Do Time in Childcare and Peer Group Exposure Predict Poor Socioemotional

Adjustment in Norway?

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Abstract

Extensive exposure to nonparental childcare during the first 4.5 years of life, has been demonstrated in some American studies to negatively affect children's socioemotional functioning. Data from 935 preschool children who averaged 54.9 (SD=3.0) months of age, from Trondheim, Norway were used to examine whether such negative effects, would emerge in Norway, a country with a different childcare system. The children's externalizing problems and social competence were unrelated to their childcare experience. More time spent in childcare during the first 4.5 years of life and experiencing peer groups of <16 or >18 children predicted greater caregiver-child conflict. The effect sizes were small. The results are discussed in terms of cross-national childcare differences.

Keywords: childcare, child development, preschool children

The majority of children in industrialized countries receive nonparental care during their infant, toddler and/or preschool years. In 2005, 61% of all American children under the age of six received some form of regularly scheduled non-relative-based care, which began during the first year of life for the majority of children (U.S. Department of Education, 2006). In Norway, where the research reported herein was undertaken, 77% of all one- to two-year-old children and 96% of all three- to five-year-old children experienced nonparental, out-of-home childcare in 2009, which was provided either in childcare centers or family daycare homes (i.e., group care offered in private homes), and few children experienced such care at younger ages. These children typically spent 35 to 40 hours or more per week in childcare after the initiation of care, and these high levels of childcare continued until the children entered school at approximately six years of age (Statistics Norway, 2010b).

Discussions regarding the effects of childcare on socioemotional development (particularly when initiated very early in life) have long been characterized by dissent (Belsky, 1986, 2001; Fox & Fein, 1990; NICHD Early Child Care Research Network, 2006). Four decades of research, mostly from the United States and United Kingdom but some from Scandinavia, have yielded few consensual conclusions. Therefore, there is a need to differentiate at least three fundamental parameters of the childcare experience because each parameter may have a distinct effect on children: 1) the quality; 2) quantity (i.e., hours, weeks, and months spent in childcare); and 3) type of care (e.g., center or child minder). However, this distinction is rarely achieved in the extant literature, with the exception of the NICHD Study of Early Childcare and Youth Development (SECCYD). The research reported herein focuses on the effects of quantity and type of

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care on the socioemotional development of children, and the type of care was operationalized in terms of exposure to larger or smaller peer groups.

The main goal of this study was to determine whether findings from the United States (a nation with limited support for parental leave and high-quality childcare) would manifest in a country with different childcare conditions. Because limited Scandinavian evidence is available, we based our hypotheses largely on the findings from the large-scale NICHD SECCYD (NICHD Early Child Care Research Network, 2005). Our first hypothesis was that more time spent in daycare during the first 4.5 years of life would predict less social competence, greater externalizing problems, and more conflict with caregivers. The same predictions formed our second hypothesis with respect to exposure to larger vs. smaller peer groups in childcare.

Effects of Childcare on Socioemotional Development

Although it is generally appreciated that higher quality childcare is associated with more positive functioning, particularly in the realm of cognitive-linguistic development (Burchinal, Peisner-Feinberg, Bryant, & Clifford, 2000; NICHD Early Child Care Research Network, 2000, 2003b), debate remains over the effects of the quantity and type of care on socioemotional development (e.g., externalizing problems, caregiver-child conflict or social competence). Particularly notable are the NICHD SECCYD findings indicating that a large amount of time spent in any type of care during the first 4.5 years of life (and/or extensive exposure to center-based care in particular) predicted somewhat higher levels of externalizing behavior (i.e., disobedience and aggression) prior to entering school (NICHD Early Child Care Research Network, 2003a,

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2006) and during the middle-childhood years (Belsky et al., 2007) and also somewhat increased impulsivity and risk taking during adolescence (Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010). This body of longitudinal work is noteworthy because of its large sample size (>1,000 subjects) and repeated measurements of the distinctive features of the childcare experience (i.e., quality, quantity, and type) at 6, 15, 24, 36 and 54 months of age. Furthermore, the inclusion of a large set of covariates (e.g., parenting, maternal depression and marital status) is an attempt to control for the non-random utilization of childcare (i.e., selection effects).

Although additional evidence that extensive amounts of time spent in childcare is associated with aggression and/or problem behavior has emerged in research conducted in the United Kingdom (Neighbourhood Nurseries Initiative Research Team, 2007), Canada (Côté, Borge, Geoffroy, & Rutter, 2008) and the United States (Loeb, Bridges, Bassok, Fuller, & Rumberger, 2007), not all studies have reported such results (e.g., Anme & Segal, 2004). A study by Borge, Rutter, Côté, and Tremblay (2004) found that aggression was significantly less common when *economically disadvantaged* Canadian children attended childcare than when they did not. Additionally, Côté et al. (2007) observed that (according to maternal reports) children who experienced nonmaternal care in Canada during their first 2.5 years of life, particularly during the first nine months, had a reduced risk of being highly aggressive. This result was observed, however, only for those children whose mothers had *failed to graduate from high school*. Nevertheless, other research has failed to find any quantity-of-care effects, either positive or negative, on socioemotional outcomes (Jaffee, Van Hulle, & Rodgers, 2011; McCartney, Scarr, Rocheleau, Phillips, & AbbottShim, 1997).

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These null findings may stem from the exclusive reliance on maternal reports (e.g., Jaffee et al., 2011). The NICHD SECCYD found that maternal reports of the social functioning of children was less sensitive to childcare effects than caregiver and teacher reports (NICHD Early Child Care Research Network, 2003a, 2006), which led the research team to abandon maternal reports when evaluating the effects of childcare following entry into school (Belsky et al., 2007; Vandell et al., 2010). Parents and teachers produce only modestly correlated assessments of problem behavior (Achenbach, McConaughy, & Howell, 1987; Berg-Nielsen, Solheim, Belsky, & Wichstrøm, 2011) due to the variation in child behavior across home and school settings and the difference in the adults' points of comparison. For example, most parents have not been exposed to the number of children (and the great variation in child behavior) that most caregivers and teachers have experienced.

Scholars have recently become appreciative of the limits of the traditional, covariate-informed regression models that are routinely used to analyze observational data and draw causal inferences. Thus, a variety of econometric approaches (e.g., fixed effects and propensity scoring) are becoming increasingly more common in non-experimental research. On the basis of an early observational report (from the NICHD SECCYD) that linked time in care to elevated levels of externalizing problems (NICHD Early Child Care Research Network, 1998, 2003a), McCartney et al. (2010) pursued several increasingly stringent strategies for evaluating the causation regarding the putative effect of quantity of care on problem behavior in children aged 4.5 years. Although the investigators provided additional evidence linking the time spent in childcare to externalizing behavior, this evidence weakened and then became

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insignificant as increasingly conservative statistical methods were employed. In addition, the study by Jaffee et al. (2011) found similar results that were based only on maternal reports of child behavior.

More recently, Yamauchi and Leigh (2011) used a large-scale Australian dataset with propensity score matching and bias estimation to address the issue of nonrandom childcare selection. This study detected negative effects of early and extensive center-based childcare on the behavioral outcomes of children from a relatively high socioeconomic status. Moreover, the effects remained (but were somewhat attenuated) when the child-adult ratio was included in the equation. A study by Baker, Gruber and Milligan (2008) analyzed a natural experiment created in Quebec, Canada, when a reform introduced subsidized and universally accessible childcare. Rigorous analyses revealed that the increased childcare usage negatively affected the socioemotional development and health of children. These recent and methodologically sophisticated studies may serve to indicate that the use of more stringent research designs does not resolve all of the inconsistencies in the childcare literature. Even when econometrically informed analytical approaches or natural experiments are adopted, evidence remains to suggest that some behavioral risks are associated with the quantity and type of childcare provided.

Timing of Care

Because infants, toddlers and preschoolers have different needs, it is plausible that childcare experiences affect children differently depending on their ages. Loeb et al. (2007) found that the negative effects on social outcomes at the start of kindergarten were

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greater for children who entered center-based care before the age of two. These negative

effects were particularly large for children who entered center-based care prior to the age

of one. Other researchers have failed to detect such discrete effects of early care and have

argued that the cumulative time spent in care, rather than the timing of the care, accounts

for the quantity of care effects found in the literature (McCartney et al., 2010; NICHD

Early Child Care Research Network, 2003a). Given these seemingly contrasting findings,

the current study sought to examine whether childcare hours during the first two years of

life would be particularly important to socioemotional outcomes at 4.5 years of age.

Group Size as an Index of Type of Care

With respect to the type of care provided, group size has been used to

operationalize different types of childcare experiences, as in the current report. The

NICHD Early Child Care Research Network (2003a) observed that more time spent in

larger peer groups predicted less social competence at an age of 54 months, whereas

center-base care per se, did not. Additionally, the quantity-of-care effects demonstrated in

the re-analysis by McCartney et al. (2010) were stronger when the children spent more

time in large peer groups, which highlights the importance of group size when studying

childcare effects. The seemingly adverse effects of large groups tended to become

stronger when behavioral problems were measured at older ages, although the age-by-

group-size interaction that was used to formally test this pattern did not prove significant

(McCartney et al., 2010). Haskins (1985) linked high-quality childcare experiences early

in life with subsequent aggression, and this result supports the view that it may be

exposure to large groups of peers that accounts for the adverse effects of childcare centers

and/or the extensive time spent in childcare. So, too, perhaps does more recent evidence

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showing that higher cortisol levels were observed among children in center-based care than those in home-based care (Vermeer & van Ijzendoorn, 2006), specifically among children in groups of more than 15 peers (Legendre, 2003). These findings also raise the possibility that stress may account for why problem behavior remains linked with early and extensive care, particularly in childcare centers with large groups of peers.

Because of the potential significance of smaller vs. larger groups and thus of family- vs. center-based daycare, it is important to note that both types of care are regulated under the same federal law in Norway to ensure the quality of care provided. Thus, the same requirements apply to both structural features, such as the adult-child ratio, and the national curriculum for these legally defined "educational enterprises." Family daycare staff members possess somewhat less education than do staff members in childcare centers and therefore must be supervised by someone with at least a bachelor's degree in educational science. Consequently, the quality-of-care conditions are similar across different care contexts (unlike in the United States). One exception, however, is related to group size, as family-based daycare typically involves smaller groups of children. For this reason, in addition to its potentially influential role in accounting for the adverse effects of childcare, group size served as the main indicator of type of care in the present study.

The Social Policy Context of Childcare in Norway

Despite the nature of reported childcare findings, virtually all developmental scholars agree that childcare and its effects occur within a societal and cultural context. The United States provides *unpaid* job-protected parental leave for only the first 12

weeks of the infant's life, and the United Kingdom provides 36 weeks of *paid* parental leave during the first year after birth. Norway offers 47 weeks of leave with 100% salary replacement and 10 additional weeks with 80% salary replacement. Moreover, the age at which Norwegian children are allowed to enroll in nonparental group care (either family- or center-based) is regulated by law; therefore, no child begins childcare before the age of 6 months, which is more or less normative in the United States. Thus, "early, extensive, and continuous" care, which Belsky (2001) called specific attention to and which the NICHD SECCYD linked to somewhat increased behavior problems throughout childhood (Belsky et al., 2007; NICHD Early Child Care Research Network, 2003a, 2006) and impulsivity and risk-taking in adolescence (Vandell et al., 2010), involves different things for different nations. Whereas "early, extensive, and continuous" care typically encompasses experiences in childcare during the first year of life in the United States, this is not the case in Norway (and in many other countries).

Prior Scandinavian Childcare Research

Given the great cross-cultural variation in parental-leave and childcare policies and practices, it is questionable as to whether the widely disseminated findings emanating from the NICHD Early Child Care Research Network (2005) could be replicated elsewhere. Interestingly, existing Scandinavian childcare research suggests that this may not be the case. Studying a Swedish sample, Campbell, Lamb and Hwang (2000) found that children who enrolled in out-of-home childcare between 1.5 and 3.5 years of age and who spent more days but fewer hours each day in childcare were more socially competent than other children. An outdated but oft-cited report by Andersson (1992) indicated that Swedish children entering nonparental childcare before the age of 1 but after the age of 6

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months were rated by teachers as more socially competent at 13 years of age than other children. Recently, another Swedish study by Bohlin, Hagekull and Andersson (2005) reported that time spent in nonparental care between 1 and 4 years of age had a positive effect on social competence at 8 years of age.

In contrast to these findings, however, are those from an earlier Norwegian study by Borge and Melhuish (1995). They monitored a cohort of 120 children from a single rural Norwegian community and observed that after controlling for child IQ, socioeconomic status (SES) and gender, 10-year-old children who spent more time in nonparental care during their first four years of life manifested more behavioral problems than their peers. Moreover, the children who were enrolled in nonparental care *after* age 4 manifested fewer behavioral problems than other children, and this beneficial effect was most pronounced for those children who scored higher on behavioral problems at the time of childcare enrollment.

However, it should be noted that the Scandinavian research discussed above was based on small sample sizes ranging from 52 (Campbell et al., 2000) to 140 (Lamb et al., 1988) children. Given the policy changes in Norway, these Scandinavian results may also be outdated. Although nonparental childcare, particularly center-based care, was initially intended for children over the age of 3, a political goal was established in 2005 to provide universally accessible nonparental care for all children beginning at the age of 1. This goal set the stage for a new law in 2009, which provided all children the right to enroll in daycare around at the time of their first birthday. This law has led to a substantial increase in the number of children under the age of 3 who are enrolled in center-based care (Statistics Norway, 2010b).

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The Current Inquiry

The research reported herein was designed to determine whether exposure to nonparental childcare and large peer groups during the first 4.5 years of life in Norway would be associated with socioemotional functioning. Specifically, we sought to determine whether findings emanating from the United States would manifest in a country with different childcare conditions.

We addressed the issue of quantity of care, timing of care, and group size while controlling for type of care (i.e., center vs. family care) and child and family background factors to discount (to some extent) the nonrandom utilization of different types and amounts of care. However, childcare in Norway is subsidized to ensure universal access and has a maximum monthly fee of 2,330 NOK ($388), regardless of whether the childcare facility is public or private. Childcare is typically offered by the municipality, and parents may only choose from a limited number of facilities. Therefore, the selection effects should be less prominent than in the United States and in many other countries. However, due to this childcare policy in Norway, those children not in care or those who receive few hours of care may differ substantially as compared to their counterparts in the UK or the U.S. Therefore, we included a wide array of child and family background factors to control for such potential biases. The following family background factors were included: socioeconomic status (SES), ethnicity of the biological parent, parental criminal records and records of parental lifetime psychological problems (NICHD Early Child Care Research Network, 2003a), alcohol abuse by the mother, the maternal age at giving birth, whether the parents lived together when the child began daycare, the number of siblings (Côté et al., 2008), the family atmosphere and the family verbal climate.

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Multiple child characteristics also served as covariates, including gender, child age at assessment (NICHD Early Child Care Research Network, 2003a), birth weight (Côté et al., 2008), and prematurity (Hill, Waldfogel, Brooks-Gunn, & Han, 2005).

Because the current study did not measure care quality, this care feature could not be examined or controlled. Evidence from the NICHD SECCYD suggests that care quality may not be a major source of bias, however, because the effects of quantity and type of care were shown to be generally independent of the effects of quality of care, at least in the context of the U.S. (NICHD Early Child Care Research Network, 2006). More importantly, from an international perspective, the quality of childcare in Norway is generally high and relatively homogeneous. Norway met eight of the ten UNICEF childcare policy and quality benchmarks that represent the minimum basic standards regarding number of staff, staff training, price and availability; Sweden was the only country to meet all ten. In comparison, the United Kingdom met five of the benchmarks, and the United States met only three (UNICEF, 2008). However, it should be noted that meeting various criteria related to structural quality measures does not necessarily translate into high-quality care, as structural criteria are only proxies for process measures of quality, such as the teacher-child relationship and the experience of the child in daycare.

Method

Participants and Recruitment

All children born in 2003/2004 living in Trondheim, Norway and their parents were invited by mail to participate in a longitudinal study of early detection and prevention of

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psychiatric disorders among preschoolers. Trondheim is the third-largest city in Norway with 173,486 inhabitants and is situated in the middle region of the country. The population of Trondheim is similar to the national average on several key indicators: the average gross income per inhabitant is 99.5% of the national average; the employment rate is identical to the national rate; and 80.0% of the households are two-parent families compared to the national average of 81.4% (Statistics Norway, 2010a).

The Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997) was sent to each home, and the parents were asked to complete and return the form at their child's health checkup at the local health clinics, which is mandatory for all 4-year-old Norwegian children. A majority of the children who were invited appeared at the check-up (97.2%). Parents with insufficient proficiency in Norwegian were excluded from the study. The health nurse at the clinic informed the parents about the study using procedures approved by the Regional Committee for Medical and Health Research Ethics. Informed, written consent was obtained from the participants, and the consent rate among eligible families was 82.1%.

The SDQ scores on the symptom scales (i.e., emotional symptoms, conduct problems, hyperactivity or inattention, and peer relationship problems) were divided into four strata using the cut off ranges of 0-4 (44.2% of the population), 5-8 (29.5% of the population), 9-11 (18.5% of the population), and 12-40 (7.8% of the population). Using a random number generator, 38.1, 49.1, 71.4 and 89.2% of children in strata 1, 2, 3 and 4, respectively, were selected to participate in the data collection at the university. A semi-structured psychiatric interview with the parent (The Preschool Age Psychiatric Assessment [PAPA]) (Egger & Angold, 2004) and an extensive child assessment was performed. Of the

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1,274 children (and parents) selected, 992 parents (77.9%) were interviewed; of those 935 (94.3%) brought their children to the university for further testing. The drop-out rates following recruitment did not differ across the SDQ strata (X^2 = 5.70, df = 3, p=.13) or gender (X^2 = 0.23, df = 1, p=.63; see Figure 1).

The children included in the current report were those who had completed the assessment at the university clinic (see Figure 1). Thus, the analysis sample consisted of 935 children (455 boys, 480 girls) and their parents, of whom 84.6% were mothers. Both the mothers and the fathers of these children were mainly of Norwegian ethnicity (91.9 %), and most of the parents were married (55.2%) or had lived together for more than 6 months (32.2%). Less than 10% of the parents were divorced or separated (9.6%); 0.3 % were widowed; 1.3% had lived together for less than six months and 1.4 % of the parents had never lived together. Most of the parents had a bachelor's degree or a higher university degree (65.2%). The families who consented but did not participate did not differ from those who participated in terms of the SDQ score (t=0.613, p=.54), the age of the child (t=1.043, p=.31), gender (X^2 = 0.036, df = 1, p= .849), highest occupation level in the household (t=-0.267, p=.44), parental years of education (mothers: t=-1.104, p=.30; fathers: -1.119, p=.26), family income (t=-0.516, p=.61), the ethnicity of the parents (mother: X^2 = 0.001, df = 1, p=.0.975; fathers: X^2 = 0.033, df = 1, p=.856) or the parental marital status (X^2 = 0.023, df = 1, p=.879). The sample, adjusted for stratification, was compared to Statistics Norway's registry information for all parents of 4-year-olds in Trondheim for the years 2007 and 2008. The analysis sample contained significantly more divorced parents (9.6%) than the general population (2.1%), although the educational level

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of the parents was virtually identical to that of the general population. Descriptive information regarding the analysis sample is shown in Table 1.

The informant caregivers were mainly women (87.1%) who had more than five years of experience working with children (82.2%). Most of the informants had a teacher college degree or a bachelor's degree (73.1%). The children typically entered nonparental childcare at approximately 12 months of age (61.9%); by 24 and 36 months of age, 84% and 93% of the children had been placed in childcare, respectively, and virtually all (98.7%) were in childcare by the age of 48 months. Only 7.1% were enrolled in childcare prior to the age of 12 months.

Procedures

The same parent who completed the SDQ at the health check-up for 4-year-olds also brought the child to the university in all but 14.1% of cases (in which the other parent brought the child to the university). At the university, the parents provided information regarding childcare history as well as the child and family background-factors that served as covariates in the analyses. The parents also consented to having their childcare provider mailed detailed questionnaires (to be answered by the current caregiver who knew the child best) concerning their children, which included questions regarding social competence, externalizing behavior and caregiver-child conflict. The questionnaire was returned within 3 weeks after the university assessment. The caregiver response rate was 91.7% (N= 857). The study was approved by the Norwegian Regional Committee for Medical and Health Research Ethics.

Measures

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Childcare predictor variables. Childcare was defined as regularly scheduled care that took place outside of the home and was provided by a non-relative to three or more children. Care provided by a nanny or by other family members was not included. The parents provided information regarding two aspects of childcare: quantity of care and group size.

Quantity of care. For each of the five measurement intervals (6-12, 13-24, 25-36, 37-48 and 49-60 months), the parents retrospectively reported the number of days and hours per week that the child was in childcare. Using this information, we calculated the total number of hours each child spent in childcare from the onset of care until the university assessment, which represented a measurement identical to the NICHD SECCYD quantity-of-care index (NICHD Early Child Care Research Network, 2006). Although the accuracy of the parental recollections could not be directly established, prior research involving both prospective *and* retrospective reports of time spent in childcare have shown the latter report type to be reliable (Vandell & Corasaniti, 1990; Vandell & Powers, 1983).

Group size. The parents reported how many other children were present in the childcare group for each measurement interval. Although group size is highly stable in Norway and more likely to be accurately recollected than elsewhere, we focused only on concurrent group size because some evidence from the United States has shown that group size cannot be accurately recollected (Vandell & Corasaniti, 1990; Vandell & Powers, 1983). Squaring the group-size-index provided a means for evaluating nonlinear groupsize effects. A similar non-linear index of childcare hours was also created, but because it did not yield any effects, no further mention of it is made.

Control variables.

Type of care. Parents reported on their child's current care arrangement (i.e. family daycare or center care), and a dummy variable was created where family daycare was coded as 0 and center care was coded as 1. This variable was included in the analyses to control for differences between care arrangements (other than group size). In Norway, few children attend family daycare after reaching the age of three, and this fact was reflected in the low number of children in our sample who currently attended family daycare (see Table 1).

Family covariates.

Socioeconomic status (SES). SES was measured using a composite of three variables: 1) the highest occupational level in the household, which was coded according to the International Classifications of Occupations (ILO, 1990); 2) the educational level of the informant parent, as measured in years; and 3) the annual family income, as measured in 13 intervals of 75,000 NOK ($12,500) ranging from no income to an income of 900,000 NOK ($ 150,000) or higher. All three variables were divided into the four categories of low, medium low, medium high and high and were scored as 1, 2, 3 and 4, respectively. These subscores were summed to create a continuous SES measure that ranged from 3 to 12. The families with the lowest scores (i.e., 5 or lower; N=112) included those with a household income below the OECD poverty threshold, parents with no secondary education, and manual workers (i.e., farmers, fishermen or unskilled workers).

Home atmosphere. The home atmosphere was assessed using the Family Assessment Device (FAD: Epstein, Baldwin, & Bishop, 1983) and two questions from the Preschool Age Psychiatric Assessment (PAPA), which were combined to create an index of "negative verbal climate" that pertained to negative and hostile speech from mother to child (e.g., "you are a mean boy" or "you are so stupid!").

Alcohol use. The current level of alcohol consumption by the mother was measured using the Alcohol Use Disorders Identification Test (AUDIT: Saunders, Aasland, Babor, Delafuente, & Grant, 1993). The AUDIT is a 10-item screening instrument used to evaluate hazardous and harmful alcohol consumption, drinking behaviors and alcohol-related problems. The responses to each question are scored from 0 to 4 and the sum of the scores range from 0 to 40; a score above 8 indicates an alcohol problem. The instrument has shown good reliability and validity (Saunders et al., 1993). In addition, the age of the mother at the time of the child's birth was included as a covariate.

Lifetime psychological problems, criminal record and ethnicity. The informant parent provided information as to whether the child's biological parents had ever experienced psychological problems (i.e., not formal psychiatric diagnoses) (yes=1, no=0). The same parent also reported as to whether the biological parents had ever been arrested (yes=1, no=0), and the ethnicity of the biological parents was coded as Norwegian=0 or not Norwegian=1.

Family status. The informant parent reported as to whether the biological parents lived together or were married at the time the child began daycare (yes=0, no=1). The same parent also reported the number of siblings for each child in the study.

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Child covariates. The covariates included gender, age at the time of assessment (mean age 54.9 months, SD: 2.96), prematurity status (yes=1, no=0), and birth weight. Low birth weight was defined as weights under 2,500 g (low=1, not low=0).

Teacher-rated child outcomes.

Social competence. The total score from the 30-item Social Skills Rating System (Gresham & Elliot, 1990) assessed cooperation, assertiveness and self-control (α=.93).

Behavior problems and externalizing behavior. The Teacher Report Form (TRF) from the preschool version of the Achenbach System of Empirically Based Assessment (ASEBA) (Achenbach & Rescorla, 2000) was used to assess externalizing problems (α = .95).

Conflict with caregivers. A slightly modified 10-item version of the conflict subscale from the Student-Teacher Relationship Scale (STRS; Pianta, 2001) was used to assess conflict in the caregiver-child relationship (α = .76) (Solheim, Berg-Nielsen, & Wichstrøm, 2011).

Statistical Analyses

To evaluate the main effects of the quantity of childcare and group size, we used multiple blockwise regressions. The covariates were entered into the first block, and the two childcare predictors were entered into the second block along with the type of care control variable. The peer group size was mean-centered before the quadratic term was created. The analyses were conducted using Mplus 5.2 (Muthén & Muthén, 1998-2007) with a robust maximum likelihood estimator (MLR). The effects on all of the outcomes

were tested simultaneously. Because we used a screen-stratified sample, we conducted weighted analyses using weights that were proportional to the inverse of the probability of selection of each subject (i.e., low screen scorers were "weighted up" and high scorers were "weighted down"). This provided unbiased general population estimates. Note that the rates of major behavior problems were low. Robust confidence intervals were estimated using the Huber-White sandwich estimator (Huber, 1967; White, 1980).

As shown in Table 1, the percentage of missing data was low. The mean covariance coverage across all of the variables included in the full model was 0.921, which indicated 7.9% of missing data overall. The missing data were treated with a full information maximum likelihood estimation procedure (FIML), which enabled the inclusion of the entire sample (N=935) (Schafer & Graham, 2002).

Results

Table 1 displays the descriptive statistics for all of the variables. Table 2 shows the results of the regression analyses. Herein, we report relations between the covariates and outcomes before reporting the primary analyses, and we then report a secondary analysis pertaining to the timing of childcare utilization (see Table 3).

Preliminary Analysis: Covariates and Outcomes

As shown in Table 2, children who were older at the time of assessment manifested more social skills, as did girls, children of higher SES families, and children whose fathers did not have any psychological problems. Boys and lower SES children showed more externalizing problems and caregiver-child conflict. Notably, the children raised in households with a negative verbal climate and negative family atmosphere showed slightly

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less caregiver-child conflict (with other variables controlled). All outcomes were significantly correlated (r =-.53, p<0.001 for conflict with social competence; r=.67, p<0.001 for conflict with externalizing behavior; and r=-.56, p<0.001 for externalizing behavior with social competence).

Primary Analyses: Childcare Effects

Although childcare predictors proved unrelated to social competence and externalizing problems, they did relate to caregiver-child conflict. Specifically, larger group sizes (Cohen's f^2=0.06) and more time spent in childcare predicted increased levels of conflict in the caregiver-child relationship (Cohen's f^2=0.05).

To examine the shape of the nonlinear association of group size and caregiver-child conflict (Cohen's f^2=0.05), we graphed and estimated the conflict scores for the children in the groups within the 25th and 75th percentiles. Most of the children were in peer groups of 18 and 20 children, which is common for regular childcare centers in Norway. The resulting slope is depicted in Figure 2, which illustrates that the children in the peer groups with 15, 19, and 20 children scored highest for caregiver-child conflict.

According to Cohen, effect sizes (i.e., Cohen's f^2) (Cohen, Cohen, West, & Aiken, 2003) of 0.02, 0.15, and 0.35 are considered small, medium and large, respectively, which implies that all of the effect sizes reported here were small. The unique explained variance (R^2) of these predictors further indicates the practical importance of these findings. The R^2 for time in care in relation to child-caregiver conflict was 0.008; therefore, time in care only explained 0.8% of the variability in caregiver-child conflict. Similarly, the linear and

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non-linear effects of group size accounted for only 0.6% and 0.8%, respectively, of the variation in caregiver-child conflict.

Secondary Analysis: Timing of Care

We conducted a follow-up analysis to determine whether early care was particularly important and tested whether the number of hours spent in childcare during the first two years of life predicted social competence, externalizing behavior and caregiver conflict at 54 months of age. For these analyses, the number of hours spent in childcare during the third, fourth and fifth years of life were controlled for. As seen in Table 3, the childcare hours during the first two years of life did not significantly predict any of the child outcomes.

Discussion

The primary purpose of this inquiry was to determine whether the negative effects of childcare quantity and group size on socioemotional functioning, such as those chronicled by the NICHD SECCYD (Belsky et al., 2007; NICHD Early Child Care Research Network, 2006; Vandell et al., 2010), would be identified in Norway, a country with a very different childcare system. Because no measure of the quality of care was obtained, it was impossible to determine whether variation in quality (, which is very constrained in Norway) predicted the outcomes considered here or moderated detected main effects of quantity of care and group size.

Quantity of Care

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The evidence supporting that greater exposure to childcare during the first 4.5 years of life is predictive of a higher degree of caregiver-child conflict is reminiscent of findings reported by the NICHD ECCRN (2003a, 2005, 2006). These results imply that large amounts of time spent in childcare may be a cause for concern, as greater conflict in the caregiver-child relationship forecasts poorer relationships with teachers in school and appears to negatively influence the socioemotional development of children and their subsequent academic success, particularly in the context of the U.S. (Hamre & Pianta, 2001). Alternatively, the greater degree of conflict reported by teachers may reflect the less inhibited, bolder and more confident behavior of children with more extensive childcare experience. There is evidence that bolder children have more difficult relationships with their preschool teachers (Rydell, Bohlin, & Thorell, 2005), and in the case of inhibited infants, childcare promotes bolder functioning (Fox, Henderson, Rubin, Calkins, & Schmidt, 2001). However, the observed small effect sizes raises questions regarding the ultimate implications of this finding, particularly because it was not coupled with related and seemingly negative effects of other aspects of socioemotional functioning, as it was in the NICHD SECCYD.

Indeed, unlike results reported by the NICHD Early Child Care Research Network (2003a, 2006), quantity of care did not predict externalizing problems or social competence in our Norwegian sample. The differences between the parental leave policies and childcare regulations in the United States and Norway seem likely determinants of the cross-national difference in childcare effects, which underscores the assertion of van Ijzendoorn and Tavecchio (2003) that studying childcare across cultures could explain seemingly inconsistent findings in childcare research. The American data

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have raised questions regarding "early, extensive and continuous care" (Belsky, 2001; Belsky et al., 2007), although "early" carries dramatically different meanings for Norway and the U.S. As noted previously, American parents have the right to only three months of unpaid leave, whereas Norwegian parents receive paid leave for the entire first year of their child's life. Although most American children who will routinely experience childcare prior to enrolling in school begin such care well before their first birthday, this is a rare experience for Norwegian infants and occurred in only 7.1% (n = 67) of the children in the current sample.

Group size

Given the findings of McCartney and colleagues (2010) that larger group sizes, which are not atypical in the United States and were normative in the NICHD SECCYD, accounted for type-of-care effects on caregiver-rated externalizing problems, we evaluated the linear and nonlinear effects of group size. Although group size did not affect externalizing problems or social competence, both linear and nonlinear effects emerged in the case of caregiver-child conflict. Contrary to the American findings (McCartney et al., 2010; NICHD Early Child Care Research Network, 2003a), however, it was greater exposure to both smaller and larger groups in preschool that predicted greater caregiver-child conflict. Again, these differences were small and accounted for less than 1% of the explained variance. Moreover, the difference in conflict scores between those in intermediate-sized groups and those in the smallest and largest groups were small, and the practical implication of this finding remains unclear.

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Peer exposure conceivably influences infants, toddlers and preschoolers differently. Larger groups can make it difficult for children to receive individual attention from caregivers and cope with their childcare surroundings; as a result, larger peer groups may negatively affect toddlers and younger children but may be beneficial during the preschool period (Langlois & Liben, 2003; Morrissey, 2010). Because preschoolers (as compared to infants) are generally more oriented towards other children, they likely require less adult attention to feel comfortable and secure, which could make older children less vulnerable to the potential negative consequences of exposure to larger groups. Larger peer groups of approximately 18 children may have the advantage of providing more plentiful pools of children from which to choose friends and playmates, which may thereby contribute to more positive interactions (particularly when the quality of care is reasonably high, as it is in Norway). Smaller peer groups, however, may promote adult interactions and provide a greater opportunity for caregiver-child conflict. Notably, there is evidence that more frequent caregiver-child interactions are associated with caregiver reports of more conflicted relationships (Koles, O'Connor, & McCartney, 2009). However, our findings indicate that even preschool-aged groups of more than 18 children may have negative consequences. Again, it is critical to highlight the small effect sizes obtained in this case pertaining to the apparent costs of both smaller and larger groups (with respect to caregiver-child conflict).

Overall, the covariates and predictors included in these analyses accounted for little of the total variance in social competence, externalizing behavior and caregiver-child conflict (9.8%, 8.6% and 6.3%, respectively), leaving most of the variance unexplained. This issue raises an important question concerning the specific factors

(which may explain child functioning) that were not captured in the analyses. An obvious factor is quality of care, which was discussed above. Quality has been found to be most important for language and cognitive development, but it has also been associated with greater social competency and reduced impulsivity (NICHD Early Child Care Research Network, 2003b). Another important explanatory factor may be parenting, as studies have shown that even for children in nonparental childcare, it is the quality of care provided by the parents that is the strongest predictor of a child's development. In the NICHD SECCYD, modest to large effect sizes of parenting were identified regarding cognitive, socioemotional and peer outcomes (NICHD Early Child Care Research Network, 2006). In conclusion, the negative consequences of early, extensive and continuous care, which were evident in previous international research, were not generally detected in the current study. The differences in parental leave policies and childcare regulations may account for some or all of the differences between the American and Norwegian data pertaining to externalizing problems and social competence. Due to what Americans (although most likely not all Europeans) would regard as extended and generous parental leave policies, virtually all Norwegian children begin childcare later in life; therefore, these children receive substantially less exposure to childcare prior to starting school than their American counterparts. Moreover, the quality of care is higher in Norway than in the United States. The limited variation in quality in Norway may limit the capacity to detect quality of care effects, although this could not be investigated in the current inquiry.

Limitations

As previously noted, the lack of quality of care measurements precluded us from investigating the main and interactive effects on the socioemotional functioning of

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children. Although regulations in Norway ensure a high level of structural quality, it is almost inevitable that there was variability in the quality of the caregiver-child interactions (i.e., process quality). Thus, while the quality appears (based on structural markers) to be high, the actual quality of the daily experiences of the child while in daycare varies across daycare contexts. Our interpretation that the quality of care in Norway is generally high (based solely on structural markers) is speculative, and the lack of process quality measurements is a major limitation of the current study. However, as Campbell et al. (2000) observed in their study of the influence of early childcare experiences on socioemotional development in Sweden, a Scandinavian country similar to Norway, the general high level of quality of Swedish care facilities made that culture a poor choice for research on the negative effects of poor childcare quality, and we suspect that the same is true for Norway. This fundamental limitation of our study, namely the lack of quality measurements, may not have limited the current work as severely as it would have been if this work had been conducted in the United States.

Although efforts were made to control for nonrandom selection of children into childcare, the type of statistical control employed in this inquiry is inherently limited. We were not in a position to adopt more conservative methods, such as propensity score matching or fixed effects' analyses, to adjust for selection bias. In the latter case, we did not have a (pretest) measure of the outcomes before the childcare experiences. In terms of propensity score matching, this can be used for adjusting for baseline differences between exposure groups, but cannot be used with continuous exposure which is what we measured in the current inquiry. This limitation is important because several studies that adopted more rigorous statistical approaches found that covariate-adjusted regression

estimates of childcare effects do not prove robust when more conservative controls for selection are employed (e.g. Jaffee et al., 2011; McCartney et al., 2010). However, the fact that Yamauchi and Leigh (2011) detected negative effects of fulltime nonparental care on children's behavioral functioning using both analysis of bias estimation and propensity score matching implies that it would be a mistake to conclude that childcare effects are never robust when more conservative controls for selection are employed. The manner in which an outcome is measured may also be relevant, given that some investigations using conservative approaches rely exclusively on maternal reports of child functioning (Jaffee et al., 2011), which the NICHD ECCRN (2003a) concluded were not particularly sensitive to child-care effects after children move beyond the toddler years.

Due to the high rate of participation in childcare in Norway, selection issues were likely less problematic than they would have been in the United States and the United Kingdom. Nevertheless, our reliance on covariate-adjusted regressions for potential selection effects and the lack of quality data do not rule out the possibility that our findings could be attributed to other factors. In addition, information regarding the time spent in childcare was collected retrospectively, which could have added some degree of inaccuracy to our data.

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Table 1

Descriptive Statistics for all Analytic Variables

Variable	M	SD	Min.	Max.	N	% missing
Childcare predictors						
Quantity						
THr 6-54 months	5538.5	2008.6	0.0	9517.5.0	888	5.0
THr 6-12 months	50.5	192.1	0.0	1080.0	901	3.6
THr 12-24 months	949.3	804.5	0.0	2115.5	901	3.6
THr 24-36 months	1343.6	674.2	0.0	3525.0	901	3.6
THr 36-48 months	1561.6	508.4	0.0	2115.0	901	3.6
THr 48-54 months	1588.1	493.5	0.0	2115.0	888	3.6
Group size 48-54 months	19.1	6.4	0.0	55.0	857	5.0
Group size, family daycare	11.7	8.8	5.0	15.0	17	0.0
Group size, center care	19.4	6.4	0.0	55.0	779	7.8
Type of CC (1= center care)	98.0%				862	7.8
Child and family characteristics						
Age at assessment (months)	54.9	3.0	48.17	67.8	930	0.5
Age at CC start (months)	23.6	10.0	6.0	59.0	881	5.8
Prematurity (1=premature)	6.5%				913	2.4
Birth weight (1=low)	4.9%				896	4.2
Alcohol abuse by M	4.2	2.5	0.0	16.0	868	7.2
Age of M at childbirth (years)	30.8	4.8	17.4	45.7	928	0.7
Ethnicity of M (1= not Norwegian)	7.0%				915	2.1
Ethnicity of F (1= not Norwegian)	9.2%				910	2.7
Criminal hist., F (1=ever arrested)	2.3%				901	3.6
Criminal hist., M (1=ever arrested)	9.1%				882	5.7
Psych. probl., M (1= ever present)	26.8%				900	3.7
Psych. probl., F (1= ever present)	13.7%				893	4.5
Fam. status at CC start (1= parents not living together)	12.4%				878	6.1
Number of siblings	1.5	0.9	1.0	9.0	811	13.3
Fam. Atmosphere	1.7	0.4	1.0	3.1	895	4.3
Verbal fam. climate (1=negative)	10.8%				890	4.8
Gender (1=male)	48.7%				935	--
Socioeconomic status	8.3	2.1	3.0	12	922	1.4
Child adjustment						
Social competence	42.0	9.5	12.8	66.0	845	9.6
Externalizing behavior	6.8	9.1	0.0	50.0	847	9.4
Conflict	17.2	5.3	11.0	46.0	850	9.1

Note. THr = total hours; CC = Childcare; M = biological mother; F = biological father;

Fam. = family; Psych. probl. = psychological problems.

Table 2

The Effects of Quantity of Care and Group Size on Socioemotional Behavior, Adjusted for Type of Care and Child, Maternal, and

Family Covariates

	Social competence			Externalizing behavior			Conflict		
	B	Se	B	B	Se	β	B	Se	β
Covariates				**Block 1: Covariates**					
Age at assess. (months)	0.29	0.11	**0.10****	-0.12	0.08	-0.04	-0.07	0.06	-0.04
Prematurity (1=prem.)	-0.04	1.64	-0.001	0.94	1.36	0.03	0.44	0.79	0.02
Birth weight (1=low)	-0.42	1.79	-0.01	-0.41	1.45	-0.01	-0.31	0.82	-0.01
Alcohol abuse by M	-0.05	0.14	-0.01	0.13	0.13	0.04	0.08	0.08	0.04
Age of M at childbirth	-0.10	0.07	-0.05	0.01	0.07	0.01	0.01	0.04	0.01
Family atmosphere	-0.60	0.80	-0.03	1.40	0.71	**0.07***	0.83	0.40	**0.07***
Verbal climate (1=neg.)	0.53	1.06	0.02	-1.15	0.90	-0.04	-1.53	0.45	**-0.09****
Ethnicity of M (1= not Norwegian)	-1.11	1.34	-0.03	1.82	1.23	0.05	0.46	0.61	0.02

Ethnicity of F (1= not Norwegian)	-0.71	1.16	-0.02	0.55	1.08	0.02	0.15	0.59	0.01
Criminal hist. of M (1=ever arrested)	-0.34	1.86	-0.01	-0.04	1.70	0.001	-0.41	1.22	-0.01
Criminal hist. of F (1=ever arrested)	-0.68	1.25	-0.02	0.71	1.20	0.03	0.30	0.64	0.02
Psych. probl. of M (1= ever present)	-0.09	0.81	-0.004	-0.31	0.65	-0.02	0.03	0.40	0.002
Psych. probl. of F (1= ever present)	-2.94	1.07	**-0.11****	0.63	0.86	0.03	0.88	0.56	0.06
Fam. status at CC start (1= P. not living together)	-0.49	1.09	-0.02	-1.13	0.92	-0.04	-0.25	0.58	-0.02
Number of siblings	-0.19	0.46	-0.02	0.55	0.43	0.05	0.10	0.22	0.02
Gender (1=male)	-3.57	0.65	**-0.20*****	3.53	0.56	**0.21*****	0.70	0.33	**0.07***
SES	0.69	0.18	**0.15*****	-0.64	0.17	**-0.16*****	-0.38	0.10	**-0.16*****
Childcare predictors				**Block 2: Childcare predictors**					
Type (1= center care)	3.05	1.73	0.05	-1.70	2.02	-0.03	-0.49	1.38	-0.01
Quantity	0.003	0.02	0.01	0.01	0.02	0.01	0.03	0.01	**0.10****
Group size	0.001	0.07	0.001	0.06	0.06	0.05	-0.08	0.04	**-0.11***
Group size quadratic term	0.001	0.004	0.02	-0.01	0.004	-0.06	0.01	0.002	**0.12****

Note. $R^2 = 0.093$ for Social Competence Block 1; $R^2 = 0.095$ for Block 2; $R^2 = 0.082$ for Externalizing Behavior Block 1; $R^2 = 0.084$ for Block 2; $R^2 = 0.043$ for Conflict Block 1; and $R^2 = 0.062$ for Block 2. Assess. = assessment; M = mother; P. = parents; SES = Socioeconomic status. *p<0.05, **p<0.01, ***p<0.001.

Table 3

The Effects of Timing of Care and Group Size on Socioemotional Behavior, Adjusted for Type of Care, Child, Maternal, and Family

Covariates

	Social competence			Externalizing behavior			Conflict		
	B	Se	β	B	Se	β	B	Se	β
Covariates				**Block 1: Covariates**					
Age at assess. (months)	0.29	0.11	**0.10****	-0.11	0.08	-0.04	-0.04	0.06	-0.03
Prematurity (1=prem.)	-0.07	1.64	-0.002	0.94	1.37	0.03	0.39	0.79	0.02
Birth weight (1=low)	-0.43	1.78	-0.01	-0.43	1.46	-0.01	-0.34	0.82	-0.02
Alcohol abuse by M	-0.06	0.14	-0.02	0.15	0.13	0.04	0.08	0.08	0.04
Age of M at childbirth	-0.10	0.07	-0.05	0.01	0.07	0.01	0.01	0.04	0.01
Family atmosphere	-0.57	0.79	-0.03	1.37	0.71	0.07	0.82	0.40	**0.07***
Verbal climate (1=neg.)	0.51	1.07	0.02	-1.09	0.89	-0.04	-1.50	0.45	**-0.09*****
Ethnicity of M (1= not Norwegian)	-1.13	1.34	-0.03	1.81	1.22	0.05	0.44	0.62	0.02

Ethnicity of F (1= not Norwegian)	-0.67	1.16	-0.02	0.53	1.08	0.02	0.11	0.59	0.01
Criminal hist. of M (1=ever arrested)	-0.48	1.87	-0.01	-0.03	1.70	-0.001	-0.39	1.22	-0.01
Criminal hist. of F (1=ever arrested)	-0.66	1.25	-0.02	0.69	1.21	0.02	0.25	0.64	0.01
Psych. probl., M (1= ever present)	-0.11	0.81	-0.01	-0.29	0.65	-0.02	0.01	0.41	0.003
Psych. probl., F (1= ever present)	-2.93	1.07	**-0.11****	0.60	0.86	0.02	0.85	0.56	0.06
Fam. status at CC start (1= P. not living together)	-0.48	1.10	-0.02	-1.11	0.93	-0.04	-0.18	0.58	-0.01
Number of siblings	-0.18	0.46	-0.02	0.54	0.43	0.05	0.09	0.22	0.02
Gender (1=male)	-3.60	0.65	**-0.19*****	3.56	0.57	**0.21*****	0.73	0.34	**0.08***
SES	0.67	0.18	**0.15*****	-0.60	0.17	**-0.15*****	-0.35	0.10	**-0.15*****
Childcare predictors			**Block 2: Childcare predictors**						
Type (1= center care)	2.91	1.74	0.04	-1.50	2.06	-0.03	-0.45	1.39	-0.01
Quantity 3-5 years	0.03	0.03	0.04	-0.02	0.03	-0.04	0.004	0.01	0.01
Quantity 0-2 years	-0.01	0.04	-0.01	0.001	0.04	0.001	0.03	0.02	0.05
Group size	0.002	0.07	0.001	0.06	0.06	0.05	-0.08	0.04	**-0.11***
Group size quadratic term	0.001	0.004	0.01	-0.01	0.004	-0.06	0.01	0.002	**0.11***

Note. $R^2 = 0.093$ for Social Competence Block 1; $R^2 = 0.097$ for Block 2; $R^2 = 0.082$ for Externalizing Behavior Block 1; $R^2 = 0.085$ for Block 2; $R^2 = 0.043$ for Conflict Block 1; and $R^2 = 0.056$ for Block 2. Assess. = assessment; M = mother; P. = parents; SES = Socioeconomic status. *$p<0.05$, **$p<0.01$, ***$p<0.001$.
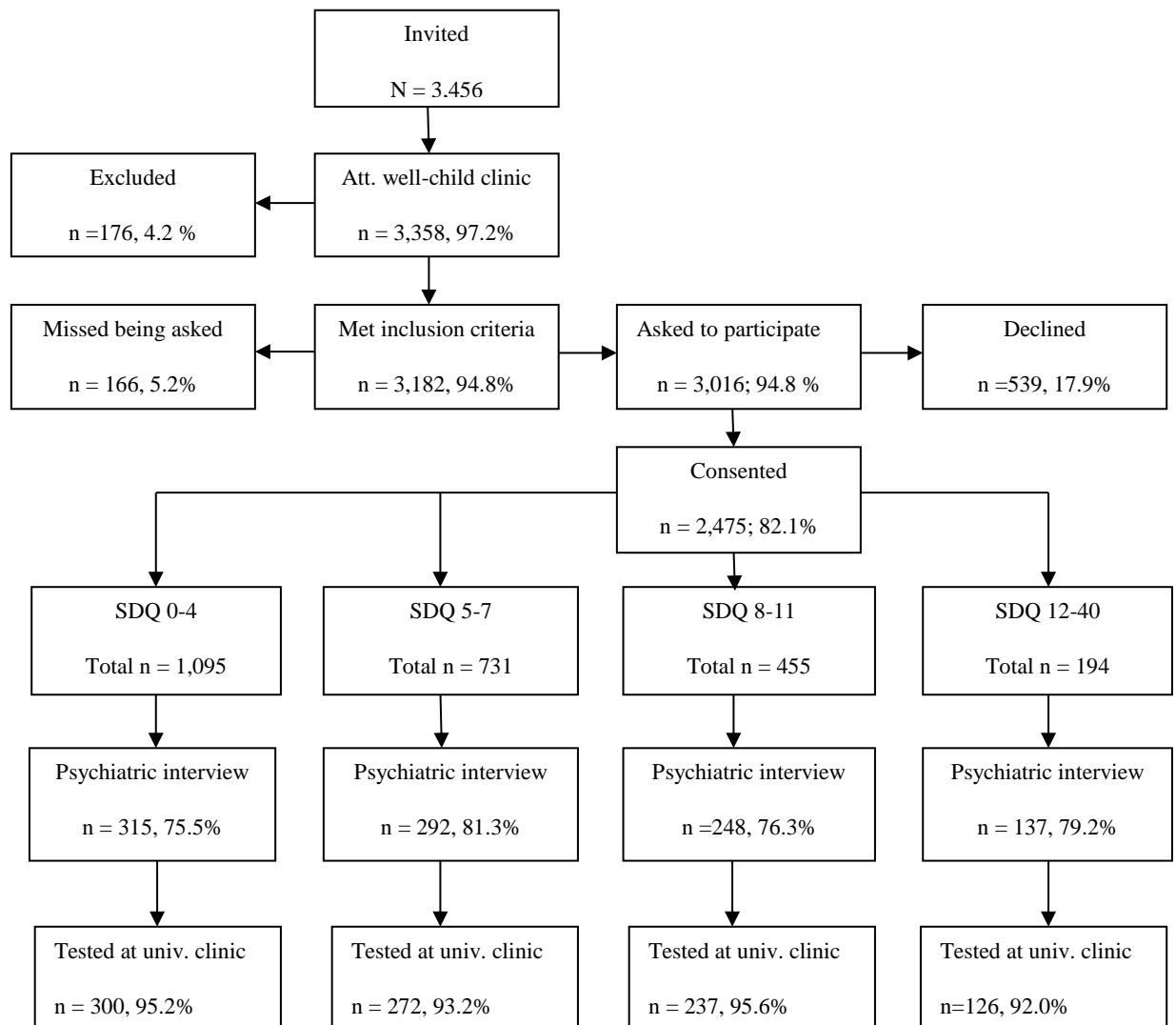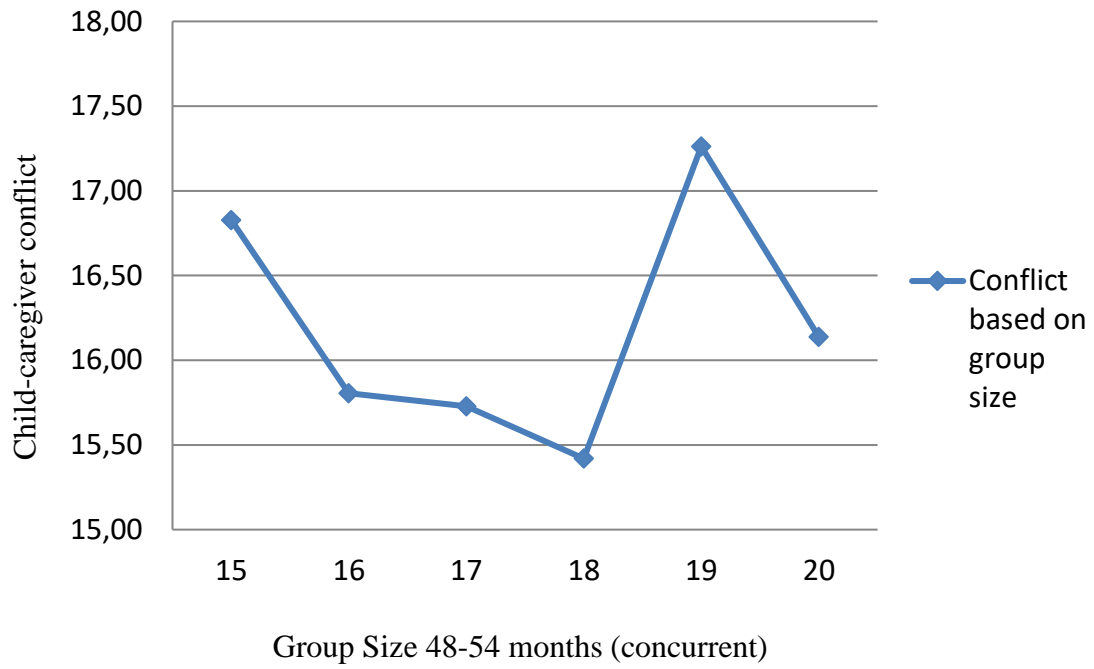
Figure 1. Sample Recruitment

Figure 2. Nonlinear Effect of Group Size on Child-Caregiver Conflict