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Parent–Infant Room Sharing During the First Months of Life: Longitudinal Links With Behavior During Middle Childhood

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Current recommendations encourage parent–infant room sharing for the first 6 months of life. This longitudinal study (N = 193) is the first to examine long-term relations of early room sharing with three domains of child behavior: sleep, behavior problems, and prosocial behavior. Information on room sharing was collected daily for infants' first 6 months. At ages 6, 7, and 8 years, outcomes were assessed with maternal and teacher questionnaires and behavioral observations. Early room sharing was not related to sleep problems or behavior problems. Additionally, more weeks of room sharing were positively related to higher maternal ratings of child sleep quality and more prosocial behavior. In conclusion, early room sharing appears to be related to positive, but not negative, behavior outcomes in middle childhood.

According to a recent report from the American Academy of Pediatrics (AAP), *children should sleep on separate surfaces within the same room, such as a crib, but never on a soft surface, armchair or couch* for at least the first 6 months of life (Moon & the Task Force on Sudden Infant Death Syndrome, 2016). Despite the historical and worldwide presence of parent–infant bed sharing as a common and valued practice, the AAP states that sharing the same sleep surface, including the bed, is assumed to be dangerous for the infant because of the risk for accidents and for sudden infant death syndrome (SIDS; Goldberg & Keller, 2007; Mileva-Seitz, Bakermans-Kranenburg, Battaini, & Luijk, 2016). parent–infant room sharing, in contrast to bed sharing, is associated with reduced rates of SIDS (e.g., Tappin, Ecob, & Brooke, 2005). Recommendations from many other Western countries, including Canada, New Zealand, Australia, and the Netherlands, are consistent with the AAP's recommendation of room sharing without bed sharing for at least 6 months (Moon & Hauck, 2017). The SIDS reduction is thought to result, at least in part, from parents being more available during the night to quickly detect threatening situations and to respond to signs of infant distress (Tappin et al., 2005). In addition to a decreased risk of SIDS, other benefits of room sharing have been reported during infancy as well, such as longer breastfeeding duration (McKenna & Gettler, 2016). Whether room sharing early in life also relates to outcomes beyond infancy is the focus of this study. This prospective longitudinal study is the first to examine long-term relations of parent–infant room sharing during the first 6 months of life with behavioral outcomes in middle childhood.

Historically, mothers have long slept in close proximity to their young, and in many cultures today this practice still dominates (Mileva-Seitz, Bakermans-Kranenburg, et al., 2016). This historical and cross-cultural variation in parent–infant nighttime proximity, and the associated SIDS risk when bed sharing, have contributed to research that focused mostly on *bed sharing* (sleeping in the parents' bed) and, more broadly, on *cosleeping* (sleeping in the parents' room, which may include both bed sharing and room sharing; Goldberg & Keller, 2007). A significant proportion of the earlier studies on cosleeping, however, did not distinguish between

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room sharing and bed sharing. Distinguishing between room sharing and bed sharing is important as current recommendations encourage room sharing, and discourage bed sharing (Moon & American Academy of Pediatrics Task Force on Sudden Infant Death Syndrome, 2016). Moreover, these two sleeping arrangements might have differential associations with child outcomes. The use of different sleep location definitions, the lack of discriminating between room sharing and bed sharing, and the lack of studies focusing on room sharing, are important considerations to take into account when interpreting the findings from previous studies, reported below, on correlates of infant sleep locations.

A variety of correlates of bed sharing and cosleeping have been found during early infancy. Both bed sharing and cosleeping have been found to facilitate breastfeeding, which is known for its health benefits for the infant (e.g., Ball, 2007; Cunningham, Vally, & Bugeja, 2018; McKenna & McDade, 2005; Sobralske & Gruber, 2009). The uninterrupted mother–infant proximity as a result of cosleeping is thought to be important for establishing breastfeeding, a phenomenon recently referred to as *breastsleeping* (McKenna & Gettler, 2016). One study found infant attachment to be a correlate of sleeping arrangements: When compared to any bed sharing, never bed sharing (i.e., solitary sleeping from birth onwards) was related to greater odds of insecure attachment and, in particular, to greater odds of resistant attachment (Mileva-Seitz, Luijk, et al., 2016). Additionally, other studies linked cosleeping to infant cortisol concentrations; examination of the stress hormone cortisol is important because of evidence that frequent and chronic exposure to elevated cortisol can take a toll on the body and is related to mental health problems (Loman & Gunnar, 2010). Two studies linked cosleeping, which principally consisted of room sharing, to lower infant cortisol reactivity in response to ecologically valid stressors at 5 weeks (bathing session) and at 12 months of age (maternal separation; Beijers, Riksen-Walraven, & de Weerth, 2013; Tollenaar, Beijers, Jansen, Riksen-Walraven, & Weerth, 2012). Another study, focusing on infant circadian cortisol instead of cortisol reactivity, indicated that more bed sharing was associated with higher bedtime cortisol concentrations at 3, 6, and 9 months of age (Philbrook & Teti, 2016).

Cosleeping (i.e., bed sharing, room sharing, or the combination of both) has also been examined in relation to infant sleep in accordance with the proposition that parental nighttime availability fosters infant's dependency on their parents to go or return to sleep and thus might lead to sleeping problems. When compared to mothers of solitary sleeping infants, mothers of cosleeping infants have reported more infant night wakings (e.g., Teti, Shimizu, Crosby, & Kim, 2016; Volkovich, Bar-Kalifa, Meiri, & Tikotzky, 2018; Volkovich, Ben-Zion, Karny, Meiri, & Tikotzky, 2015). Maternal reports of increased night wakings, however, were not supported by objective infant sleep measures: Use of actigraphy recordings revealed no differences in sleep disruption between cosleeping and solitary sleeping infants (Teti et al., 2016; Volkovich et al., 2015, 2018). In another study, at 4 months of age, the longest mother-reported single sleep period for solitary sleepers was longer than that for room sharing infants; by 9 months of age, infants who had become solitary sleepers before 4 months of age had relatively longer mother-reported total sleep and single sleep periods compared to other infants (Paul et al., 2017). Similarly, solitary sleepers slept a greater proportion of the night during their first 8 months than bed sharers and room sharers (mother reported; Huang et al., 2016). These differences in sleep duration were not supported by another study investigating infants aged from 0 to 36 months using an Internet-based parental questionnaire; although infants who coslept (both room sharing and bed sharing) had later bedtimes, sleep duration was similar to that of solitary sleepers (Yu, Sadeh, Lam, Mindell, & Li, 2017). In sum, the literature indicates that cosleeping contributes in positive ways to infant outcomes (e.g., more breastfeeding, reduced infant cortisol reactivity). With respect to infant sleep, early cosleeping seems unrelated to night wakings, but the literature is mixed about relations between sleeping arrangements and sleep duration.

Whether sleeping arrangements in the first months of life also relate to outcomes beyond infancy is the focus of this study. Links between early parent–infant cosleeping and later child behavior have rarely been examined, even though environmental influences early in life are assumed to have significant effects on later development (Loman & Gunnar, 2010). Two of the three existing studies focused on parent–infant bed sharing and relations with later child sleeping behaviors. Whereas one of these studies of bed sharing, using a prospective design, found early bed sharing not to predict night wakings in childhood (Jenni, Fuhrer, Iglowstein, Molinari, & Largo, 2005), the other, a retrospective study, found early bed sharing to relate to more night wakings and failure to fall asleep alone at preschool age (Keller &

Goldberg, 2004). The Keller and Goldberg study also showed that children who shared the bed with their parents early in life were more self-reliant and socially competent as preschoolers. A third study focused on cosleeping (including both bed sharing and room sharing), and found that solitary sleeping from birth onwards (retrospectively reported) was related to higher basal cortisol levels in children between the ages of 3 and 8 (Waynforth, 2007). In sum, the research on the links between early parent–infant cosleeping arrangements and later child behavior is scarce and focused mostly on bed sharing and cosleeping (without distinguishing between room sharing and bed sharing). However, bed sharing and room sharing are different arrangements and might have distinct relations with a child's later behavior. Moreover, room sharing during the first 6 months of life, but not bed sharing, is currently recommended to reduce risk of SIDS (Moon & the Task Force on Sudden Infant Death Syndrome, 2016). To our knowledge, no previous study has examined whether early parent–infant room sharing, in particular, relates to later child behavior.

Notwithstanding the lack of compelling evidence, pediatricians and researchers have speculated about the consequences of cosleeping (including both bed sharing and room sharing) for children's development later in childhood. Some discourage the practice of cosleeping. According to this perspective, the availability of parents to respond to infants' needs during the night fosters infants' dependency on their parents to go or return to sleep; such dependency is thought to lead to more sleeping problems, including bedtime struggles, increased night wakings, and nighttime anxieties beyond infancy and into childhood (e.g., Madansky & Edelbrock, 1990; Mindell, Sadeh, Kohyama, & How, 2010; Morelli, Rogoff, Oppenheim, & Goldsmith, 1992). Studies on psychosocial sleep interventions during the first 6 months of infant life designed to limit the amount of parental responsiveness during bedtime and nighttime have shown positive effects on concurrent infant sleep measures but have included no examination of outcomes beyond infancy (for reviews, see Crichton & Symon, 2016; Kempler, Sharpe, Miller, & Bartlett, 2016). As such, these interventions provide no support for the perspective that long-term sleep problems may result from cosleeping and the accompanying increased parental nighttime responsiveness. Nonetheless, some clinicians may encourage parents to establish independent sleep environments (i.e., in a separate room from parents) during the first year with the aim of promoting healthy and sustainable sleep patterns (Paul et al., 2017). These clinicians might base their recommendation on empirical literature that infant sleeping problems have long-term consequences for children's emotion regulation, mood, and behavior (Foley & Weinraub, 2017; Paul et al., 2017; Walker, 2009), even though other studies find no evidence that infant sleep problems predict long-term negative outcomes (Price, Wake, Ukoumunne, & Hiscock, 2012). Most centrally, it is important to note that the mixed research findings on the outcomes of infant sleep problems shed little direct light on the question of whether infant room sharing will influence later child outcomes. Finally, others have argued that, if children do not sleep in a separate room from parents, the developmental goals of autonomy and independence will be derailed, and children will become dependent in other developmental domains as well, including socioemotional development (e.g., Brazelton, 1992; Ferber, 1985).

In contrast, some researchers have pointed to the possible facilitating effects of room sharing on children's later development, including strengthening child competence and reducing nighttime fears (Goldberg & Keller, 2007; Keller & Goldberg, 2004; McKenna & McDade, 2005). We propose that the physical proximity associated with infant–parent room sharing may, through a variety of mechanisms, start a chain of events as follows: (a) proximity contributes to the parent's assistance in regulating the infant; (b) parental regulation then facilitates the infant's developing emotional and behavioral self-regulatory capacities (e.g., Choe, Olson, & Sameroff, 2013; Schore, 2001); and (c) child self-regulatory capacities, in turn, facilitate later social and emotional development, resulting in fewer internalizing and externalizing problems, and more prosocial behavior (e.g., Moffitt et al., 2011; Williams, Nicholson, Walker, & Berthelsen, 2016). This cascade model is in line with the early life stress model (ELS; Loman & Gunnar, 2010). The ELS model states that adverse care from parents experienced early in life regulates the activity of infant stress systems, which in turn impact the development of prefrontal regulatory systems, increasing the risk for regulatory behavioral problems. Regulatory capacities are thought to be also crucial for prosocial behavior because children need to remain regulated when witnessing another's need—rather than become dysregulated, overwhelmed, or self-focused themselves—in order to respond prosocially to this need (Eisenberg & Fabes, 1995; Gross, Stern, Brett, & Cassidy, 2017).

Why might the proximity associated with infant–parent room sharing help parents contribute to

infant regulation? First, it has been hypothesized that room sharing infants experience quicker responses to their nighttime needs (e.g., their parents may hear infants' distress at lower levels of intensity and duration than other parents). These infants, therefore, are thought to be buffered from the higher levels of distress needed to rouse a more distant parent (Beijers et al., 2013; Tollenaar et al., 2012); this buffering can be viewed as providing the infant with experiences of parental regulatory assistance. Second, the increased physical proximity associated with room sharing might also provide more opportunities for infant exposure to *hidden regulators*, a concept of maternal regulation introduced by Hofer (1994). Based on a series of experiments with rat pups, Hofer (e.g., Hofer, 2016) argued that a number of sensorimotor, thermal, and tactile events that are components of typical parent–offspring interactions (e.g., touch, smell, temperature, movement, texture) have long-term regulatory effects on offspring behavior, and that at least some of these hidden regulators are likely present in humans. For example, frequency of parental touch is associated with brain activity in preterm infants and 5-year-olds (Brauer, Xiao, Poulain, Friederici, & Schirmer, 2016; Maitre et al., 2017). Also, maternal touch during a stressful procedure was found to reduce infants' physiological reactivity to stress (Feldman, Singer, & Zagoory, 2010), and breast milk odor was found to have analgesic effects in preterm infants during painful procedures (de Chanville et al., 2017). Hence, room sharing might provide more opportunities for infants to experience parental regulatory assistance through these hidden regulators, including maternal touch and odors.

This Study

This prospective longitudinal study is the first to examine the long-term relations of parent–infant room sharing (i.e., the particular form of cosleeping defined as sharing the same room but not the same bed) during the first 6 months of life with three domains of behavior in middle childhood: sleep, behavior problems, and prosocial behavior. During middle childhood, children are assumed both to encounter distinct developmental challenges and to develop new capabilities. Moreover, middle childhood is characterized by entry into first grade, a meaningful transition for children (Stams, Juffer, & van Ijzendoorn, 2002). As such, we selected a transitional period because the effects of possible early life risk and protective factors may particularly then become manifest (Shonkoff & Phillips, 2000).

Because current recommendations encourage room sharing, and discourage bed sharing (e.g., Moon et al., 2016), we included only infants who shared their parents' room and excluded infants who slept in their parents' bed. To focus on the first 6 months of life, we controlled for sleeping arrangements at 12 and 30 months of age. Our hypotheses were based on: (a) our conceptual model that room sharing would be related to increased children's regulatory capacities, as described above, and (b) our previous findings relating cosleeping more broadly (i.e., including largely room sharing, with some bed sharing) to decreased stress reactivity (an indicator of children's increased regulatory capacities) in the same sample examined here (Beijers et al., 2013; Tollenaar et al., 2012). We hypothesized that more weeks of room sharing would be related to fewer sleeping problems, fewer behavior problems, and more prosocial behavior in middle childhood.

Method

Participants

Participants were part of the ongoing longitudinal BIBO study in which mothers and their children were followed from pregnancy. The overall aim of this study is to examine prenatal and early caregiving factors and their impact on children's development and health. Pregnant women were recruited through midwife practices near Nijmegen, Arnhem, and surrounding areas. Only mothers with healthy, singleton pregnancies, no drug use, and a clear understanding of the Dutch language were included. The ethical committee from the Faculty of Social Sciences of Radboud University approved the study (#ECG300107), and all participants provided informed consent.

Two hundred and twenty pregnant women were recruited. Because of medical issues such as prematurity, eight mothers and their infants were excluded; during the first 3 months postpartum, another 19 mothers discontinued the study due to personal circumstances. This resulted in a final sample of 193 mothers and their infants at the start of this longitudinal study (for more information, see Beijers et al., 2013; Tollenaar et al., 2012). Retention rate from 3 months to 8 years was high (92%). At 6 years of age, 188 families participated; at 7 years of age, 182 families participated; and at 8 years of age, 177 families participated. The demographic characteristics of the mothers and their children are presented in Table 1. No demographic differences

Table 1
Descriptives of the Study Variables

Variables	*N*	*M*	*SD*	Range
Confounders				
Maternal education level (%)	162			
Secondary education		19.00		
College/university		75.19		
Child sex (%)	166			
Girls		47		
Boys		53		
Number of siblings	166	1.31	0.67	0–3
Infant negative affectivity, 0–6 months	166	2.52	0.49	1.50–4.12
Number of weeks breastfeeding, 0–6 months	163	16.72	11.12	0–27
Maternal depression				
Postpartum	166	5.00	3.27	0–21
At 6 years of age	142	3.98	3.24	0–15
At 8 years of age	150	4.97	3.96	0–24
Cosleeping at 12 months (%)[a]	158	7.60		
Cosleeping at 30 months (%)[b]	156	7.70		
Predictors				
Number of weeks room-sharing (0–6 months)	166	10.75	9.88	0–27
Outcomes				
Maternal report total sleep problems (6 years)	145	39.63	4.70	33–53
Maternal sleep rating (6 years)	145	8.62	0.94	6–10
Maternal report internalizing problems (6 & 7 years)	155	48.10	9.42	32–72.5
Maternal report externalizing problems (6 & 7 years)	155	48.54	9.02	32–73
Teacher report internalizing problems (6 years)	113	5.90	6.32	0–42
Teacher report externalizing problems (6 years)	113	5.18	6.99	0–28
Maternal report total behavior problems (8 years)	154	8.19	5.20	0–26
Maternal report prosocial behavior (8 years)	154	7.69	1.93	2–10
Teacher report prosocial behavior (6 years)	114	14.15	6.43	1–30
Dropped pencil task (6 years; % children picking up)	135	20.00		

[a]At 12 months of age, five children classified as bed sharers and seven children classified as room sharers. [b]At 30 months of age, eight children classified as bed sharers and four children classified as room sharers.

were found between participating mothers and those who dropped out.

Procedures

Information on nightly room sharing was collected with the use of daily diaries during the first 6 months of life (Weeks 1–27). The mothers received the diaries and accompanying instructions at the end of pregnancy so they could start providing data immediately after birth. When children were 6 years old, children participated in a data collection session in a research van parked next to the school. Several behavioral tasks were administered, including a measure of prosocial behavior (the "Dropped Pencils" task; see Simons, Cillessen, & de Weerth, 2017, for more information about the school visit). Teachers were invited to complete questionnaires on the specific child participating in the longitudinal study. Mothers completed a questionnaire about child sleep problems and rated the child's general sleep quality; teachers completed a questionnaire about child prosocial behavior; and mothers and teachers completed a questionnaire about child internalizing and externalizing behavior. When children were 7 years old, mothers again completed the questionnaire about child internalizing and externalizing behavior. At 8 years of age, mothers completed a questionnaire about child behavior problems and prosocial behavior. See Table 2 for an overview of the study variables and points of data collection. Both mothers and teachers were blind to the study objectives.

Measures

Room Sharing

Room sharing data were collected during the first 6 postpartum months with the use of a

Table 2
Overview of Study Variables and Data Collection Points

	N	Age 6	Age 7	Age 8
Maternal report total sleep problems	145	X		
Maternal sleep rating	145	X		
Maternal report internalizing problems	155	X	X	
Maternal report externalizing problems	155	X	X	
Teacher report internalizing problems	113	X		
Teacher report externalizing problems	113	X		
Maternal report total behavioral problems	154			X
Maternal report prosocial behavior	154			X
Teacher report prosocial behavior	114	X		
Dropped pencil task	135	X		

logbook provided by the experimenters. Mothers reported daily where the infant had slept during the past night by marking lines in a table that consisted of 30-min time blocks spanning between 8 p.m. and 8 a.m. Similar to Anders and Keener (1985) and Beijers et al. (2013), we defined nighttime as 12 a.m. to 5 a.m., the usual time of the parents' sleep. For every 30 min, mothers marked whether the infant slept in his or her own room, in the parents' room in a separate bed, in the parents' bed, or elsewhere; when the infant was awake, no line was drawn.

Ecological momentary assessments (EMA), such as our extensive daily sleep diary, are known to reduce bias, including reporter and recall bias. The use of EMA is especially appropriate to capture the assessment of moods and behaviors believed to change over time (Trull & Ebner-Priemer, 2009). As sleeping arrangements in the first postpartum months are highly subject to change (Beijers et al., 2013; Tollenaar et al., 2012), the use of a daily diary importantly improves reliability and validity (Trull & Ebner-Priemer, 2009).

In order to avoid including infants who were largely solitary sleepers but who came into their parents' room only intermittently, a week in which an infant slept in the parents' room < 10% of the time was not considered to be a room-sharing week. This cut-off point was based on our previous work that showed that outcomes were similar in infants who shared the parents' room for 10%–90% and for 90%–100% of the night (Tollenaar et al., 2012). For this reason, in this study the number of weeks in which 10%–100% room sharing occurred were summed and used as the independent variable (possible range 1–26; see Beijers et al., 2013). Because our definition of room sharing entailed parent and infant sleeping on separate surfaces within the same room, infants who slept predominantly in the parents' bed (i.e., ≥ 90% of the time for at least 2 weeks; $n = 7$) were excluded.

Sleep Behavior

Children's Sleep Habits Questionnaire. To measure child sleep problems at age 6, mothers completed the 35-item Children's Sleep Habits Questionnaire (CSHQ; Owens, Spirito, & McGuinn, 2000). Using a 3-point scale, mothers reported sleep behaviors occurring over a "typical" recent week. The questionnaire yields a total score for sleep problems and eight subscale scores reflecting key sleep domains that encompass the major medical and behavioral sleep disorders in children: bedtime resistance, sleep anxiety, night waking, sleep onset delay, sleep duration, parasomnias, sleep disordered breathing, and daytime sleepiness. The measure demonstrates good psychometric properties, also in Dutch samples (Owens et al., 2000; van Litsenburg, Waumans, van den Berg, & Gemke, 2010). The Total Sleep Problem Scale was used as outcome measure. In the present sample, the Cronbach's α of the Total Sleep Problem Scale was .71.

Global rating of sleep quality. When children were age 6, mothers rated their child's sleep through the following question: "On the basis of last week, how do you judge your child's sleep on a scale from 0 to 10? (0 = worst imaginable sleep, 10 = best possible sleep)."

Internalizing and Externalizing Behavior

Child Behavior Checklist 4–18. Mothers used this measure to indicate whether problem behaviors occurred within the last 6 months (3-point scale; Achenbach, 1991). The internalizing dimension consists of scales tapping anxious/depressed, somatic, and withdrawn behaviors; the externalizing dimension consists of the scales tapping delinquent and aggressive behavior. Previous research has established the measure's adequate psychometric properties (Achenbach & Rescorla, 1991). In this study, at both ages 6 and 7, the Cronbach's alpha for both internalizing and externalizing was ≥ .82. Scores across ages 6 and 7 were sufficiently correlated with support the use of an average internalizing score and an average externalizing score (Pearson's $r = .72$ for each dimension).

Teacher's Report Form. The Teacher's Report Form (TRF) is a variation in the Child Behavior Checklist 4–18 (CBCL 4–18) that is adapted for school personnel to report children's classroom behaviors (Achenbach, 1991; Verhulst, van der Ende, & Koot, 1997). Scales paralleling those of the CBCL 4–18, described above, were used to tap internalizing and externalizing behavior problems at age 6. The measure's satisfactory reliability and validity were confirmed for the Dutch translation (van Widenfelt, Goedhart, Treffers, & Goodman, 2003). In this study, Cronbach's α was .83 for internalizing behavior and .91 for externalizing behavior.

Strengths and Difficulties Questionnaire. Four 3-point subscales of the Strengths and Difficulties Questionnaire (SDQ) were used to tap mother-reported behavioral and emotional problems at age 8: hyperactivity/inattention (e.g., "constantly fidgeting or squirming;" five items), conduct problems

(e.g., "often loses temper;" five items), emotional symptoms (e.g., "many worries or often seems worried;" five items), and peer relationship problems (e.g., "rather solitary, prefers to play alone;" five items; Goodman, 1997). A total problems score was created by summing responses to all 20 items. Previous studies have demonstrated good reliability and validity of the instrument (Stone, Otten, Engels, Vermulst, & Janssens, 2010). In the present sample, the Cronbach's α for the total problems score was .77.

Prosocial Behavior

Strengths and Difficulties Questionnaire. A five-item subscale from the SDQ (described above) was used to assess children's mother-reported prosocial behavior at age 8 (Goodman, 1997). Sample items include "helpful if someone is hurt, upset or feeling ill." In the present sample, the Cronbach's α for the prosocial behavior subscale was .66.

Preschool Social Behavior Questionnaire. At age 6, teachers used a 10-item subscale of the Preschool Social Behavior Questionnaire (PSBQ) to measure prosocial behavior with peers (Tremblay, Vitaro, Gagnon, Piche, & Royer, 1992). Each item was rated on a 4-point scale (0 = certainly not characteristic, 3 = very characteristic), and a summed score was created (possible range, 0–30). Sample items include "Comforts a child that is crying or upset." The measure has been found to have good predictive validity and test–retest reliability (Tremblay et al., 1992). Cronbach's α was .93.

The "Dropped Pencils" task. This task took place at the end of the experimental session at age 6. The experimenter pretended to accidentally drop 50 pencils in front of the child, saying: "Oops, all the pencils fell down. I have to quickly get something. I'll be right back." The experimenter left the research van and returned after 10 s. The number of pencils picked up was recorded by the experimenter on her return. This procedure was adapted from measures of spontaneous helping behavior used in bystander intervention studies (Latane & Dabbs, 1975). Helping, as one of the components of prosocial behavior, is evident early in development, and is more other-focused when compared to, for example, sharing (Weltzien, Marsh, & Hood, 2018). Adaptations of the "Dropped Pencils" task have been successfully used in other studies as a measure of prosocial behavior (e.g., Dovidio & Morris, 1975; Kothgassner et al., 2017; Lefevor & Fowers, 2016; Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007). These studies found that participants picked up fewer pencils when stressed (Dovidio & Morris 1975) and socially excluded (Kothgassner et al., 2017; Twenge et al., 2007). Because most children in this study either picked up no pencils (80%), some pencils (5.9%), or all the pencils (14.1%), a dichotomous variable was used that indicated whether or not the child picked up any pencils.

Confounders

To control for sleeping arrangements at later ages, the daily diary used in the first 6 months of life was also completed for two consecutive weeks when children were 12 months and 30 months of age. As only a few children either bed shared or room shared at these ages (see also Table 1), data were combined, and children who slept either in the same room or in the same bed with their parents between midnight and 5 a.m. for 10%–100% of the time were classified as a cosleeper at that age. Results were similar when analyses were conducted with two distinct variables for bed sharing and room sharing.

Because higher infant temperamental negative affectivity has been related to cosleeping (Ramos, Youngclarke, & Anderson, 2007), as well as to later behavior (Luthar, Cicchetti, & Becker, 2000), we controlled for infant negative affectivity using the Infant Behavior Questionnaire–Revised (IBQ–R; Gartstein & Rothbart, 2003). Mothers completed the IBQ–R when infants were 3 and 6 months of age; infant negative affect scores were highly correlated across time (r = .55), and an average score was used.

Given some indication that postpartum depressive symptoms are associated with type of sleeping arrangements (Mileva-Seitz, Luijk, et al., 2016; Teti et al., 2016), as well as with parenting and later child behavior (Field, 2010; Sanger, Iles, Andrew, & Ramchandani, 2015), we asked mothers to complete the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) when infants were 3 and 6 months of age; scores were strongly correlated across time (r = .54) and averaged. Because current depressive symptoms might bias maternal ratings, mother EPDS scores collected when children were 6 and 8 years of age were used as confounders in analyses using maternal report. Additionally, because breastfeeding has been reciprocally related to cosleeping (i.e., cosleeping facilitates breastfeeding, and breastfeeding mothers more often cosleep; Ball, 2007; McKenna & McDade, 2005; Sobralske & Gruber, 2009), the number of breastfeeding weeks during the first 6 months (mother reports in weekly diaries) was added as a confounder. Last, maternal

educational level (cosleeping has been predicted by low economic status; Cortesi, Giannotti, Sebastiani, & Vagnoni, 2004), number of siblings (cosleeping has been predicted by number of siblings; Li et al., 2009), and child sex (sex differences are evident in behavior problems and prosocial behavior; Hill, Degnan, Calkins, & Keane, 2006) were added as confounders.

Missing Data

Twenty mothers did not provide sufficient data on room sharing (i.e., fewer than 17 weeks of data were provided). From the remaining 173 infant diaries, 105 infants had no missing weeks, data were missing from 1 to 2 weeks for 44 infants, and missing from 3 to 10 weeks for 24 infants. Missing weeks were replaced with the mean score of the previous and following weeks. Seven infants were excluded because they did not meet criteria for either room sharing or solitary sleeping described above (i.e., they slept predominantly in the parents' bed ($\geq$ 90% or more of the time, for at least 2 weeks). From the remaining 166 infants, the following data were missing for the outcome variables: sleep behavior (CSHQ and sleep quality rating, $n = 21$), averaged CBCL data at 6 and 7 years ($n = 11$), TRF data ($n = 53$), SDQ data ($n = 12$), PSBQ data ($n = 52$), and data from the "Dropped Pencils" task ($n = 31$). Reasons for missing data were mostly because of (a) lack of child participation at age 6, or (b) teacher failure to complete the questionnaire, largely because of time demands in both cases. The following confounder data were missing: maternal educational level ($n = 4$), breastfeeding data during the first 6 months of life ($n = 3$), cosleeping data at 12 months of age ($n = 8$), cosleeping data at 30 months of age ($n = 10$), maternal depression at age 6 ($n = 24$), and maternal depression at age 8 ($n = 16$).

Statistical Analyses

First, the following outliers were detected: teacher-rated internalizing ($n = 1$) and externalizing ($n = 2$) problems. These outliers (defined as > 3 *SD* above the mean) were subsequently winsorized (i.e., replaced by the next highest or lowest value). Hierarchical regression models were computed for the continuous outcomes in the three behavioral domains using the number of room-sharing weeks in the first 6 months as the predictor. A logistic regression model was computed for the prosocial behavioral task, as a dichotomous variable was created that indicated whether or not the child picked up any pencils. To examine whether the links between early room sharing and later child behavior were moderated by child sex, interaction effects between the number of weeks room sharing and infant sex were tested. Missing value analysis showed that data were missing completely at random (Little's Missing Completely At Random (MCAR) test: $\chi^2 = 95.021$, $df = 80$, $p = .121$). Expectation-maximization algorithm was used to impute missing values in the data set, as described by Dempster, Laird, and Rubin (1977). Results were similar when analyses were conducted with the imputed data. The results using the original data set are reported.

Results

Preliminary Analyses

Descriptives of study variables are presented in Table 1. The percentage of infants room sharing decreased over the first 6 months of life, from 86.7% in the first week to 16.9% of the infants in the 26th week of life. Table 3 presents the correlations between the number of weeks room sharing during the first 6 months of life and the confounders. More weeks of room sharing were significantly related to higher maternal educational level ($r = .28$, $p < .01$), more siblings ($r = .19$, $p < .05$), more weeks of breastfeeding ($r = .42$, $p < .01$), and cosleeping at 12 months of age ($r = .24$, $p < .01$). The correlations between the predictors and child outcome variables are shown in Table 4. The number of weeks room sharing during the first 6 months of life was not significantly related to any of the outcome measures. None of the interaction effects between the number of weeks room sharing and child sex was significant. To preserve power, these interaction effects were not included in the regression models of the principal analyses.

Principal Analyses

Sleep Behavior

Table 5 shows the results of the hierarchical regression models for the two outcomes in the behavioral domain of sleep using the number of room-sharing weeks in the first 6 months as the predictor. The results show that the number of weeks of room sharing were not related to sleep problems. Moreover, the number of weeks of room sharing were related to mothers' higher ratings of the quality of their child's sleep ($p = .018$), explaining 4% of the variance.

Table 3
Correlations Among Number of Weeks Room Sharing and Confounders

	1	2	3	4	5	6	7	8	9	10	11
1. Number of weeks room sharing in first 6 months	—										
2. Maternal educational level	.28**	—									
3. Child sex	−.00	−.07	—								
4. Number of siblings	.19*	−.13	−.05	—							
5. Infant negative affectivity (0–6 months)	−.01	.16*	.08	.04	—						
6. Number of weeks breastfeeding (0–6 months)	.42**	.19*	−.05	−.04	.13	—					
7. Maternal depression postpartum	.06	.04	.03	−.09	.34**	−.03	—				
8. Maternal depression at 6 years of age	.00	−.09	.20*	−.03	.13	−.09	.47**	—			
9. Maternal depression at 8 years of age	.00	.00	.07	−.02	.13	−.05	.32**	.42**	—		
10. Cosleeping at 12 months (bed- and room sharing)	.24**	.09	.03	.08	.07	.01	.03	.03	.03	—	
11. Cosleeping at 30 months (bed- and room sharing)	.12	−.10	−.02	.07	.07	.06	.05	−.04	.07	.10	—

Note. *N*s range between 142–166.
*p = .05. **p = .01.

Table 4
Correlations Among Study Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Number of weeks room sharing (0–6 months)	—										
2. Maternal report total sleep problems (6 years)	−.01	—									
3. Maternal sleep rating (6 years)	.12	−.54**	—								
4. Maternal report internalizing problems (6 & 7 years)	.02	.32**	−.23**	—							
5. Maternal report externalizing problems (6 & 7 years)	−.03	.37**	−.32**	.48**	—						
6. Teacher report internalizing problems (6 years)	.02	.00	−.01	.34**	.04	—					
7. Teacher report externalizing problems (6 years)	.10	.10	−.06	.20**	.37**	.24**	—				
8. Maternal report total behavioral problems (8 years)	−.01	.33**	−.23**	.46**	.58**	.02	.37**	—			
9. Maternal report prosocial behavior (8 years)	.09	−.17**	.20**	−.21**	−.28**	−.01	.01	−.38**	—		
10. Teacher report prosocial behavior (6 years)	.09	.04	.08	−.04	−.11	−.37**	−.36**	−.08	.20**	—	
11. Dropped pencil task (6 years)[a]	.17	−.12	.09	.04	−.05	.07	.35**	.04	.16	−.03	—

Note. *N*s range between 113–155.
[a]0 = no picking up, 1 = picking up.
*p = .05. **p = .01.

Internalizing and Externalizing Behavior

Table 6 shows the results of the hierarchical regression models for the five outcomes in the domain of behavior problems using the number of room sharing weeks in the first 6 months as the predictor. The results show that the number of weeks of room sharing were not related to any of the behavior problems measures reported by the mother or the teacher.

Prosocial Behavior

Table 7 shows the results of the hierarchical regression models for the three outcomes in the domain of prosocial behavior using the number of

Table 5
Multiple Hierarchical Regression Models for the Prediction of Child Sleep Behavior

	Sleep behavior					
	Maternal report total sleep problems at age 6			Maternal sleep rating at age 6		
	B	β	*SE*	*B*	β	*SE*
Step 1						
Maternal educational level	0.32	.09	0.30	−0.08	−.12	0.06
Child sex (1 = male, 2 = female)	−0.99	−.11	0.80	0.22	.12	0.16
Number of siblings	−0.50	−.08	0.58	0.14	.11	0.12
Infant negative affectivity, 0–6 months	2.23*	.23	0.88	−0.27	−.14	0.18
Number of weeks breastfeeding, 0–6 months	−0.06	−.15	0.04	−0.01	−.15	0.01
Maternal depression 0–6 months	−0.01	−.01	0.14	−0.01	−.03	0.03
Cosleeping at 12 months (0 = no, 1 = yes)[1]	1.25	.07	0.14	−0.53	−.15	0.03
Cosleeping at 30 months (0 = no, 1 = yes)[a]	3.67*	.21	1.51	−0.41	−.12	0.30
Current maternal depression	0.13	.09	1.49	−0.03	−.10	0.30
Step 2						
Number of weeks room sharing, 0–6 months	.00	.00	.05	.02*	.24	.01
Total R^2 (Step 1 and 2)	.15			.16		
Df	127			127		
Total *N*	137			137		
Step 2 R^2 change	.00			.04*		
F^2 change	0.00			5.78		
p-Value F^2 change	.99			.02		

Note. $N = 137$ for both analyses. B = unstandardized coefficient.
[a]As only a few children either bed shared or room shared at these ages, data were combined and children were classified as cosleepers at that age.
*$p = .05$.

room sharing weeks in the first 6 months as the predictor. The results show that the number of weeks of room sharing were signficantly related to picking up any pencils during the "Dropped Pencils" task ($p = .017$), explaining 7% of the variance. In addition, the number of weeks of room sharing were significantly related to more mother-reported prosocial behavior ($p = .040$), explaining 3% of the variance. Number of weeks of room sharing were not related to teacher-reported prosocial behavior ($p > .05$).

Additional Findings

Analyses provided information beyond the principal focus of this article—that is, information about the relations between the confounders and each outcome. First, higher infant temperamental negative affectivity and cosleeping at 30 months of age predicted more sleep problems in middle childhood (see Table 5). Second, higher infant temperamental negative affectivity, maternal postpartum depression, fewer siblings, and cosleeping at 30 months of age predicted more mother-reported internalizing problems in middle childhood. Additionally, maternal postpartum depression predicted more teacher-reported internalizing problems, and current maternal depression predicted more mother-reported total problems (see Table 6). Third, lower maternal educational level, being a female, lower maternal postpartum depressive symptoms, and lower current maternal depression predicted more mother-reported prosocial behavior, and being a female predicted more teacher-reported prosocial behavior (see Table 7).

Discussion

Despite the lack of compelling evidence, several professionals equate the practice of cosleeping, including room sharing, with subsequent infant dependency and more sleeping and other behavior problems (Paul et al., 2017). As a consequence, parents might refrain from choosing room sharing, even though room sharing during the first 6 months of life is currently recommended in order to reduce the risk of SIDS (Moon & the Task Force on Sudden Infant Death Syndrome, 2016). This study aimed to link room sharing in the first 6 months of life and child behavior in middle childhood in order to empirically evaluate these concerns. Room sharing was operationalized as the number of weeks in which parent–infant room sharing occurred within the first 6 months of life (see also Beijers et al., 2013). Our results showed that more weeks of room sharing in the first 6 months of life were not related to sleep problems

Table 6
Multiple Hierarchical Regression Models for the Prediction of Child Internalizing and Externalizing Behavior

	Child internalizing and externalizing behavior														
	Maternal report internalizing at age 6 and 7			Maternal report externalizing at age 6 and 7			Teacher report internalizing at age 6			Teacher report externalizing at age 6			Maternal report total problems at age 8		
	B	β	*SE*	*B*	β	*SE*	*B*	β	*SE*	*B*	B	*SE*	*B*	β	*SE*
Step 1															
Maternal educational level	−0.27	−.04	0.57	−0.40	−.06	0.61	−0.14	−.04	0.43	−0.47	−.10	0.53	−0.25	−.07	0.31
Child's sex (1 = male, 2 = female)	1.59	.09	1.50	−2.30	−.13	1.61	−0.24	−.02	1.10	0.76	.06	1.37	1.45	.14	0.81
Number of siblings	−2.88**	−.22	1.08	−0.91	−.07	1.16	−0.19	−.02	0.81	0.33	.03	1.01	−1.03	−.14	0.60
Infant negative affectivity, 0–6 months	3.90*	.20	1.66	2.27	.12	1.78	0.33	.03	1.25	1.29	.09	1.55	0.64	.06	0.92
Number of weeks breastfeeding, 0–6 months	0.09	.10	0.08	0.10	.12	0.08	0.01	.01	0.06	0.02	.03	0.07	−0.01	−.02	0.04
Maternal depression 0–6 months	0.60*	.21	0.27	−0.05	−.02	0.29	0.36*	.21	0.18	−0.11	−.05	0.23	−0.01	−.01	0.14
Cosleeping at 12 months (0 = no, 1 = yes)[a]	−3.27	−.09	2.85	−0.80	−.02	3.05	−2.27	−.11	2.13	1.77	.07	2.65	1.75	.09	1.57
Cosleeping at 30 months (0 = no, 1 = yes)[a]	7.01*	.20	2.81	−0.59	−.02	3.01	1.59	.08	2.09	−2.13	−.08	2.60	0.44	.02	1.55
Current maternal depression	0.13	.04	0.26	0.31	.11	0.28							0.48**	.37	0.11
Step 2															
Number of weeks room sharing, 0–6 months	.02	.02	.09	−.04	−.04	.10	.02	.03	.07	.07	.10	.08	.01	.02	.05
Total R^2 (Step 1 and 2)	.25			.06			.07			.04			.20		
df	127			127			100			100			135		
Total *N*	137			137			109			109			145		
Step 2 R^2 change	.00			.00			.00			.01			.00		
F^2 change	.05			.14			.06			.67			.04		
p-Value F^2 change	.82			.71			.80			.41			.85		

Note. *N*'s range between 109–145. *B* = unstandardized coefficient.
[a]As only a few children either bed shared or room shared at these ages, data were combined and children were classified as cosleepers.
*p = .05. **p = .01.

in middle childhood, but were related to higher maternal ratings of children's sleep quality. In addition, more weeks of room sharing were not related to maternal or teacher reports of internalizing and externalizing behavior problems. Last, more weeks of room sharing were related to more observed prosocial behavior, and more prosocial behavior as reported by mothers but not by teachers. The number of weeks room sharing in the first 6 months of life predicted 3%–7% of the variance in child sleep quality and prosocial behavior. Each of these findings is discussed below.

Room sharing was unrelated to sleep problems during middle childhood, including sleep anxiety, sleep onset delay, and night wakings. Moreover, mothers who room shared with their infant for more weeks during the first 6 months of life later provided higher ratings for their child's sleep quality. Our findings can be viewed as converging with the prospective study that found early bed sharing

Table 7
Multiple Hierarchical Regression Models for the Prediction of Child Prosocial Behavior

	Prosocial behavior								
	Maternal report at age 8			Teacher report at age 6			Dropped pencil task at age 6[a]		
	B	β	*SE*	*B*	β	*SE*	*B*	Wald	*SE*
Step 1									
Maternal educational level	−0.24*	−.17	0.12	0.57	.13	0.47	−0.17	0.80	0.19
Child's sex (1 = female, 2 = male)	−0.95**	−.25	0.30	−3.40**	−.26	1.22	−0.17	0.13	0.48
Number of siblings	0.04	.01	0.22	−0.51	−.06	0.90	0.08	0.05	0.35
Infant negative affectivity, 0–6 months	−0.13	−.03	0.34	−0.85	−.06	1.38	0.97	3.34	0.53
Number of weeks breastfeeding, 0–6 months	−0.02	−.09	0.02	−0.01	−.02	0.06	−0.04	2.22	0.03
Maternal depression 0–6 months	−0.11*	−.18	0.05	−0.07	−.04	0.20	−0.05	0.48	0.07
Cosleeping at 12 months (0 = no, 1 = yes)[b]	−0.13	−.02	0.58	1.32	.06	2.37	1.00	1.48	0.82
Cosleeping at 30 months (0 = no, 1 = yes)[b]	−0.79	−.11	0.57	−1.28	−.05	2.32	−1.62	2.01	1.14
Current maternal depression	−0.08*	−.17	0.04						
Step 2									
Number of weeks room sharing, 0–6 months	0.04*	0.20	0.02	0.04	0.07	0.08	0.07*	5.73	0.03
Total R^2 (Step 1 and 2)	.21			.11			.16*,[c]		
df	135			101					
Total *N*	145			110			127		
Step 2 R^2 change	.03*			.00			.07*,[a]		
F^2 change	4.31			0.32					
p-Value F^2 change	.04			.58			.01*		

Note. *N*'s range between 110–145. *B* = unstandardized coefficient.
[a]Logistic regression analysis. [b]As only a few children either bed shared or room shared at these ages, data were combined and children were classified as cosleepers. [c]Nagelkerke R^2.
*p = .05. **p = .01.

to be not predictive of night wakings in childhood (Jenni et al., 2005) but nonconverging with the retrospective study relating early bed sharing to more night wakings and failure to fall asleep alone at preschool age (Keller & Goldberg, 2004). Nevertheless, it remains unclear whether the study from Jenni et al. (2005) should be viewed as indicating consistency, given that bed sharing and room sharing are different arrangements and might therefore have distinct relations with child's later sleep behavior. The findings of our study did not mesh with those from Keller and Goldberg's (2004) study. The Keller and Goldberg study involved retrospective reports, which may be subject to recall bias. Additionally, it is possible that a study on sleep problems and/or sleeping arrangements attracted different families struggling with these issues. Finally, developmental differences may also account for the discrepant findings: the Keller and Goldberg study examined preschool children and this study examined early school-aged children. Potential effects of early risk and protective factors may manifest differently at different ages.

The question about potential mechanisms that explain the link between room sharing in the first 6 months of life and later child sleep remains. Although not included in this paper because sample size precluded a test of its mediating role, infant emotional and behavioral regulatory capacities were viewed as playing a key role in our conceptual model. As proposed earlier, the maternal proximity associated with infant–parent room sharing contributes to infant emotional and behavioral regulatory capacities. Infant emotional and behavioral regulatory capacities, in turn, would then predict better sleep in childhood. For example, the ability to regulate emotions could enable a child to regulate negative emotions and thoughts, preventing the child from ruminating at bedtime and enabling him or her to fall asleep, whereas the ability to regulate behavior could enable the child to comply with family sleep routines, such as certain bedtimes (Bub, Robinson, & Curtis, 2016). Cross-sectional research has linked emotional and behavioral regulatory capacities to fewer sleep problems in childhood and adolescence (e.g., Owens, Dearth-Wesley,

Lewin, Gioia, & Whitaker, 2016; Williams et al., 2016), and longitudinal research has indicated that preschool self-regulation predicts fewer sleep problems during middle childhood (Bub et al., 2016).

The possibility of a common denominator predicting both early room-sharing arrangements and child sleep should also be noted. Such a denominator could be family perceptions about child sleep. Whether parents perceive child sleep behaviors, including night wakings, to be negative and disruptive varies between families (Keller & Goldberg, 2004).

These perceptions might be predictive of the notion mothers have about their child's sleep in childhood but also of the type of sleeping arrangement chosen in the first 6 months of life.

Compared to mothers whose infants were solitary sleepers by 6 months of age, mothers of infants in consistent cosleeping arrangements throughout the first 6 months have been found to be more aware of their infant's night wakings (Teti et al., 2016; Volkovich et al., 2015, 2018). Although the reasons behind the sleeping arrangements have not been investigated, mothers who notice and view their infant's night wakings to be more negative and disruptive, might have changed their sleeping arrangement to solitary sleeping within the first 6 months. Additionally, these same mothers might have also provided lower ratings of their child's sleep quality in childhood. To eliminate this possibility of a maternal reporter bias, future research investigating whether children room sharing early in life indeed sleep better in childhood should incorporate objective sleep measures such as actigraphy.

To our knowledge, this study is the first to examine early sleeping arrangements as potential predictors of later child behavior problems. Some professionals have argued that if children do not sleep by themselves they will become dependent on others and their socioemotional development will be derailed (e.g., Brazelton, 1992; Ferber, 1985). This study found more weeks of room sharing in the first 6 months to be unrelated to internalizing and externalizing behavior problems, and as such the state of the field remains that there is no support for the notion that early room sharing has negative consequences on later child behavior. Strikingly, these findings held despite the fact that we included different questionnaires about behavior problems, different raters (mothers and teachers), and different child ages (6, 7, and 8 years). Future studies that include observations of behavior problems may yield differing results.

More room-sharing weeks in the first 6 months were related to more observed prosocial behavior in middle childhood and more maternal-reported (but not teacher-reported) prosocial behavior. Although this study is the first to relate early sleeping arrangements to later child prosocial behavior, these results are consistent with the Keller and Goldberg (2004) findings on bed sharing: Children who shared the bed with their parents during the first months were more self-reliant and socially competent as preschoolers. It is unclear why more weeks of room sharing were related to more observed and maternal-reported prosocial behavior, but not to teacher-reported prosocial behavior. Research indicates that prosocial behavior is very complex, and many factors are likely to interact when predicting prosocial behavior (Gross et al., 2017). The lack of strong correlations among our prosocial measures and the inconsistencies across reporters could, for example, be explained by factors such as the type of reporter, type of context, type of target, or an interplay among these factors (Gross et al., 2017). Children have different relationships with mothers and teachers, and specific relationships might differentially influence the prosocial behavior occurring within the relationship context. For instance, early sleeping arrangements, as part of the mother–infant relationship, might predict prosocial behavior within the family (visible to the mother) but not prosocial behavior within the classroom (visible to the teacher), as this latter behavior might be more susceptible to the teacher–child relationship (Kienbaum, Volland, & Ulich, 2001). Additionally, mother–teacher reporter discrepancies may emerge from contextual factors, such as the presence of others, which has been found to be particularly important in predicting prosocial behavior; for example, children can be less prosocial when bystanders are present (Plötner, Over, Carpenter, & Tomasello, 2015). This contextual dimension of presence of others is one on which mothers and teachers may vary, with mothers typically viewing their children in the presence of fewer other people than teachers. On this dimension, compared to the classroom context, the family context is relatively more similar to the laboratory context in which the observational task occurred. Moreover, prosocial behavior has been found to vary depending on whether the target is a peer, an experimenter, or the mother (e.g., van der Mark, van IJzendoorn, & Bakermans-Kranenburg, 2002), and the contexts in which mothers and teachers view their children vary on the presence/absence of these targets. Finally, it is important to note that nearly one-third

of the teachers failed to complete the questionnaire, largely because of time demands. This relatively large amount of missing teacher data could have affected the interreporter correlations and results.

What mechanisms could explain the link of room sharing in the first 6 months of life to later prosocial behavior? As noted above, the proximity associated with infant–parent room sharing may facilitate parental regulation of the infant, which in turn may facilitate the infant's developing self-regulatory capacities (e.g., Choe et al., 2013; Schore, 2001). As noted earlier, self-regulation is thought to be crucial for prosocial behavior because children need to remain regulated when witnessing another's need (e.g., for help)—rather than become dysregulated, overwhelmed, or self-focused—in order to focus on and respond prosocially to this need (Eisenberg & Fabes, 1995; Gross et al., 2017). In our previous studies, cosleeping has been related to what appeared to be more efficient infant physiological stress regulation (blinded for review; blinded for review). More weeks of room sharing might thus be related to better regulatory capacities in times of stress, a requirement to be able to behave prosocially toward another person. Additionally, parental regulatory assistance in response to infant nighttime needs might contribute to children's internal working models (IWMs; Bowlby, 1969/1982), experience-based representations of how other people may be expected to behave and a complementary representation of the self. Room sharing may facilitate the development of positive IWMs of others as valued resources (available when needed) and of the self as competent (in this case, competent in eliciting care). Prosocial behavior is thought to be fostered by positive working models of others as valued people worthy of care, and of the self as a competent person whose helpful overtures are welcomed (Gross et al., 2017). In sum, it is reasonable to speculate that early room sharing may set into action a developmental cascade wherein nighttime parent–infant interactions result in spreading effects across different levels—from physiological to representational levels (Masten & Cicchetti, 2010). More specifically, room sharing may lead to more parental regulatory assistance of the infant when needed during the night, which in turn may facilitate child regulatory capacities and positive child IWMs. Subsequently, child regulatory capacities and/or positive IWMs, would lead to increased child prosocial behavior later in life, as has been shown to be the case (e.g., Futh, O'Connor, Matias, Green, & Scott, 2008; Nie, Li, & Vazsonyi, 2016).

Yet future research is needed to test this developmental cascade model. The larger pattern of findings raises the question: If emotion regulation and IWMs are important outcomes of room sharing that mediate the link to prosocial behavior, why do they not also mediate a link to behavior problems given that they are well-known predictors of behavior problems (e.g., Mullin & Hinshaw, 2007)? At least two possibilities come to mind. Perhaps these mechanisms do mediate a link to behavior problems, but such mediation was not present in this low-risk sample characterized by relatively few behavior problems. Second, perhaps there are mechanisms involved that differentially predict prosocial behavior and not behavior problems. For instance, perhaps mothers who themselves are highly prosocial engage more in room sharing, and their infants are also more prosocial later through the mechanism of imitating maternal behavior.

Beyond the immediate focus of this study, the analyses provided information about another important question: How are later cosleeping arrangements (i.e., at 12 and 30 months of age) related to childhood outcomes? Whereas cosleeping at 12 months of age was not related to child behavior in middle childhood, cosleeping at 30 months of age was related to more total sleep problems, and to more internalizing behavior problems (using the CBCL, which includes a subscale about sleep problems). These findings converge with findings from earlier studies reporting cosleeping in late infancy and toddlerhood to be related to more sleep problems (e.g., Keller & Goldberg, 2004; Latz, Wolf, & Lozoff, 1999; Teti et al., 2016). That sleeping arrangements at 30 months of age, but not during the first year of life, were related to sleeping and internalizing problems during middle childhood could point to the possibility that sleeping arrangements at different ages have different consequences for later child behavior. Another explanation is that cosleeping in late infancy and toddlerhood is a marker of, but not necessarily the cause of, child sleep and internalizing problems (Davis, Parker, & Montgomery, 2004; Keller & Goldberg, 2004). Researchers have emphasized the importance of distinguishing between infants who slept with their parents because parents choose this sleeping arrangement as a preferred practice beginning in infancy (also referred to as "early" or "intentional" cosleepers) versus children who begin cosleeping in late infancy or toddlerhood as a response to sleep problems (also referred to as "reactive" cosleepers; Keller & Goldberg, 2004; Latz et al., 1999). Such "reactive" cosleeping may indicate that parents have brought their child into their room in desperation or exhaustion, or as a matter of convenience.

Our data favor this last explanation, as the number of weeks room sharing in the first 6 months of life was not related to cosleeping at 30 months of age (r = .12, p = .13, see Table 3), indicating that the group of infants room sharing was different from the group of toddlers cosleeping. The relations among timing of sleeping arrangements, child sleep problems, and parental reasons for sleeping arrangements, need further exploration, especially because sleep problems early in a child's life are related to various later negative child outcomes (e.g., Williams et al., 2016).

This study has several strengths, including the longitudinal prospective design, the daily report of sleeping arrangements for the first 6 months of life, and again for 2 weeks at 12 and 30 months of age, and the use of a multireporter (mother and teacher), multiage (6, 7, and 8 years) and multimethod (questionnaires and observational tasks) design. However, limitations should also be noted. First, despite the longitudinal, prospective design of our study, it is important to note that we cannot presume causality. Moreover, almost all mothers were highly educated and lived together with their partner, which limits the generalizability of the study. In addition, the room-sharing data and later sleep data were both based on maternal report. Precautions were taken to reduce reporter bias by controlling for maternal depression and educational level and by using an extensive daily sleep diary for the first 27 weeks of life. EMA, such as sleep diaries, are known to reduce reporter bias (Trull & Ebner-Priemer, 2009). Nevertheless, the use of more objective measures in future studies, including observations and actigraphy, will reduce the possibility that maternal reporter biases drove the present results. The use of child self-report measures for sleep problems has also been suggested, because even though parent reports have shown adequate correlation with objective sleep measures, certain aspects of sleep problems can be unnoticed by parents (van Litsenburg et al., 2010).

Our research can be extended in important ways. First, our results may be particular to the (country masked for blind review) context. Future studies are needed to replicate our findings in larger prospective longitudinal studies in different cultures, including cultures in which cosleeping and room sharing are the norm. If there is enough variation in sleeping arrangements within the specific culture, these studies should also differentiate between bed sharing, room sharing, and solitary sleeping to investigate whether these sleeping arrangements have distinct relations with later child's behavior. Additionally, in future studies, it would be important to differentiate between early bed sharing/room sharing and reactive bed sharing/room sharing. Also, future studies should examine whether relations found between early sleeping arrangements and later child behavior are indeed mediated by child regulatory capacities and/or IWM, as proposed. Examination of whether room sharing parents differ on dimensions not examined here that underlie the relations found would also be important. Moreover, further exploration should also investigate whether early sleeping arrangements could affect other child developmental outcomes, including cognition and physical health.

In sum, the recent recommendations supporting room sharing have emerged from compelling evidence that this practice reduces the risk of SIDS (e.g., Moon & the Task Force on Sudden Infant Death Syndrome, 2016). Yet even in the face of procedural recommendations, some parents may avoid room sharing if they believe that such a practice might contribute to such later difficulties as sleep problems, behavior problems, and poor social relations through interfering with the healthy development of the child's autonomy. The present prospective longitudinal study is the first to examine the middle-childhood correlates of infant–parent room sharing. These data suggest that early room sharing is not associated with later negative behavioral outcomes and, in contrast, provide some indication that room sharing predicts later improved sleep quality and prosocial behavior. If future studies reveal converging findings, practitioners will have a body of data available on which to base discussions with parents about this important family decision.

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