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RESEARCH ARTICLE

Child care quality and Dutch 2- and 3-year-olds' socio-emotional outcomes: Does the amount of care matter?

Martine L. Broekhuizen[1] | Marcel A.G. van Aken[2] | Judith S. Dubas[2] | Paul P.M. Leseman[1]

[1] Faculty of Social and Behavioral Sciences—Child, Family, and Education Studies, Utrecht University, Utrecht, The Netherlands

[2] Faculty of Social and Behavioral Sciences—Developmental Psychology, Utrecht University, Utrecht, The Netherlands

Correspondence
Martine L. Broekhuizen, Faculty of Social and Behavioral Sciences—Child, Family, and Education Studies, Utrecht University, PO Box 80140, 3508 TC, Utrecht, The Netherlands.
Email: m.l.broekhuizen@uu.nl

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Abstract

High amounts of early child care have sometimes been linked to higher levels of behaviour problems, while high-quality child care has more often been related to fewer behaviour problems and more social competence. The current study investigated whether the level of centre emotional and behavioural support (child care quality) interacted with the amount of child care in predicting children's socio-emotional behaviour. Participants were 417 children (mean age = 27 months) from 61 Dutch daycare centres. The amount of daycare ranged from 1 to 5 days per week (M = 2.3 days). Multi-level analyses showed that, independent of the amount of daycare, high levels of centre emotional and behavioural support were related to more caregiver-rated social competence 1 year later. In addition, children spending 3.5 days or more in highly supportive daycare centres showed the lowest levels of parent-rated externalizing behaviour 1 year later. The findings emphasize (a) that the combined effects of the amount and quality of child care are important and (b) that high-quality early child care is related to children's socio-emotional development. Further policy, practice, and research implications are discussed.

Highlights

- We studied in a Dutch sample how the amount and quality of daycare interacted in relation to children's socio-emotional outcomes.
- High levels of daycare quality were related to more teacher-rated social competence.
- Children spending 3.5 days or more in highly supportive daycare centers showed less parent-rated externalizing behavior.

KEYWORDS

amount of child care, child care quality, externalizing behaviour, internalizing behaviour, social competence

1 | INTRODUCTION

High amounts of experienced child care have sometimes been linked to higher levels of behaviour problems (Gialamas, Mittinty, Sawyer, Zubrick, & Lynch, 2015; e.g., Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007; NICHD ECCRN, 2003, 2006), while high-quality child care has more often been related to fewer behaviour problems and more social competence (e.g., Burchinal et al., 2008; Mashburn et al., 2008; NICHD ECCRN, 2006; Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2010). These negative behavioural associations with high amounts of child care, but positive behavioural associations with child care quality, raise questions about possible combined effects of the amount and quality of child care in relation to children's socio-emotional development. Indeed, some studies find that the relation between spending long hours in child care and behaviour problems can partially be compensated by high-quality care (e.g., McCartney et al., 2010). Additionally, other studies show that the relation between high-quality care and positive aspects of children's socio-emotional development could be enhanced by spending more time in high-quality care (e.g., Votruba-Drzal, Levine Coley, & Chase-Lansdale, 2004). Most of these studies were conducted in the United States. The diverse patterns and the lack of studies outside the United States stress the importance of examining under what conditions (e.g., SES and different child care systems) high amounts of child care function as a risk factor that can be compensated by high-quality care or as a factor that is related to positive behavioural outcomes when combined with high quality care. The current study was designed to address these issues, by examining in a Dutch sample with relatively high variation in the amount of child care (1 to 5 days per week) whether child care quality moderates the link between the amount of child care and both positive and negative aspects of children's socio-emotional behaviour 1 year later.

1.1 | Child care in the Netherlands

The Dutch child care system is significantly different from many other Western countries, including the United States, where most child care research originates. In the Netherlands, children start elementary school at age 4 years, with 2 years of pre-primary education before they start first grade at age 6 years. Early childhood education and care (ECEC) settings for children up to age 4 years can be divided into two types: daycare centres and preschools. Daycare centres (0–4 years) focus on children with working parents and as such provide full-day child care during the work week. Children can start in daycare centres from 3 months of age onwards (i.e., the end of paid maternity leave), and it is possible to enrol children anywhere from 1 to 5 days per week. Preschools (2.5 to 4 years), on the other hand, provide half-day educationally oriented programs to prepare children for pre-primary education. Children can attend a preschool 2 to 4 mornings (or afternoons) per week, depending on the family's socioeconomic status (i.e., four mornings when parents have a lower educational level or do not speak Dutch). This means that both the average amount of ECEC and the variability in the amount of ECEC are much lower in preschools than in daycares. To maximize the variability in amount and avoid possible biases due to care type differences, the current study focuses specifically on 2- and 3-year-old children in daycare centres. Caregivers in daycare centres have at least 3 years of care-oriented vocational training after graduating from the vocational track in high school (i.e., 10th grade).

As in other Western countries, the percentage of women in the paid labour force has increased in the Netherlands at extreme rates: from 52.4% in 1990 to 74.3% in 2012 (OECD, 2000, 2013). Both this increase in female labour participation and the better affordability and availability of child daycare have led to a tremendous growth in the use of daycare centres (Bosch, Deelen, & Euwals, 2008). Only between 2006 and 2011 the number of children

between 0 and 4 years attending child daycare has increased by 60% (Statistics Netherlands, 2007, 2012) with 55% of all Dutch children between 0 and 4 years attending child daycare in 2011 (Statistics Netherlands, 2012). Different from many other Western countries, however, is that 60.7% of all Dutch women in the paid labour force work only part-time (OECD, 2013). This has led to relatively high variation in the amount of days children spend in child daycare with an average attendance rate of 2 to 3 days per week (Veen, Roeleveld, & Heurter, 2010). In contrast, child daycare in the United States is paid for per week or month, and children attend child care on average for 33 hours a week (U.S. Census Bureau, 2010). This relatively high variation in the amount of care in Dutch daycare centres marks the Dutch situation as an ideal case to further investigate the combined effects of the amount and quality of daycare on children's socio-emotional development.

1.2 | The amount of child care and children's socio-emotional development

Most recent evidence for the possible negative behavioural effects of extensive time per week in child care comes from studies that used data from the NICHD Early Child Care Research Network (ECCRN) Study of Early Child Care and Youth Development (SECCYD). These studies showed that high amounts of early non-familial child care across the first years of life (i.e., measured as the average number of hours per week from birth until 36 or 54 months of age) were related to higher levels of teacher-rated behaviour problems at those same ages (NICHD ECCRN, 2003, 2006), in Kindergarten (NICHD ECCRN, 2003), and in sixth grade (Belsky et al., 2007). Moreover, this indicator of the cumulative amount of child care positively predicted higher levels of self-reported impulsivity and risk-taking behaviours at age 15 years (Vandell et al., 2010). Results are less consistent when mother reports of child behaviour problems are used. Although small associations were found between high amounts of non-familial child care across the first years of life and mother-rated externalizing behaviour at Kindergarten (NICHD ECCRN, 2003), no associations were found between the amount of child care and mother-rated externalizing behaviour during the preschool years (i.e., 36 and 54 months of age) (NICHD ECCRN, 2006).

In addition to the NICHD study, several other researchers both in and outside of the United States have investigated the association between the amount of child care and children's socio-emotional development. Some studies find similar associations with negative behavioural outcomes using diverse measures, such as the cumulative or average amount of child care between the onset of care and 36 months (Gialamas et al., 2015), and 60 months of age (Solheim, Wichstrøm, Belsky, & Berg-Nielsen, 2013), the average amount of hours at 2–3 years of age (Yamauchi & Leigh, 2011), the average amount of hours in pre-kindergarten (Loeb et al., 2007), and full-time centre care at 4 years (Coley, Votruba-Drzal, Miller, & Koury, 2013). However, several other studies found no relation with extensive time in child care or preschool and children's negative behavioural outcomes in the early years (Barnes, Leach, Malmberg, Stein, & Sylva, 2010; Romano, Kohen, & Findlay, 2010; Votruba-Drzal, Coley, Maldonado-Carren, Li-Grining, & Chase-Lansdale, 2010; Zachrisson, Janson, & Naerde, 2013b). When comparing these studies, it seems that the most consistent negative behavioural associations are found for teacher reports (Gialamas et al., 2015; Loeb et al., 2007; NICHD ECCRN, 2006) and for families from relatively high SES families (Loeb et al., 2007; Yamauchi & Leigh, 2011). Thus, these mixed findings appear to be partially due to variations in study designs, such as differences in informants and sample characteristics.

As noted by McCartney et al. (2010), the association between the amount of child care and children's negative behavioural outcomes was mostly an empirical finding, not an a priori hypothesized result. Two possible explanations for these associations have been suggested, which relate to the parent–child relationship. First, extensive child care could induce attachment insecurity in children, leading to problems with children's emotion regulation. Second, when children spend extensive time in child care, parents know children less well, which could lead to less harmonious interactions and, consequently, associated behaviour problems (for a critical review, see McCartney et al., 2010). However, studies directly testing these two hypotheses found very limited evidence supporting these explanations (e.g., NICHD ECCRN, 2003). A third, more intuitive possibility is that the child care centres in which children spend long hours also have low process quality. However, the identified associations in the NICHD studies remained significant when child care quality was included as a covariate (Belsky et al., 2007; NICHD ECCRN, 2006; Vandell et al., 2010). Hence, the exact mechanism behind the negative behavioural associations with the amount of child care is

unknown. Studies are needed, which examine whether the effects of the amount of care are enhanced or diminished when process quality is also considered.

1.3 | Child care quality and children's socio-emotional development

Research on child care quality has focused on both structural characteristics of the child care setting (i.e., more distal features, such as child-staff ratio and group size) and process quality characteristics (children's daily experiences, such as caregiver–child interactions; Lamb & Ahnert, 2006; Phillips & Lowenstein, 2011). Whereas structural quality characteristics are often seen as prerequisites for high-quality child care, process quality care measures aim to tap into the actual care received by children (Lamb & Ahnert, 2006). Supportive caregiver–child interactions, the most common indicator of high process quality child care, are hypothesized to stimulate children's social and emotional development. More specifically, emotionally and behaviourally sensitive and responsive caregivers are hypothesized to strengthen children's sense of security and their capacities to engage in positive interactions with both adults and peers (e.g., Downer, Sabol, & Hamre, 2010). This in turn helps children to develop emotion and behaviour regulation and to establish and maintain positive relationships (Merritt, Wanless, Rimm-Kaufman, & Peugh, 2012; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). Several studies have indeed indicated that highly supportive caregiver or teacher–child interactions, assessed either as the average support over several years or as one moment in time in pre-Kindergarten, is prospectively related to more social competence and fewer behaviour problems in (early) childhood (Burchinal et al., 2008; Mashburn et al., 2008; NICHD ECCRN, 2006; Peisner-Feinberg et al., 2001; Sylva et al., 2010) and adolescence (Vandell et al., 2010) on some, but not all socio-emotional outcomes. A meta-analytic study by Keys et al. (2013) on four large-scale studies in the United States showed, however, that child care or preschool process quality (assessed in 3- to 5-year-olds) was not reliably associated with child social skills and problem behaviours at kindergarten entry. The fact that both null and positive behavioural associations are reported across studies indicates that child care process quality is not an unequivocal predictor of children's socio-emotional development.

1.4 | Interactions between the amount of child care and child care quality

The trend towards negative behavioural associations with the amount of child care and positive behavioural associations with child care quality, as well as the sometimes reported null effects of both the amount and quality of child care, raise questions about whether it is sufficient to investigate the amount and quality of child care individually. Several studies have examined the combined effects of the amount and quality of child care in relation to children's socio-emotional development. For indicators of structural quality, negative behavioural associations with extensive time in child care were partially compensated by a low child–staff ratio in an Australian study (Yamauchi & Leigh, 2011) and a low proportion of time spent in a large group of peers in a reanalysis of the NICHD SECCYD data (McCartney et al., 2010). For indicators of process quality, a more diverse pattern of possible combined effects was found. In the same reanalysis of the NICHD SECCYD data, it was shown that children who spent extensive hours in low-quality child care during the first years of life exhibited higher levels of externalizing behaviour at 24 and 54 months (but not at 36 months) than children who spent extensive hours in high-quality child care. For these latter children, high process quality care mitigated the association between extensive time in child care and child externalizing behaviour (McCartney et al., 2010). Two other studies conducted in the United States confirm that high process quality child care can be beneficial for children spending extensive time in care. First, among a very low income sample, children who spent extensive time in high-quality child care from 2 years of age showed the least mother-rated externalizing and internalizing behaviour problems 16 months later compared to children spending less time in either low- or high-quality child care (Votruba-Drzal et al., 2004). Second, Burchinal et al. (2008) showed that children whose mothers had not completed high school were better behaviourally adjusted in kindergarten when they attended high-quality pre-K for more hours per week. For children whose mothers had a high school degree, pre-K quality was related to better child behavioural adjustment regardless of the hours per week in pre-K.

Based on these studies, it can be concluded that there is variation in the combined effects of the amount and quality of child care on children's socio-emotional development. While some studies using more or less representative samples in terms of SES found mitigating or compensatory effects of high-quality child care for negative behavioural effects of spending extensive time in child care (McCartney et al., 2010; Yamauchi & Leigh, 2011), other studies investigating socioeconomically disadvantaged samples found even positive behavioural effects of high amounts of child care when children experienced high-quality care (Burchinal et al., 2008; Votruba-Drzal et al., 2004). Nevertheless, it should be noted that some child care studies also found no evidence for interactions between the amount and quality of child care (e.g., Abner, Gordon, Kaestner, & Korenman, 2013).

Although differences across samples could partially explain these divergent results, two additional factors complicate the interpretation of these combined effects. A first factor is that many studies have combined different types of care together (e.g., home-based care, daycare, and pre-school) to calculate the indicator for the amount of child care (e.g., McCartney et al., 2010; Votruba-Drzal et al., 2004). The amount of child care and quality figures therefore does not always reflect the same child care experience. In the present study, we address this issue by examining the amount and quality of child care at the same daycare centre. A second factor complicating the interpretation of the reported combined effects is the variation in the way that child care is organized both nationally (i.e., different types of child care) and internationally (i.e., different child care systems). This variation makes it difficult to generalize research results from, for example, the United States to other countries with different child care systems (Love et al., 2003; van IJzendoorn & Tavecchio, 2003; Vermeer et al., 2008). Finally, because there appear to be divergent results for caregiver and parent-rated behaviours, with most consistent associations with the amount of child care for caregiver-rated externalizing behaviours, this study examined caregiver and parent ratings separately.

1.5 | Current study

The current study addresses the above needs and limitations by investigating, in a Dutch sample with relatively high variation in the amount of daycare (1 to 5 days per week), whether daycare process quality, as the most proximal and strongest predictor of children's development (e.g., Phillips & Lowenstein, 2011; Sabol, et al., 2013) moderates the link between the amount of daycare and both caregiver and parent ratings of children's socio-emotional behaviour concurrently and 1 year later. On the basis of the summarized studies, we examined whether there were (a) compensatory effects of high-quality daycare for possible negative behavioural effects of spending extensive time in daycare or (b) strengthening effects of high-quality daycare, leading to positive behavioural effects of high amounts of daycare. We want to emphasize that the term "effects" refers to statistical associations, as we cannot make strong inferences about causation given the correlational design of this longitudinal study. See Figure 1 for a hypothetical

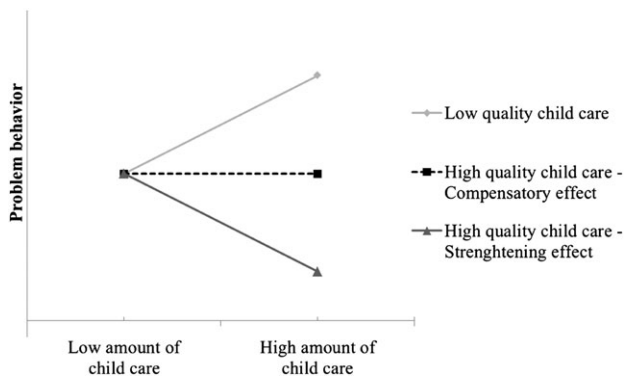

FIGURE 1 Hypothetical illustration of a compensatory and a strengthening interaction effect between the amount and quality of child care for child problem behaviour

illustration of these two models for child problem behaviour. We test which of these two models fits best for our Dutch sample of children attending a daycare centre.

2 | METHOD

2.1 | Procedure

The current study uses first (T1) and second wave (T2) data from pre-COOL (Veen et al., 2012), an ongoing longitudinal cohort study on the effects of ECEC in the Netherlands. In total, 502 centres were approached to participate in the cohort study, of which 260 agreed (51.8%; 75 daycares, 180 preschools, and 5 centres that provide both types of care). Although participating centres were more often located in urban than rural municipalities (70.9% vs. 55.0%), the ratio of participating and nonparticipating centres over different national regions (north, east, south, and west) was approximately the same. Overall, more centres were approached, and thus participated, in the western part of the Netherlands (45.7% of all centres), which is consistent with the distribution of the population within the country.

As mentioned, the current study focused specifically on children in daycares. Within the participating daycares, parents of all children turning 2 years old between April and October 2010 were personally informed by the child's caregiver about the pre-COOL study and were given a detailed letter. This letter outlined the opportunity to withdraw the child from participation in the study. Participating children were individually assessed (e.g., executive functioning, language skills) in the daycare centre, and both their caregivers and parents received a questionnaire. To assess child daycare quality, observations of the social, emotional, and educational climate were made when at least four children in a group participated in the study using the toddler version of the CLASS (La Paro, Hamre, & Pianta, 2011). In total, 793 children attended a daycare in which at least one group was observed with the CLASS during the first measurement wave. Approval for the study, including the passive parental consent, was obtained from the Ethical Advisory Committee of the Department of Education of the University of Amsterdam.

2.2 | Participants

The sample of the present study consisted of children for whom at least CLASS data and information about the amount of daycare (as reported by parents) were available at T1 (n = 417, 53.2% boys). These children were distributed over 61 daycares, with approximately seven children per daycare (range: 1–16, with one exception of 21). Children were on average 27 months (SD = 2.5, range: 20–37 months) at T1 and 41 months (SD = 2.8, range: 34–49 months) at T2. Most children came from Dutch and other western families (92.1%), and 7.9% came from non-western immigrant families (e.g., Moroccan, Turkish, and Surinamese). Regarding parental educational level, 68.1% of children had at least one parent with a college or university degree; 6.9% had parents with a lower vocational education or less, with the remainder having parents who had at least a vocational education. These percentages are in line with statistics showing that daycares in the Netherlands are most often visited by children from Dutch families with a relatively high educational level (cf., Veen et al., 2010). With respect to daycare usage, 80.0% of the children were enrolled in child daycare before age 1 year. Furthermore, children attended child daycare on average 2.32 days a week (SD = 0.92, range: 1–5 days), which is representative for the Dutch population (Veen et al., 2010).

2.3 | Measures

2.3.1 | Amount of daycare—T1

The amount of daycare at T1 (i.e., the amount of half-days per week in child daycare, M = 4.64, SD = 1.84) was assessed in the T1 parent questionnaire (n = 315). For 102 children who were missing at T1, this information was provided at T2 in a short additional questionnaire. In general, parents have a contract with a daycare for a certain amount of full-days per week, but in some daycares, it is possible to have additional half-day contracts (e.g., two full-days, and

one half-day). The distribution of the amount of daycare variable in half-days is given in Table 1. This table shows that most children attend a daycare for an even amount of half-days, which represents the common practice of full-day contracts. Most children attended a daycare for four (34.3%) or six half-days (26.9%), which means two or three full-days.

2.3.2 | Child daycare quality—T1

Child daycare quality at T1 was assessed with the CLASS Toddler (La Paro et al., 2011; Thomason & La Paro, 2009). The CLASS Toddler is an age-adapted version of the widely used CLASS pre-K (Pianta, La Paro, & Hamre, 2008) and comprises eight dimensions, fitting two higher-order domains: emotional and behavioural support and engaged support for learning. Each group was observed for four 20-min cycles during a 3- to 4-hr morning visit. Prior to data collection, observers were trained in the CLASS by a certified trainer. Afterwards, assistants completed an online reliability test by scoring five standard video fragments using an approved Dutch translation of the standardized CLASS manual. Observers passed the reliability test when dimension scores reached a within one-point agreement of 80% with the master coder (average score was 86.4%). Next, observers conducted a live-observation together with a certified CLASS observer. The within one-point agreement of these live observations was on average 89.9%. All groups were observed within a 3-month period after the observers' training.

For the current study, only the domain emotional and behavioural support was used, given our interest in children's social and emotional development. This domain consists of five dimensions: positive climate, negative climate, teacher sensitivity, regard for child perspectives, and behavioural guidance. Observers rated all dimensions on a 7-point rating scale, with 1 and 2 reflecting a *low*; 3, 4, and 5 reflecting a *medium*; and 6 and 7 reflecting a *high score*. In line with a study by Pakarinen et al. (2010), we afterwards decided to exclude the dimension negative climate, because there was almost no variance on this dimension (M = 1.17, SD = 0.23, range: 1–1.87).

Of the 61 daycares in this study, 2 had three observed groups, 50 had two observed groups, and 9 had one observed group. For 248 children, it was known that they resided in one of the observed groups. For the other 169 children, it could not be confirmed whether they could not be assigned to one of the groups because of lacking data or that the child resided in a non-observed group (because less than four children within a group participated in the study). To increase the number of children with matched child daycare quality scores, the CLASS dimension scores were aggregated on the centre level instead of on the group level. To validate this approach, the correlation between the aggregated centre-level score on emotional and behavioural support and a random group-level score

TABLE 1 Distribution of the amount of half-days in daycare at T1

Half-days in child care	*n*	%
1	6	1.4
2	59	14.1
3	29	7.0
4	143	34.3
5	22	2.5
6	112	26.9
7	5	1.2
8	34	8.2
9	0	0.0
10	6	1.4
Total	417	100

Note. Most children attend a daycare centre for an even amount of half-days, which represents the common practice of full-day contracts. Occasionally, children attend a certain amount of full-days and one half day.

on emotional and behavioural support from that daycare centre was examined (excluding daycares with only one observed group). This correlation was .87, which indicates that group quality levels within the same daycare were highly related to each other. Next to these practical considerations and the high inter-correlation, there are also two other, more theoretical, reasons to aggregate the CLASS scores at the centre level. First, because of the high rate of part-time daycare caregivers in the Netherlands (Visser, 2002), children often experience different caregivers during different days of the week. It can therefore be questioned whether a single morning group quality assessment is a good indicator of children's average daycare experience during the whole week. Second, a recent Dutch study assessing the interactive skills of caregivers in child daycare centres showed that comparable parts of the variance in caregivers' sensitive responsiveness resided at the group and centre level (Helmerhorst, Riksen-Walraven, Gevers Deynoot-Schaub, Tavecchio, & Fukkink, 2014). As a result, it is possible that centre-level quality is as predictive of children's development as group-level quality. After aggregating the scores on the centre level, the mean score of emotional and behavioural support was 5.00 (SD = 0.59, range: 2.97–6.06). Cronbach's α was .78.

2.3.3 | Child internalizing and externalizing behaviours—T1 and T2

Child internalizing and externalizing behaviour was based on parent and caregiver reports on a selection of items from the problems scale of the Brief Infant–Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2002). The BITSEA is a widely used screening instrument for 1- to 3-year-old children at risk for socio-emotional problems and has shown good to excellent psychometric properties (Briggs-Gowan, Carter, Irwin, Wachtel, & Cicchetti, 2004). Child internalizing behaviour was assessed with six items on mood, withdrawal and general anxiety (e.g., "Your child… seems withdrawn"; "has less fun than other children"; "has no energy"). Child externalizing behaviour was assessed with five items on impulsivity, activity, aggression, and disobedience (e.g., "Your child… is restless and can't sit still"; "hits, shoves, kicks or bites children (not including brother/sister)"). All items were rated on a 5-point scale ranging from 1—*never* to 5—*always*. An exploratory factor analysis on the T1 data, using maximum likelihood estimation and an oblique rotation, showed that these items indeed loaded on two factors explaining 46% of the variance in the parent data and 55% of the variance in the caregiver data. Cronbach's α for internalizing behaviour was .69 at T1 and .64 at T2 for parent reports, and .79 at T1 and .83 at T2 for caregiver reports. For externalizing behaviour, Cronbach's α was .73 at T1 and .68 at T2 for parent reports, and .82 at T1 and .87 at T2 for caregiver reports. The mean scale scores were computed and used in further analyses, provided parents and caregivers responded to at least four out of five items on internalizing behaviour and five out of six items on externalizing behaviour. Correlations between parent and caregivers report were .17 at T1 (p = .008) and .11 at T2 (p = .111) for internalizing behaviour and .30 at T1 (p < .001) and .36 at T2 (p < .001) for externalizing behaviour, which is consistent with the generally low correlations found in the literature on multi-informant data (e.g., Kerr, Lunkenheimer, & Olson, 2007).

2.3.4 | Child social competence—T1 and T2

Caregivers rated children's social competence at T1 through seven items of the BITSEA competence scale (Briggs-Gowan & Carter, 2002) using the same 1 (*never*) to 5 (*always*) rating scale. Sample items are "your child… tries to help when someone is hurt (e.g., gives a toy)" and "…plays well with other children" (α = .73). At T2, caregivers filled out five of the seven items assessed at T1 (α = .75). The mean scale scores were computed and used in further analyses when caregivers responded to at least six out of seven items at T1 and four out of five items at T2.

2.4 | Covariates

To control for possible social selection effects that are inherent to early child care research (e.g., NICHD ECCRN & Duncan, 2003), the following covariates were selected: child gender, ethnic minority status, enrolment in daycare before age 1 year, low and high family educational level (all dummy variables), and child age (continuous variable). Furthermore, by controlling for child outcomes at T1 when predicting outcomes at T2 (i.e., estimating residualized change models), the effects of possible selection bias were further diminished.

2.5 | Missing data analysis

A summary of the available parent and caregiver reports of children's socio-emotional outcomes is given in Table 2. Several tests were conducted to compare children with and without complete data in order to assess possible selective attrition. Children with both T1 and T2 parent reports (n = 180) were less likely to belong to an ethnic minority group (11.5% vs. 4.5%, χ^2 (1) = 5.26, p = .022) or to have parents with a lower educational level (8.5% vs. 2.8%, χ^2 (1) = 4.78, p = .029) than children with only parent reports at T1 (n = 135). Nevertheless, there were no significant differences when comparing these two groups on the amount of daycare and child socio-emotional outcomes at T1, F(3, 310) = 0.11, p = .956. Second, children with both T1 and T2 caregiver reports (n = 180) were less likely to belong to a minority group (12.8% vs. 6.6%, χ^2 (1) = 5.93, p = .021) than children with only caregiver reports at T1 (n = 86), but did not significantly differ on parental educational level. Furthermore, there were no significant differences when comparing these two groups on the amount of daycare and child socio-emotional outcomes at T1, F(4, 258) = 0.57, p = .687.

Given the minor differences between the groups with and without complete data, it was decided to have an additional correction for possible selective missingness. Participants who had missing data on either T1 or T2 outcome variables (but not both), or who had missing data on the covariates (3.1%), were still included in the analyses using full information maximum likelihood (FIML) estimation (Enders, 2010). As such, the parent-rated outcomes models contained 375 participants and the caregiver-rated outcomes models 371 participants (see Table 2). FIML has been recommended as one of the most appropriate ways of dealing with possible selective attrition (e.g., Asendorpf, van de Schoot, Denissen, & Hutteman, 2014; Enders, 2010). Moreover, simulation studies show that FIML provides less biassed regression parameter estimates compared to other missing data procedures (Enders, 2001; Olinsky, Chen, & Harlow, 2003). To account for possible non-normality in the outcome variables, models were estimated using FIML with robust standard errors.

2.6 | Analysis strategy

Mplus 7.11 (Muthén & Muthén, 2013) was used to sequentially estimate two series of multilevel models (Hox, 2010; Raudenbush & Bryck, 2002), one for all caregiver-rated outcomes simultaneously and one for all parent-rated outcomes simultaneously (i.e., child internalizing behaviour, externalizing behaviour, and social competence at both T1 and T2). In the first step, two null models were specified to estimate the amount of variance at both the child (level 1) and centre level (level 2) and to calculate intra-class correlations (σ level 2 / (σ level 1 + σ level 2). In the second step, the full models, the covariates, and the amount of daycare at T1 (i.e., number of half-days in daycare) were entered as child level (level 1) explanatory variables and centre emotional and behavioural support

TABLE 2 Descriptive statistics of child outcomes at T1 and T2

Child outcomes	T1 (M_{age} = 27 months)				T2 (M_{age} = 41 months)			
	n	*M*	*SD*	Range	*n*	*M*	*SD*	Range
Caregiver report								
Internalizing behaviour	264	1.84	0.55	1.00–3.83	283	1.85	0.54	1.00–4.00
Externalizing behaviour	263	2.12	0.73	1.00–4.75	282	2.04	0.71	1.00–4.40
Social competence	266	3.86	0.45	2.43–5.00	284	4.04	0.50	2.20–5.00
Parent report								
Internalizing behaviour	315	1.50	0.42	1.00–3.00	238	1.73	0.44	1.00–3.00
Externalizing behaviour	314	2.17	0.61	1.00–3.80	238	2.24	0.50	1.20–3.20

Note. T1 = Time 1; T2 = Time 2. For caregiver reports, 371 children had reports on T1 and/or T2, with 48% (n = 180) having both T1 and T2 reports. For parent reports, 375 children had reports on T1 and/or T2, with 49% (n = 180) having both T1 and T2 reports.

at T1 as the centre level (level 2) explanatory variable. Furthermore, child outcomes at T1 were controlled when predicting child outcomes at T2 (i.e., estimating residualized change models). In the third step, the slopes as outcomes models, centre emotional and behavioural support was included as a predictor of the slope of the amount of daycare to investigate whether the relation between the amount of daycare and children's socio-emotional outcomes was moderated by centre emotional and behavioural support. Model equations for these types of multilevel models can be found in Hox (2010). Both daycare quality and the amount of daycare were centred on the grand mean to avoid multicollinearity problems (Cohen, Cohen, West, & Aiken, 2003). Finally, as recommended by Baguley (2009), the unstandardized slope coefficients were used as a measure of simple effect sizes.

3 | RESULTS

Descriptive statistics and correlations between the study's main predictor and outcome variables are presented in Tables 2 and 3, respectively. The moderately strong correlations between the outcomes at T1 and T2 indicated moderate stability. The amount of daycare was positively related to caregiver-rated externalizing behaviour at both T1 and T2 and negatively related to internalizing behaviour at T2. There were no significant correlations between the amount of daycare and parent-rated outcomes. For emotional and behavioural support, there was a positive association with caregiver-rated social competence at T2.

3.1 | Multilevel models

3.1.1 | Null models

The amount of variance that was present at both the child (level 1) and centre level (level 2) is presented in Table 4. For the caregiver-rated behaviour, there was substantial variance that could be attributed to the centre level for most outcome variables. However, for the parent-rated behaviour, there was very little variance that could be attributed to the centre level for all outcome variables. Absence of substantial variance at the centre level makes it less likely that there

TABLE 3 Correlations (*r*) between centre emotional and behavioural support, the amount of daycare, and caregiver- and parent-rated child outcomes

	1	2	3	4	5	6	7
Centre level (level 2)							
1. Emotional and behavioural support T1	—	.03	.00	−.04	n/a	.02	.03
Child level (level 1)							
2. Amount of daycare T1	.03	—	.00	.05	n/a	−.00	−.00
3. Internalizing T1	.01	−.00	—	.27***	n/a	.46***	.15*
4. Externalizing T1	.03	.25***	.00	—	—	.09	.50***
5. Social comp. T1	.01	.03	−.32***	−.28***	—	n/a	n/a
6. Internalizing T2	−.05	−.16**	.31***	−.08	−.30***	—	.03
7. Externalizing T2	.05	.19**	−.09	.50***	−.28***	.25***	—
8. Social comp. T2	.17**	.09	−.11	−.14**	.29***	−.52***	−.45***

Note. T1 = Time 1; T2 = Time 2; n/a = not applicable, because this information was not available at T1. Social comp. = Social competence for caregiver-reports and prosocial behaviour for parent reports. Correlations for parent reports are presented above the diagonal, and correlations for caregiver reports below the diagonal. The amount of daycare was assessed from parents.

*$p < .05$.

**$p < .01$.

***$p < .001$.

TABLE 4 Null models and ICC of caregiver- and parent-rated outcomes at T1 and T2

	INT T1	EXT T1	SC T1	INT T2	EXT T2	SC T2
Caregiver-reports—variance components						
Level 2—centre	.008	.005	.021	.053	.051	.024
Level 1—child	.288	.523	.178	.243	.447	.225
ICC	.027	.010	.118	.218	.114	.096
Parent-reports—variance components						
Level 2—centre	.000	.004	—	.001	.003	—
Level 1—child	.179	.364	—	.191	.243	—
ICC	.000	.006	—	.003	.012	—

Note. ICC, intra-class correlations; T1 = Time 1; T2 = Time 2; INT = internalizing behaviour; EXT = externalizing behaviour; SC = social competence.

will be a significant main effect of centre emotional and behavioural support. However, cross-level interactions between centre emotional and behavioural support and the amount of daycare might still be found given that variance at the second level is less important when cluster sizes are small. Therefore, the subsequent steps of the analysis were still performed for both the caregiver- and parent-rated outcomes model.

3.1.2 | Full models

The parameter estimates for the full models are given in Tables 5 and 6. Congruent with the correlations, there was moderate stability from T1 to T2 for all outcome measures. For caregiver-rated outcomes, enrolment in daycare before age 1 year (0 = no, 1 = yes) was related to less internalizing behaviour and more social competence at T1; having an ethnic minority status (0 = western family, 1 = non-western immigrant family) was related to less externalizing behaviour at T1; high family educational level (0 = low/medium, 1 = high) was associated with less externalizing behaviour at T2; and girls (0 = boy, 1 = girl) showed less externalizing behaviour and more social competence at both T1 and T2. For parent-rated outcomes, girls showed less externalizing behaviour at both T1 and T2; and having an ethnic minority status was related to less externalizing behaviour at T1 and more externalizing behaviour at T2.

There were some main effects of the amount of daycare and centre emotional and behavioural support in the full model of the caregiver-rated outcomes. Table 5 shows that more time in daycare was related to more externalizing behaviours at T1 (B = 0.10, p < .001). This effect decreased to non-significance 1 year later at T2, after controlling for externalizing behaviour at T1 (B = 0.04, p = 0.061). In addition, high centre emotional and behavioural support was related to more social competence at T2 (B = 0.15, p < .001). These significant results were replicated in a model without applying FIML to estimate missing data and in a model in which only the 248 children of whom we knew that they resided in one of the observed groups were included. In the model with the parent-rated outcomes, neither the amount of daycare nor the level of centre emotional and behavioural support was associated with the outcome variables.

3.1.3 | Slopes as outcomes models

Finally, the two full models were expanded with a cross-level interaction between the amount of daycare and centre emotional and behavioural support for each outcome variable. In the slopes as outcomes model for the caregiver-rated outcomes, none of the six cross-level interactions were significant, and therefore, the full model is seen as the final model. In the slopes as outcomes model for the parent-rated outcomes, one of the four cross-level interactions was significant. The level of centre emotional and behavioural support (level 2) influenced the relationship between the amount of daycare and externalizing behaviour at T2 (level 1) (B = −0.06, p = .002). This result was replicated in a model without applying FIML to estimate missing data and in a model in which only the 248 children were included of whom it was known that they resided in one of the observed groups. To improve the model fit, the non-

TABLE 5 Full model: predicting caregiver-rated internalizing behaviour, externalizing behaviour, and social competence at T1 and T2

	INT T1		EXT T1		SC T1		INT T2		EXT T2		SC T2	
	B	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Level 1—child												
Intercept	2.07***	.08	2.31***	.13	3.59***	.06	1.90***	.09	2.32***	.11	3.81***	0.04
Internalizing T1	—		—		—		0.23***	.05	—		—	
Externalizing T1	—		—		—		—		0.38***	.06	—	
Social comp. T1	—		—		—		—		—		0.12	.08
Gender (girl)	0.09	.07	−0.21*	.10	0.22***	.04	−0.01	.06	−0.17**	.07	0.14*	.06
Ethnic minority status	−0.06	.11	−0.23*	.12	0.04	.07	0.00	.18	0.03	.14	−0.05	.14
Low family education	−0.03	.14	−0.26	.17	−0.02	.13	0.02	.12	−0.13	.16	0.00	.13
High family education	0.09	.08	−0.14	.11	0.04	.06	0.11	.06	−0.22**	.07	0.02	.09
Enrolment age 1	−0.30***	.07	0.02	.10	0.17**	.06	−0.11	.09	0.02	.08	0.05	.08
Amount of day care T1	−0.00	.02	0.10***	.02	0.01	.01	−0.04	.02	0.04	.02	0.02	.02
Level 2—centre												
Emotional and behavioural support T1	0.02	.05	0.02	.05	−0.01	.05	−0.06	.06	0.04	.06	0.15***	.05
Comparison variance components												
Level 2 (null/full)	.008/.005		.005/.003		.021/.012		.053/.025		.051/.024		.024/.002	
Level 1 (null/full)	.288/.270		.523/.464		.178/.165		.243/.231		.447/.345		.225/.221	

Note. *N* = 371 from 55 daycare centres. T1 = Time 1; T2 = Time 2; *B* = unstandardized regression coefficient; *SE* = standard error of *B*; INT = internalizing behaviour; EXT = externalizing behaviour; SC = social competence; — = not included within model.

*$p < .05$.

**$p < .01$.

***$p < .001$.

TABLE 6 Full model: predicting parent-rated internalizing and externalizing behaviour at T1 and T2

	INT T1		EXT T1		INT T2		EXT T2	
	B	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Level 1—child								
Intercept	1.52***	.10	2.30***	.10	1.76***	.10	2.38***	.09
Internalizing T1	—		—		0.49***	.06	—	
Externalizing T1	—		—		—		0.39***	.06
Gender (girl)	0.07	.12	−0.17**	.06	0.02	.07	−0.16**	.05
Ethnic minority status	0.07	.25	−0.42***	.11	0.09	.25	0.31**	.13
Low family education	−0.06	.14	0.17	.16	0.24	.16	−0.07	.15
High family education	0.04	.11	−0.05	.09	−0.03	.10	−0.11	.07
Enrolment age 1	−0.11	.12	−0.02	.09	−0.02	.09	0.08	.07
Amount of daycare T1	0.00	.02	0.02	.02	0.01	.02	−0.01	.02
Level 2—centre								
Emotional and behavioural support T1	0.01	.04	−0.02	.04	0.02	.04	0.01	.05
Comparison variance components								
Level 2 (null/full)	.000/.000		.004/.005[a]		.001/.000		.003/.002	
Level 1 (null/full)	.179/.177		.364/.337		.191/.144		.243/.171	

Note. n = 375 from 58 daycare centres. T1 = Time 1; T2 = Time 2; *B* = unstandardized regression coefficient; *SE* = standard error of *B*; *INT* = internalizing behaviour; EXT = externalizing behaviour; — = not included within model.

[a]A possible explanation for the small increase in the variance components is that there was less than perfect random sampling at both levels. The total variance (i.e., level 1 and 2 variance) decreases, but there is probably some error in the distribution of the variance over the two levels (Hox, 2010).

**p < .01.

***p < .001.

significant cross-level interactions were removed from the model. The parameter estimates of this slopes as outcomes model are presented in Table 7. The Akaike information criterion (AIC; Akaike, 1973), a criterion used for model comparison, of this model was compared with the AIC of a model in which only a random slope for the amount of daycare on externalizing behaviour at T2 was specified. Including centre emotional and behavioural support as a predictor of the random slope decreased the AIC from 5892.9 to 5888.5.

3.1.4 | Interpretation cross-level interaction parent-rated externalizing behaviour at T2

In order to interpret and probe the significant cross-level interaction, simple slopes were calculated at minus and plus one *SD* from the sample mean of centre emotional and behavioural support (Cohen et al., 2003; see Figure 2). The simple slopes show that there was a trend-level relation between the amount of daycare and child externalizing behaviour at T2 for children experiencing relatively high centre emotional and behavioural support (B = −0.05, p = .083).

Furthermore, the range of values of centre emotional and behavioural support was calculated for which the association between the amount of daycare and child externalizing behaviour was significant (i.e., a region of significance analysis; Preacher, Curran, & Bauer, 2006). This analysis showed that the amount of daycare negatively predicted child externalizing behaviour at levels of centre emotional support higher than 5.69 on a 1 to 7 scale (+1.17 *SD*). In terms of the CLASS measure, this score means a high-quality rating. In addition, the range of values of the amount of daycare was calculated for which the association between centre emotional and behavioural support and child externalizing behaviour was significant. This analysis indicated that emotional and behavioural support negatively predicted externalizing behaviour at T2 when children attended daycare for more than 3.51 days (+1.28 *SD*; the shaded area on the

TABLE 7 Slopes as outcomes model: predicting parent-rated internalizing and externalizing behaviour at T1 and T2

	INT T1		Ext T1		INT T2		Ext T2	
	B	*SE*	*B*	*SE*	*B*	*SE*	*B*	*SE*
Level 1—child								
Amount of daycareT1	0.00	.02	0.02	.02	0.01	.02	−0.01	.03
Level 2—centre								
Emotional and								
Behavioural support T1	0.01	.04	−0.02	.05	0.02	.04	−0.02	.05
Slope amount | emotional and behavioural support T1	—		—		—		−0.06**	.02
Comparison variance components								
Slope (random/outcome)							.000/.000[a]	
Level 2 (null/outcome)	.000/.000		.004/.005		.001/.000		.003/.001	
Level 1 (null/outcome)	.179/.177		.364/.338		.191/.144		.243/.168	

Note. The same covariates were included (see Table 6), and the regression coefficients were practically the same. n = 375 from 58 daycare centres. T1 = Time 1; T2 = Time 2; *B* = unstandardized regression coefficient; *SE* = standard error of *B*; INT = internalizing behaviour; EXT = externalizing behaviour; — = not included within model.

[a]The fact that there was no significant variance around the slope in the random slopes model only means that the data do not provide enough information for distinguishing fixed (true) from random variation, which is plausible given our relatively small cluster size (1 to 16) and small sample size at the cluster level (55 and 58). These circumstances make it hard to find *within cluster* (i.e., centre) differences in the slopes. However, including a Level-2 predictor as a predictor of a random slope adds information, which may provide a foundation for modelling variability in a coefficient through a cross-level interaction (Nezlek, 2012).

*p < .05.

**p < .01.

***p < .001.

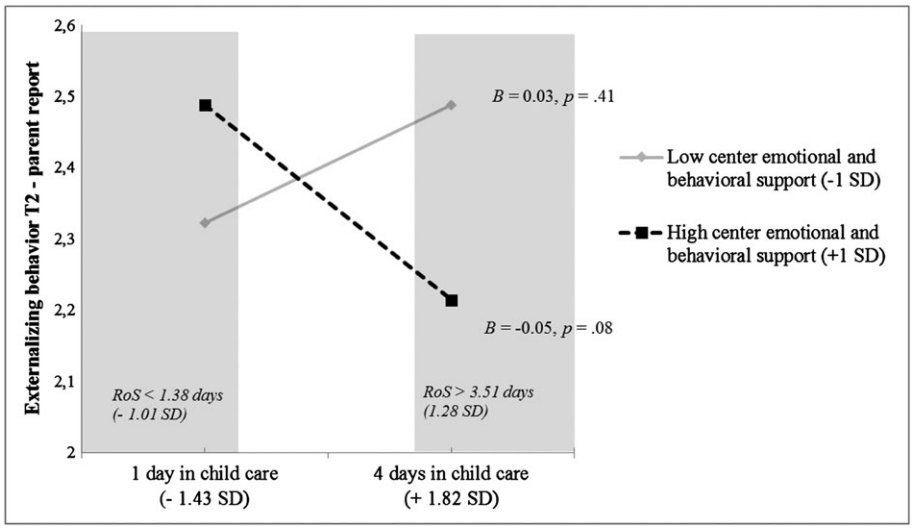

FIGURE 2 Cross-level interaction between the amount of daycare and centre emotional and behavioural support at T1 on parent-rated externalizing behaviour at T2, including regions of significance (RoS; shaded areas) and unstandardized regression coefficients of the simple slopes (B)

right in Figure 2). Another, unanticipated, finding was that when children spent fewer than 1.38 days in daycare (−1.01 *SD*; the shaded area on the left in Figure 2), emotional and behavioural support was positively related to externalizing behaviour at T2.

4 | DISCUSSION

The current study focused on a sample of 2-year-old Dutch children with high variation in the amount of experienced daycare to investigate whether an indicator of daycare process quality, centre emotional and behavioural support, interacted with the amount of daycare in predicting both caregiver and parent reports of both positive and negative aspects of children's socio-emotional behaviour 1 year later. We first discuss the results for caregiver-rated behaviours and then the results for parent-rated behaviours. Finally, we elaborate on some strengths and limitations of the current study.

4.1 | Caregiver-rated behaviours

Contrary to our hypotheses, we found no interactions between the amount of daycare and centre emotional and behavioural support in the model with caregiver-rated outcomes. In addition, high centre emotional and behavioural support did not relate to fewer caregiver-rated internalizing and externalizing behaviours. However, we did find that more days in daycare was associated with more caregiver-rated externalizing behaviour problems, although this effect decreased to non-significance when predicting externalizing behaviour one year later at age 3 years, when controlling for externalizing behaviour at age 2 years. This slight negative behavioural association with the amount of daycare is consistent with results from the NICHD studies (Belsky et al., 2007; NICHD ECCRN, 2003, 2006) and several other studies (Gialamas et al., 2015; Loeb et al., 2007; Yamauchi & Leigh, 2011). Although attachment insecurity and emotion regulation problems have been suggested as possible explanations for these findings (for a critical review, see McCartney et al., 2010), the supporting evidence for these claims is limited (e.g., NICHD ECCRN, 2003). A possible alternative explanation for the (slight) concurrent negative relation with the amount of daycare in the current study is that children who spend more time in daycare feel more at ease in the daycare setting, which is reflected in slightly higher levels of externalizing behaviour (i.e., impulsivity, activity, aggression, and disobedience) in that setting. In addition, caregivers see children more often and therefore have more opportunities to observe and rate low-frequency negative behaviours.

Consistent with other studies reporting positive associations between supportive caregiver or teacher–child interactions and children's social behaviours (Burchinal et al., 2008; Mashburn et al., 2008; Peisner-Feinberg et al., 2001; Sylva et al., 2010), we found that higher levels of centre emotional and behavioural support were related to higher levels of caregiver-rated social competence one year later at age 3 years. This means that regardless of the amount of time children spend in daycare, high-quality daycare could potentially exert a positive influence on child social development.

An additional noteworthy finding from the model with caregiver-rated behaviours was that children who were enrolled in daycare before age 1 year exhibited less caregiver-rated internalizing behaviour and more social competence at age 2 years. An explanation for this positive association is that children who are enrolled in daycare at an early age are more accustomed to interacting with other children and the daycare experience in general, which leads to more socially appropriate and less withdrawn and anxious behaviour. Nevertheless, as these associations were cross-sectional, we cannot rule out that children with less caregiver-rated internalizing behaviour and more social competence at age 2 years are the ones whom parents feel comfortable about enrolling in daycare at an early age.

4.2 | Parent-rated behaviours

In the model with parent-rated outcomes, we found no main effects for either the amount of daycare or centre emotional and behavioural support as predictors of concurrent socio-emotional outcomes or socio-emotional outcomes 1 year later. However, we did find a significant interaction between the amount of daycare and centre emotional and behavioural support in predicting changes in child externalizing behaviour from age 2 to age 3 years. That is, high levels of centre emotional and behavioural support predicted decreases in externalizing behaviour at age 3 years for

children who spend more than 3.5 days in a high-quality daycare setting. This result can be interpreted as a strengthening effect of high-quality daycare, leading to positive behavioural effects of more time in daycare. Our results are consistent with findings reported by Votruba-Drzal et al. (2004) and Burchinal et al. (2008) for children from low SES families in the United States and extends these findings by finding a strengthening effect for children from relatively high SES families in the Netherlands. A possible explanation for this finding is that children need to be exposed to child care for a certain amount of time before positive (parent-rated) behavioural effects of high-quality child care occur. An alternative explanation for this finding, which could also explain the divergence in findings between parent- and caregiver-rated outcomes, is that parents who spend less time with their child have less time to observe externalizing behaviour and perhaps feel secure about their child's socio-emotional development because their children attend a high-quality daycare. Future research could test these two competing hypotheses by including more objective observation measures of children's (externalizing) behaviour in both the home and child-care setting.

Finally, an unexpected cross-over effect indicated that high levels of centre emotional and behavioural support were related to increases in externalizing behaviour over time for children spending less than 1.38 days per week in daycare. This finding was not anticipated, although Burchinal et al. (2008) and Votruba-Drzal et al. (2004) found similar results for children from low SES families. A speculative explanation for this result is that children who spend only 1 day per week in child daycare may experience some difficulty adjusting to the (larger) group setting and therefore act out more with parents. This behaviour may be unexpected for parents who place their children in high-quality daycare. This explanation could be tested in future studies by simultaneously investigating parental perspectives on child daycare quality (i.e., do they also evaluate the daycare as being of high quality?) and parental expectations about how easily children can adapt to a centre when attending only 1 or 2 days per week. Nonetheless, this unexpected finding first needs to be replicated in different samples to determine whether it is a stable empirical finding. More generally, the possibility of nonlinear associations between the amount of child care and children's socio-emotional outcomes (i.e., negative behavioural associations when children spend either very few or many days in child daycare) is a promising avenue for future research, specifically in countries with high variation in the amount of child care.

4.3 | Strengths, limitations, and future directions

Some remarks regarding the results and sample need to be mentioned. First, unlike other studies, we found no main effects of centre emotional and behavioural support in relation to both caregiver and parent reports of child internalizing and externalizing behaviours. This could again be due to the fact that children in the Netherlands spend on average only 2 to 3 days in daycare. This is partially supported by the identified longitudinal cross-level interaction in our and other studies, suggesting that links with quality are stronger (or only exist) when they are combined with the amount of time that children spend in that specific child care setting. However, we are somewhat cautious in this remark, given that we only found an interaction between the amount and quality of daycare for parent-rated externalizing behaviour. Replication of the finding in other samples is needed to verify its reliability.

Second, the relatively high non-response rate of caregivers and parents raises the possibility that only the most dedicated and involved parents or caregivers participated in the study. Although we found some differences in parental educational level and ethnic minority status between children with only T1 and children with T1 and T2 data, there were no differences in the amount of daycare and socio-emotional outcomes at age 2 years (T1). These findings suggest that there was no problematic selective missingness in our sample. Moreover, by including the participants who had missing data at either T1 or T2 using a FIML procedure, we compensated (at least partially) for possible unidentified selection effects (Enders, 2010). Nonetheless, we still cannot completely rule out the possibility of selective missingness, and thus, whether results may generalize beyond the study sample.

A third limitation is related to our indicator of the amount of daycare. Within the current study, we used the amount of time children spent in child daycare at the time of the quality assessment. Several other studies, like those from the NICHD ECCRN, have instead focused on cumulative amounts of care during the first years of life. Although other studies have found associations between the average amount of child care at a certain point in time and

children's behavioural outcomes (e.g., Loeb et al., 2007; Yamauchi & Leigh, 2011), it could be that cumulative amount of care is a stronger predictor of children's development. However, it may well be that children attend child care for very few hours in the first 2 years of life, but many hours at ages 2 and 3 years. This would lead to an average cumulative amount of hours, while these children would be exposed to the assessed level of emotional and behavioural support at age 2 years for many hours. Therefore, using concurrent amount of child care seems to be a more precise measure of children's current child care experience.

Another issue that should be mentioned is that parent and teacher ratings of children's socio-emotional behaviours were not aggregated, but analysed separately. A statistical reason for not aggregating parent- and teacher-rated behaviours is that, consistent with the literature on multi-informant data (e.g., Kerr et al., 2007), correlations between parent- and teacher-rated behaviours were low (only .11 (T1) and .17 (T2) for internalizing behaviour and .30 (T1) and .36 (T2) for externalizing behaviour). The magnitudes of these correlations, specifically for children's internalizing behaviour, were too low to aggregate the scores into one mean score. Moreover, from a theoretical point of view, it can even be questioned whether it should be the aim to aggregate caregiver and parent ratings of children's socio-emotional behaviours. Specifically, do we expect that children's behaviour in the home setting (primary source for parent reports) is strongly related to children's behaviour in the child care setting (primary source for caregiver reports)? As mentioned above, possible alternative explanations for the concurrent association between the amount of time in daycare and caregiver-rated externalizing behaviour are that children who spend more time in child care feel more at ease in the child care setting or that caregivers have the opportunity to observe low-frequency externalizing behaviours. More qualitative caregiver interviews might shed led on the validity of these interpretations. In this light, it is also important to mention that the absolute levels of most children's externalizing behaviour could still be typified as falling within the normal range.

A fifth, related issue is that the identified main and interaction effects were small in size. This could be due to our quite conservative residualized change models, with a relatively small time interval of only 1 year between T1 and T2. In addition, issues with statistical power and measurement error are amplified when investigating interaction effects, especially when the variance in the predictor and outcome variables is somewhat restricted (McClelland & Judd, 1993; Whisman & McClelland, 2005). This was the case for the variance of our quality indicator (M = 5.00, SD = 0.59), also in comparison to another study using the CLASS-Toddler (La Paro, Williamson, & Hatfield, 2014), although not in comparison to studies using the CLASS pre-K (e.g., Burchinal, Vandergrift, Pianta, & Mashburn, 2010; Hamre, Hatfield, Pianta, & Jamil, 2014). Also, the BITSEA showed skewed distributions with means ranging between 1.50 and 1.85 for internalizing behaviour and between 2.04 and 2.24 for externalizing behaviour, with a possible range from 1 to 5.

The fact that we still found effects, however, even with these quite conservative models and the somewhat restricted variance in predictor and outcome variables highlights the importance of our findings. Furthermore, child development is multi-determined, which makes it unlikely to find large associations with early child care (Lamb & Ahnert, 2006), especially when children go on average two to three days a week. Finally, as child care is becoming a normative experience for young children in many Western countries, we agree with and reiterate the points made by Vandell et al. (2010): "Small effects distributed over many people may have cumulative influences … children without child-care experience may be influenced by their classmates with early child care."

Besides these remarks and limitations, this study makes several noteworthy contributions to the field of early child care research. As noted above, in other studies, the amount of child care and quality indicators did not always reflect the same child care experience (e.g., McCartney et al., 2010; Votruba-Drzal et al., 2004). In our study, we only took into account the hours spent in child daycare, which was the setting for which we had quality assessments. The second strength of this study is that we used a large Dutch sample with high variation in the experienced amount of daycare, extending the knowledge base on the impact of child care that has been primarily conducted in the United States. As we should be careful with generalizing results from U.S.-based child care studies to other countries, we also should be careful with generalizing results from the current study to the United States and other international settings. We hope that other large child care studies throughout the world will extend our results by further investigating combined effects of the amount and quality of child care in different child care systems and with children from varying

(socioeconomic) backgrounds. In this way, we can perhaps identify more universal, and more system- and culture-specific mechanisms within the associations between the amount of child care and children's socio-emotional development.

5 | CONCLUSION AND PRACTICAL IMPLICATIONS

Both in science and public debate, there is still considerable discussion about whether high amounts of child care have a negative or positive influence on children's socio-emotional development (e.g., McCartney et al., 2010; Zachrisson, Dearing, Lekhal, & Toppelberg, 2013a). Results from the current and other studies (e.g., Votruba-Drzal et al., 2004; Yamauchi & Leigh, 2011), however, suggest that this focus on negative or positive influences of the amount of child care is too simplistic. Instead, research should focus on the interactions between the amount and quality of child care for understanding children's socio-emotional development. The results in this study indicate that in a relatively high SES, Dutch sample, a high amount of daycare is positively related to children's behavioural development as experienced by parents, but only when child daycare quality is high. As mentioned before, future studies should further illuminate these findings by investigating in large child care studies throughout the world the role of differences in SES. Moreover, studies should acknowledge the diverging perspectives that parents and caregivers can have on children's behaviour, as children behave differently in the group or classroom versus the home-environment. Finally, the findings from the current study need to be replicated in samples with more variability in child care process quality and children's outcomes to extend and examine the robustness of the current findings.

The two main findings from this study, (a) that high-quality daycare is related to more social competence in the daycare centre and (b) that high amounts of daycare are relate to less externalizing behaviour at home when daycare quality is high, are important from a policy perspective, especially in light of the alarming finding that child care process quality in the Netherlands has steadily decreased between 1995 and 2009 (Helmerhorst et al., 2014; Vermeer et al., 2008). Intervention strategies and policies can benefit from this knowledge by investing in high-quality child care, also for children from relatively high SES families. Moreover, policymakers should not pose high amounts of child care as a risk factor; when high-quality child care is assured, high amounts of child care might even be an opportunity for children's positive behavioural development.

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