Early Childhood Research Quarterly 62 (2023) 102–114

Contents lists available at ScienceDirect

Early Childhood Research Quarterly

journal homepage: www.elsevier.com/locate/ecresq

Comparing center-based with home-based child care: type of care moderates the association between process quality and child functioning

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ARTICLE INFO

Article history:
Received 24 December 2020
Revised 14 July 2022
Accepted 28 July 2022

Keywords:
Early childhood education and care (ECEC)
center-based child care
home-based child care, teacher-child relationship
social-emotional functioning
well-being

ABSTRACT

This study compares process quality and child functioning in Dutch center-based care and home-based care and explores the role of the dyadic caregiver-child relationship. Participants in this study included 228 children from 74 locations (154 attending center-based child care, 74 home-based child care; mean age 2.5 years). The level of emotional and behavioral support and caregiver-child closeness was higher in home-based care than center-based care, whereas quality of the physical environment was higher in center-based child care. Children's well-being was higher and levels of problem behavior were lower in home-based care compared to center-based care. The caregiver-child relationship was related to a higher level of well-being and less problem behavior. Process quality was more strongly related to children's functioning in home-based child care compared to center-based child care. The dyadic relationship quality is an important element of the care ecology of preschool children and predicts child functioning in both home-based and center-based care.

1. Introduction

Early childhood education and care (ECEC) has become a part of everyday life for many young children all over the world. Full-day nonparental child care is, after the home setting, the second most important environment in which children from various countries develop in their early years (Lamb & Ahnert, 2007). Child care in the early years typically comprises either center-based child care or home-based child care (OECD, 2017).

1.1. Quality of center-based and home-based child care

The global quality of center-based child care and home-based child care is, on average, at a medium level in various countries (Eckhardt & Egert, 2020; Vermeer, van IJzendoorn, Cárcamo, & Harrison, 2016). The mean global quality of center-based child care is adequate, as the meta-analysis of Vermeer et al. (2016); $M = 3.96$) showed, which summarized findings from 72 studies with use of the Environmental Rating Scales (ERS). A recent meta-analysis of 37 studies of the global quality of home-based child care, measured by ERS, also reported adequate quality on average (Eckhardt & Egert, 2020; $M = 3.78$).

Studies with direct comparisons between the global quality of center-based and home-based child care have revealed important differences in structural characteristics and process quality (Dowsett, Huston, Imes, & Gennetian, 2008; Groeneveld, Vermeer, van IJzendoorn, & Linting, 2010; Iruka & Forry, 2018; Li-Grining & Coley, 2006; National Institute of Child Health and Human Development [NICHD], 2004; Porter et al., 2010). Related to structural characteristics, group size and child-staff ratio are larger in center-based care than home-based child care, and caregivers (throughout this article "caregivers" refer to staff members who care for children in a center- or home-based setting) in center-based care often have higher levels of education and training compared to home-based child care (Dowsett et al., 2008; NICHD, 2004). Finally, center-based child care, where the physical environment of the location is exclusively designed for children, generally provides children with more space, toys and materials than home-based child care (Dowsett et al., 2008; Li-Grining & Coley, 2006). With regard to process quality, findings from the literature are mixed. Whereas some studies reported a higher level of process quality in center-based care compared to home-based

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https://doi.org/10.1016/j.ecresq.2022.07.017

studies (Bigras et al., 2010; Dowsett et al., 2008; Li-Grining & Coley et al., 2006; Porter et al., 2010), other studies reported the opposite pattern (Groeneveld et al., 2010).

1.2. Child functioning in center-based and home-based child care

Center-based child care attendance is in some studies associated with less favorable social-emotional outcomes than home-based child care, although differences are small (Burchinal, 1999; Coley, Votruba-Drzal, Miller, & Koury, 2013; Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007; NICHD, 2003; Vandell, 2004; Vermeer & van IJzendoorn, 2006). In addition, the evidence is equivocal, because other studies did not find an association between type of care and children's social-emotional development (Gordon, Colaner, Usdansky, & Melgar, 2013; Votruba-Drzal, Coley, & Chase-Lansdale, 2004).

Comparative studies from the structure-process-outcome paradigm (see NICHD, 2002b) have investigated differences in child functioning taking into account the structural characteristics and process quality of both types of child care. As expected, process quality is positively related to children's cognitive and social-emotional development in both center-based and home-based child care (Loeb, Fuller, Kagan, & Carrol, 2004; Votruba-Drzal et al., 2004). Groeneveld et al. (2010) found that caregiver sensitivity in home-based care - but not in center-based care - was positively associated with children's well-being. Also, Iruka and Forry (2018) found associations between child care quality and children's preschool and kindergarten academic skills among children in home-based care but not center-based care. These findings suggest that process quality has different relationships with children's outcomes in home-based vs center-based care.

Comparative studies of center-based vs home-based care have included different background characteristics of children and their families in their design. The child and family populations may be different in center-based and home-based child care and, hence, taking into account these several variables in the analysis deserves attention in comparative studies. Gender, age, and SES are often used as basic demographic covariates, generally complemented with the quantity of child care (e.g., Coley et al., 2013; NICHD, 2003; Peng & Robins, 2010). Child temperament and parenting stress are usually not included as a covariate, although they predict child functioning as well (e.g., Belsky & Pluess, 2012; Boyce & Ellis, 2005). High parenting stress is an important environmental risk variable at family level that has been associated with problem behaviors among children (Neece, Green, & Baker, 2012).

1.3. The role of the caregiver-child relation

Various studies within the structure-process-outcome paradigm in ECEC research (e.g., NICHD, 2002a) have traditionally included observational measures to chart the global quality of the child care environment, often complemented with a measurement of the quality of the interactions between caregivers and children. Observational measures like ERS scales and interaction measures (e.g., CLASS) provide indications at group level, which have a modest association with child outcomes (Perlman et al., 2016).

Although a broad range of quality dimensions is captured with widely used quality measures at group level, the quality of the relationship between a caregiver and an individual child, at a dyadic level, has less often been included. There is ample research in the school setting that has identified the supportive role of affective student-teacher relationships (Roorda, Koomen, Spilt, & Oort, 2011). Supportive student-teacher relationships promote student adjustment (Hamre and Pianta, 2001; Lee & Bierman, 2015), social skills (Jeon et al., 2010; Lippard, La Paro, Rouse, & Crosby, 2018), and academic achievement (Hamre and Pianta, 2001; Lippard et al., 2018); in fact, this relationship was stronger than the contribution of emotional support at classroom level. Studies have shown that the dyadic relationship can also be reliably measured in a child care context with caregivers and children (e.g., Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Fukkink, Sluiter, Gevers Deynoot-Schaub, & Helmerhorst, 2019; Lippard et al., 2018; Westerberg, Newland, & Mendez, 2020), similar to the measurement of the teacher-child relationship in elementary school. Taking into account the caregiver-child relationship complements traditional measures of process quality and provides a richer description of children's individual child care experiences.

1.4. Dutch center-based and home-based child care

In the Netherlands, the Dutch Child Care Act includes the provision of full-day ECEC services to children in center-based child care (343,000 children, 50% of the Dutch population of 0–4 years old) and home-based child care (64,000 children, 9% of 0–4 years old) (2020). Additionally, public prekindergarten facilities, or playgroups, offer child care for children from 2–4 years. All provisions of ECEC are subsidized by the government. Many Dutch parents choose center-based care because it offers their child ample opportunities for peer play in relatively large groups. In addition, the large teams of professional staff ensures continuous care during holidays, which is attractive to parents. Other parents opt for home-based care, because it offers their child a home-like, small-scale setting with a relatively small group of children (Intomart, 2011). Specifically, a child care home consists, on average, of 3.71 children (vs 11.1 in center-based care) with a maximum child-caregiver ratio of 1:5 (vs 1:8 in center-based care, depending on the age composition of the center; Slot et al., 2019). Additionally, home-based care offers a more flexible service to parents than center-based care, which follows the 9-to-5 working hours of most working parents.

1.5. Present study

The differences in structural characteristics between center-based child care and home-based child care, including group size and caregiver stability, may be related to changes in the magnitude of the relationship between process quality (global process quality, caregiver-child interaction, and dyadic caregiver-child relation) and developmental outcomes for children. Figure 1 shows this basic conceptual framework that guided the present study, which is derived from the general structure-process-outcome paradigm. In this study, we focused on multiple aspects of children's social-emotional functioning, including externalizing- and internalizing behavior problems, social-emotional strengths, and well-being, focusing on discrete skills within social-emotional domain to understand a child's overall social-emotional functioning (Campbell et al., 2016).

The first goal of this study is to compare process quality and social-emotional functioning of children in Dutch center-based care and home-based care while taking into account basic demographic covariates (i.e., gender and age of the child, family level of income), the quantity of child care, child temperament, and parenting stress. Second, we explored whether process quality has a different impact on children's outcomes in center-based vs home-based care. The research questions are as follows:

1) Are there differences in process quality and caregiver-child relationships between center-based and home-based child care in the Dutch context?
2) Are there differences in aspects of social-emotional functioning between children in center-based and home-based child care?

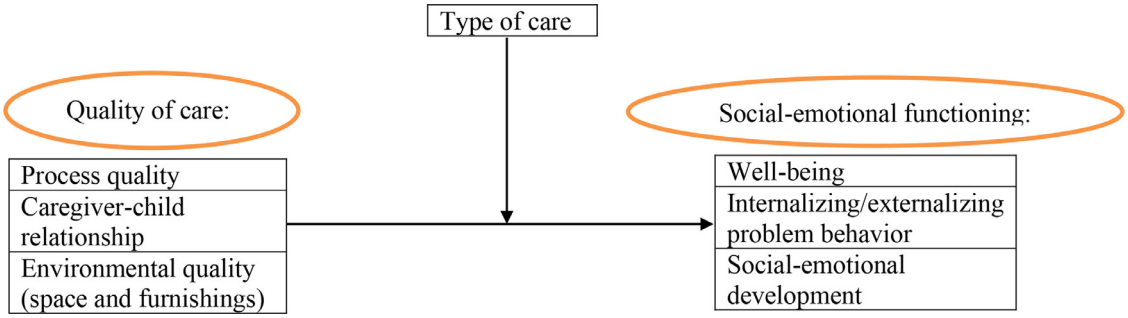

Fig. 1. Conceptual framework: moderating effects of quality and type of care on social-emotional functioning.

3) Are there differences in social-emotional functioning related to process quality at classroom level and the caregiver-child relationship at dyadic level?
4) Is the relation between children's social-emotional functioning and process quality at classroom level and the caregiver-child relationship at dyadic level moderated by the type of child care?

2. Method

2.1. Participants

This study reports data that were collected as part of the first wave of the longitudinal GROWTH-CURVE study (GROWTH-CURVE, Childcare United in Research of Vantage Effects). Data were collected from children, their parents, and their caregivers. Participants in this study included 228 children. There were 154 children from 44 child care centers (M = 3.73, SD = 0.79), and 74 children from 33 child care homes (M = 2.38, SD = 0.68). Children (50% girl) were aged 21 to 40 months at time of the ECEC (in this article ECEC refers to both child care centers and home-based child care) visit (M = 30.15, SD = 3.77). Most of the children (91.2%) had a at least 1 parent born in the Netherlands.

Parents (N = 193, 88.1% female) who completed the questionnaire were aged 25–50 years (M = 34.83, SD = 4.51) at time of the ECEC visit, they were biological parents of the child (100%), and most of them were living with the other biological parent of the child (92.7%). Parents were highly educated, with 3.1% having finished lower vocational education (i.e., elementary- or high school), 23.8% having finished intermediate vocational education (i.e., community college or equivalent), and 73.1% having finished higher vocational education or university. Net monthly household income was between middle and upper-middle income for 49.0% of families (between 2150 and 4300 euros) and upper-middle to high income for 41.8% of families. Only 9.2% of families had a low household income. These attributes of the children and their families are comparable to parents and children in general Dutch ECEC settings (van den Brakel, Portegijs, & Hermans, 2020). Filling out a parent questionnaire was voluntary. Children (N = 35, 15%) of parents who did not complete a parent questionnaire showed no significant differences in age, $F(1, 226) = 2.00$, $P = 0.16$, or gender $\chi^2(1) = 1.65$, $P = 0.20$.

Caregivers (N = 94) who provided data on child behavior were all women (100%). Most of the caregivers were born in the Netherlands (92.6%) and were Dutch native speakers (95.7%). Regarding caregivers' educational levels, 4.3 percent of caregivers had completed lower vocational education, 74.5% finished intermediate vocational education, and 21.3% finished higher vocational education. Years of work experience in child care varied from 0 to 46 years (M = 15.04, SD = 8.80). The questionnaire was completed by the caregiver who had the most contact with the child; consequently, multiple caregivers per child care center could provide data on child behavior. Children (N = 40, 18%) of caregivers who did not complete a caregiver questionnaire were, on average, older, $F(1, 226) = 4.84$, $P = 0.03$. There were no significant differences for gender of the child, $\chi^2(1) = 1.00$, $P = 1.00$.

2.2. Procedure

Participants were recruited through 2 national Dutch ECEC organizations for center-based care and 3 national home-based child care bureaus, each with locations spread throughout the Netherlands. The locations had to include a minimum number of 4 (center-based child care) or 2 children (home-based child care) in the intended age range (24 to 36 months); the children had to be present on the same day; they had to have attended an ECEC setting at least 2 days a week over the previous 2 months; finally, the location had to offer their services for at least a year. We invited 60 child care centers through their organization, of which 44 (73.3%) participated. For the recruitment of child care homes, we followed a different procedure. In the Netherlands, childcare homes are affiliated with special agencies (in Dutch: "gastouderbureaus"). We sent out a call to participate in this study to which home-based care providers could respond when they met criteria related to the age of children. Because it was unclear how many child care homes met our criteria beforehand, response rates could not be determined for this group. Our procedure resulted in the participation of 33 home-based care providers. A total of 77 child care centers/homes across 74 child care locations participated.

Data collection started October 2018 and ended April 2019. A trained observer visited each child care center/home for an entire day. To prevent systematic differences between location types, we followed a standard filming procedure, equal in both types of child care. The observer filmed the caregivers interacting with the children during 4 segments of twenty minutes each that included activities such as play, lunch/snack, and transitions. In addition, the preselected children were filmed for 1 minute at 3 different, randomly selected points in time, which was identical for center- and home-based locations during the day. After filming, when most of the children took their nap, the research assistant conducted observations for coding the quality of the physical environment (ECERS-R/FCCERS-R subscale space and furnishings). In addition to the observations, digital questionnaires were sent to the parents and caregivers prior to the visit.

Parents received compensation via a professional photograph of their child at the ECEC setting. Caregivers in center-based child care were offered extra hours to fill in questionnaires, and caregivers in home-based child care received a 50-euro gift voucher or compensation via their home-based child care organization. Active informed consent was obtained from caregivers and parents of all the children present at the day of visit. The study has been approved by the Ethics Committee of the Faculty of Social and Behav-

ioral Sciences of the University of Amsterdam (file number 2018-CDE-9262).

2.3. Measures

2.3.1. Child care process quality

Child care process quality was measured using the Classroom Assessment Scoring System (CLASS) Toddler (La Paro, Hamre, & Pianta, 2011). We used the *Emotional and Behavioral Support* (EBS) and *Engaged Support for Learning* (ESL) scale. The EBS domain consists of 5 dimensions: *Positive climate, Negative climate, Teacher sensitivity, Regard for child perspectives*, and *Behavioral guidance*. The ESL domain comprises of 3 dimensions: *Facilitation of learning and development, Quality of feedback*, and *Language modeling*. The CLASS measure is initially designed to assess quality in center-based child care, but the observation protocol can be modified for use in home-based settings (Hamre, Goffin, & Kraft-Sayre, 2009). The CLASS focuses on adult-child interactions in a group setting, and has been used in studies of both center-based and home-based child care in different countries (e.g. Perren, Frei, & Herrmann, 2016; Thorpe et al., 2020). Prior to data collection, research assistants were trained as CLASS observers by an Affiliate CLASS Trainer. After oral and written instructions, assistants completed an online reliability test by scoring 5 video clips. Observers passed the reliability test when dimension scores reached within 1 point agreement of 80% with the online Teachstone certification program. Observers rated all dimensions using a 7-point rating scale, with 1 and 2 reflecting a low score; 3, 4 and 5 reflecting a midrange score; and 6 and 7 reflecting a high score. Each dimension is based on behaviors observed across 4 cycles of twenty minutes. The scores are averaged across the cycles to yield a classroom score for each dimension, and each domain is an aggregate of the corresponding dimension scores consistent with CLASS-Toddler scoring guidelines. The videos were coded by assistants who did not visit the location. About 23% of the videos were double coded, observers reached within 1 point agreement of 94.4% on average (range 90.6%–100%). Internal consistency was calculated with Cronbach's α of the averaged scores of the 4 observed cycles and was adequate with 0.84 for EBS and 0.75 for ESL, comparable to other studies (e.g., Wysłowska & Slot, 2020).

2.3.2. Caregiver-child relationship

Caregivers rated their relationships with the preselected children using the authorized Dutch translation of Pianta's (2001) Student-Teacher Relationship Scale (STRS; Koomen, Verschueren, & Pianta, 2007), which has been validated for the Dutch context, including its use with preschool children (see Roorda, Verschueren, Vancraeyveldt, van Craeyveldt, & Colpin, 2014). The relationship dimensions as measured by the STRS, which are based on parent–child attachment literature (Koomen, Verschueren, Van Schooten, Jak, & Pianta, 2012), fit both home-based and center-based settings. The STRS measures 3 dimensions of the student-teacher relationship. The *Closeness* subscale reflects the degree of openness, warmth, and security in the relationship according to the teacher/caregiver, and it consists of 11 items (e.g., "I share an affectionate, warm relationship with this child"). The *Conflict* subscale refers to the degree to which a teacher/caregiver perceives teacher-student interactions as negative, discordant, unpredictable, and unpleasant, and it consists of 11 items (e.g., "This child and I always seem to be struggling with each other"). The *Dependency* subscale denotes the developmentally inappropriate degree of overreliance and possessiveness of the child in the relationship, as perceived by the teacher/caregiver, and it consists of 6 items (e.g., "This child is overly dependent on me"). The scores for each item are rated on a 5-point scale ranging from 1 (*not at all applicable*) to 5 (*highly applicable*). Higher scores in the closeness scale and lower scores in the conflict and dependency scale indicate more positive caregiver-child relationships. Internal consistency was adequate with Cronbach's α of 0.77 for Closeness, 0.82 for Conflict, and 0.76 for Dependency.

2.3.3. Quality of space and furnishings

The quality of space and furnishings of center-based child care and home-based child care was measured using the Space and Furnishings subscale of the Early Childhood Environment Rating Scale-Revised (ECERS-R; Harms, Clifford, & Cryer, 1998) or Family Child Care Environment Rating Scale-Revised (FCCERS-R; Harms, Cryer, & Clifford, 2007). The ECERS-R and FCCERS-R share the same format and scoring system (Schaack, Le, & Setodji, 2013). Prior to data collection, research assistants were trained during a session in a center-based child care setting under supervision of an ERS observer. After the training, the assistants discussed their scores with the ERS observer, and consensus scores were made. Subsequently, assistants received the FCCERS subscale and discussed per indicator to what extent the specific indicators corresponded or differed from the ECCERS-R. Scoring is based on observation as well as caregiver responses to questions about aspects of the program that could not be observed. Items are rated on a 7-point scale with descriptors for the scores 1 (inadequate), 3 (minimal), 5 (good), and 7 (excellent). Internal consistencies for the ECERS-R/FCCERS-R space and furnishings (Cronbach's alpha) were 0.67 and 0.61 in this study; these figures are comparable to other studies (e.g., Slot et al., 2019).

2.3.4. Well-being

Children's states of well-being were measured in 2 ways: observed well-being (by independent observers) and reported well-being (by the caregiver and parent).

2.3.4.1. Observed well-being. This was measured by the Well-being Scale of the Dutch Consortium for Child Care Research (de Kruif et al., 2007), which distinguishes pleasure, self-confidence, vitality, and relaxation as indicators. Research assistants were trained by a certified trainer and coders were trained until they reached an absolute agreement of 80% with a consensus score provided by experts. Scores were based on 3 one-minute videos of the preselected child at randomly selected time points at ECEC. Scores were registered on a 7-point scale, ranging from (1) very low well-being (signals of discomfort are clearly present, e.g., crying, screaming) to (7) very high well-being (signals of comfort are clearly present, e.g., enjoyment, smiling). Scores were aggregated across time periods. About 10% of the videos were double-coded. There were 4 coders. One of the 4 coders did all of the double coding (and none of the "regular" coding) for the purpose of calculating the ICC interobserver agreement. ICC estimates were calculated based on a single-score rating, absolute-agreement, 2-way random-effects model. Interobserver agreement was adequate (.86).

2.3.4.2. Children's reported well-being at ECEC. This was assessed with the shortened version of the Leiden Inventory for the Child's Well-being in Day Care (LICW-D, de Schipper, Tavecchio, van IJzendoorn, & van Zeijl, 2004). Caregivers and parents completed this questionnaire. The LICW-D consists of 12 items (e.g., "This child feels at ease with all the professional caregivers"). The scores for each dimension are rated on a 6-point scale ranging from 1 (never) to 6 (always), with higher scores reflecting a higher well-being at child care. Internal consistency was adequate with Cronbach's alpha of 0.87 for the caregiver version and .83 for the parent version.

2.3.5. Social-emotional development

Children's social-emotional development was measured with the Ages and Stages Questionnaire: Social-Emotional (ASQ:SE;

Squires, Bricker, & Twombly, 2002). The ASQ-SE distinguishes 7 domains: self-regulation, compliance, adaptive functioning, autonomy, affect, social communication, and interactions with people. The questionnaires for 24, 30, and 36 months were used, depending on the child's age. The questionnaire was completed by both the parent and the caregiver. The age versions 24, 30, and 36 months consisted of 26, 29, and 31 items, respectively. Examples of items include: "Does your child contact you when a stranger approaches?" and "Does your child look at you when you talk to him?" Parents and caregivers indicated the frequency of the described behavior in their child on a 3-point Likert scale: *usually* (score = 0), *sometimes* (score = 5) and *rarely or never* (score = 10). In addition, parents and caregivers could indicate whether they find the behavior worrying; if so, 5 extra points were added. Higher scores reflect potential problems in social-emotional development, while lower scores suggest that the child's social-emotional behavior is seen as competent by the parents or caregiver. Cronbach's alpha for the caregiver version of 24, 30, and 36 months was 0.66, 0.73, and 0.66 and for the parent version 0.45, 0.63, and 0.67.

2.3.6. Externalizing and internalizing problem behavior

Children's externalizing and internalizing problem behavior was measured with the Child Behavior Checklist / 1½-5 (CBCL / 1½-5) and the Caregiver-Teacher Report Form (C-TRF; Achenbach & Rescorla, 2000). The CBCL was completed by a parent, while caregivers completed the C-TRF. The CBCL and C-TRF are similarly constructed to cover a range of behavioral, emotional, and social function problems. Both questionnaires consist of 99 specific problem items, all of which are rated on a 3-point scale (0 = *not true;* 1 = *somewhat or sometimes true*; 2 = *very true or often true*) based on children's functioning over the preceding 2 months. The C-TRF replaces 17 items relevant to family situations for items specific to the child care center/home situation. The CBCL and C-TRF contain 2 subscales: the Internalizing scale, which includes 36 items representing symptoms of anxiety, depression, and apathy, and the Externalizing scale, which includes 24 symptoms indicative of inattention and aggression. Higher scores on the CBCL and C-TRF indicate that a child displays more problem behavior. Internal consistency was good (α = 0.93 for the CBCL and 0.94 for the C-TRF).

2.3.7. Temperament

Children's temperament was measured with the Early Childhood Behavior Questionnaire Very Short Form (ECBQ-VSF; Putnam, Jacobs, Gartstein, & Rothbart, 2010). The ECBQ-VSF is a 36-item measure that was developed as an abbreviated form of the original ECBQ (Putnam, Gartstein, & Rothbart, 2006). This measure assesses 3 dimensions of temperament: Surgency (e.g., "While playing indoors, how often did your child run through the house?"); Negative Affect (e.g., "While in a public place, how often did your child seem afraid of large, noisy vehicles?"); and Effortful Control (e.g., "When asked to do so, how often was your child able to be careful with something breakable?"). Parents and caregivers indicated the frequency of the described behavior in their child on a 7-point Likert scale: 1 (*never*) to 7 (*always*), with "Does not apply" as additional option if an item was considered not to be relevant for their child. Higher scores indicate higher levels of Negative Affect, Surgency, and Effortful Control. Internal consistency was adequate (Cronbach's α is 0.60 for Surgency, 0.64 for Negative Affect, 0.66 for Effortful Control).

2.3.8. Parental stress

Parental stress was measured with the Dutch abbreviated version of the Parenting Stress Index (PSI; de Brock, Vermulst, Gerris, & Abidin, 1992), which assesses the parent's perceived stress in parenting. The PSI consists of 25 items (e.g., "Parenting with this child is harder than I thought it would be"). Items are rated on a 6-point Likert scale, ranging from 1 (*completely disagree*) to 6 (*completely agree*). Internal consistency was high (Cronbach's α: 0.91).

2.3.9. Background characteristics

In the questionnaire, we added questions related to demographic characteristics, including age, country of birth, language spoken at home, highest level of parents' education, type of education, family level of income, and quantity of child care.

2.4. Analysis

Multi-level regression analyses were used with the Mixed procedure in SPSS to take into account the hierarchical nature of the data with children (level 1) nested within child care centers/homes (level 2). Because child care center/home level and location almost coincided, no separate level was created for location. The caregiver level mostly overlapped with center/home level, therefor we created no separate level for caregivers as well. To understand children's overall social-emotional functioning, focusing on discrete skills within each of the social, emotional, and cognitive domains is necessary (Campbell et al., 2016), and, hence, we used separate multi-level regression analyses for multiple aspects of children's social-emotional functioning. For all multi-level analyses, a random intercepts model was selected.

We estimated 2 models for each outcome measure. Model A involves a comparison between children's social-emotional development, internalizing and externalizing behavior, and observed and reported well-being in center-based care and home-based care. The ASQ:SE, CBCL and C-TRF, the Well-being scale and LICW-D were the dependent variables with type of child care (center-based care or home-based care) as predictor. Covariates were child gender, child age, days of care per week, ECBQ NA, ECBQ Sur, ECBQ EF, level of income of parents, and parental stress. We estimated Model B to test whether there were differences in aspects of social-emotional functioning related to process quality at classroom level and the caregiver-child relationship at dyadic level. This model involves a comparison between children's functioning in child care with the quality measures as predictor (CLASS Toddler subscales, STRS subscales, and ECERS-R/FCCERS-R space and furnishings). Covariates were type of care, child gender, child age, days of care per week, ECBQ NA, ECBQ Sur, ECBQ EF, level of income of parents, and parental stress. Model fit was evaluated with the log-likelihood test and "explained" variance.

We conducted moderation analyses to assess whether type of care moderated the relationship between the predictor (CLASS subscales, STRS subscales, and ECERS-R/FCCERS-R space and furnishings) and child functioning with PROCESS version 3.4 (Hayes, 2018). All continuous variables that define products were mean-centered. Moderation analysis was conducted using a bootstrapping procedure (5000 bootstrap samples) to estimate the indirect, direct, and total effects. A preliminary test indicated no multicollinearity (VIF between 1.07 and 2.60 for all independent variables). We used the Benjamini-Hochberg procedure (Benjamini & Hochberg, 1995) to reduce the risk of Type 1 error. The false discovery rate for the analyses was set at q = 0.05, except for the tested moderation analyses where q = 0.10 was used. With our moderation analyses we were willing to accept this higher false discovery rate, given widely acknowledged challenges to detect interaction effects in field studies (McClelland & Judd, 1993). Coefficients that remained significant after adjusting for multiple comparisons are printed in bold.

Missing data for the study variables ranged between 0% and 23.2%, and was missing completely at random (Little's MCAR test, χ^2 = 378.77, P= 0.067). To address missing data, we used single imputation via expectation maximization.

Table 1
Descriptive characteristics of the sample.

	Total sample $N = 228$		Center-based $N = 154$		Home-based $N = 74$		Difference test
	Range	% / *M* (*SD*)	Range	% / *M* (*SD*)	Range	% / *M* (*SD*)	
Child & family characteristics							
Gender (% girl)	-	50%	-	54.5%	-	40.5%	3.92[a]*
Age child (in months at visit)	21 - 40	30.15 (3.77)	23 – 40	30.48 (3.75)	21 - 37	29.45 (3.72)	3.82[b]
Born in NL parent (%)	-	91.2%	-	92.1%	-	89.6%	0.34[a]
Educational level (% College or more)	-	73.1%	-	73.8%	-	71.6%	0.10[a]
Income level (% high)	-	42%	-	45.2%	-	35.8%	1.59[a]
Age parent (at visit)	25 - 50	34.83 (4.51)	25 – 50	35.29 (4.65)	25 - 46	33.99 (4.13)	3.70[b]
Single parent (% 2-parent families)	-	92.7%	-	90.5%	-	97.0%	3.39[a]
Parental stress (PSI)	25 - 89	43.87 (13.87)	25 – 85	43.28 (13.55)	25 - 89	44.92 (14.48)	0.58[b]
Quantity child care (days per week)	1 – 5	2.55 (0.78)	1 – 5	2.63 (0.83)	1 – 4	2.42 (0.68)	3.16[b]
ECBQ Negative Affect	1.42 – 5.08	2.57 (0.59)	1.42 – 4.33	2.56 (0.57)	1.42 – 5.08	2.58 (0.62)	0.06[b]
ECBQ Surgency	3.75 – 6.58	5.11 (0.58)	3.75 – 6.58	5.16 (0.56)	3.91 – 6.42	5.01 (0.58)	3.01[b]
ECBQ Effortful Control	3.25 – 6.33	5.10 (0.54)	3.25 – 6.33	5.12 (0.55)	3.67 – 6.00	5.06 (0.54)	0.50[b]
Caregiver characteristics	Total sample $N = 94$		Center-based $N = 63$		Home-based $N = 31$		Difference test
Gender (% woman)	-	100%	-	100%	-	100%	-
Born in Netherlands (%)	-	92.6%	-	93.7%	-	90.3%	0.33[a]
Educational level (% college or more)	-	21.3%	-	20.6%	-	22.6%	0.05[a]
Work experience in child care (yrs)	0 – 46	15.04 (8.80)	1 – 46	15.16 (9.38)	0 - 35	14.81 (7.65)	0.03[b]

[a] = = χ^2,
[b] = *F* value,
* $p < .05$.

Table 2
Social-emotional functioning of the child.

	Total sample ($N = 228$)		Center-based ($N = 154$)		Home-based ($N = 74$)		*F* value
	Range	*M* (*SD*)	Range	*M* (*SD*)	Range	*M* (*SD*)	
Well-being (WB) observed	2.33–6.00	4.38 (0.56)	2.33–5.67	4.29 (0.56)	3.67–6.00	4.57 (0.52)	11.85***
WB questionnaire parent	44–72	61.50 (6.05)	44–72	61.17 (6.18)	44–72	62.28 (5.77)	1.66
WB questionnaire caregiver	38–72	62.61 (7.03)	38–72	60.71 (6.74)	46–72	65.88 (6.32)	25.26***
CBCL internalizing	0–25	6.02 (4.82)	0–21	5.77 (4.81)	0–25	6.49 (4.84)	0.94
CBCL externalizing	0–33	11.29 (7.00)	0–31	11.07 (7.18)	0–33	11.70 (6.70)	0.34
TRF internalizing	0–30	5.42 (5.24)	0–23	5.78 (5.05)	0–30	4.79 (5.55)	1.50
TRF externalizing	0–58	10.63 (9.00)	0–58	11.62 (9.69)	0–28	8.92 (7.42)	3.82
ASQ:SE parent	0–5.52	0.91 (0.72)	0.16–3.55	0.88 (0.59)	0–5.52	0.97 (0.92)	0.80
ASQ:SE caregiver	0–5.32	1.00 (0.79)	0–5.32	1.15 (0.83)	0–3.10	0.75 (0.66)	10.76***

* $P < 0.05$,
** $P < 0.01$,
*** $P < 0.001$.

Table 3
Quality of center-based vs home-based child care.

	Center-based		Home-based		Difference		
	Range	*M* (*SD*)	Range	*M* (*SD*)	*F* (*df*)	*P*	η^2
At center level							
CLASS total score	2.96–5.03	4.00 (0.49)	2.78–5.11	4.31 (0.61)	6.07 (74)	0.016	0.08
CLASS emotional and behavioral support	4.30–6.70	5.44 (0.54)	4.15–6.60	5.84 (0.62)	8.94 (74)	0.004	0.11
CLASS engaged support for learning	1.42–3.75	2.57 (0.56)	1.17–4.17	2.79 (0.72)	2.31 (74)	0.133	0.03
ECERS-R/FCCERS-R space and furnishings	2.86–6.57	4.77 (0.95)	1.80–5.80	4.06 (1.00)	9.50 (71)	0.003	0.12
At caregiver-child level							
STRS closeness	26–55	46.71 (5.15)	36–55	49.54 (4.69)	13.17 (175)	0.000	0.07
STRS dependency	6–26	12.28 (4.48)	6–28	12.09 (4.58)	0.07 (175)	0.794	0
STRS conflict	11–41	16.46 (5.58)	11–40	15.48 (5.44)	1.31 (175)	0.254	0.01

3. Results

Descriptive background information for children, parents, and caregivers of the total sample and per type of care are presented in Table 1. Participants from the 2 types of child care predominantly shared background characteristics with 1 exception. There was a higher percentage of girls in center-based child care than in home-based child care, $\chi^2(1, N = 228) = 3.92$, $P = 0.048$.

The descriptive statistics for all outcome- and quality variables are presented in Tables 2 and 3. Observed well-being was significantly higher for children in home-based child care, $F(1, 211) = 11.85$, $P = 0.001$. Caregiver-reported well-being was also higher for children in home-based child care, $F(1, 175) = 25.26$, $P < 0.001$. Caregivers also reported more favorable scores for children's social-emotional development in home-based child care, $F(1, 175) = 10.76$, $P = 0.001$. No significant differences were found for the other outcome variables (see Table 2; see Appendix A for zero-order correlations between these variables). CLASS EBS and ESL were not significantly correlated with any of the STRS subscales (CLASS EBS with STRS Closeness, Dependency, Conflict $r(175) =$ -

Table 4
Multilevel model-A: relations between child characteristics and child functioning (N = 228).

	WBobs	WBqp	WBqc	CBCLint	CBCLext	TRFint	TRFext	ASQp[d]	ASQc[d]
Fixed model									
Intercept	1.96 (0.66)**	53.63 (6.46)***	75.77 (7.10)***	-7.74 (4.31)	10.28 (5.75)	-7.28 (5.68)	4.76 (9.81)	-0.38 (0.70)	1.83 (0.85)*
Type of care[a]	**0.25 (0.08)****	**1.89 (0.75)** *	**4.59 (0.95)*****	0.24 (0.49)	-0.02 (0.67)	-0.88 (0.73)	-2.52 (1.23)*	0.09 (0.08)	**-0.43 (0.10)*****
Gender child[b]	0.16 (0.07)*	-0.47 (0.71)	-0.70 (0.76)	0.83 (0.48)	1.64 (0.63)**	1.38 (0.61)*	2.69 (1.08)*	-0.03 (0.08)	0.36 (0.09)***
Age child	-0.01 (0.01)	-0.08 (0.10)	-0.39 (0.11)***	0.11 (0.06)	-0.01 (0.09)	0.27 (0.09)**	-0.12 (0.15)	0.01 (0.01)	-0.01 (0.01)
Days of care p/w	0.04 (0.05)	-0.21 (0.47)	1.72 (0.51)***	0.32 (0.32)	0.24 (0.42)	-0.17 (0.41)	1.67 (0.72)*	0.07 (0.05)	-0.03 (0.06)
ECBQ NA	0.08 (0.07)	-2.44 (0.70)***	-2.20 (0.75)**	3.28 (0.47)***	2.10 (0.62)***	1.83 (0.60)**	-0.59 (1.06)	0.17 (0.08)*	0.20 (0.09)*
ECBQ Sur	0.14 (0.07)*	2.71 (0.67)***	1.67 (0.73)*	-0.56 (0.45)	1.74 (0.60)**	-1.56 (0.58)**	1.13 (1.03)	0.16 (0.07)*	-0.07 (0.09)
ECBQ EF	0.19 (0.08)*	0.69 (0.76)	-1.82 (0.83)*	-0.00 (0.51)	-4.43 (0.67)***	1.56 (0.66)*	-0.17 (1.16)	-0.25 (0.08)**	-0.05 (0.10)
Income parents[c]	0.04 (0.06)	0.29 (0.57)	-0.71 (0.63)	-0.55 (0.38)	-0.05 (0.50)	0.03 (0.50)	-0.16 (0.88)	-0.03 (0.06)	-0.07 (0.08)
PSI	0.01 (0.00)*	-0.00 (0.03)	0.05 (0.03)	0.11 (0.02)***	0.16 (0.03)***	-0.01 (0.03)	0.06 (0.05)	0.02 (0.00)***	-0.00 (0.00)
Work exp. c. yr	0.00 (0.01)	-0.11 (0.05)*	-0.04 (0.05)	0.04 (0.03)	0.09 (0.04)*	-0.01 (0.04)	-0.06 (0.07)	0.00 (0.01)	-0.01 (0.01)
Random model									
R^2	0.14	0.17	0.24	0.53	0.44	0.12	0.09	0.35	0.14
–2LL Null/Full	369.978–	1421.711–	1492.599–	1328.265–	1495.435–	1347.939–	1595.659–	465.884–	485.416–
model-A and	337.725	1380.082	1421.670	1196.681	1325.851	1318.876	1576.116	366.931	453.203
Δ-2LL(Δ*df*=10)	32.253***	41.629***	70.929***	131.584***	169.584***	29.063**	19.543*	98.953***	32.213***

Note. Type of care coefficients that remain significant when adjusting for multiple comparisons are printed in bold.
ASQc = Ages and Stages Questionnaire: Social Emotional caregiver report; ASQp = Ages and Stages Questionnaire: Social Emotional parent report; CBCLext = Child Behavior Checklist externalizing problems CBCLint = Child Behavior Checklist internalizing problems;; ECBQ EC = Early Childhood Behavior Questionnaire Effortful Control; ECBQ NA = Early Childhood Behavior Questionnaire Negative Affect; ECBQ Sur = Early Childhood Behavior Questionnaire Surgency; PSI = Parenting Stress Index; TRFext = Teacher Report Form externalizing problems; TRFint = Teacher Report Form internalizing problems; WBobs = Well-being observed; WBqc = Well-being caregiver report; WBqp = Well-being parent report; Work experience = work experience caregiver in years.
[a] Reference category = home-based.
[b] Reference category = boy.
[c] Reference category = low/middle/upper middle income.
[d] Lower scores on the ASQ = more favorable.
* $P < 0.05$.
** $P < 0.01$.
*** $P < 0.001$.

0.02, -0.01, 0.03, P= 0.82, 0.86, 0.69, respectively, and CLASS ESL with STRS Closeness, Dependency, Conflict $r(175)$ =0.13, 0.00, -0.11, P= 0.08, 0.95, 0.16) and we therefore considered the CLASS and STRS subscales as independent features of process quality in our analyses.

3.1. Differences in process quality and caregiver-child relationships (question 1)

Home-based child care showed significantly higher scores on CLASS EBS, $F(1,74)$ = 8.94, P= 0.004, and STRS Closeness, $F(1, 175)$ = 13.17, P< 0.001, whereas center-based child care showed significantly higher scores on ECERS-R/FCCERS-R space and furnishing, $F(1, 71)$ = 9.50, P= 0.003. Effect sizes (η^2) were medium to high for CLASS EBS and ECERS-R/FCCERS-R (0.11 and 0.12) and medium for STRS Closeness (0.07). There were no significant differences for CLASS Total, CLASS ESL, STRS Dependency, and STRS Conflict (see Table 3); the sample size for the STRS measure (N = 228) is larger than for the CLASS and ECERS-R/FCCERS-R measures (N = 77) and, hence, the statistical power is different for these tests.

3.2. Differences between children in center-based and home-based child care (question 2)

Differences in child functioning between center-based and home-based child care, corrected for child and family covariates, are presented in Table 4. Main effects of the type of care were found for observed well-being, parent-reported well-being, caregiver-reported well-being, and caregiver-reported ASQ:SE. Home-based child care was related to higher levels of observed well-being (B = 0.25, P= 0.003), parent-reported well-being (B = 1.89, P= 0.013), and caregiver-reported well-being (B = 4.59, P< 0.001). Further, home-based caregivers reported more favorable aspects of social-emotional development (B = -0.43, P< 0.001), compared to their colleagues from center-based care.

3.3. Differences in social-emotional functioning related to childcare quality (question 3)

We investigated the relationship between quality of care and child functioning to answer the third research question (see Table 5). Child care quality at the caregiver-child relationship level was related to child functioning for all outcome variables, except for parent-reported externalizing behavior and ASQ:SE. The ELS subscale of the CLASS was not related to child outcomes, whereas the EBS scale was positively related to observed well-being and showed a negative relationship with parent-reported externalizing problem behavior. The ECERS/FCCERS subscale was not related to any measure of child functioning from our study.

3.4. Moderation by type of child care (question 4)

We conducted moderation analyses to answer the fourth research question whether the relationship between quality of care and child functioning is moderated by type of care. A significant moderating effect of type of care on the relation between STRS Closeness and 2 outcome measures was found, i.e., parent-reported well-being (B = -0.57, P< 0.001; B_{center} = -0.06, B_{home} = 0.41), and caregiver-reported well-being (B = -0.53, P= 0.004; B_{center} = 0.14, B_{home} = 0.52), see Table 6. The moderating effect for these outcome variables showed the same pattern (Figure 2): Closeness is more strongly related to child functioning in home-based child care than in center-based care.

Finally, there was a significant moderating effect of type of care on the relation between STRS Conflict and the outcome variable parent-reported internalizing problem behavior (B = -0.46, P< 0.001; B_{center} = 0.01, B_{home} = 0.51), and caregiver-reported internalizing behavior (B = -0.37, P= 0.002; B_{center} = -

Table 5
Multilevel model-B: relations between quality of care and child functioning (N = 228).

	WBobs	WBqp	WBqc	CBCLint	CBCLext	TRFint	TRFext	ASQp[c]	ASQc[d]
Fixed model									
Intercept	2.13 (0.81)**	53.51 (7.53)***	66.85 (8.04)***	1.57 (5.07)	20.07 (6.93)**	-1.18 (6.11)	8.30 (10.91)	-0.56 (0.87)	3.41 (0.90)***
CLASS EBS	0.18 (0.09)*	0.07 (0.77)	0.09 (0.91)	-0.38 (0.52)	-1.42 (0.70)*	-0.12 (0.68)	0.09 (1.29)	0.15 (0.09)	-0.05 (0.09)
CLASS ESL	-0.13 (0.08)	0.93 (0.66)	1.37 (0.79)	-0.18 (0.44)	-0.18 (0.60)	-0.47 (0.60)	-0.14 (1.13)	-0.13 (0.08)	-0.06 (0.08)
ECERS-R/ FCCERS-R	0.01 (0.04)	-0.40 (0.35)	0.13 (0.42)	0.32 (0.24)	0.62 (0.32)	0.06 (0.32)	0.03 (0.59)	0.02 (0.04)	-0.06 (0.04)
STRS Close	-0.00 (0.01)	**0.21 (0.08)****	**0.45 (0.08)*****	**-0.24 (0.05)*****	-0.11 (0.07)	**-0.28 (0.06)*****	0.03 (0.11)	-0.01 (0.01)	**-0.03 (0.01)*****
STRS Dep	**-0.04 (0.01)*****	**-0.49 (0.09)*****	**-0.51 (0.09)*****	0.09 (0.06)	0.01 (0.08)	**0.39 (0.07)*****	**-0.30 (0.12)***	0.01 (0.01)	-0.00 (0.01)
STRS conflict	**0.02 (0.01)****	0.12 (0.07)	0.01 (0.08)	0.06 (0.05)	0.15 (0.07)*	**0.20 (0.06)*****	**1.00 (0.10)*****	-0.01 (0.01)	**0.06 (0.01)*****
Type of care[a]	-0.23 (0.09)*	-0.77 (0.83)	-2.96 (0.96)**	-1.46 (0.56)**	-1.51 (0.76)*	-0.28 (0.72)	1.85 (1.35)	-0.10 (0.10)	0.30 (0.10)**
Gender child[b]	-0.14 (0.07)*	0.43 (0.66)	0.73 (0.67)	-0.70 (0.44)	-1.45 (0.61)*	-1.24 (0.51)*	-1.81 (0.88)*	0.03 (0.08)	-0.32 (0.08)***
Age child	-0.01 (0.01)	-0.11 (0.09)	-0.43 (0.10)***	0.13 (0.06)*	-0.01 (0.08)	0.26 (0.07)***	-0.23 (0.13)	0.02 (0.01)	-0.01 (0.01)
Days of care p/w	0.04 (0.05)	-0.66 (0.45)	1.09 (0.45)*	0.58 (0.30)	0.25 (0.41)	0.29 (0.35)	1.45 (0.60)*	0.10 (0.05)	0.01 (0.05)
ECBQ NA	0.15 (0.07)*	-1.73 (0.67)**	-1.82 (0.67)**	3.25 (0.45)***	1.96 (0.61)**	1.56 (0.51)**	0.16 (0.89)	0.18 (0.08)*	0.26 (0.08)***
ECBQ Sur	0.12 (0.07)	2.25 (0.63)s***	1.02 (0.65)	-0.28 (0.43)	2.14 (0.58)***	-1.14 (0.49)*	1.09 (0.86)	0.16 (0.07)*	-0.06 (0.08)
ECBQ EF	0.15 (0.07)*	0.52 (0.71)	-2.00 (0.73)**	-0.02 (0.48)	-4.52 (0.66)***	1.33 (0.56)*	-1.81 (0.97)	-0.25 (0.08)**	-0.11 (0.09)
Income parents[c]	0.02 (0.06)	-0.11 (0.53)	-1.20 (0.55)*	-0.49 (0.36)	-0.09 (0.49)	0.22 (0.42)	-1.01 (0.74)	-0.00 (0.06)	-0.09 (0.06)
PSI	0.01 (0.00)	-0.03 (0.03)	0.03 (0.03)	0.11 (0.02)***	0.16 (0.03)***	-0.00 (0.02)	-0.02 (0.04)	0.02 (0.00)***	-0.01 (0.00)
Work exp. C. yr	0.00 (0.01)	-0.13 (0.04)**	-0.07 (0.05)	0.04 (0.03)	0.08 (0.04)*	-1.18 (0.04)	-0.12 (0.06)	0.00 (0.01)	-0.01 (0.01)
Random model									
R^2	0.23	0.29	0.43	0.51	0.57	0.40	0.35	0.37	0.39
–2LL Null/Full model-A and	369.978–311.543	1421.711–1343.650	1492.599–1356.265	1328.265–1163.490	1495.435–1305.759	1347.939–1231.751	1595.659–1489.082	465.884–359.810	485.416–376.398
Δ-2LL(Δ*df*=16)	58.435***	78.061***	136.334***	164.775***	189.676***	116.188***	106.577***	106.074***	109.018***[s]

Note. Quality of care coefficients that remain significant when adjusting for multiple comparisons are printed in bold.
ASQc = Ages and Stages Questionnaire: Social Emotional caregiver report; ASQp = Ages and Stages Questionnaire: Social Emotional parent report; CBCLext = Child Behavior Checklist externalizing problems CBCLint = Child Behavior Checklist internalizing problems; CLASS EBS = Classroom Assessment Scoring System Emotional and Behavioral Support scale; CLASS ESL = Classroom Assessment Scoring System Engaged Support for Learning scale; ECBQ EC = Early Childhood Behavior Questionnaire Effortful Control; ECBQ NA = Early Childhood Behavior Questionnaire Negative Affect; ECBQ Sur = Early Childhood Behavior Questionnaire Surgency; E(FC)CERS-R = ECERS-R and FCCERS-R subscale space and furnishings; PSI = Parenting Stress Index; STRS Close = Student-Teacher Relationship Scale Closeness subscale; STRS Conflict = Student-Teacher Relationship Scale Conflict subscale; STRS Dep = Student-Teacher Relationship Scale Dependency subscale; TRFext = Teacher Report Form externalizing problems; TRFint = Teacher Report Form internalizing problems; WBobs = Well-being observed; WBqc = Well-being caregiver report; WBqp = Well-being parent report; Wsork experience = work experience caregiver in years.
[a] Reference category = home-based.
[b] Reference category = boy.
[c] Reference category = low/middle/upper middle income.
[d] Lower scores on the ASQ = more favorable.
* $P < 0.05$.
** $P < 0.01$.
*** $P < 0.001$.

Table 6
Moderating effects of type of child care on the relationship between quality and child outcome.

	WBobs B(*SE*)	WBqp B(*SE*)	WBqc B(*SE*)	CBCL int B(*SE*)	CBCL ext B(*SE*)	TRF int B(*SE*)	TRF ext B(*SE*)	ASQp[b] B(*SE*)	ASQc[b] B(*SE*)
CLASS EBS x Type[a]	0.09 (0.13)	0.36 (1.34)	2.54 (1.49)	0.54 (1.10)	3.85 (1.56)*	-1.66 (1.16)	-1.80 (1.99)	0.01 (0.17)	-0.01 (0.17)
CLASS ESL x Type[a]	0.12 (0.12)	1.74 (1.15)	2.21 (1.27)	-0.00 (0.95)	1.65 (1.36)	-0.69 (1.00)	-0.46 (1.71)	0.13 (0.14)	-0.22 (0.15)
ECERS-R/FCCERS-R x Type[a]	-0.02 (0.08)	0.76 (0.81)	-0.28 (0.91)	-0.23 (0.67)	-0.14 (0.97)	-0.96 (0.70)	-2.61 (1.19)*	-0.17 (0.10)	-0.07 (0.10)
STRS Close x Type[a]	-0.04 (0.02)*	**-0.57 (0.17)*****	**-0.53 (0.18)****	0.21 (0.14)	0.02 (0.21)	0.36 (0.15)*	0.16 (0.25)	0.03 (0.02)	0.04 (0.02)*
STRS Dep x Type[a]	-0.03 (0.02)	0.04 (0.18)	0.09 (0.19)	-0.28 (0.15)	0.05 (0.22)	-0.29 (0.15)*	-0.48 (0.27)	-0.03 (0.02)	-0.02 (0.02)
STRS Conflict x Type[a]	0.02 (0.02)	0.36 (0.15)*	0.21 (0.16)	**-0.46 (0.12)*****	0.01 (0.18)	**-0.37 (0.12)****	0.31 (0.20)	-0.00 (0.02)	0.00 (0.02)

Note. Quality of care coefficients that remain significant when adjusting for multiple comparisons are printed in bold. Predictors are mean centered and no variables are standardized; B = unstandardized regression coefficient; *SE* = standard error of B.
[a] home-based = 0, center-based = 1.
[b] Lower scores on the ASQ = more positive development.
* $P < 0.05$.
** $P < 0.01$.
*** $P < 0.001$.

0.31, $B_{home} = 0.64$), see Tables 5 and 6. The moderation effect (see Figure 3) showed a pattern similar to that of STRS Closeness: Conflict is more strongly related to a child's functioning in the home-based child care setting compared to the center-based child care setting.

4. Discussion

The results of our comparative study show that the level of process quality was higher in home-based child care than center-based care, including emotional support of the caregiver and closeness between the caregiver and individual children at dyadic level. However, the quality of the physical environment was higher in center-based than home-based child care. Children in home-based child care showed more favorable outcomes for social-emotional functioning than children in center-based care across different measures (i.e., observation and questionnaires) and across different informants (i.e., parents, caregivers, and external observers). Finally, the relation between process quality and children's well-being and internalizing problem behavior was moderated by type of child care. Well-being of children was positively related to closeness between caregiver and children in home-based child care

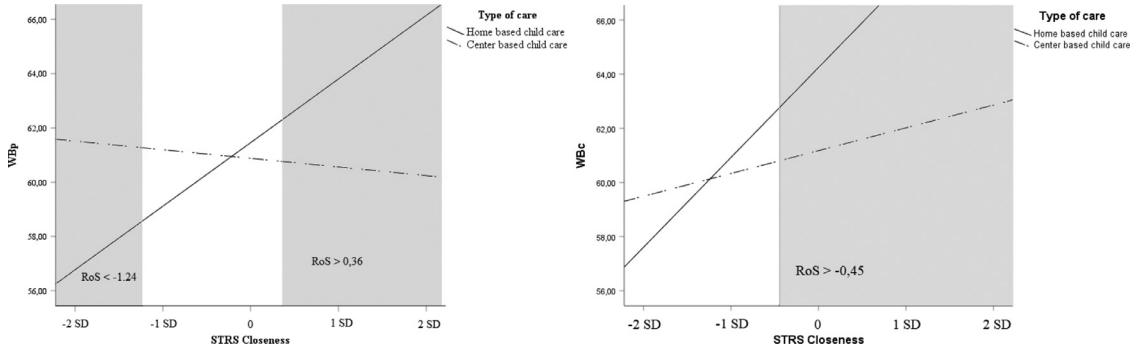

Fig. 2. Moderator effects of STRS closeness and type of care on child functioning.
Note. Region of significance included (RoS; shaded area).

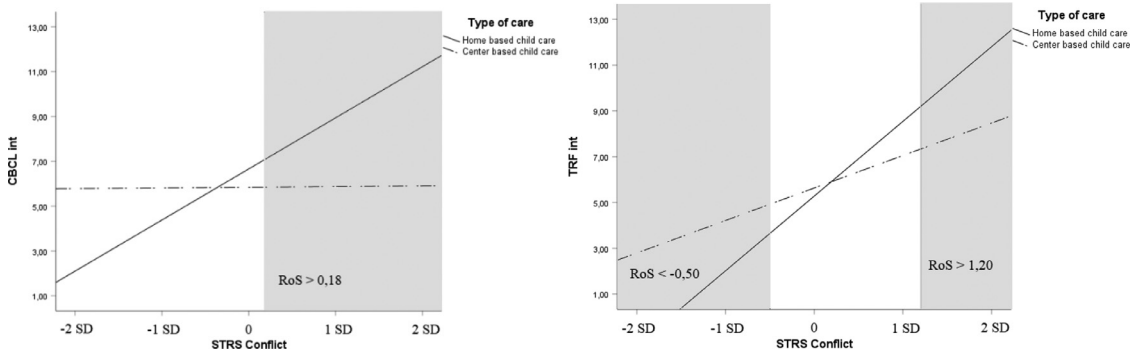

Fig. 3. Moderating effects of STRS conflict and type of care on child functioning.
Note. Region of significance included (RoS; shaded area).

only. A similar pattern was found for levels of conflict: lower levels of conflict in caregiver-child relationships were related to fewer internalizing problems in home-based child care. The child-caregiver relationship seems thus a stronger predictor for socio-emotional functioning in the context of home-based care vs center-based care. The converging results across different measures and different informants speak to the robustness of our findings related to the superior position of home-based child care as opposed to center-based care, acknowledging methodological limitations of comparative studies and the other limitations of our study (see below).

Our findings add to the current knowledge on process quality in center-based and home-based child care. Whereas other studies reported higher levels of process quality in center-based care than home-based care (Bigras et al., 2010; Dowsett et al., 2008; Li-Grining & Coley, 2006; Porter et al., 2010), our findings confirm outcomes of a previous study into Dutch home-based care by Groeneveld et al. (2010). It should be noted that findings in favor of home-based care (including our study) usually involve emotional support from the caregiver. Hence, home-based care seems to provide a warm and nurturing environment for young children, but does not offer higher levels of instructional support (see also Porter et al., 2010).

In line with prior research (e.g Broekhuizen, van Aken, Dubas, & Leseman, 2018; Keys et al., 2013; Lamb & Ahnert, 2007), we found that relationships between child care quality and socio-emotional effects were generally modest; there were also null-effects for some of the socio-emotional outcome measures. In our study, there was limited variance for the CLASS subscales. As a result, establishing a link between this measure at the group level and children's socio-emotional functioning becomes more difficult, although we did find relationships with observed wellbeing and parent-reported externalizing problem behavior. We also found associations between dyadic quality and children's socio-emotional functioning. These findings highlight the importance of high-quality ECEC experiences for children's socio-emotional functioning.

Our finding that children in home-based child care have slightly higher levels of well-being is in line with previous studies (see Burchinal, 1999; Coley et al., 2013; Loeb et al., 2007; NICHD, 2003; Vandell, 2004; Vermeer & van IJzendoorn, 2006); some studies reported nonsignificant differences (Gordon et al., 2013; Votruba-Drzal et al., 2004). Although home-based child care may not offer an optimal physical environment (Dowsett et al., 2008; Li-Grining & Coley, 2006; this study), its favorable structural characteristics like smaller group size, the caregiver-child ratio and caregiver stability may contribute to the relatively high levels of emotional support and closeness in caregiver-child relationships, which in turn influence social-emotional functioning of young children in Dutch home-based care settings. Associations between process quality and children's outcomes may be found for home-based care, because process quality levels are higher (see Burchinal, Vandergrift, Pianta, & Mashburn, 2010) and there was more variation in home-based care in our study, which strengthens correlational patterns.

Our findings underline the importance of the caregiver-child relationship at dyadic level, which moderates children's well-being and problem behavior. Our study expands on previous studies that have shown that supportive student-teacher relationships and classroom emotional support are 2 different dimensions of the classroom context that both promote student social adjustment (see Jeon et al., 2010; Lee & Bierman, 2015; Lippard et al., 2018). Our study shows that closeness and conflict in the caregiver-child relationship and emotional support from the caregiver are important predictors for child functioning of toddlers in child care settings, in particular in home-based care.

Finally, the significant moderating effect of home-based vs center-based care adds new insights to the current small knowledge basis of comparative studies. The findings from

Groeneveld et al. (2010), Iruka and Forry (2018), and our own study suggest that child care quality in home-based care is a stronger predictor of children's development in their early years than in center-based care. A new finding from our study is that not only the relation between process quality (group level) but also the caregiver-child relationship (dyadic level) in home-based care is more strongly related to children's social-emotional functioning compared to center-based child care settings. A possible explanation is that the number of children in child care homes is relatively small compared to child care centers. Possibly, a promotive effect of a positive caregiver-child relationship is "diluted" in case of larger groups of children in center-based care, whereas this relationship is a critical factor in the small groups of children of home-based care. In the Netherlands, there are, on average, 4 children in home-based child care with 1 caregiver, compared to eleven children with 2 caregivers in center-based child care (Slot et al., 2019). Structural characteristics like group size and the caregiver-child ratio influence process quality (Cassidy et al., 2005; NICHD, 2002a) and may have a direct effect on dyadic relationships and caregiver-child interaction. This assumed mechanism may also explain why children in home-based child care are more often securely attached to their caregivers than children in center-based child care (Ahnert, Pinquart, & Lamb, 2006). Our explanation may apply to social-emotional functioning of toddlers only and more research is needed to investigate whether it may extend to the cognitive domain of child development. The fact is that Engaged Support for Learning is in the lower range for both types of child care, and, hence, quality levels may be below a critical threshold to expect a strong, positive relationship with the cognitive domain.

4.1. Strengths and limitations

Strengths of this comparative study were methodological triangulation for children's well-being, multiple informants for our social-emotional functioning measures, and the broad scope of our research design by including measures at child, dyadic, and group level. Another strength is the use of the same instruments for center-based child care and home-based child care, which made it possible to make a comparison between these 2 settings.

Despite these strengths, the study also has its limitations. First, it was challenging to recruit participants from the home-based child care setting. It is possible that we selected home-based child care caregivers that were highly motivated to participate in our study or may otherwise not be representative for the Dutch population. It should be noted, however, that our home-based child care sample showed significant variation of process quality, which enabled us to detect significant relationships with child functioning.

Second, the quality measures from our study allowed a comparison between center-based and home-based care. However, to our knowledge, no studies have been conducted that demonstrated measurement invariance of ECEC quality measures across in a multi-group validation study. Hence, we do not know whether there is configural, metric and/or scalar equivalence for the CLASS, environmental scales (ECERS, FCCERS) and STRS in a center- and home-based setting (Putnick & Bornstein, 2016).

A third limitation is that we should be cautious in generalizing our results. All of the participating child care centers were recruited via 2 national organizations representing a large number of child care centers in different regions of the Netherlands. Relatedly, small independent centers were not included in our sample. Even though the attributes of the children and their families in our sample were comparable to parents and children in Dutch ECEC settings (van den Brakel et al., 2020), there still could be a selection bias.

A fourth limitation is that comparative studies involve intact groups. We controlled for some background characteristics of families and children in our analysis, but important, unobserved traits may not be taken into account in our comparative study.

Lastly, the internal consistency of the ASQ:SE parent version was low for the 24-month-olds questionnaire. This may have contributed to a somewhat lower reliability of this outcome measure, reducing the chance of finding a statistically significant result.

4.2. Implications for practice

In our Dutch sample, we found that home-based child care provided on average higher quality care, and children had higher levels of well-being compared to center-based care. We found a robust relationship between process quality and the caregiver-child relationship with children's social-emotional development. The dyadic caregiver-child relationship is an important aspect of the care ecology of children. Including this dyadic relationship in a multidimensional concept of quality of ECEC settings may help us to gain further insights into the effects of different types of child care in future research. Regarding the professional development of ECEC staff, focusing on the dyadic relationship means that caregivers should become aware of the importance of having sensitive interactions with children at group level and of establishing a dyadic relationship with each individual child in the group (Driscoll & Pianta, 2010; Vancraeyveldt et al., 2015).

Acknowledgments

This work received funding from the Dutch Organization for Health Research and Development [ZonMw grant number 544001003].

Disclosures

None.

Appendix A. Table of correlations of main predictor and variables total sample

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Type (cbc=1)	-																			
2. Gender (girl=1)	.131*	-																		
3. WBobs	-.231**	-.186**	-																	
4. WBqp	-.096	-.054	.161*	-																
5. WBqc	-.355**	-.005	.172*	.457**	-															
6. CBCLint	-.071	-.055	.047	-.298**	-.248**	-														
7. CBCLext	-.043	-.212**	.135	-.088	-.008	.662**	-													
8. TRFint	.092	-.081	-.014	-.315**	-.657**	.326**	.097	-												
9. TRFext	-.145	-.154*	.075	.043	-.161*	.057	.168*	.453**	-											
10. ECBQ NA	-.018	.158*	.086	-.232**	-.160	.524**	.395**	.165*	.041	-										
11. ECBQ Sur	.127	-.149*	.121	.165*	.006	.017	.185*	-.047	.124	.138	-									
12. ECBQ EC	.052	-.145*	.030	.152*	-.103	-.252**	-.550**	.097	-.022	-.228**	.016	-								
13. ASQp	-.066	-.013	.119	-.092	-.031	.389**	.381**	.104	.174*	.357**	.131	-.324**	-							
14. ASQc	.241**	-.204**	-.043	-.112	-.391**	.273**	.222**	.435**	.567**	.108	.035	-.031	.176*	-						
15. CLASS EBS	-.334**	-.053	.193**	.095	.136	-.049	-.110	-.068	-.048	-.050	.072	.064	.055	-.132	-					
16. CLASS ESL	-.160*	-.013	-.026	.136	.188*	-.109	-.113	-.129	-.094	-.040	.047	.010	-.041	-.174*	.623**	-				
17. E(FC)CERS-R	.314**	.028	-.038	-.065	-.096	.004	-.008	.027	.036	.005	-.026	.047	-.001	.032	.125	-.002	-			
18. STRS Close	-.265**	-.004	-.011	.137	.333**	-.196*	-.084	-.250**	-.171*	.075	.060	.030	-.042	-.342**	-.017	.133	-.158*	-		
19. STRS Dep	.020	.026	-.176*	-.297**	-.308**	.110	.005	.401**	.077	.094	-.003	.055	-.019	.131	-.014	.004	-.081	.117	-	
20. STRS Confl	.086	-.070	.088	-.106	-.295**	.193*	.146	.433**	.527**	.025	.050	.074	.059	.468**	.030	-.105	-.007	-.240**	.365**	-

Note. cbc = center-based care (=1; home-based care = 0); boy = 0; * $p < .05$. ** $p < .01$.

CRediT authorship contribution statement

Rosanne M.V. Sluiter: Conceptualization, Methodology, Formal analysis, Investigation, Resources, Data curation, Writing – original draft, Writing – review & editing, Visualization, Project administration, Funding acquisition. **Minne Fekkes:** Conceptualization, Writing – review & editing, Supervision, Funding acquisition. **Ruben G. Fukkink:** Conceptualization, Methodology, Resources, Writing – review & editing, Supervision, Funding acquisition.

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