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Multiple determinants of caregiver behavior in child care centers

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Abstract

In this study of the multiple determinants of professional caregiving, 237 caregivers (age range: 18–56 years) from 64 Dutch child care centers were extensively observed during their interactions with the children (0–4 years) in their usual care group. The choice of potential determinants of the caregiving quality was guided by Belsky's [Belsky, J. (1984). The determinants of parenting: A process model. *Child Development, 55*, 83–96] model of the determinants of parenting. Consistent with Belsky's model, quality of caregiving was found to be multiply determined by characteristics of the caregiver, the children and the caregiving context. More specifically, lower-quality care was provided by younger caregivers, to younger children, and by caregivers reporting higher physical occupational workloads. The differences between the participating child care centers proved to explain more variance in the quality of professional caregiving than the differences between the individual caregivers.

Keywords: Caregiver–child interaction; Child care centers; Determinants of caregiving; Professional caregiver; Child care quality

The quality of caregiving by professional caregivers in child care centers has been established as an important influence on various aspects of child development (NICHD ECCRN, 2003; NICHD ECCRN & Duncan, 2003). Many studies have been devoted to the quality of professional child care and its effects on the children's well-being and development (for reviews see Lamb, 1998; Vandell & Wolfe, 2000). Nevertheless, what determines the quality of caregiving behavior in professionals involved in the care of young children remains unclear. Ample studies have been dedicated to the explication of individual differences in *parental* caregiving behavior and many were inspired by Belsky's (1984) seminal model of the determinants of parenting. The model assumes parenting to be shaped by multiple determinants in three domains: (1) parental personality or personal psychological resources, (2) child characteristics, and (3) contextual sources of stress and support. Because there was no theoretical model available for professional caregiving, Belsky's model was used as a guideline for our choice of potential determinants. In keeping with the model, we hypothesized three groups of characteristics to multiply determine the quality of nonparental caregiving: (1) personal characteristics of the caregiver, (2) characteristics of the child care group, and (3) characteristics of the caregiving context. Before reporting on the present study, we will first elaborate our hypotheses with regard to each group of determinants within the perspective of earlier research.

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1. Personal characteristics of the caregiver

In parents, personal characteristics such as personality, age, and level of education have been found to affect the quality of caregiving (Belsky & Barends, 2002; Clark, Kochanska, & Ready, 2000; Kochanska, Friesenborg, Lange, & Martel, 2004; Van Bakel & Riksen-Walraven, 2002). Yet, very few studies have examined the effect of the personal characteristics of professional caregivers on the quality of their care and those that have, have done so with a quite restricted focus, i.e., the effects of their depressive symptoms. Similar to the findings in parents, results indicated that caregivers reporting more depressive symptoms displayed a lower-quality of caregiving behavior than those reporting fewer depressive symptoms (Hamre & Pianta, 2004). In a previous study on the present sample of professional caregivers (De Schipper, Riksen-Walraven, Geurts, & Derksen, 2006), their self-reported general mood (i.e., optimism and happiness) was found to be significantly and positively related with the quality of their care as observed during a structured play episode. In the present study, caregiver general mood is also expected to show a relation with caregiver behavior in other caregiving situations.

The educational level of professional caregivers has also been frequently reported to be associated with the quality of the care provided (Lamb, 1998; Vandell & Wolfe, 2000). To date, this has not been confirmed for the Netherlands, which is possibly due to the restricted variance in the educational levels of the professional caregivers working in Dutch child care centers (De Schipper, Riksen-Walraven, & Geurts, 2006; Gevers Deynoot-Schaub & Riksen-Walraven, 2005; Van IJzendoorn, Tavecchio, Stams, Verhoeven, & Reiling, 1998). In the Netherlands, most child care workers receive the same general vocational training, which does not specifically prepare them to work with very young children. Hence, much has to be learned from hands-on experience. Therefore, rather than caregiver education, in the present study we expected caregiver work experience to be related to the quality of professional caregiving as has earlier been observed by Gevers Deynoot-Schaub and Riksen-Walraven (2005) although this was not confirmed by other Dutch studies (Van IJzendoorn et al., 1998; Vermeer et al., 2005).

Little is known about the relationship between the caregivers' age and the quality of their interactions with the children in their care. In their study in Dutch child care centers, Van IJzendoorn et al. (1998) found a positive association between age and quality of caregiver behavior whereas another study failed to find such a relationship (Gevers Deynoot-Schaub & Riksen-Walraven, 2005). For mothers, a positive association between age and quality of parenting has been found (Moore & Brooks-Gunn, 2002). This was confirmed in a recent study by Bornstein, Putnick, Suwalsky, and Gini (2006), who demonstrated that the association between age and quality of parenting was particularly prominent among younger mothers. Given that many professional caregivers working in child care centers are relatively young as well, we also expected to find a positive association between caregiver age and quality of caregiver behavior in the present study.

Finally, we included the caregivers' physical health as a potential determinant of their caregiving behavior. As caring for groups of young children in professional child care settings is generally considered to be strenuous and stressful, a good physical condition and the absence of health problems are crucial. Particularly in the field of care and education it is quite common, though, for staff to continue working when they are suffering from health problems (Aronson, Gustafsson, & Dallner, 2000) and in various professions a negative relation between health problems and job performance has been found (Roe, 2003). We anticipated a similar association in professional caregiving.

2. Child care group characteristics

In parental caregiving studies, caregiver quality is investigated relative to the characteristics of individual children. Because in child care centers caregiver interactions mostly involve more than one child, we defined child characteristics at the level of the care group. For the purposes of the present study large group size, high child-caregiver ratio and younger mean age of the children were deemed relevant care group characteristics. The first two variables have been associated with lower-quality caregiving in numerous studies (Vandell & Wolfe, 2000; NICHD ECCRN, 2002a, b). In an earlier study with the current sample, observations during a structured play session revealed that the quality of caregiver–child interactions was lower in the groups containing more children per caregiver (5 versus 3), especially when they included younger children (De Schipper, Riksen-Walraven, & Geurts, 2006). We therefore expected all three aspects to also be associated with a lower-quality of caregiver behavior in situations other than structured play.

3. Contextual characteristics

The third group of determinants, i.e., contextual characteristics, is of special interest in the field of professional child care. Surprisingly little attention has been awarded to the potential impact of the work environment of professional child care providers on the quality of their care, despite the wide recognition of the demands and stress involved in the job. Phillips, Howes, and Whitebook (1991) found more favorable working conditions to be related to a higher-quality of care. Moreover, they reported a positive relation between higher job satisfaction and lower turnover rates on the one hand and quality of care on the other. Accordingly, in the present study we anticipated quantitative and qualitative workload in the workplace to be associated with lower-quality caregiving and, secondly, that supportive relations with colleagues and supervisors would positively affect the caregivers' behavior toward the children. Belsky's postulation (1984) that support received from a spouse and from the wider social network would augment the quality of parenting has been confirmed in numerous studies (for a review see Cochran & Niego, 2002). Although we also took the support our caregivers received at home into account (see next paragraph), we expected support from colleagues and supervisors received at the workplace to primarily contribute to the quality of their caregiving. Although child care research has not examined this association before, studies in the field of occupational psychology have shown that supportive relations with coworkers within the job setting boosted job performance in other professions (AbuAlRub, 2004; Beehr, Jex, Stacy, & Murray, 2000).

As mentioned above, we also assessed the caregivers' home workload and support. Work-family interaction studies have repeatedly demonstrated that the work and home domain may affect each other both negatively and positively (for a review see Geurts et al., 2005). In our study, we consequently hypothesized perceived home workload to be negatively related to the quality of care and support at home to contribute positively to the quality of care.

4. Aim of the present study

To examine the potential determinants of the quality of professional caregiving in child care centers in the Netherlands we observed the behavior of a large cohort of caregivers toward the children in their care in three different situations: (1) during structured play with small groups of children, (2) during lunch with the complete care group, and (3) throughout a morning. As explained above, in line with Belsky's 1984 model of the determinants of parenting, we expected factors in three domains to independently contribute to the quality of professional caregiving. In sum, with regard to the first domain, i.e., the professional caregiver's personal characteristics, we expected a higher-quality of caregiving to be associated with a better general mood, more professional experience, a higher age, and fewer health problems. As to the second domain, i.e., characteristics of the child care group, we expected higher-quality caregiving to occur in cases of lower child-caregiver ratios, smaller group sizes and older children. Finally, a propos the domain of contextual characteristics, in each of the three observed situations we expected higher-quality care in the case of lower workload and more support in the work context and at home.

Although we expected factors from the three domains to contribute to the quality of caregiver behavior in each of the three observed situations, we did not exclude the possibility that the contribution of individual factors to the quality of caregiver behavior might be different depending on the situation in which the caregiver–child interaction was observed. For example, workload and support experienced from colleagues may explain more variance in caregiver behavior as observed during everyday interactions with the children throughout an entire morning than during a relatively short structured play episode with a small group of children. We therefore decided to keep the three sitations apart and explore whether the behavior of the caregivers in the different situations was related to different combinations of predictors.

In the present study we observed different caregivers working in the same child care groups and caregivers from different groups in the same child care centers. This allowed us to use multilevel analysis to examine what part of the variance in the quality of caregiver behavior lies at the three different levels (i.e., the individual caregiver, the child care group, and the child care center), as well as how much variance at each of the levels is explained by the potential determinants. This information may be helpful in interpreting the possible effects of the specific predictors of caregiver behavior included in the present study, as well as in discussing possible sources of the variance that remains *un*explained by the present predictors. We expected part of the variance in the behavior of the professional caregivers to lie at the level of the child care group and at the level of the child care center. That is because some of the influences that mold the quality of caregiver behavior may be group-specific (such as support from colleagues or age of the children in the care group) or center-specific (such as support from the supervisor or years of existence of the center). Because the

present study is the first to use such a multilevel approach in examining the quality of professional caregiving in child care centers, we did not formulate more specific hypotheses regarding the relative proportions of variance explained at the different levels, but merely explored this.

5. Method

5.1. Participants

Using the address locator on a child care website and regional telephone directories, all child care centers in the cities of Nijmegen and Arnhem and surrounding areas (i.e., the middle and southern regions of the Netherlands) were identified. The resulting 131 centers all received a letter explaining the purpose of our study and the procedures to be adhered to, together with an invitation to participate. Two weeks later, the center directors were called and asked about their caregivers' willingness to join the trial. A total of 64 centers (49%) agreed to participate and all the caregivers that volunteered also took part in the study, i.e., 246 caregivers involved in the care of 133 care groups. Most of the non-participating centers' gave 'too busy' or 'objections to being videotaped' as reasons for their refusal. Due to incomplete data, eight caregivers had to be excluded from the analyses. Since only one caregiver was male, we also excluded his data from further analyses.

The final sample thus included 237 female caregivers from 62 child care centers and 132 child care groups; 32 infant groups (0–2 years), 34 toddler groups (2–4 years), and 171 mixed-age groups (0–4 years). The mean age of the caregivers was 31 years (range: 18–56 years). The majority (80.2%) had completed lower or intermediate vocational training. Duration of active employment in child care ranged from 2 to 360 months with a mean of 78.2 months.

5.2. Procedure

One of three trained researchers (i.e., the first author or one of two psychology Master's students) visited each of the caregivers while she was working with her usual group. The visit lasted from 9:00 h until 12:00 h or 1:00 h, i.e., including lunchtime. When more than one caregiver working in the same care group participated, the group was visited multiple times so that observations and other types of data could be collected separately for each individual caregiver. Approximately 2 weeks prior to the visit, the caregivers had been sent a set of questionnaires to gather information on demographic variables and the characteristics to be examined. During the visits, the completed questionnaires were collected and the caregivers were interviewed to obtain background information on their current care group (e.g., the number of children present and their ages). Throughout the morning, the researcher unobtrusively observed the caregiver's behavior toward the children and took notes on any striking events or behaviors. After snack time, which was between 10:00 h and 11:00 h, the caregiver was videotaped during two consecutive 10-min episodes of structured play, one episode with a group of three and one episode with a group of five children. The children involved were taken randomly from the caregiver's usual group and were 10 months of age or older. The structured play episodes were conducted away from the rest of the group to prevent interactions between participants and non-participants. Next, 20 successive minutes of lunch interactions were videotaped from the moment that the caregiver sat down at the table with her group. At the end of the visit, the researcher completed a rating scale (CIS) to give an overall impression of the caregiver's interactions with the children throughout the morning excluding the caregiver's behaviors during the three videotaped intervals.

6. Measures

6.1. Caregiver behavior

6.1.1. Caregiver behavior during structured play

The videotaped caregiver–child interactions for each of the structured play episodes were rated by four trained observers who were blind to the other data. They used six 7-point scales, which were adapted from scales developed by Erickson, Sroufe, and Egeland (1985) and the NICHD's Observational Record of the Caregiving Environment (ORCE; see NICHD ECCRN, 1996): (1) supportive presence or the provision of emotional support; (2) respect for children's autonomy or nonintrusiveness; (3) adequacy of structure and limit setting; (4) quality of instructions; (5) negative regard

or the caregiver's expression of impatience, irritation, anger, dislike, distrust, or rejection of the children; (6) expression of positive affect or speaking in a warm tone, hugging, other physical expressions of affection, smiling, laughing, and general enjoyment of the children. For a more extensive description of the scales, see De Schipper, Riksen-Walraven, and Geurts (2006). For our further analyses, the ratings of the structured play episodes were averaged across the two episodes.

Interrater reliabilities were computed for 44 randomly selected functional play episodes. The intraclass correlations ranged from .86 to .98, and the weighted Kappas from .75 to .94 for all scales. A composite score for overall quality of caregiver behavior was formed by calculating the mean for the six standardized scale scores after reversal of the score for negative regard. Cronbach's alpha for the combined scale was .90.

6.1.2. Caregiver behavior during lunch

The caregiver–child interactions videotaped during lunch were rated by six trained observers blind to the other data, again using six 7-point scales. Three of the six scales, i.e., *respect for children's autonomy*, *negative regard*, and *expression of positive affect*, were the same as the ones used to rate the structured play interactions. The other scales were chosen to match the remaining scales used for the structured play episodes; these scales were thought to be more appropriate for rating caregiver behavior during the unstructured lunch episode. One scale was adapted from the Ainsworth Sensitivity Scales (Ainsworth, Bell, & Stayton, 1974) and indicated *sensitive responsiveness*, which is conceptually closely related to the scale used to rate 'caregiver supportive presence' during the structured play episode. The last two scales were adapted from the ORCE (NICHD ECCRN, 1996) and reflected *stimulation of the children's development*, and *detachment or lack of emotional involvement with the children*.

The interrater reliabilities were computed for 24 of the lunchtime video sessions. The intraclass correlations ranged from .89 to .94 and the weighted Kappas from .84 to .97 for all scales. A composite score for overall quality of caregiver behavior was formed by calculating the mean of the six standardized scale scores after reversal of the scores for detachment and negative regard. Cronbach's alpha for the combined scale was .91.

6.1.3. Overall caregiver behavior (CIS overall)

The behavior of the caregiver throughout the morning (hereafter referred to as CIS *Overall*) was rated by the three researchers following their visits to the centers, using an adapted version of the Caregiver Interaction Scale (CIS; Arnett, 1989). The CIS was specifically designed to evaluate caregiver behavior during interactions with a group of young children and includes 26 items rated along a four-point Likert scale. The CIS version used here consisted of 34 items rated along a five-point scale ranging from 1: "not at all" to 5: "completely" characteristic of the caregiver. A five-point scale was applied here because a pilot study revealed such a scale to better capture the variation in observed caregiver behavior than the more limited four-point scale. The 26 items from the original version were used although the formulation of some of the items was adjusted to avoid ambiguity. Eight items were added. Six of these items were developed to assess the caregiver's stimulation of child development in various domains (e.g., "encourages the children's fantasy"; "encourages the children to think of solutions for problems"). These items were added because stimulation of child development was deemed an important aspect of professional caregiving to young children, which was underrepresented in the original CIS; moreover, stimulation of development was also included as an aspect of caregiver behavior in the scales used to rate caregiver behavior during structured play and lunch. The seventh new item assesses lack of caregiver involvement with the children (e.g., "during activities with the children, there is little attention for the children, e.g., attention is aimed at colleagues instead"). During the pilot study, this behavior was observed frequently and it was added as an item because it was thought to be a potentially relevant indicator of caregiving quality. The eighth new item assesses the control techniques used by the caregiver (e.g., "unnecessarily interferes with children's activities") and comes from an adapted version of the CIS used in a German study (Ahnert, Lamb, & Steltenheim, 2000); our pilot observations showed the item to be relevant in the Dutch child care context as well. For a more comprehensive description of the adapted CIS, see De Schipper, Riksen-Walraven, and Geurts (2006).

In the course of the data collection, two researchers visited 18 centers together to determine the reliability of their ratings. The intraclass correlations ranged from .94 to .98, and the weighted Kappas (for agreement within one scale point) from .92 to .98.

Based on principal components analysis with varimax rotation on the 34 items, five scales were formed: *stimulation of development* (10 items, $\alpha = .90$), *positive regard* (11 items, $\alpha = .92$), *negative regard* (six items, $\alpha = .86$), *positive control* (four items, $\alpha = .75$), and *negative control* (three items, $\alpha = .77$). A composite score for the overall quality of

caregiver behavior, the CIS *Overall*, was formed by calculating the mean of all 34 items, after reversal of the negatively formulated items. Cronbach's alpha for the combined scale was .93. For further analyses the CIS *Overall* score was standardized.

6.2. Personal characteristics of the caregiver

6.2.1. General mood

Caregiver general mood was assessed using the general mood component of the Dutch version (Derksen, Jeuken, & Klein-Herenbrink, 1998) of the self-report Emotional Quotient Inventory (EQ-i; Bar-On, 1997). The complete EQ-i consists of 133 items rated along a five-point scale ranging from (1) 'not true of me' to (5) 'true of me'. The scores are standardized on the basis of a mean of 100 and a standard deviation (S.D.) of 15. The general mood component involves two subscales, *happiness* and *optimism*, and we used the overall score for general mood. High scores indicate that the respondent is able to enjoy life and experience a general feeling of contentment, while low scores reflect feelings of unhappiness, depressive symptoms and pessimism.

6.2.2. Age and professional experience

The set of questionnaires the caregiver completed prior to the visit also included questions about her age (in years) and professional experience (in months).

6.2.3. Health problems

Caregiver health problems were evaluated with the (original) Dutch, short version of the Subjective Health Questionnaire (VOEG13; see Joosten & Drop, 1987). The questionnaire lists 13 possible health problems (e.g., backache, headache, and exhaustion) of which the caregivers are asked to indicate whether they have experienced them (1) or not (0). A sum score was calculated to represent the caregiver's health status, with higher scores indicating more health problems. Cronbach's alpha for this scale was .73.

6.3. Characteristics of the child care group

6.3.1. Child age, child-caregiver ratio, and group size

In the interview during the visit the caregiver provided information on the total number of caregivers and children present during the morning, which was used to calculate the overall child-caregiver ratio. The lunchtime ratio was established by observation and noted down separately. The caregivers also provided information about the ages of the children participating in the structured play situation and on the number of children younger than 2 years within their current care group. The latter was expected to be an important group characteristic, because an earlier study on the same sample (De Schipper, Riksen-Walraven, & Geurts, 2006) showed that the quality of professional caregiving was related to the age of the children; infants in particular were more likely to receive lower-quality caregiving. In the present study we maintained the age that is generally used to distinguish between infant and toddler groups as a split criterion, that is the age of two.

6.4. Contextual characteristics

6.4.1. Work characteristics

Caregiver experiences with the work situation were measured using six scales of the (original) Dutch version of the Questionnaire on the Experience and Evaluation of Work (VBBA; Van Veldhoven & Meijman, 1994). The complete VBBA consists of 153 items rated along a four-point scale ranging from (1) '(almost) never' to (4) '(almost) always'. The scales assessing quantitative and qualitative occupational workload are: (1) quantitative workload (12 items, e.g., "do you have a lot of work to do?"; $\alpha = .86$); (2) physical load (seven items, e.g., "do you think your work is physically strenuous?"; $\alpha = .87$) (3) mental load (seven items, e.g., "does your work require a lot of concentration?"; $\alpha = .81$); (4) emotional load (seven items, e.g., "in your work, are you faced with things that affect you personally?"; $\alpha = .65$). Scales used to assess at-work support are: (5) relations with colleagues (nine items, e.g., "can you ask your colleagues for help when necessary?"; $\alpha = .81$) and (6) relations with superiors (nine items, e.g., "at work, do you feel appreciated

by your supervisor?"; $\alpha = .87$). Mean scores were calculated for the individual scales. Higher scores indicate higher quantitative and qualitative workload and less support.

6.4.2. Home characteristics

Caregiver evaluation of the home workload was assessed using three questions taken from a questionnaire developed by Geurts et al. (2005). The questions were formulated to parallel the workplace quantitative workload items: (1) "do you have a lot of work to do at home?", (2) "do you need to work hard to get everything done at home?", and (3) "do you wish you could take things a little easier at home?". The items are rated along a four-point scale ranging from (1) '(almost) never' to (4) '(almost) always'. A composite score indicating the level of at-home workload was computed by calculating the mean for the three items. Cronbach's alpha for this composite score was .83. Caregiver experience of partner support was assessed using one item derived from a Dutch questionnaire gauging family problems (Koot, 1997). For our purposes, the original question was changed into a positive formulation ("do you feel that you get sufficient support from your partner?") and rated along a four-point scale ranging from (1) '(almost) never' to (4) '(almost) always'.

6.5. Characteristics of the child care center

6.5.1. Years of existence and number of child places

The participating center directors were interviewed about their center's qualities shortly after they had provided their consent. These distinguishing features were included in the analyses as possible predictors of differences in the quality of care provided at the various centers.

7. Results

7.1. Preliminary analyses

Analyses of the three caregiver-behavior ratings (all standardized scores) revealed significant, moderately positive correlations between caregiver behavior during structured play and lunch ($r = .28$, $p < .01$), during structured play and CIS *Overall* ($r = .36$, $p < .01$), and during lunch and CIS *Overall* ($r = .33$, $p < .01$). Given these moderate correlations and because, as indicated in Section 1, the determinants of caregiver behavior toward the children could differ across the three assessment episodes, the scores for caregiver behavior in the three situations were kept apart and used as separate measures in the subsequent analyses.

Table 1 shows the intercorrelations for the predictor variables in each of the three domains, as well as the center variables. The mean scores and S.D.s for the predictors are shown in Table 2. As can be seen from Table 1, the caregivers' scores for general mood were significantly less positive when they reported more health problems, but health and general mood were not associated with age or years of experience. As regards predictor correlations from different domains, several aspects merit special mention. First, the general mood scores for the caregivers working with older children in the structured play episodes were significantly higher than those for the workers caring for younger children. Second, caregivers reporting more unfavorable context characteristics, such as a higher quantitative workload at work and at home, also reported more health problems. Finally, few significant correlations were found between care group and contextual aspects. Unfavorable group characteristics, such as larger group sizes and higher child–caregiver ratios, proved not associated with higher quantitative and qualitative load in the work environment.

The correlations between the various predictors and the quality of caregiver behavior in the three care conditions are listed in Table 2. Several features of the correlation patterns stand out. Overall, correlations were weak and only few proved significant. The significant correlations are distributed across all three predictor domains indicating that caregiver behavior toward the children was related to the characteristics of the caregiver, the care group and context. Predictor variables that showed a significant association with quality of caregiving in one care condition did not necessarily show similar correlations in the other conditions. Thus, caregiver general mood and health scores proved significantly correlated with caregiving quality during structured play but not with the lunch or CIS *Overall* ratings. In contrast, caregiver age and experience were related to caregiving quality during lunch and CIS *Overall* but not to caregiving during structured play. Finally, all significant correlations were in the expected direction except for the positive correlation between the caregivers' higher workload scores and higher-quality lunchtime caregiving behavior toward the children.

Table 1
Intercorrelations for predictor variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Characteristics																				
Caregiver ($n = 237$)																				
1. General mood	–																			
2. Health problems	−.24**	–																		
3. Age	−.07	.01	–																	
4. Experience	−.07	.01	.67**	–																
Care group																				
5. Child age (play)	.19**	−.05	−.03	.02	–															
6. Child age (lu/mor)[a]	.01	−.01	−.09	−.06	−.56**	–														
7. Ch-cg ratio (lunch)	.13	.03	−.13*	−.12	.27**	−.05	–													
8. Ch-cg ratio (mor)	.08	−.02	−.06	−.11	.24**	−.12	.61**	–												
9. Group size (lunch)	.06	.01	−.05	−.03	.37**	−.06	.40**	.36**	–											
10. Group size (mor)	.09	.03	−.11	−.09	.30**	.17*	.47**	.42**	.53**	–										
Context																				
11. Quant. wld. (w)	−.13	.36**	.29**	.23**	.04	−.05	.08	.05	.02	.14*	–									
12. Physical ld. (w)	.01	.34**	.02	−.02	−.06	.05	.13*	.00	−.04	.05	.40**	–								
13. Mental ld. (w)	.21**	−.01	−.05	−.04	.02	.05	−.07	−.03	−.03	.00	.21**	.20**	–							
14. Emotion. ld. (w)	−.02	.04	.08	.18**	.00	−.13	−.08	−.03	−.08	−.02	.15*	.09	.26**	–						
15. Colleagues (w)[b]	−.17**	.17*	.02	.06	−.09	.05	.01	.02	−.02	.07	.21**	.16*	.03	.23**	–					
16. Supervisor (w)[b]	−.16*	−.02	.12	.14*	.01	−.16*	−.04	.02	.05	.06	.18**	−.01	−.03	.24**	.40**	–				
17. Workload (h)	−.18**	.24**	.30**	.29**	−.02	−.07	−.03	−.09	.01	−.06	.39**	.11	.09	.14*	.15*	.17**	–			
18. Support (h)	.12	−.04	−.03	−.08	.02	−.07	−.04	.09	−.02	.02	−.17*	−.17*	.08	.01	−.09	−.05	−.24**	–		
Care center																				
19. Years of existence	.04	−.01	.15*	.19**	−.01	−.04	.07	.00	−.05	−.08	−.01	.14*	−.06	.05	.03	−.05	−.01	−.03	–	
20. # of child places	−.05	−.07	.10	.02	−.13	.04	−.11	−.08	−.11	−.14*	.07	.12	−.07	.09	−.11	.06	.02	.01	.31**	–

[a] Child age: number of children under the age of two.
[b] Higher scores indicate *less* support.
* $p < .05$.
** $p < .01$.

Table 2
Means and standard deviations (S.D.) for all predictors and correlations with caregiving quality

	M	S.D.	Play	Lunch	CIS *Overall*
Characteristics					
Caregiver (*n* = 237)					
General mood	104.67	11.10	.19**	.03	−.01
Health problems	3.74	2.70	−.13*	−.01	−.01
Age	31.00	8.92	−.06	.26**	.24**
Experience	78.19	60.66	.01	.20**	.15*
Care group					
Child age					
Mean age in months (play)	32.58	6.96	.43**	–	–
# children < 2 years (lunch/CIS)	4.97	3.27	–	−.24**	−.25**
Child–caregiver ratio					
Lunch	4.64	1.88	–	.12	–
Morning	4.54	1.40	–	–	.05
Group size					
Lunch	9.08	2.58	–	−.01	–
Morning	10.96	2.99	–	–	−.08
Context					
Work					
Load					
Workload	2.28	0.42	.01	.14*	.05
Physical load	2.40	0.63	−.17*	.02	−.14*
Mental load	3.11	0.52	.01	.01	−.05
Emotional load	1.84	0.33	.07	.11	.07
Support					
Colleagues	1.44	0.36	−.02	−.01	.02
Supervisor	1.49	0.47	.05	.00	.12
Home					
Workload	2.13	0.66	−.02	.05	−.11
Support	3.37	0.79	.05	−.03	.00
Care center					
Years of existence	9.45	6.08	−.11	.14*	.05
Number of child places	43.16	21.19	−.10	−.03	−.01

* $p < .05$.
** $p < .01$.

7.2. Multiple determinants of caregiver behavior

In our subsequent analyses we examined the independent contributions of the predictors to the quality of caregiver behavior. Given that some caregivers worked with the same child care group and/or were affiliated with the same child care center, the contribution of the predictor variables to the explained variance in their behavior toward the children was examined using multilevel analysis. For each of the dependent caregiver-behavior variables (i.e., structured play, lunch, and CIS *Overall*) a separate five-step analysis was conducted as described by Hox (2002). In the first step, a model without predictors was analyzed to determine the number of levels present in the data and to get an estimate of the distribution of the variance across the various levels. Examination of the two-level empty model for caregiving quality during structured play (i.e., containing a caregiver level, a child care group level and no predictor variables) revealed significant variance in caregiver behavior at the individual caregiver level and at the care group level. Addition of the third level, i.e., care center, significantly improved the model fit (decrease in deviance: 6.82, $p < .01$); however, the care group variance was no longer significant, suggesting that the observed differences between the child care groups were largely due to differences between the centers. Removal of the group level from the model confirmed this

Table 3
Significant predictors from the final models for caregiver behavior ($n = 237$)

	β	β SE
Structured play		
Child age (mean age)	0.25**	0.04
Physical load	−0.08*	0.04
Lunch		
Caregiver age	0.19**	0.05
Child age (# children < 2 years)	−0.17**	0.05
CIS overall		
Caregiver age	0.20**	0.06
Child age (# children < 2 years)	−0.21**	0.06
Physical load	−0.17*	0.06

* $p < .05$.
** $p < .01$.

since it did not lead to a significant decline in the fit of the model (increase in deviance: 0.25, *ns*). The empty-model analysis for the other variables showed that the two levels (individual and a day-care center) found in the structured play data were also present in these data.

Accordingly, the models used in the present study had a two-level hierarchical structure with *individual caregivers* nested within the *child care centers* in which they worked. The intraclass correlation showed that 26% of the total variance in caregiver behavior during structured play was related to differences between the child care centers. For lunchtime caregiving this was 17% and for CIS *Overall* 29%.

The next four steps in the multilevel analyses were used to structure the final model for the quality of caregiver behavior in each of the three situations. First, in order to explain differences between individual caregivers, predictors at the individual level (e.g., caregiver age and general mood) were entered and selected for inclusion in the final model using the backwards method. Next, to explain variance between the day care centers the same procedure was applied for the predictors at the center level (years of existence, number of child places, and predictors at the individual level aggregated into predictors at the center level; see Hox, 2002). Subsequently, to compute whether the predictors at either level had the same effect in each of the centers, the slope variance for all predictors (including those that were excluded in previous steps) was examined. Finally, cross-level interactions were analyzed to further delineate potential explanations for the between-center differences. The resultant statistics for the final models are shown in Table 3.

7.2.1. Determinants of caregiver behavior during structured play

The final model for the quality of caregiver behavior during the structured play episode included characteristics from two domains: care group and context. The mean age of the caregiver's care group proved to be a significant predictor as well as the perceived physical workload (for the beta weights of the significant predictors, see Table 3), i.e., higher care quality correlated with higher mean age of the care group, and with lower perceived physical workload. Together, the two predictors accounted for a 13% reduction of the residual variance on the individual level while at the center level this was 49%, indicating that the predictors explained more variance at the level of the child care centers than at the individual level.

7.2.2. Determinants of caregiver behavior during lunch

The final model for the lunch assessment also included characteristics from two domains: caregiver and care group. Here, caregiver age and the number of children under the age of two were the significant predictors, with older caregivers providing higher-quality care and groups with fewer children under the age of two receiving a better quality of care. Together, the two predictors accounted for a 5% reduction of the residual individual variance while this was 42% for child care center residual variance, indicating that again the predictors explained more variance at the level of the child care centers than at the individual level.

7.2.3. Determinants of overall caregiver behavior

The final model for the CIS *Overall* observations comprised significant predictors from all three domains. From the domain of personal characteristics it concerned the caregiver's age, with older caregivers providing higher-quality care. As to the child group characteristics, the number of children under the age of two accounted for a significant decrease in the residual variance: the fewer the children under the age of two, the higher the quality of care. Finally, from the contextual characteristics, professional physical workload was the significant determinant, with higher physical workload predicting lower-quality caregiving. Together, the three predictors accounted for an 11% reduction in the caregiver and a 22% cut in the center residual variance, indicating that also for the overall caregiver interactions the predictors explained more variance at the level of the child care centers than at the individual level.

8. Discussion

The present study was the first to examine the multiple determinants of parenting to professional caregiving in child care centers. The model we found for the determinants of caregiving in the participating centers corresponds with the basic proposition of Belsky's (1984) model of the determinants of parenting that caregiver behavior is shaped by factors from three domains, namely caregiver, child and contextual characteristics. As regards the first, the ages of the participating caregivers explained a significant part of the variance in their behavior toward the children during the lunchtime and CIS *Overall* observations, with older caregivers providing higher-quality care. In the child domain, the age of the children in the care group proved to be an additional predictor of the quality of care in all three of the observed situations, with groups including younger children receiving lower-quality care. And finally, in the domain of contextual characteristics, a single aspect of qualitative occupational workload, namely higher physical load, uniquely predicted a lower-quality of caregiver behavior toward the children during the structured play period and CIS *Overall*.

Although the above findings were in line with our hypotheses, several of our outcomes were strikingly deviant. First of all, against expectations the caregivers' general mood scores – reflecting their ability to enjoy life and experience a general feeling of contentment or, conversely, the extent to which they experience feelings of unhappiness and depressive symptoms – did not explain variance observed in the quality of their interactions with the children beyond other predictors. As outlined in the introduction, earlier studies did find the personal characteristics of their adult caregivers and the reported depressive symptoms in particular to be important determinants of caregiver–child interactions, both in parents and in professional caregivers. Possibly, the general mood subscale of the EQ-i that we used in the present study captures too little of the negative mood spectrum to also assess the effect of the caregivers' depressive symptoms. Given the high incidence of depression among professional caregivers in child care centers (Fish, Lietzow, Casey, & Brockdorff, 2005), future studies into the multiple determinants of professional caregiving should also include more sensitive measures of depression. Furthermore, future studies are recommended to also include personality characteristics that have earlier been found to predict the quality of parenting such as ego-resilience (Van Bakel & Riksen-Walraven, 2002) or the Big Five personality dimensions (Belsky & Barends, 2002; Kochanska et al., 2004).

Although the caregivers' self-reported general mood did not predict the quality of their caregiving, their age did: a higher age coincided with a higher-quality of care beyond other predictors. The lunchtime and overall interactions the older caregivers had with the children were superior to those of the younger caregivers. However, this was not the case for the structured play interval, which reflects that the older staff performed better during everyday activities and 'natural' interactions with the children but apparently not during the more educational activities. The association between caregiver age and quality of care may be accounted for by differences in job motivation between older and younger employees. Traditionally, staff turnover rates are high among care providers in child care centers (see also Lamb, 1998; Vandell & Wolfe, 2000), probably because caring for groups of young children is a strenuous job that does not pay all that well and offers few career opportunities. Hence, caregivers who stay on longer or start working at a later age may be more intrinsically motivated for the work involved than their younger colleagues. This was confirmed by our inspection of the associations between caregiver age and the separate items of the CIS: among the highest correlating items were "seems to enjoy the children" ($r = .26$, $p < .01$) and "seems distant or detached from the children" ($r = -.20$, $p < .01$). Nevertheless, we do not rule out other potential explanations for the observed relationship between age and quality of caregiver–child interactions and further research is clearly warranted.

In the domain of characteristics of the child care group, the age of the care group was found to uniquely predict the quality of the caregiver–child interactions in all three observed situations. Lower mean group age (structured

play session) and higher numbers of children younger than two years (lunch and CIS *Overall*) were associated with lower-quality of caregiving behavior. Remarkably and contrary to our expectations, the other two child care group characteristics, i.e., child–caregiver ratio and group size, did not predict the quality of caregiving. These characteristics have explicitly been established as major determinants of the quality of care in numerous studies in various countries (Lamb, 1998; Vandell & Wolfe, 2000). Indeed, in a previous study with the current sample, we found that an experimental manipulation of the child–caregiver ratio (3:1 versus 5:1) significantly affected the quality of caregiver–child interactions during the structured play session (De Schipper, Riksen-Walraven, & Geurts, 2006). The present study showed neither the child–caregiver ratio nor the group size to predict the quality of the caregiver–child interactions, in neither of the two more 'natural' situations (lunchtime and CIS *Overall* observations). Given that these factors also proved unrelated to the quality of caregiving in other studies conducted in child care centers in the Netherlands (Van IJzendoorn et al., 1998; Vermeer et al., 2005), our present finding may be typical for the Dutch situation. Then again, the distributions of the scores for ratio and group size in the present sample could also have underlain the absence of an association, but inspection of the relevant means and S.D.s in Table 2 shows that the Dutch values do not substantially differ from those reported for other countries (cf. Vandell & Wolfe, 2000). Moreover, comparison of relevant characteristics of the present sample to those of a representative sample of Dutch child care centers (Vermeer et al., 2005) showed no striking differences in variables such as child–caregiver ratio; caregiver age, experience or education; the centers' years of existence, which also supports the validity of our findings.

A typically Dutch factor that might be relevant is that in the Netherlands center-based child care is traditionally interpreted as 'care' rather than 'education.' Little attention is paid to educational activities and the educational quality of Dutch child care centers is consequently low compared to the quality in other countries (Gevers Deynoot-Schaub & Riksen-Walraven, 2005; Vermeer et al., 2005). If group size and child–caregiver ratio matter more during educational activities than during everyday routines and the 'free play' intervals, which is plausible, the lack of educational activities in the Dutch child care centers would explain why these two factors were unrelated to the quality of caregiver–child interactions in our study.

Against our expectations, the levels of perceived occupational workload and support did not substantially contribute to the quality of the caregivers' interactions with their children. For the various types of stressors at work only the caregivers' subjective physical workload was found to independently and negatively affect the quality of their caregiving: the physical aspects of the job clearly affected the care they provided more than the mental and emotional factors. Support from colleagues and supervisors proved wholly unrelated. Theoretically, the near absence of associations might be due to our measures lacking validity to assess support and workload, but several findings speak against this argument. The instrument (VBBA) we used to assess work characteristics is well-established and has proven validity (for a review, see Van Veldhoven, De Jonge, Broersen, Kompier, & Meijman, 2002). Moreover, the various measures for occupational workload and support were meaningfully related to other contextual and personal characteristics (see Table 1), which further supports the validity of our findings. Apparently, the role support from colleagues and supervisors plays in determining the quality of care for young children in child care centers is less important than the role marital support has in determining the quality of parenting in the home setting.

It may be concluded from the findings reported in this study, that the determinants of professional caregiving do not seem to correspond well with the determinants of parenting. A similar conclusion was drawn by Ahnert, Pinquart, and Lamb (2006) in their meta-analysis on child–caregiver attachments in professional child care, where they stated that "the factors shaping the quality of child care provider relationships in these contexts differ from those known to shape child-mother attachments" (p. 674). How, then, do the determinants of the quality of professional child care identified in the present study differ from those that have been found to shape the quality of parenting? We tentatively conclude that in professional caregiving settings the predictors are less 'socio-emotional' and more 'professional' in nature than the predictors of parental care in the home situation. Professional care levels proved *not* associated with the caregivers' general mood, nor with the support they received from others in the workplace or with emotional and mental workload, while similar factors have been found to play a key role in determining the quality of care the parents provide (Belsky & Barends, 2002). This is consistent with the findings Constantino and Olesh (1999) reported. They found their professional caregivers' security of attachment representations also *not* to be related to the quality of the care provided whereas the effect of such security on parental caregiving had previously been extensively documented. The authors explained the disparity in findings by the higher level of emotional involvement that is characteristic of the parent-child relationship and not typical of the relationship between professional caregivers and the children

in their care. In sum, Constantino and Olesh's explanation may also apply to the current results as in our study the personal factors affected the quality of professional caregiving far less than the more structural or regulatable factors such as the level of physical workload in our case, and caregiver wages, which were found to be among the most powerful predictors in many earlier studies (Lamb, 1998; Vandell & Wolfe, 2000). It needs to be noted that because the remuneration of professional caregivers in child care centers are quite uniform in the Netherlands, we did not include this factor as a potential determinant.

Another striking finding of the present study – which supports the assumption discussed above regarding the 'professional' nature of the determinants of professional caregiving – is that the predictors of the quality of professional caregiving explained more variance at the level of the child care centers than at the level of the individual caregivers. This seems to imply that certain facets pertaining to the center in which the caregivers work may also partly determine or account for the differences in the quality of care they provide although the aspects we examined, i.e., center size and years of existence, were not related to the quality of care. A possible candidate is the educational level of the parents whose child or children attend a particular child care center. Lower levels of parental education are associated with more developmental and behavioral problems in the children, who may hence be difficult to deal with, which consequently may negatively affect the quality of the caregiver–child interactions (see Vandell & Wolfe, 2000). However, such a 'selection effect' is highly unlikely to occur in the Netherlands because center-based child care is predominantly used by parents with more advanced schooling and because selection of centers based on quality is very difficult given the lack of valid national quality indicators (Gevers Deynoot-Schaub & Riksen-Walraven, 2005). In a previous study in Dutch child care centers the lack of such a selection effect was also found (Gevers Deynoot-Schaub & Riksen-Walraven, 2006). To shed more light on the between-center differences in the quality of the caregiver–child interactions we observed, other workplace characteristics that directly affect the caregivers (e.g., ergonomic facilities for the caregivers, their working hours, selection policy for caregivers or educational orientation of the child care center) warrant further investigation.

The presumed absence of the abovementioned selection effect was also the reason why we did not include temperamental characteristics or other indicators of 'difficultness' of individual children such as behavioral problems as possible predictors of the quality of caregiver behavior. We simply assumed more 'difficult' children to be randomly distributed across caregivers and therefore to not explain variance in the quality of caregiver behavior. But this assumption remained untested in the present study, which may be considered a limitation. Future studies – and certainly studies in countries where selection effects are at work – should also take characteristics of individual children into account as an indicator of the 'difficultness' of a care group. If a selection effect is indeed the case, which implies that parents with less difficult children select higher-quality child care for their children, a measure for 'difficultness' of the care group based on the difficultness of individual children can be expected to explain variance in the quality of caregiver behavior particularly at the level of the centers.

Although the results are not very strong and more research is definitely needed to corroborate our findings and to determine their generalizability to other countries and different child care contexts, the findings of the present study have implications for policy and practice. First, the clear and consistent positive association between child age and the quality of professional caregiving that was found in the present study underscores the need to pay special attention to the quality of child care for the youngest children, that is, the infants. This was recently confirmed in another observational study in Dutch child care centers, which showed caregiver sensitivity toward 3- to 6-month-old infants to be clearly inadequate for a substantial number of children (Albers, Riksen-Walraven, & de Weerth, in press). As shown in an earlier study on the present sample (De Schipper, Riksen-Walraven, & Geurts, 2006), merely improving caregiver–child ratios may be an effective measure to enhance the quality of care provided to infants in child care centers. Providing specialized training to professional caregivers working with infants may also be useful in countries such as the Netherlands, with an educational system that does not prepare caregivers specifically to working with very young children.

The positive association between the physical workload reported by caregivers and the quality of their caregiving suggests that improvement of the work environment and conditions for the caregivers may also facilitate the provision of higher-quality caregiving. Given that it is the physical workload that is related to the caregiving quality, improvement of ergonomic facilities in particular may be expected to lead to improvement of caregiving. But given the correlational nature of the data and the fact that this study is the first to take into account the work conditions of professional child care providers in predicting the quality of their caregiving, the empirical evidence in this area is too limited to afford more specific implications for child care practice and policy.

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