i>F</i> inc.
1	Gender ^a	0.06	0.07	0.06	0.10	0.01	0.01	2.03
2	Temperament	-0.16	0.05	-0.21**	0.23	0.06	0.04	8.52**
3	Arrangement stability	0.13	0.05	0.19*	0.37	0.13	0.08	5.44**
	Caregiver availability	0.16	0.08	0.15*				
	Child-professional caregiver ratio	0.01	0.04	0.03				
4	Temperament \times caregiver availability	-0.06	0.03	-0.14*	0.39	0.15	0.02	3.92*

Note. $F(6, 179) = 5.35$, $P < 0.001$ for the total model.

^a 0 = boy, 1 = girl.

* $p < 0.05$.

** $p < 0.01$.

Table 4

Multiple hierarchical regression analyses of gender, temperamental difficultness, and child care characteristics on internalizing, externalizing, and total problem behavior ($N = 93$)

	Variable	<i>B</i>	S.E. <i>B</i>	β	<i>R</i>	<i>R</i> ²	<i>R</i> ² inc.	<i>F</i> inc.
Internalizing problem behavior ^a								
1	Gender ^a	-0.09	0.04	-0.21*	0.24	0.06	0.06	5.62*
2	Temperament	0.08	0.03	0.23*	0.37	0.14	0.08	8.47**
3	Arrangement stability	-0.07	0.03	-0.26**	0.48	0.23	0.10	3.58*
	Caregiver availability	-0.01	0.04	-0.03				
	Child-professional caregiver ratio	-0.02	0.02	-0.07				
4	Temperament \times arrangement stability	-0.05	0.02	-0.26*	0.54	0.29	0.06	6.81*
Externalizing problem behavior ^c								
1	Gender ^b	-0.17	0.06	-0.30**	0.27	0.07	0.07	7.29**
2	Temperament	0.06	0.05	0.12	0.30	0.09	0.02	1.71
3	Arrangement stability	0.02	0.04	0.06	0.33	0.11	0.02	0.48
	Caregiver availability	-0.04	0.06	-0.06				
	Child-professional caregiver ratio	-0.03	0.03	-0.09				
Total problem behavior ^d								
1	Gender ^b	-0.11	0.04	-0.30**	0.29	0.09	0.09	8.43**
2	Temperament	0.08	0.03	0.24*	0.38	0.15	0.06	6.57*
3	Arrangement stability	-0.02	0.03	-0.09	0.41	0.17	0.02	0.63
	Caregiver availability	-0.02	0.04	-0.04				
	Child-professional caregiver ratio	-0.02	0.02	-0.09				

^a $F(6, 86) = 5.86$, $P < 0.001$ for the total model.

^b 0 = boy, 1 = girl.

^c $F(5, 87) = 2.07$, $P = 0.08$ for the total model.

^d $F(5, 87) = 3.44$, $P < 0.01$ for the total model.

* $p < 0.05$.

** $p < 0.01$.

analyses a subsample of 93 children, aged 18–30 months was used because the Child Behavior Checklist is not validated for children under the age of 18 months.

In the multiple hierarchical regression on internalizing behaviors, three variables and one interaction term contributed significantly to the equation. Boys showed more internalizing problems than girls. Children who were perceived by their mothers as more difficult showed more internalizing behavior. Stability of care arrangements was significantly associated with internalizing problem behavior. Children in more care arrangements showed more internalizing problem behavior. One interaction term was significant, namely the interaction between temperament and arrangement stability. In the group of more difficult children, the children attending more care arrangements showed more internalizing behavior problems ($r(51) = -0.53, p < 0.001$). In the group of less difficult children, this association between care arrangements and internalizing problems was absent ($r(38) = -0.10, p = 0.54$). The overall regression equation was significant, explaining 29% of the variance in internalizing problem behavior.

In the regression equation for externalizing behavior only the child's gender contributed significantly, explaining 11% of the variance. Boys showed more externalizing problems. The child's temperament did not contribute significantly to the regression.

In the regression equation for total problem behaviors, two variables contributed significantly to the regression. Boys showed more problem behaviors than girls. Children who were perceived by their mother as more difficult, showed more total problem behavior as perceived by the professional caregiver. The total model explained 17% of the variance of total problem behavior.

4. Discussion

In this study, we attempted to expand our knowledge of a child's temperament and his socio-emotional functioning within the day care setting. We evaluated the adjustment of 186 young children in a day care setting using the 'goodness-of-fit' hypothesis (Thomas & Chess, 1977) to address possible relations of children's temperament with their socio-emotional well-being and problem behavior. To explore whether temperament is related to the child's adjustment to day care, we investigated main effects of temperament, stability and child–professional caregiver ratio as well as interactions between temperament and stability and child–professional caregiver ratio with respect to the child's problem behavior and well-being in day care. Results indicate that children perceived by their mothers as being more difficult show more internalizing and total problem behavior as well as less satisfaction and happiness within the day care setting. Our findings that more difficult children show more internalizing and total problem behavior are in accordance with previous studies relating temperament to (later) problem behavior within the home setting (for reviews see Bates, 1989; Campbell, 1995; Rothbart & Bates, 1998), within the day care setting (Klein, 1991; Zajdeman & Minnes, 1991), and across care settings (Hagekull & Bohlin, 1995). Also, the NICHD Early Child Care Research Network (1998) studied the effects of characteristics of child, family and child care on the child's problem behavior and found that toddlers show more problem behavior in the home setting when they had a more difficult temperament in infancy, but no association was found when toddlers' problem behavior was observed by professional caregivers in the non-maternal care setting.

No associations between temperament and externalizing behavior were found. This finding may be related to the hypothesis put forward by Rothbart and Bates (1998) that specific temperament dimensions relate in a differentiated way to internalizing and externalizing behavior of children. Our results support their hypothesis in that the difficult temperament scale, in which items on adaptability and irritable

distress were overrepresented, was associated with more internalizing behavior. In accordance with their hypothesis, it is likely that our temperament scale was not associated with more externalizing behavior, because the scale did not include items on resistance to control. We acknowledge the contamination problem due to item-content overlap in the assessment of temperament and problem behavior. However, [Lengua, West, and Sandler \(1998\)](#) found that associations between temperament and behavior problems remained significant and interpretable after decontamination of measures. Our results do not support the hypothesis that the association between temperament and problem behavior is due to rater bias, as it was based on independent ratings within two different care settings. Our findings may point to a meaningful continuity between the two domains of temperament and adjustment ([Bates, 1990](#); [Rothbart & Bates, 1998](#)).

In addition to previous studies, we found that children with a more difficult temperament show less well-being in the day care setting as perceived by professional caregivers. Our study showed that the association between a more difficult temperament and the child's well-being in center care was present for children aged 6–30 months. The aim of our study was to focus on the young child's adjustment to the day care setting. The results indicate that in the process of adapting to center day care, the temperamental characteristics a child brings to this situation are of special significance in that they either facilitate or hamper this process. More easy-going children appear to have fewer problems in adapting to the center care setting and show more well-being, whereas less easy-going children appear to have more problems and show less well-being.

Our results partly support the goodness-of-fit hypothesis in that day care, in particular daily stability of care, affects difficult children and more easy-going children in different ways. For children who are perceived as more difficult, more switches in care arrangement were associated with more internalizing problems, whereas for 'less difficult' children, this association was absent. An easy child is likely to experience less problems on account of attending parallel care arrangements. However, for children with a more difficult temperament, several parallel arrangements seem to interfere with the process of adapting to the day care setting. This result supports the goodness-of-fit hypothesis in that adverse effects of day care are most prominent in the group of more difficult children. The [NICHD Early Child Care Research Network \(1998\)](#) also found that toddlers experiencing more unstable care arrangements show more problem behavior, although differences in results between easy-going and difficult children were not detected. The concept of goodness-of-fit typically is used to describe parents adapting to difficulties presented by their infants ([Seifer, 2000](#)). Seifer noted, however, that it could be applied equally well to the resilient child who adapts to less than optimal caregiving circumstances. The above results support this alternative way of applying the goodness-of-fit hypothesis.

The goodness-of-fit hypothesis was supported in yet another way. For children whose caregivers at the center were more available, a more easy-going temperament was associated with more well-being, whereas for children experiencing lower access to caregivers this association was not found. These results suggest that children experiencing low versus high caregiver availability adjust differently to day care. In accordance with our expectations the results show that high caregiver availability allows easy-going children to adapt more fluently to the day care setting. Yet, the results also show that the availability of trusted caregivers does not prevent children who are perceived as more difficult from showing less well-being. One explanation may be that when a difficult child has greater access to trusted caregivers, the child may feel less inhibited to show his real feelings. Perhaps this allows these children to express their actual feelings of well-being more clearly, particularly when they are very young. Also, the results might indicate that a caregiver anticipates adjustment difficulties in more irritable children, and therefore is more

often available for them. In this way, the availability of the caregiver promotes the easy-going child's adjustment to the care setting. Yet, at the same time, her availability cannot prevent more difficult children from showing less well-being. It should be emphasized that our interaction effects must be replicated in independent studies before they can constitute the basis for practical guidelines.

In this study, new aspects of a child's day-to-day experiences of stability in care have been investigated. We expected that differences in the quality and stability of the child care setting would help us better understand differences in the child's adjustment to day care. Children who experience several switches in child care environment within a short time period have problems in coping with these parallel care arrangements, especially when they have a more difficult temperament. In addition, children feel more at ease in day care, when trusted caregivers are more available. No association was found between child-caregiver ratio and the child's adjustment to day care. This last result concurs with that of [Van IJzendoorn, Tavecchio, Stams, Verhoeven, and Reiling \(1998b\)](#), who did not find associations between structural aspects of quality of care and observed quality of care. [Van IJzendoorn et al. \(1998b\)](#) argued that this may be due to state regulations concerning the child-caregiver ratio in the Netherlands. These regulations require a maximum ratio ranging from 4:1 for infant day care groups to 8:1 in groups with children aged 36–48 months. Therefore, in our study this structural aspect of quality equally could not show sufficient variation to explain differences in the child's well-being. Furthermore, we acknowledge that the concept of quality of care is complex and multidimensional ([Munton, Mooney, & Rowland, 1995](#)) and that our measurement of quality of care was limited. Our finding that caregiver availability was associated with the child's well-being, but not with child-professional caregiver ratio supports this notion and calls for future research into goodness-of-fit in day care in the context of a more comprehensive assessment of day care quality.

Gender differences in problem behavior were found, indicating that boys showed more internalizing, externalizing, and total problem behavior. [Crowther, Bond, and Rolf \(1981\)](#) and [Luk, Leung, Bacon-Shone, and Lieh-Mak \(1991\)](#) also reported more problem behaviors for boys in a day care context. In contrast, very similar scale scores on problem behavior as perceived by the parents were reported for boys and girls in a Dutch community sample of 2–3-year-olds ([Koot, 1993](#)). Few gender differences are reported in rates of externalizing and internalizing behavior in infancy and toddlerhood ([Campbell, 1995](#); [Keenan & Shaw, 1997](#); [NICHD Early Child Care Research Network, 1998](#)). Our results might indicate that the setting of center day care itself promotes early gender differences in problem behavior, as [Crowther et al. \(1981\)](#) and [Luk et al. \(1991\)](#) also found gender differences in children attending day care or preschool. Boys may have more problems than girls adjusting to the child care context. Although at this early age, internalizing and externalizing behavior might not yet indicate maladaptive functioning, the results indicate the need for further study on the meaningfulness of the instrument as an indicator of the young child's adjustment to day care from 12 or 18 months onwards.

The results are limited in that they do not reflect associations over time and causality cannot be determined. The restriction to center care gave us the opportunity to study more closely what happens within the day care setting. Nevertheless, we are aware that this choice implies limited applicability of our findings. Further longitudinal and observational research is needed to expand our knowledge on the role of temperament, looking at both dimensions of temperament and environmental factors such as stability in care and quality of care in relation to the child's feelings of well-being and problem behavior in day care and other care settings.

In summary, the findings indicate that children with a more difficult temperament show more internalizing and total problems and less well-being in the day care setting. When primary caregivers were more

available, children felt more at ease in day care. When children experienced parallel care arrangements, they showed less satisfaction and happiness in the day care setting as well as more internalizing problem behavior. Two findings give some support for the goodness-of-fit hypothesis for child care stability. First, for children with a more difficult temperament, several parallel arrangements seem to interfere with their adjustment to the day care setting. Second, high caregiver availability seems to allow easy-going children to adapt more fluently to the day care setting, but it does not seem to support more difficult children in their adjustment process.

5. Implications for practice

The results of our study support the notion that parents and professional caregivers should consider the child's temperamental characteristics in his or her process of adapting to the child care setting. For example, when a child starts in day care, professional caregivers may discuss a child's temperamental characteristics with the parents. It may be helpful to exchange information about parents' and caregivers' supporting strategies in relation to a child's temperamental characteristics, and to attune these strategies.

The results indicate that in center day care children with a more difficult temperament will not always be protected from suboptimal functioning. Parents as well as the professional day care team should review the care arrangements of the child periodically to evaluate the child's socio-emotional functioning. The Leiden Inventory for the Child's Well-being in Day care (LICW-D) may be a valuable instrument to discuss different aspects of the child's well-being in day care. Special attention could be paid to a child's possible difficulties in coping with parallel care arrangements as well as with less optimal availability of trusted caregivers.

In everyday life parents and caregivers often use temperamental characteristics to describe children. To use the scientific knowledge about temperament in a professional way requires a systematic introduction into this literature and its implications for raising children. We therefore recommend that educational programs for professional caregivers should include information on theory, measurement, and practical implications of children's temperamental characteristics. Such information may enhance professional caregivers' knowledge about children's temperament, and improve their skills for coping with children who have a more difficult temperament. This may help to promote 'goodness-of-fit' between individual children and their caregiving environment.

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