

COLLEGE VS. CHILDHOOD: THE LONG-TERM EFFECTS OF PARENTAL LEAVE IN
THE FIRST YEAR OF LIFE ON COLLEGE STUDENT COGNITION
AND EMOTION REGULATION

By

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Abstract

Having a caregiver home in the first year of life has been associated with many positive benefits for child development. However, no studies in the United States have examined the long-term effects of having a caregiver home past age 15. The current study sought to determine whether the duration of caregiver time at home in the first year of life was associated with the cognitive abilities and emotion regulation of college students. A total of 1,000 participants completed a series of online surveys, an IQ examination, and a frustration-inducing task. Results did not indicate a significant effect of caregiver leave on college student cognition, but there were significant associations between longer time at home and less difficulty regulating emotions. Additionally, there was a significant relationship between student gender, caregiver time at home, and student emotional regulation, where men experienced less difficulty regulating emotions in college when caregivers were home for more than six months during the first year of life. The results indicate a need for better parental leave policies in the United States to support healthy child development.

College vs. Childhood: The Long-Term Effects of Parental Leave in the First Year of Life on College Student Cognition and Emotion Regulation

The days when the majority of mothers stay home with their children while fathers leave to work are dwindling. In 2015, 46% of two-parent households have both parents working full time, a number that has increased from 31% in 1970 (Pew Research Center, 2015). As of 2015, only 26% of households in the USA have a mother at home and not employed while the father works full time, and the remainder of two-parent households have a mother who works part time or a mother who works full time while the father stays home. However, due to the lack of universal paid parental leave policies in the USA, many families must make the difficult decision of being separated from their child at an early age in order to return to work. Many parents, particularly mothers, find themselves having to leave their jobs to stay home with their children due to restrictive, demanding workplace policies, despite the majority of these women expressing a desire to stay employed (Stone & Lovejoy, 2004).

It is important to note that a large body of research shows that the development of children is unhindered by having a working mother (Siegel & Haas, 1963). However, research shows benefits for children's development from having a parent home in the first year of life, such as significantly higher scores in cognitive development compared to children whose mother worked full-time (Brooks-Gunn et al., 2010). These same findings were not replicated for later years of children's development, which found no cognitive differences between children whose other parent was at home or worked full time in the second and third years of life, suggesting the importance of being at home in the first year. Additionally, benefits were also found for mothers, with mothers who were at home in the first year exhibiting fewer maternal depressive symptoms

than those employed full-time (Brooks-Gunn et al., 2010). Existing research suggests maternal depression is associated with lower levels of maternal sensitivity, creating a greater likelihood of children developing an insecure attachment (Trapolini et al., 2008). However, there is little research on the impacts of parental leave for development beyond childhood. The current study sought to assess whether parental leave affects cognitive abilities and emotional regulation in emerging adulthood.

Parental Leave Policies

Out of 193 United Nations countries, there are only three that do not offer some form of paid parental leave – one of which is the USA (Johnson & Calvert, 2022). When evaluating maternity leave among high-income countries, the USA is the only one that does not mandate any form of paid leave (Johnson & Calvert, 2022). Across the world, policies vary, with some countries offering full compensation or partial compensation for differing amounts of time. Switzerland, for example, falls on the low end with offering 14 weeks of protected leave for mothers at 80% compensation (Ray et al., 2010). France and Germany, on the other hand, each provide over 300 weeks of protected leave that can be divided between parents, with approximately 20 of those weeks paid. Although women still tend to take the majority of the leave compared to men, the access to paid leave and the ability for men and women to split leave in some countries contributes to greater equality on the parental leave equality index (Castro-Garcia & Pazos-Moran, 2016).

The USA, on the other hand, offers little support for new parents, especially compared to the aforementioned countries. The USA has the Family and Medical Leave Act (FMLA), which requires companies to provide 12 weeks of unpaid leave for employees (Waldfoegel, 1999). However, there is no mandated provision of paid leave. Because of this, many of those who

could use the leave are unable to take it. The U.S. Department of Labor found that over 3.5 million people in the USA needed leave but could not take it, with 80% of those reporting that they did not take unpaid leave because they could not afford it (Ray et al., 2010).

Within the USA, it is illegal to separate a puppy from its mother in 28 states (Johnson & Calvert, 2022). However, there are not similar mandates for human mothers and their children, with many working mothers having to leave their children between 2-6 weeks after birth, a timeframe that falls before the majority of daycares will admit infants (typically between 6-8 weeks; Johnson & Calvert, 2022). These limited policies are in place despite recommendations that paid maternity and paternity leave should be offered for new parents, as demonstrated in a report by the President's Commission on the Status of Women (Gault et al., 2014). Parental leave is considered an essential part of a woman-friendly welfare state, critical for ensuring gender equality (Ray et al., 2010). The USA's failure to provide paid parental leave is not only detrimental for child development but for parent well-being, which also influences how children are raised.

The Impact of Parental Figures on Development

Parental figures and caregivers are critical for healthy child development. Parental separation is one of the most stress-inducing events in the lives of children and their parents, creating short- and long-term impacts on family relationships (Stadelmann et al., 2010). Additionally, the length of time a mother spends with her child in their first year of life was found to directly influence success in the child's future school and work endeavors (Johnson & Calvert, 2022). However, it is not only the quantity of time that matters in parenting, but the quality of time. Mothers who were employed were found to typically spend higher quality time with their infants after coming home from work when compared to stay-at-home mothers

(Bianchi, 2000). These results, however, only pertain to mothers who have received high quality support and made a choice to go back to work rather than being forced to return due to lack of adequate financial, workplace, and social support.

Attachment Theory

Attachment theory was first presented by John Bowlby and further expanded by Mary Ainsworth (Bretherton, 2013). The theory states that the attachment bond developed between a parent and their child influences the way in which that child will later develop relationships with others in their life based on a working model they develop (Pallini et al., 2014). An attachment bond is defined by parenting, evolving based on how nurturing, responsive, and sensitive the parent is in meeting the child's needs. Although Bowlby was responsible for attachment theory, Mary Ainsworth developed the Strange Situation to assess attachment and identify three attachment classifications – secure, insecure-avoidant, and insecure-resistant – with the classification of disorganized being added later (Bretherton, 2013). A key aspect of attachment is that it forms in the child's first year of life, showing how critical the period of infancy is for development.

Attachment theory can be used to assess how the lack of parental leave in the first-year influences parenting, which then influences how a child's attachment develops. Research on working parents and attachment generally finds no effects, suggesting that the attachment style of a child to a parent who works is not directly impacted by parental employment (Scarr et al., 1989). However, the stressors of employment can negatively impact the quality of care that a parent provides. These stressors include limited social supports offered in the workplace (e.g., parental leave, childcare, or wage deficiency), as well as attitudes and expectations of maternal and paternal roles in caregiving, particularly in households with two full-time working parents.

Due to work-related stress, a parent may provide less sensitive care to their children, therefore creating a greater likelihood of their child developing an insecure attachment to their parental figure.

Ecological Systems Theory

Ecological systems theory also highlights the importance of parenting on children's emotional and cognitive development through the lifespan (Bronfenbrenner & Evans, 2000.) This theory posits that the environment shapes development through increasingly broad, interacting layers (Johnson, 2008). The layers consist of the microsystem, mesosystem, exosystem, macrosystem, and chronosystem. The microsystem consists of interpersonal relationships with a direct influence on the individual, whereas the mesosystem is the links that occur between microsystems. The exosystem consists of environments the child is not directly embedded in but is indirectly influenced by. The macrosystem is broad cultural beliefs and ideologies and the chronosystem is the change over time that occurs in the lifespan (Johnson, 2008).

Parents are located within a child's microsystem as a direct influence on development. The way that parents treat their children and respond to their needs, just as in attachment theory, is critical for impacting the child, as they are a part of that child's closest environment (Johnson, 2008). Within this, the emotional state of parents will directly affect how the child is cared for and how they develop. Parenting stress from the burdens of caring for new infants while trying to manage work and their own healing can transmit to children through interactions that take place within the microsystem (Lidbeck & Bernhardsson, 2021).

Bronfenbrenner's theory also highlights the influence other systems have on a child's life through the lens of parental leave. The parents' workplace is an aspect of the exosystem. As

such, the parental leave that the workplace offers belongs to a child's exosystem. In addition, the culture of the workplace will affect parents, which in turn affects children. Bronfenbrenner demonstrated that the values upheld in the parent's place of work had an influence on how that parent raises their child (Bronfenbrenner, 2000). For example, a stressful deadline placed on a parent at work may cause the parent to be more stressed and have a short temper with, or lash out at, their children when they return home. The macrosystem includes parental leave policies that the government has put into place. This aspect of government and culture affects the time a child has with their parents early on, creating a trickle-down effect and impacting the child's future development.

The Effects of Parental Leave

Parental leave is not adequately provided in the USA, despite nearly every other country in the world offering some form of paid leave. These insufficient policies are in place despite significant evidence showing the benefits for children at many stages of life, as well as for their parents.

Newborns & Infancy. The benefits of having a parent home at the start of a child's life can be witnessed early on. It is hypothesized that parental leave policies have the probability to improve outcomes for preterm newborns based on the parent having the ability to invest more in their child early on and have higher involvement, both protective factors against the health risk of premature infants (Greenfield & Klawetter, 2016). It has been difficult to accurately assess this hypothesis, however, as families who are more likely to have an infant born prematurely are also less likely to have accessible paid leave. However, this is not the only study that has shown the influence of parental leave on infant health. Other research demonstrates that providing a bonus week of maternity leave is associated with a 3% decrease in infant mortality rates (Ruhm,

2000). Providing paid maternity leave was found to reduce low birth weights by 3.2%, as well as decrease the possibility of an early-term birth by 6.6% (Stearns, 2015). Overall infant health was also increased by the provision of paid maternity leave (Rossin, 2011). Additionally, it has been found that infants who have spent a greater degree of time with their parents at home have higher rates of emotional processing and better emotional configuration (Gredebäck et al., 2011). These results demonstrate the benefits parental leave can have in the earliest stages of life.

Toddlerhood. The effects of having a parent home in the first year of life persist beyond infancy and extend into the toddler years. A recent study discovered that mothers who were granted monetary compensation during their parental leave had toddlers with significantly increased language scores compared to children of mothers who did not receive such leave (Kozak et al., 2021). Additionally, better outcomes were found for behavioral patterns of toddlers among the former group of mothers. However, it is important to note that this same study did not identify any connections between paid leave and cognitive or socioemotional scores when assessing the entire sample. Physical health was also found to be beneficially affected for toddlers of mothers with maternal leave. Children who had mothers with longer maternity leaves were more likely to be breastfed for a greater duration of time (Fabel, 2021). Because of this, these toddlers had lower likelihood of experiencing health conditions such as allergies, asthma, or diarrhea. The founding of the FMLA contributed to this as well, with children born after the enactment of this having better health outcomes as young children and toddlers (Rossin, 2011).

Early Childhood. The positive effects of having a parent being home in the first year of life are shown to continue into early childhood, leading to benefits such as better physical health and improved cognitive performance for the child (Gregg & Waldfogel, 2005). Research

conducted in Chile assessed the effect of a national increase in paid maternity leave from 12 weeks to 24 weeks on long-term development by following children from 7 months to 6 years (Albagli & Rau, 2018). Results showed significant gains in child cognitive skills that are projected to persist into adulthood, with particular significance found for those with less-educated mothers.

Some research indicates there may be minimal benefits of increased maternity leave for children (Baker & Milligan, 2015). A study examining an extension of maternity leave in Canada found no significant positive effects on cognitive and behavioral development for 4 and 5-year-olds (Baker & Milligan, 2015). However, the study in question examined a policy increase from six months to a year, not a provision of leave where one didn't already exist. Additionally, the study was found to be in contrast with other existing literature on the topic.

International Studies of Adult Outcomes

Within the USA, no studies have looked at the long-term effects of parental leave in the first year of life on college students. However, international studies have assessed long-term effects, including to 30 years of age, to determine whether parental leave in the first year affects development into adulthood. For example, a study examined the long-term effects of an implemented maternity leave policy in Norway in 1977 (Carneiro et al., 2015). The new policy provided 4 months of paid leave and 12 months of unpaid leave for mothers, replacing the previous one only providing 12 weeks of unpaid leave. Results comparing children born before the policy change and after showed that children with a mother who stayed home in the first year of life had lower high school dropout rates, were more likely to attend college, and had higher economic earnings by 30 years of age compared to peers whose mothers were not home in the

first year. The results were found to be especially significant for children with a mother who would have had to take a low level of unpaid leave prior to the policy reform.

Swedish policies granting additional time off and greater benefits for mothers who had two children within a specific period of timer also found significant long-term benefits for the first-born child, such as higher cumulative GPA in the ninth grade and greater likelihood of going to college (Ginja et al., 2020). Although no significant effects were found for the second-born child, those findings were found to be consistent with second-born children tending to fare worse academically than their older siblings (Ginja et al., 2020). This peer-reviewed research serves as a form of justification for examining long-term outcomes, even with confounding variables that may occur throughout a child's development.

Further international studies have assessed the optimal length of parental leave. A policy expanding parental leave from 12 to 24 months was implemented in Austria in 1990 (Danzer & Lavy, 2013). The effects on later cognitive abilities were assessed by comparing test scores at 15 years of age between a group of children born in 1987 and 1990. No significant differences were found between group scores, suggesting that the increased time was not necessary for long-term cognitive development. However, strong positive effects were found for boys with highly educated mothers (Danzer & Lavy, 2013).

College Student Outcomes

Overall, parental leave has been found to impact a variety of child and adult outcomes. However, the impact on cognitive and social development has been studied more than other outcomes. Generally, research finds benefits on a variety of cognitive outcomes including higher GPAs (Ginja et al., 2020) and long-term gains in cognitive skills (Albagli & Rau, 2018). With respect to social and emotional development, individuals whose parents took advantage of leave

during the first year were more likely to have better behavioral patterns (Kozak et al., 2021) and emotional configuration skills (Gredebäck et al., 2011). The current study extends this research by focusing on IQ, GPA, and emotion regulation in emerging adults currently enrolled at the university level.

Current Study

Knowledge that has been obtained points to the multiple positive effects parental leave has on child development. However, the duration of those benefits is unclear, particularly in the USA. Although it is known there is an effect in childhood, whether those impacts continue to extend into adolescence and emerging adulthood is not yet evident in the USA. After evaluating the existing research, the primary research question posited is whether the duration of parental leave in the first year of life was associated with the intellectual functioning and emotion regulation skills of college students. It was hypothesized that the longer a parental figure stayed home in the first year of life, the better a college student would perform on an IQ test, a measure of cognitive ability, and the greater their emotional regulation skills would be.

Method

Participants

The study consisted of two parts. Participants in Part 1 were college students ($n = 1000$) at Texas Christian University (TCU) between the ages of 18 and 25. The mean age was 19.19 years ($SD = 1.24$). Participants were comprised of female-identifying ($n = 818$), male-identifying ($n = 171$), and non-binary ($n = 11$) subjects, with 70.60% of participants ($n = 706$) identifying as White, 10.40% identifying as Hispanic/Latino, 7.00% identifying as Asian/Asian American, 6.60% identifying as mixed ethnicity, and 5.40% identifying as Black/African American. The majority of participants were first-years ($n = 449$), followed by sophomores ($n = 261$), juniors (n

= 161), seniors ($n = 115$), and fifth-year/other students ($n = 14$). The household incomes of student's parents were also considered. Among those who knew the income of their parents ($n = 709$), 28.20% reported an income greater than \$500,000, 21.00% reported an income between \$250,000-\$500,000, 15.80% reported an income between \$150,000-\$250,000, 10.00% reported an income between \$100,000-\$150,000, and 25.00% reported an income below \$100,000.

Participants in Part 1 were then invited to come into the lab for an in-person session as Part 2. Of those invited, 90 came in and completed participation. Participant ages ranged from 18-23, with a mean age of 19.07 years ($SD = 1.30$). The majority of participants were female-identifying ($n = 78$), followed by male-identifying ($n = 11$) and non-binary ($n = 1$). When reporting ethnic background, 75.60% identified as White, 11.10% identified as Hispanic/Latino, 6.70% identified as Asian/Asian American, 3.30% identified as Black/African American, and 3.30% identified as mixed ethnicity. Most participants were first-years ($n = 50$), followed by sophomores ($n = 17$), seniors ($n = 12$), and juniors ($n = 11$). For those who reported knowledge of parent income ($n = 74$), 21.60% reported an income greater than \$500,000, 31.10% reported an income between \$250,000-\$500,000, 16.20% reported an income between \$150,000-\$250,000, 8.10% reported an income between \$100,000-\$150,000, and 23.00% reported an income below \$100,000.

The self-identified primary caregiver of participating students in Part 2 was also contacted to participate in the study via email recruitment. Out of 90 participants, 74.44% ($n = 67$) of parents responded and agreed to participate, and 66.67% ($n = 60$) successfully completed the survey. 91.67% ($n = 55$) of the parents who participated were mothers, while 8.33% were fathers.

Procedures

College students were recruited through the Department of Psychology at TCU, using an online research participation website (SONA Systems) to register for the study. The study had two parts. In Part 1, students completed a series of online surveys. Measures included self-report of parent time at home in the first year of life, self-report of college GPA, and two surveys assessing emotion regulation capacities. Then, participants were invited to register for the on-campus laboratory for the second part of the study. Those who did so completed a survey to assess their baseline emotional state before taking an IQ test to assess cognitive abilities. Upon completion of the cognitive ability test, participants completed the same earlier survey to assess emotional reactivity (post-test emotions – pre-test emotions). Participants then had 15 minutes to complete the Tower of Hanoi, which was implemented in the study as a method of inducing frustration. After 15 minutes, participants completed the emotion survey again. After this, participants were free to leave. The contact information of the primary caregiver referenced in the online survey was also obtained. Participants were compensated with course credit hours which could be allotted towards psychology courses they were enrolled in as extra credit.

The primary caregivers of participants were contacted via the provided information from participating students. Parents were recruited via an invitational email. If they responded and were willing to participate, they were sent an email with a link to a Qualtrics survey to provide information about the length of time they were home during their child's early years. Upon completion of the survey, parents were compensated with a \$10 Amazon gift card.

Measures

Cognition. Cognitive abilities were measured via administration of the Raven's-2 Progressive Matrices Clinical Edition (Raven et al., 2018), a test designed to assess one's capacity to solve complex problems and think in a clear, comprehensive manner. The test

consisted of 48 picture puzzles each missing a piece, with participants having to identify which multiple choice answer fit the pattern. After accounting for age, results were scored using the scoring manual. Participant's scores were converted to a standardized score ($M = 100$, $SD = 15$). College GPA was also collected as a variable of cognition. During the online survey, students self-reported their current overall GPA.

Emotion Regulation. To induce frustration for the participant during the in-person portion of the study, participants had 15 minutes to work on the Tower of Hanoi (Simon, 1975), a task involving three rods and nine discs of increasing sizes, creating a cone-like shape. Participants were instructed to move all discs from the first rod to the third one, stacked in the same original order. However, discs could only be moved one at a time and a larger disc could never be placed on top of a smaller one. The task is complicated and takes 511 moves if perfectly solved; however, participants were told that the task was simple and that the average person could complete the task in 6 minutes. This was done to try and increase the frustration levels of being unable to solve it in the time provided.

In order to measure emotion regulation during the task, participants completed a shortened version of the Positive Affect and Negative Affect Scales (PANAS; Watson et al., 1988), which was administered three times throughout the study – once at the study's start, once after the Raven's cognitive ability test was administered, and once after the Tower of Hanoi. The shortened PANAS is a ten-question survey assessing both positive affect and negative affect independently. Positive affect is defined as the degree of feelings of enthusiasm, alertness, and activity. Negative affect is defined as the degree of feelings of distress and aversive mood states. The questions consist of ten different emotional states, with participants identifying the extent to which they are currently feeling that way, ranging on a 5-point Likert scale from 1 (very slightly

or not at all) to 5 (extremely). Internal consistency for the current study was 0.88 for positive affect and 0.89 for negative effect. To quantify emotion dysregulation, a reactivity score was calculated by subtracting the initial PANAS score from the Tower of Hanoi score. See Appendix A for scale.

Two online surveys were also administered to assess emotion regulation. The first survey was the Difficulties in Emotion Regulation (DERS; Gratz & Roemer, 2004). The survey consists of 41 self-report questions, that are answered using a 5-point Likert scale from 1 (almost never) to 5 (almost always). The scale consists of six subscales: Nonacceptance of Emotional Responses, Difficulties Engaging in Goal-Directed Behavior, Impulse Control Difficulties, Lack of Emotional Awareness, Limited Access to Emotion Regulation, and Lack of Emotional Clarity. Total score was also measured. Higher scores indicate greater difficulty regulating emotions (11 of the 41 items were reverse-coded). Internal consistency for the current study was 0.88. See Appendix B for scale.

The final measure used to assess emotion regulation was the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003). The survey consisted of 10 questions on a 7-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The scale consists of two subscales measuring the use of reappraisal strategies and suppression strategies. Higher scores represent higher reappraisal of emotions (adaptive emotion regulation strategy) and higher emotion suppression (maladaptive emotion regulation strategy), respectively. Internal consistency for the current study was 0.88 and 0.84 respectively. See Appendix C for scale.

Parent Leave. The duration of time a parent was home with their child in the first year of life was recorded via parent survey. Parents completed a survey indicating their relationship status at the time of the child's birth and first birthday, the duration of time they were home in

the child's first year of life, whether they received a form of paid leave, and whether they returned to paid employment in the child's first year. The same questions were asked about their partner at the time. Open-ended free response questions also asked about how the parent believe the duration of time they were home in the first year of life impacted the child cognitively and emotionally, as well as how it influenced the parent-child relationship. Student participants in the study had the opportunity to report on the same things from the child perspective.

Results

Assumptions

Prior to running analyses, assumption tests were performed to examine normality of the data. The independence of observations was met due to participants participating independently and without influence of other participants without information of the study's purpose. The dependent variables were all on interval scales and therefore met that assumption. All Part 1 variables met the assumption of homogeneity of variance via Levene's Statistic, $ps > .05$. For Part 2, the majority of variables met the homogeneity of variance assumption via Levene's Statistic, $ps > .05$. However, the PANAS at times 2 and 3 (for both positive and negative scales) violated this assumption, $ps \leq .047$. Since the PANAS met the assumption for homogeneity of variance in time 1, analyses moved forward as planned.

The data did not meet assumptions of normality for either time point. All Part 1 variables violated the Kolmogorov-Smirnov and Shapiro-Wilks tests, $ps \leq .001$. In Part 2, the Difficulties Engaging in Goal Directed Behavior subscale, Lack of Emotional Awareness subscale, DER total score, ERQ Reappraisal subscale, and IQ score all met assumptions of normality via Kolmogorov-Smirnov and Shapiro-Wilks tests, $ps \geq .107$. However, the Nonacceptance of Emotional Responses subscale, Impulse Control Difficulties subscale, Limited Access to

Emotion Regulation Strategies, Lack of Emotional Clarity, ERQ Suppression, and all PANAS scores violated normality assumptions via Kolmogorov-Smirnov and Shapiro-Wilks tests, $ps \leq .040$.

Because of these findings, histograms were examined for normal distribution. In both Part 1 and Part 2, the Difficulties Engaging in Goal Directed Behavior subscale, Lack of Emotional Awareness subscale, DER total score, ERQ Reappraisal subscale, and ERQ Suppression subscale had normal distribution. However, the Nonacceptance of Emotional Responses subscale, Impulse Control Difficulties subscale, Limited Access to Emotion Regulation Strategies subscale, Lack of Emotional Clarity subscale violated normality and were skewed to the right. In Part 2, all PANAS scores and IQ were normally distributed via histogram.

Despite some of these normality violations, the planned analyses were moved forward in light of the central limit theorem. The central limit theorem states that multiple, different situations allow for normality without accounting for how the sample data is shaped (Field, 2017). Field also reports that the sample size that is widely recognized as typically large enough to assume normality is $n = 30$. Since the sample sizes for Part 1 and Part 2 of this study were $n = 1000$ and $n = 90$ respectively, the participant pool was larger than what was needed, allowing normality to be assumed. Regarding homogeneity of variance violations, ANOVA designs are strong against the issue, meaning the central limit theorem still applies (Field, 2017).

Frustration Task

Following assumptions testing, t -tests were administered using the Part 2 data to test for significant differences. A paired samples t -test was conducted to evaluate if there were differences between Time 1 and Time 3 of the PANAS. Results were nonsignificant for both the negative ($t(89) = -.675, p = .251$) and positive ($t(89) = 1.619, p = .055$) administrations, though

positive affect results were trending towards significance. These results indicate that emotional states stayed constant from before to after engaging in the Tower of Hanoi, regardless of caregiver time at home.

Effects of Time at Home in Part 2

Following the administration of the *t*-test, a one-way analysis of variance (ANOVA) was performed to evaluate the effects of parent time at home (home less than 9 months vs. home more than 9 months) on difficulties with emotion regulation, using Part 2 data. Time at home was divided into groups of more than 9 months at home and less than 9 months at home due to 58 of the 90 participants falling into the highest category of time at home (9-12 months). Results were nonsignificant, $F(1,88) = .019, p = .891$.

Another set of one-way ANOVAs was performed on Part 2 data to evaluate the effects of parent time at home (home less than 9 months vs. home more than 9 months) on emotion regulation strategies and results were nonsignificant for reappraisal, $F(1,88) = .852, p = .359$, and suppression, $F(1,88) = .233, p = .631$. The combination of results indicates that there was no effect of caregiver time at home on student ability to emotionally regulate in emerging adulthood among Part 2 subjects.

A final one-way ANOVA was performed on Part 2 data to assess the effects of parent time at home (home less than 9 months vs. home more than 9 months) on IQ scores. Results were nonsignificant, $F(1,88) = .683, p = .411$. These findings indicate there may not be an effect of parent leave in the first year of life on cognitive abilities for college students.

Effects of Time at Home in Part 1

After Part 2 data failed to yield significant results, a Pearson correlation coefficient was performed on the Part 1 data to examine correlations between the variables of gender, parent

time at home, GPA, and scores on the ERQ and DER. Significant negative correlations were found between parent time at home and the Difficulties Engaging in Goal Directed Behavior DER subscale, ($r(998) = -.071, p = .025$), the Limited Access to Emotion Regulation Strategies DER subscale ($r(998) = -.078, p = .014$), and the Total Score on the DER ($r(998) = -.078, p = .014$). All other correlations were non-significant, $ps > .065$.

Gender and Leave Time on Emotion Regulation

A 2(gender: male vs. female) x 9(parent leave time, see Table 1) between-subjects ANOVA was performed on DER scores. The results indicated no significant main effect for gender, $F(1,988) = .02, p = .858$, or parent leave time, $F(9,988) = 1.629, p = .102$. However, the interaction between gender and parent leave time was significant, $F(8,988) = 1.934, p = .050$. See Table 1 for statistics.

Simple main effect analyses show that while there were no significant differences (regardless of gender) when the primary caregiver was home for less than six months, $ps \geq .055$, when a caregiver was home for longer than six months, there were significant decreases in scores on the DER (meaning less difficulty regulating emotions), $ps \leq .014$. Results indicated that for those who identified as women, there was not an effect of parental leave time on DER scores, demonstrating that caregiver time at home was not a significant predictor of emotion regulation in emerging adulthood. However, for those men, DER scores significantly decreased after a caregiver was home for longer than six months, showing that caregiver time at home positively influenced emotion regulation capacities for boys in emerging adulthood. See Figure 1.

Discussion

The current study examined whether the amount of time a caregiver was home during their child's first year of life was associated with the child's cognition (comprising of IQ and

GPA) and emotion regulation during the college years. Although parental leave time was not a significant predictor of cognitive abilities, there were significant associations between parental leave time and emotion regulation, especially among male students. These findings highlight the importance of caregiver availability during the first year of life and have implications for the development of government policies.

Overall, there were small associations between parental leave and student's emotion regulation abilities. Specifically, greater time at home was associated with less difficulty with emotion regulation. The associations between parental time at home and emotion regulation was different for female-identifying students versus male-identifying students. For female-identifying students, there was little variation in scores in relation to parent time, with emotion regulation abilities remaining consistent regardless of how long a caregiver was home during the first year of life. However, for male-identifying students there was a significant, negative association between parental time at home and emotion regulation abilities. That is, approximately 20 years later, male students showed better emotion regulation abilities when their parent stayed at home longer. This association became statistically significant after caregivers were home for longer than six months. These results demonstrate a possible mediator for difficulties with emotion regulation, as boys tend to do worse on this assessment compared to girls and traditionally struggle more with emotion regulation. Having a caregiver at home for longer in the first year of life may be something that diminishes these difficulties.

Based on these results, it appears that six months may be a significant length of time for obtaining long-term results on emotion regulation. If a caregiver is home for less than six months, there may not be a long-term impact on how an individual emotionally regulates. However, if the primary caregiver is home for longer than six months in the first year, there may

be a long-term influence on diminishing difficulties with emotion regulation, particularly for men. Other research suggests that six months is a significant and recommended amount of time for long-term benefit (Gregg & Waldfogel, 2005), supporting the findings of this study. It also has been predicted in other studies that effects of parental leave on social and emotional outcomes would be larger for boys than girls, aligning with our results (Brooks-Gunn et al., 2010).

Although there were no significant associations between parental leave and cognitive abilities, there are some possible explanations for this. IQ was only administered in Part 2 of the study, which resulted in a smaller sample size as compared to the emotion regulation data. In addition, among Part 2 participants, there was little variability as 64.44% of participants reported the longest amount of parental leave time. Additionally, the variable of college GPA was self-reported by participants. As the majority of participants were first-year students, they did not yet have a GPA to report, limiting the data pool. Since there have not been other studies looking at college students, we cannot look to prior research to confirm or deny the possibility of these associations.

Though none of the results from Part 2 were significant, there are a few explanations for these findings as well. There were only 90 subjects who participated in Part 2, creating a smaller data pool. Having 64.44% of participants fall into the longest length of time at home is also something that led for little comparison between groups, limiting the accuracy of comparisons.

Limitations

This study does have limitations that warrant discussion. The sample was not representative of the general population of college students, as the sample was predominantly female-identifying, White, high SES students at a private southern university. As such, these

individuals were likely to be wealthier and may have been more likely to be provided with paid leave or be able to afford to stay home. This did not allow us to capture those with less resources for comparison. Additionally, all participants were enrolled in at least one psychology course at the time of the study, limiting who was able to participate. As a result, the majority of subjects were either psychology majors, psychology minors, or first-years in Introduction to Psychology. This does not reflect the overall make-up of the university, or necessarily the typical college student. By having a majority of first-year participants, it also does not allow for comparison to see if these effects last through college after more time away from home. Future studies should try to recruit a greater variety of students and compare effects based on school year.

An additional limitation was having to rely on student reports for parent duration of time at home, which may not be perfectly accurate. I attempted to address this limitation by directly contacting caregivers for confirmation of the time they spent at home in the first year. However, only participants in Part 2 were asked for caregiver contact information, and of the 90 contacted, only 60 responded to the survey. As such, we had to rely on the student report from the remainder of the participants and assume accuracy of leave time. Because of this, we are unable to confirm if the associations found are based on accurate reports of caregiver time at home. Therefore, if students are over-reporting the time at home, it places them in an incorrect category and doesn't allow for comparison between groups. Future research should attempt to contact more caregivers for confirmation of leave time and recruit more participants with the understanding not all caregivers will respond.

The degree of time between the onset of the independent variable (parental leave time) and the dependent variables (cognitive and emotion regulation abilities) also acts as a limitation. Since nearly two decades have elapsed, it is possible that other aspects of lived experiences could

account for these effects. Things like traumatic events (such as divorce or the death of a family member), socioeconomic status, or parent education could be influences on the findings. Because this was not a longitudinal study that tracked participants over the timespan, there cannot be a comparison between where the student was at earlier timepoints. Conducting a longitudinal study would be necessary to see if the effects are consistent throughout the lifespan.

Future Directions

The results of the current study suggest that there are long-term benefits associated with increased parental leave time. This research serves as support for providing better leave mandates for caregivers, such as paid leave or an increased duration of leave time. This would allow caregivers to financially provide for their children while also being home during critical periods. These results have the potential to serve as advocacy to representatives of the federal government as evidence for why parental leave needs greater financial attention and better mandates.

Future research should attempt to address some of the aforementioned limitations. Studies should try to replicate the findings of this study by administering the same questionnaires among a more diverse population of college students to assess the generalizability of the current findings. Additionally, future research should examine the effect of parental leave on other developmental aspects, such as sociability, cognitive abilities, or attachment. Prior research indicates long-term benefits on mental health and other health differentials (Fabel, 2021); however, there has been little research on long-term effects for other variables, creating gaps in the literature. At younger ages, there have been associations found increased caregiver time at home and between fewer externalizing problems for children (Brooks-Gunn et al., 2010), but no research has examined how long these effects persist for.

Conclusion

The present study examined whether caregiver time at home in the first year of life was associated with long-term cognitive or emotion regulation benefits among college students. Overall, the results suggest that although there may not be cognitive benefits associated with parent time at home, there are emotional benefits, particularly if the caregiver stayed at home for at least six months. This aligns with other research in countries outside the USA and highlights the critical need for federally implemented paid leave policies. Specifically, based on this research, I recommend that the federal government provide at least six months of paid leave for all parents.

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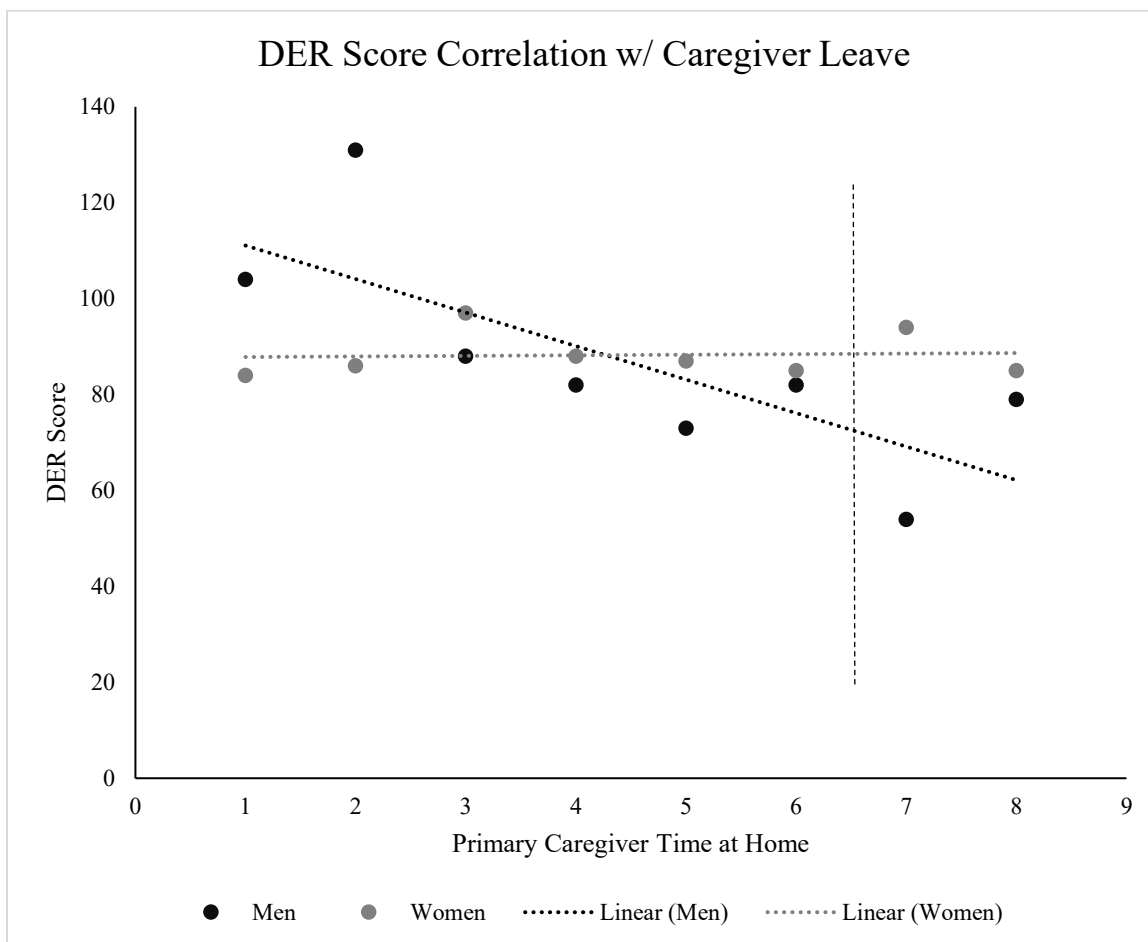
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Table 1*Child Difficulties with Emotion Regulation as a Function of Caregiver Time at Home and Gender*

		<i>M</i>	<i>SE</i>
Not Home At All			
	Male	0	0
	Female	98.143	8.394
1 Day – 2 Weeks			
	Male	104.000	22.208
	Female	84.000	7.403
2 Weeks – 1 Month			
	Male	131.000	22.208
	Female	86.933	5.734
1 Month – 2 Months			
	Male	88.333	12.822
	Female	97.222	5.234
2 Months – 3 Months			
	Male	82.750	11.104
	Female	88.233	4.055
3 Months – 18 Weeks			
	Male	73.000	12.822
	Female	87.667	3.866
18 Weeks – 6 Months			
	Male	82.667	12.822

	Female	85.958	4.533
6 Months – 9 Months			
	Male	54.500	15.703
	Female	94.900	4.966
9 Months – 1 Year			
	Male	79.391	1.807
	Female	85.377	0.883

Figure 1



Appendix A

PANAS Questionnaire

Use the following scale to choose the response that is most true for you:

1 – Very Slightly or Not at All

2 – A Little

3 – Moderately

4 – Quite a Bit

5 – Extremely

Thinking about yourself and how you normally feel, to what extent do you feel at this moment:

1. Upset
2. Hostile
3. Alert
4. Ashamed
5. Inspired
6. Nervous
7. Determined
8. Attentive
9. Afraid
10. Active

SUBSCALES:

1. **Positive Affect Items:** 3, 5, 7, 8, 10

2. **Negative Affect Items:** 1, 2, 4, 6, 9

Appendix BDER Questionnaire

Use the following scale to choose the response that is most true for you:

1 – Almost Never

2 – Sometimes

3 – About Half the Time

4 – Most of the Time

5 – Almost Always

1. I am clear about my feelings.* _____
2. I pay attention to how I feel.* _____
3. I experience my emotions as overwhelming and out of control. _____
4. I have no idea how I am feeling. _____
5. I have difficulty making sense out of my feelings. _____
6. I am attentive to my feelings.* _____
7. I know exactly how I am feeling.* _____
8. I care about what I am feeling.* _____
9. I am confused about how I feel. _____
10. When I'm upset, I acknowledge my emotions.* _____
11. When I'm upset, I become angry with myself for feeling that way. _____

12. When I'm upset, I become embarrassed for feeling that way. _____
13. When I'm upset, I have difficulty getting work done. _____
14. When I'm upset, I become out of control. _____
15. When I'm upset, I believe that I will remain that way for a long time. _____
16. When I'm upset, I believe that I'll end up feeling very depressed. _____
17. When I'm upset, I believe that my feelings are valid and important.* _____
18. When I'm upset, I have difficulty focusing on other things. _____
19. When I'm upset, I feel out of control. _____
20. When I'm upset, I can still get things done.* _____
21. When I'm upset, I feel ashamed with myself for feeling that way. _____
22. When I'm upset, I know that I can find a way to eventually feel better.* _____
23. When I'm upset, I feel like I am weak. _____
24. When I'm upset, I feel like I can remain in control of my behaviors.* _____
25. When I'm upset, I feel guilty for feeling that way. _____
26. When I'm upset, I have difficulty concentrating. _____
27. When I'm upset, I have difficulty controlling my behaviors. _____
28. When I'm upset, I believe there is nothing I can do to make myself feel better. _____
29. When I'm upset, I become irritated with myself for feeling that way. _____

30. When I'm upset, I start to feel very bad about myself. _____
31. When I'm upset, I believe that wallowing in it is all I can do. _____
32. When I'm upset, I lose control over my behaviors. _____
33. When I'm upset, I have difficulty thinking about anything else. _____
34. When I'm upset, I take time to figure out what I'm really feeling.* _____
35. When I'm upset, it takes me a long time to feel better. _____
36. When I'm upset, my emotions feel overwhelming. _____

** indicates reverse coding*

SUBSCALES:

1. **Nonacceptance of emotional responses:** 11, 12, 21, 23, 25, 29
2. **Difficulty engaging in goal-directed behavior:** 13, 18, 20R, 26, 33
3. **Impulse control difficulties:** 3, 14, 19, 24R, 27, 32
4. **Lack of emotional awareness:** 2R, 6R, 8R, 10R, 17R, 34R
5. **Limited access to emotion regulation strategies:** 15, 16, 22R, 28, 30, 31, 35, 36
6. **Lack of emotional clarity:** 1R, 4, 5, 7R, 9

Appendix C

ERQ Questionnaire

Use the following scale to choose the response that is most true for you:

1 – Strongly Disagree

2

3

4 – Neutral

5

6

7 – Strongly Agree

1. When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about. _____
2. I keep my emotions to myself. _____
3. When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about. _____
4. When I am feeling positive emotions, I am careful not to express them. _____
5. When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm. _____
6. I control my emotions by not expressing them. _____
7. When I want to feel more positive emotion, I change the way I'm thinking about the situation. _____

8. I control my emotions by changing the way I think about the situation I'm in. _____
9. When I am feeling negative emotions, I make sure not to express them. _____
10. When I want to feel less negative emotion, I change the way I'm thinking about the situation. _____

SUBSCALES:

1. **Cognitive Reappraisal Items:** 1, 3, 5, 7, 8, 10
2. **Expressive Suppression Items:** 2, 4, 6, 9