Lonely Only Children? Companionship Patterns and Well-Being Among Adolescents With and Without Siblings

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ABSTRACT

This study contributes to debates over only children versus children with siblings by comparing companionship patterns and well-being among adolescents with and without siblings in the home. The sibling socialization literature suggests children without sibling interactions may be at a disadvantage, spending more time alone and experiencing worse well-being. Conversely, theories positing a quantity-quality trade-off with increasing family size suggest parents may ensure that only children have higher quality social interactions than adolescents with siblings. Using the American Time Use Survey (N = 6,177), this study shows that only children spend more time alone than children with siblings, but also more one-on-one time with parents. Additionally, only children are less stressed when alone and have less negative feelings when with peers, but have less meaningful interactions with non-household adults than do children with siblings. Only children may be more adapted to spending time alone as well as with peers.

Keywords: adolescents, only child, siblings, family processes, well-being, resource dilution, shared time, sibling socialization, child quantity versus quality, family size

INTRODUCTION

The number of one-child families in the United States is on the rise. The share of women ages 40 to 44 who have only one child ever born nearly doubled from 1976 to 2014, from 10% to 18% (Livingston, 2015; U.S. Census Bureau, 2016). Despite an upward trend in one-child households, most Americans still express a preference for children to have at least one sibling, with two children being the modal ideal family size (Gao, 2015). Stereotypes regarding personality traits among only children also endure in the United States, partially due to the legacy of theories put forth by G. Stanley Hall, who asserted that only children were spoiled, indulged, and deficient (Pocock, 2015). Even though Hall's theory of negative personality traits among only children has little empirical basis (Falbo, 2012; Polit & Falbo, 1987), debates regarding quantity versus quality trade-offs in family size and positive versus negative sibling effects endure (Juhn, Rubinstein, & Zuppann, 2015; McHale, Updegraff, & Whiteman, 2012; Yucel & Yuan, 2015).

This study informs debates about only children versus children with siblings by investigating differences in companionship patterns—who individuals spend time with in their lives—and well-being associated with companionship patterns among adolescents. We focus on adolescents because of the increased importance of autonomy in their daily lives in who they choose to spend their time with (Guisinger & Blatt, 1994). Companionship patterns and subjective well-being of only children during social interactions likely differ from children with siblings because of differing opportunities for socialization (i.e., only children do not have access to sibling interactions), and also because of differential allocation of family resources by family size. We explore the salience of two theoretical approaches to modeling sibling effects, namely the "lonely only child" hypothesis and the resource dilution model.

We rely on the American Time Use Survey (ATUS; see Hofferth, Flood, & Sobek, 2018) to explore isolation and social interactions of adolescents and their subjective well-being during time spent alone and with others inside and outside of the household. This data set offers several advantageous features for this research. The data are nationally representative, allowing us to move beyond small, homogeneous samples found in psychological research to explore a broad view of differences in social interactions among adolescents who are only children versus those with siblings. The panel nature of the data allow us to account for unobserved individual heterogeneity.

We make two distinct contributions to the literature. First, we use the ATUS to uniquely test hypotheses from theoretical models of only children and resource dilution. Often, these models are tested in seclusion, resulting in discontinuity in understanding the mechanisms that could be driving differences between children with and without siblings. Because we are able to test several hypotheses simultaneously with the same data, we highlight connections between distinct theoretical approaches to comparing children with and without siblings. Second, this paper provides empirical evidence on how opportunities to socialize could contribute to differences in adolescent development observed among children with and without siblings. By scrutinizing differences in companionship patterns among adolescents with and without siblings, as well as their subjective well-being during social interactions and time alone, this work enlarges not only the academic literatures on adolescents, families, time use, and development, but also public perceptions of the lived experiences of only children versus children with siblings.

Only Children, Time Use, and Subjective Well-Being

Despite the increasing prevalence of one-child families (Livingston, 2015; U.S. Census Bureau, 2016), public sentiments about only children remain negatively skewed. Parents with one child, in fact, often experience social pressure to have another child for fear that their only child will be lonely, spoiled, and/or selfish (Pocock 2015; Sandler 2013). These cultural attitudes are the legacy of the "only child myth." Around the turn of the 20th century, G. Stanley Hall, first president of the American Psychological Association and expert on child development, put forth the theory that being an only child was a "disease" and that only children grew up deficient, indulged, and spoiled (Pocock 2015).

Nearly 90 years later, Polit and Falbo (1987) empirically scrutinized the notion that only children had deficient personalities through their comprehensive meta-analysis of the research on personality traits and sibship size. Examining five "personality clusters" (achievement motivation, character, personal control, personal adjustment, sociability), Polit and Falbo found that only children were either similar to, or had better outcomes than, peers with siblings in these five clusters. Importantly, only children were statistically indistinguishable in these five clusters from first-born children and children with just one sibling. Falbo's (2012) updated review also noted that inconsistencies in the literature on personality traits among only children that prevailed in the literature after the publication of her meta-analytic results could be attributed to life course stage differences, with only children exhibiting differences with peers in early childhood on measures such as social and interpersonal skills (Downey & Condron 2004) but becoming indistinguishable from peers by adolescence (Bobbitt-Zeher & Downey 2010; Yucel & Downey 2015).

Even though there is little empirical evidence that only children differ markedly from children with siblings—especially first-born children and children with one sibling—in personality domains, other studies on siblings effects and family size suggest the existence of salient differences between only children and children with siblings in other realms of development (Blake, 1989; Downey, 1995, 2001; Juhn et al., 2015; McHale et al., 2012). Companionship patterns and subjective well-being during social interactions represent two such domains of development where children with and without siblings may differ, but prior research on these issues is virtually non-existent. The prior theoretical and empirical research on only children, sibling effects, and resource dilution, however, suggests two sets of hypotheses regarding companionship patterns among children with and without siblings and subjective well-being during their time-use patterns, which we refer to as the "lonely only child" hypothesis and the resource dilution hypothesis. Within these hypotheses, we focus on two dimensions of time use and well-being: time spent alone and time spent in social interactions.

The Lonely Only Child

The presence or absence of siblings influences opportunities for socialization among adolescent children within a household. Data suggests that in early adolescence, children with siblings spend nearly 7% of their waking time alone with their sibling, and up to 20% or more time with siblings and other family members present. Although those percentages decline into late adolescence, to 3% and 10% respectively, adolescents still spend more time alone with siblings than they do with either of their parents (Larson, Richards, Moneta, Holmbeck, & Duckett, 1996). Because they do not have the opportunity for natural interactions with siblings, only children will likely fill their excess time in some way. The "lonely only child" hypothesis draws on Hall's hypothesis about negative outcomes for only children, and proposes that instead

of spending time with siblings, children without siblings spend their time in isolation. Hall's theory also suggests that only children will be more socially withdrawn than children with siblings, and will thus spend less time in social interactions with others.

The "lonely only child" hypothesis further proposes that time alone should be associated with negative emotions among only children if they feel that spending more time alone is non-normative (i.e., if they perceive that they should be spending less time alone and more time with friends or other individuals). Hall's theory of the "deficient" only child suggests that only children could be unhappy in general, regardless of their companionship patterns, which will lead to more negative feelings in social interactions. It may also be the case that only children are less adept at socializing relative to children with siblings. For example, a recent prospective within-family study showed that younger siblings had greater social skills than firstborn siblings when compared at the same age. The firstborns in this study were only children for the first few years of life, and thus had fewer daily social interactions with other children than their younger siblings did (Prime, Plamondon, & Jenkins, 2017). Similar patterns may extend to the comparison of only children versus those with siblings.

These predictions come with several caveats. First, a lack of opportunities to interact with siblings in the household does not necessarily imply an increase in time spent alone. With the absence of siblings in the household, adolescent only children may spend more time with other members of the household, namely parents. Second, only children who are adolescents could be accustomed to spending more time alone in the household than adolescent children with siblings, so spending time alone may not necessarily be associated with negative well-being. Finally, to the extent that only children spend more time alone, they may find social interactions with parents, friends, and others to be meaningful and special experiences that increase their well-

being. In other words, time spent in social interactions could offset any negative feelings associated with being alone for only children.

Resource Dilution

An extensive theoretical literature on family size proposes a trade-off between child quantity and quality within a family (Becker & Tomes, 1976; Blake, 1981; Downey, 2001; Juhn et al., 2015). These models represent child development as a "production function" where parents invest in their children through time and monetary inputs, and these investments made by parents determine a child's quality later in life. Parents with a fixed supply of both time and money will invest more resources into only children, whereas resources will be divided and diluted for children with siblings. The models therefore imply a substitution between the quantity and quality of children in a family, with each child in a family receiving fewer resources as family size increases.

Past empirical work on resource dilution has focused almost exclusively on adult outcomes such as longevity (Baranowska-Rataj, Barclay, & Kolk, 2017), income (Black, Devereux, & Salvanes, 2005), and educational achievement (Angrist, 2010; Kidwell, 1981; Kuo & Hauser, 1997; Li, Zhang, & Zhu 2008; Mercy & Steelman, 1982; Qureshi, 2018; Steelman & Powell, 1989). With the exception of Juhn et al. (2015), this line of research has not examined the parental time investments that lie at the center of the original theory, as well as time investments by others that could also be associated with quantity-quality trade-offs. As we will demonstrate, parental time investments in children and child socialization patterns are critically different for children with and without siblings in the household. We thus address a critical aspect of quantity-quality trade-off theories by evaluating a key mechanism underlying these models.

Resource dilution models predict that parents of only children will invest more time and resources into shaping quality socialization for their children. This hypothesis proposes that only children and their parents not only compensate for an absence of siblings in terms of their time-use patterns (i.e., ensuring that children spend less time alone and more time with others), but also have higher-quality social interactions than children with siblings. Importantly for this analysis, resource dilution may not be solely associated with total sibship size, but rather the presence of one versus multiple children in the household. For example, the parents of a child with an older sibling who has moved out of the household will likely focus more of their time and resources on the child remaining in the household, even though this child is not an only child.

If the resource dilution hypothesis is salient, then only children will spend more time with their parents than do children with siblings. Parents of only children will also use their resources (time, social connections, monetary resources, transportation, etc.) to actively ensure that only children do not spend too much time alone. Therefore, the resource dilution hypothesis predicts that only children will spend less time alone, and more time with parents, friends, and non-household adults, than children with siblings.

Because social interactions for only children are hypothesized to be higher in quality, only children may find time with others to be more meaningful and positive. Their interactions with others should thus be marked by more positive feelings of well-being than for children with siblings. Children with siblings may also be more likely to experience negative social comparisons with siblings. Social comparison within families is one indirect mechanism of sibling socialization (Browne, Meunier, O'Connor, & Jenkins, 2012; Jensen & McHale, 2015; Solmeyer, Killoren, McHale, & Updegraff, 2011). Parents often interpret behavior or attitudes of

one sibling in contrast to their other children (for example, see Jensen, McHale, & Pond, 2018), and comparisons and differences in treatment between siblings have implications for family relationships (Kowal, Krull, & Kramer, 2004; Tamrouti-Makkink, Dubas, Gerris, & van Aken, 2004) and well-being (Richmond, Stocker, & Rienks, 2005; Shanahan, McHale, Crouter, & Osgood, 2008). Social comparison processes could generate more negative social interactions for children with siblings than children without siblings, especially during time spent with parents.

Hypotheses

In the current study, we empirically test two hypotheses stemming from theoretical models on only children, sibling effects, and resource dilution, summarized in Table 1. The "lonely only child" hypothesis posits that, compared to children with siblings, only children will spend more time alone and less time in social interactions with others. Only children may have negative well-being sentiments when they spend time alone if alone time is increasingly difficult as it accumulates and more negative well-being in time spent with others if they are unhappy in general and/or if adolescents with siblings are more socially adept. Nonetheless, to the extent that they are acclimated to spending more time alone, only children may express more positive feelings about their time alone than children with siblings. Only children may also find social interactions to be highly meaningful and positive if they have less access to natural sibling interactions and/or if social interactions offset negative feelings associated with time alone.

The resource dilution model suggests that only children should spend less time alone than do children with siblings and more time in social interactions—both interactions with members of the household (e.g., one-on-one time with parents) and with individuals outside of the household (e.g., with mentors, friends, etc.). Because social experiences for only children are presumably higher-quality interactions, they should find time with others to be more meaningful

and positive than children with siblings. Additionally, competition among adolescents with siblings may sour their social interactions, and adolescents with siblings may thus find social interactions, especially those with parents, to be less positive.

In examining time use and well-being, we included time spent with a variety of interaction partners (i.e., mothers, fathers, mentors, friends). Relationships and time spent with each of these types of people likely have different meaning for adolescents, and should thus be treated separately. The theories we have used, however, offer few suggestions on how effects may differ among these social interaction partners. The exception is the time with parents for only children should be especially meaningful. Additionally, we explore a broad range of types of well being in order to offer a comprehensive view of negative, positive, high and low arousal domains (Russell, 2003). As with interaction partners, we also offer no specific hypotheses on how effects may differ for each domain of well-being, but we explored them separately.

METHODS

Data

We performed our analysis of adolescents with siblings and those who are only children utilizing individual-level time-use diaries from the American Time Use Survey. The ATUS is a nationally representative time diary study of Americans beginning in 2003 and continuing annually. The U.S. Census Bureau administered the ATUS in connection with the Current Population Survey. A phone interview lasting about 30 minutes documented an individual's time use over a 24-hour period, from 4 a.m. of the previous day until 4 a.m. of the interview day. Respondents accounted for all time throughout the day (Hamermesh, Frazis, & Stewart, 2005). Interviewers used the Day Reconstruction Method and computer assistance to elicit high-quality recall and accuracy (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004), and for each

primary activity throughout a day, respondents reported who else was present. The surveyors collected data for each day of the week, although they oversampled weekends. Sampling weights provided by the ATUS ensure that average time use was representative of the United States' national population. ATUS participants came from every state within the United States and Washington, D.C. We pooled data from 2003 to 2017 and restricted the sample to adolescents who were between ages fifteen and eighteen who were not married or parents, leaving a final sample of 6,177 adolescents. Table 2 provides a demographic overview of the sample.

Of particular interest is the survey's refined information about adolescent time use and companionship patterns. We combine measures of which activities were performed, who else was present, and well-being reports of these activities to study the time use of adolescents with and without siblings.

Measures

Presence of siblings. Only children (N = 1,450) were classified as an adolescent living in a household with no other children. Although some of the respondents classified as only children may have had siblings living in other households, our focus on daily interactions with siblings applied to adolescents who did not live with siblings. Adolescents with siblings (N = 4,491) were any respondent who lived in a household with at least one other child.

Social interactions and isolation. We measured the number of minutes within a 24-hour period that a respondent spent with a particular companion type. Adolescents interacted with people throughout the day, and we created measures to describe and analyze how much time they spent with family members, only parents, siblings, relatives, friends, mentors or alone. Dichotomous variables measuring whether the respondent spent any time with a companion were also constructed. Table 3 reports information on average differences in shared time with

companions between those with and without siblings. Raw differences in the prevalence of spending time alone and with many companion types were observed in addition to mean differences in time spent with parents only, household members, and adult relatives.

Adolescent well-being during social interactions and isolation. We used four dimensions of well-being to measure the adolescents' responses during social interactions and isolation. A subset of ATUS respondents answered the following questions: (a) How meaningful did you consider what you were doing [to be]? (b) How happy did you feel during this time? (c) How sad did you feel during this time? (d) How stressed did you feel during this time? For each question, the respondents chose their answers from a scale of 0 (e.g., *not happy at all*) to 6 (e.g., *very happy*). These questions mirror subjective well-being components of the Princeton Affect and Time Study (Krueger et al., 2009) and the European Social Survey (OECD, 2013). Russell (2003) explained core affect along two independent dimensions: the positive/negative dimension and the arousal dimension. Russell characterized emotions as one of four types: positive high arousal (e.g., happiness), positive low arousal (e.g., contentment), negative high arousal (e.g., stress), or negative low arousal (e.g., sadness). The combination of the well-being indicators in the ATUS therefore measure affect across both dimensions. Additionally, the survey also included meaningfulness, allowing us to evaluate which interactions provided meaning independent of the reported negative and positive emotions of a situation. Given these justifications, indicators on meaning, happiness, sadness, and stress allowed for a broad investigation into well-being in adolescents during various activity categories with differing activity companions. Table 4 summarizes these measures. No differences in average well-being measures were observed between only children and respondents with siblings.

Sociodemographic characteristics, location, and timing controls. We included individual and household sociodemographic characteristics. We included the adolescent's age (in years). We included gender to allow for companionship patterns to differ by gender considering prior work documenting gender differences in peer relationships between adolescent girls and boys (Cheng & Chan, 2004; Helsen, Vollbergh, & Meeus, 2000). We included student status (enrolled or not). We included controls for income level. Low-income households were classified as having real family income below $40,000 in 2016 dollars, and this approximately corresponded to income levels below 150% to 175% of the poverty threshold, depending on family size. Middle-income spanned from $40,000 to $100,000, and high income households reported income above $100,000. We controlled for race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, other). Geographic information was captured in dichotomous region and urban variables. A location control indicated whether or not an activity occurred at a respondent's home or yard. Timing controls included survey year, month, day of the week, and time of day.

Analytic Approach

Social interactions and isolation. To analyze interaction and isolation among adolescents, we modeled the duration of contact an adolescent had with companions. We used Ordinary Least Squares (OLS) regression to analyze minutes per day spent with companion categorizations, and each companion type was estimated as a separate dependent variable. The companion categorizations were not mutually exclusive. We represented the minutes per day person *i* spent with companion type *j* as the dependent variable.

$$C_{ij} = \beta_0 + \beta_1(OnlyChild_i) + X\Gamma + \epsilon_{ij}$$

OLS estimates of linear models show greater robustness than Tobit estimates when nonparticipation is caused by the fact that time diary surveys sample days rather than longer time horizons (Steward, 2013). The omitted base group was adolescents with siblings, and all

estimates were made in comparison to adolescents with siblings. The matrix X contained sociodemographic, location, and timing controls (Enrolled in School: 0 = respondent is not enrolled in school, 1 = enrolled; White, non-Hispanic: 0 = not white or Hispanic, 1 = white and non-Hispanic; Black, non-Hispanic: 0 = not African American or Hispanic, 1= African American and non-Hispanic; Hispanic: 0 = not Hispanic, 1 = Hispanic; Low-income household: 0 = household income is greater than $40,000 in 2016 dollars, 1 = household income is below $40,000; Metro Area: 0 = does not live in a metropolitan area, 1 = lives in a metropolitan area; Female: male = 0, 1 = female; Lives with Mother: 0 = does not reside with biological or adopted mother, 1 = resides with biological or adopted mother; Lives with Father: 0 = does not reside with biological or adopted father, 1 = resides with biological or adopted father). Extensive margins analysis was also performed, and although we do not report those results, patterns remained unchanged.

Adolescent well-being during social interactions and isolation. To explore the well-being of adolescents as they engage with others, we took advantage of the multilevel nature of our data. Rather than focus on absolute well-being rankings, we measured well-being for each adolescent during activities of interest relative to reports of his or her own well-being when in different contexts. Because our data set consisted of three activities and emotional evaluations per individual, we could estimate person-specific fixed effects to control for unobserved individual characteristics. By transforming variables to deviations from individual-specific means, we controlled for all invariant factors affecting well-being. Thus, we consistently estimated the effects of social interactions by using fixed effects (with robust standard errors) while controlling for unobservable confounding factors in a robust framework (Wooldridge, 2016). We conceptualized the basic model in matrix form as follows:

$$y_{ij} = \beta_0 + \beta_1(OnlyChild_i) + \beta_2 \cdot Companion_{ij} + \gamma \cdot (2\ way\ interactions) + X\Gamma + \alpha_i + \epsilon_{ij}$$

We represent well-being for adolescent *i* in context *j* as the dependent variable. The Only Child binary variable separates the sample by sibling status (Only Child: 0 = *no*, 1 = *yes*). The companion vector contained binary variables indicating whether companion type *j* was present at the time of the well-being measure. We treat alone time as the base case, and all companionship estimates are in relation to well-being when alone. The two-way interactions vector contained interactions between the Only Child binary variable and companion variables. These interactions allowed for differences in responses to social interactions among those with and without siblings. The matrix X contained sociodemographic, location, and timing controls. We assumed that any endogeneity confounding factors in the error term was person-specific, as represented by α_i. We assumed the person-specific unobserved effect was the same regardless of the well-being observation, and we assumed the idiosyncratic exogenous factor was independent of the contextual and activity-level covariates and the context-invariant covariates.

RESULTS

Social Interactions and Isolation

The results from an OLS regression measuring differences in time spent with various companions are shown in Table 5. Adolescents without siblings in the household were alone forty-five minutes more per day than adolescents with siblings. Despite spending more time alone, adolescents without siblings spent thirteen additional minutes in family time, defined as time with at least one parent present and any other family members who may have been present. Children without siblings in the household spent a great deal more time interacting with parents. To be sure, relative to children with siblings, only children spent an estimated seventy-one minutes more per day having time with only one or both parents and no other people. Only

children also spent more time with adults outside of their households. Compared to adolescents with siblings, only children spent fifteen minutes more each day with non-household adults such as adult relatives, mentors, and neighbors. Adolescents with and without siblings spent a similar amount of time with cousins and friends.

Adolescent Well-Being During Social Interactions and Isolation

In Table 6 we report results from fixed effects regression estimating the impact of spending time with companions compared to being alone on adolescent well-being, stratified by sibling structure. Differences in adolescent well-being for only children were measured through interaction terms. The magnitudes correspond to how much a covariate changed adolescents' immediate well-being on a 6-point scale.

Adolescents without siblings in the household were less stressed when spending time alone compared to adolescents with siblings. Adolescents without siblings found family time to be less meaningful than adolescents with siblings; however only children also experienced less negative feelings during family time. Only children did not respond differently than children with siblings to spending time with just parents. Only children did, however, had less meaningful interactions with non-household adults compared to children with siblings. When spending time with cousins and friends, adolescents without siblings experienced less sadness than adolescents with siblings. When spending time with other companions, typically in large group settings like school or work, only children were less sad and more stressed compared to adolescents with siblings. As the interaction results demonstrate, differences in subjective well-being varied significantly between only children and children with siblings across companionship patterns.

Discussion and Conclusion

We used the ATUS to examine differences in companionship patterns and subjective well-being during social interactions among children with and without siblings in the household. Scrutinizing adolescent time-use and well-being patterns in social interactions allowed us to test the salience of two sets of hypotheses stemming from psychological/developmental, economic, and sociological theories of only children and sibling effects: the lonely only child and resource dilution hypotheses. We also conducted this research in order to provide insight into the validity of popular sentiments about patterns of development among only children, such as the notion that these children might be lonely or maladjusted.

Our research supports the conclusion that adolescents with and without siblings in the household showed striking differences in both their companionship patterns and their subjective well-being. Only children spent substantially more time alone (around 45 minutes, on a typical day) than children with siblings. Only children, however, were not uncomfortable during their alone time; they were less stressed during their alone time than children with siblings who spent time alone. Only children were therefore alone more often but not necessarily lonely.

Even though total time spent with at least one parent only differed by a small amount (13 minutes more each day for only children), only children spent substantially more time with just parents and no other companions (around 71 minutes, on a typical day). Children with siblings often have others present when spending time with their parents (most often their siblings), whereas only children spend more time alone with one or both parents. Thus, the two main ways that only children spend time in their households are alone and in dyadic or triadic interactions with parents.

Only children did not respond differently during time spent with just parents and no other companions. Notably, regardless of sibship status, all adolescents had less meaningful and happy moments during time spent with just parents compared to time spent alone. This outcome may be a function of this stage of development. Even though only children spent more time with non-household adults, they found time with non-parental adults such as mentors and adult relatives to be less meaningful than did adolescent children with siblings. Taken together with the results on well-being in time-use with parents, these findings suggest that while only children spent more time with parents and non-household adults, they were not necessarily more comfortable with adults compared to children with siblings.

Adolescents who were only children and those with siblings spent similar amounts of time with peers, including friends and cousins. Only children, however, were more likely to express positive feelings during social interactions with friends and cousins. During time with non-sibling children, only children expressed lower levels of sadness than children with siblings. This result suggests that similar-age-peers provide positive interactions for children without siblings.

Our results give insight into differences and similarities between theoretical perspectives on only children versus children with siblings. In patterns of companionship, we found that only children partially compensated for a lack of sibling time with increased time with parents and non-household adults. Additionally, they spent more time alone than children with siblings, an empirical finding consistent with a lonely only child model and not consistent with predictions of a resource dilution model. Adolescents with siblings in the household did not spend as much one-on-one time with parents, presumably because their time with parents was shared with siblings. The decreased prevalence of one-on-one time with parents among children with siblings

is consistent with a resource dilution model. The model predicts a scarcity of focused one-on-one attention from parents resulting from parent time spreads across more children.

Our empirical findings on well-being in companionship patterns do not fit squarely with any one theoretical model. Even though children without siblings in the household spent more time alone than those with siblings, they did not express negative emotions that would be associated with loneliness when they were alone. In fact, these children were much more comfortable being in isolation than children with siblings. Thus, only children might be best described as "alone but not lonely." Increased well-being among only children during their time alone could be the result of the fact that alone time was so familiar to them. It could also be the case that children with siblings, because they are often in the presence of others, are not as comfortable being alone.

The resource dilution model suggests that adults in the household and non-household individuals (neighbors, mentors, peers) could potentially act as substitutes for siblings for only children. If this were the case, then children without siblings in the household would express more positive feelings of well-being when spending time with these groups. We found only partial support for this claim. Only children did not have more meaningful interactions with non-household adults in their lives than children with siblings. All of these adolescents found time spent alone to be more meaningful and happy than time alone with parents, and children without siblings in the household found interactions with non-household adults to be less meaningful than their counterparts with siblings.

We observed better well-being, however, when children without siblings at home interacted with peers. A lonely only child model suggests this pattern follows from the special nature of social interactions for only children, given that they spend more time alone.

Alternatively, a resource dilution explanation for this phenomenon would be that the quality of social interactions with friends may decline as family size increase, because the adolescent does not receive as high quality of social training from parents. Of particular interest is that children with siblings report less stress in large groups settings, captured by the "Other" category. Overall, these results suggest that children without siblings in the household may compensate for a lack of social interactions with siblings through positive interactions with peers, but not necessarily more meaningful one-on-one interactions with parents and other adults.

This research speaks to a broader question of whether being an only child is associated with positive or negative patterns of development. Direct contact with siblings shapes social skills and behavior (Buist & Vermande, 2014; Solmeyer, McHale, & Crouter, 2014), and only children miss out on the positive influence of siblings. Only children partially make up for time not spent with siblings by spending more time with parents. To the extent that these parent-child interactions are not stressful, and are involved and supportive, then they may positively benefit adolescent development (Cripps & Zyromski, 2009). However, we find that all adolescents find one-on-one time with parents to be less meaningful and happy than time spent alone, suggesting that benefits of parent attention documented by others may be long-term rather than immediate. We also find that only children spend more time alone. However, only children are not stressed when they are alone, suggesting that only children may not experience the same negative outcomes associated with being alone compared to other adolescents. These findings prompt questions about whether links between time in isolation and increased stress and depressive symptoms found in past research (Hall-Lande, Eisenber, & Christenson, 2007) are heterogeneous, a topic that deserves further research attention.

The ATUS data allow us to make substantial progress in understanding social interactions and well-being disparities between adolescents with and without siblings. Despite the progress made, limitations of this research remain. Birth order may be an important factor in sibling socialization patterns, which was not addressed in this study due to limitations of the data. Future work could delineate social interaction patterns by birth order to more fully understand the interplay between sibling effects and birth order in larger families. Our work evokes questions on potentially disparate effects of isolation on other domains of adolescent development, and future studies might examine whether being an only child moderates the developmental effects of isolation. These data only allow us to measure disparities in time-use and well-being between those with and without siblings; we are unable to definitively explain why these patterns occur, and more work is needed to better understand driving forces behind the findings. Finally, the associations we report may be moderated by gender, race, ethnicity and socioeconomic background, and future work might expound on these relationships.

Overall, our findings suggest that, while all models of sibling effects are consistent with aspects of the empirical evidence on adolescent time-use and well-being, no single model fully explains them. Our work points to a need for more comprehensive, flexible, and collaborative theories on sibship status and child outcomes. By confirming that adolescents with and without siblings differ in their companionship patterns and their responses to companions, we show the importance of expanding comparisons of only children versus children with siblings into new domains outside of personality characteristics and educational performance and attainment. We also demonstrate the importance of revealing trade-offs experienced by only children. While only children bear costs in terms of the absence of interactions with siblings, they reap a positive benefit of increased access to the undivided attention of parents, attention which is less available

in homes with more children. Even though the experiences of growing up with or without siblings differ, there are positive aspects to both situations—being an only child is not necessarily better or worse than having siblings.

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Table 1
Hypotheses regarding expected differences in companionship by presence or absence of siblings

Hypothesis	Time alone	Subjective well-being when alone	Time spent with people	Subjective well-being when with people
Lonely only child	Only children spend more time alone than children with siblings.	Time alone may impair the well-being of only children if it is especially isolating. OR Only children could be acclimated to spending time alone; being alone may not be associated with negative well-being.	Only children spend less time with others than do those with siblings.	Only children could be "unhappy" in general, regardless of their time-use patterns. OR Because only children have less access to natural sibling interactions, they may find interactions with others to be especially meaningful.
Resource dilution	Only children spend similar time alone as children with siblings.	Alone time is a separate domain; resource dilution offers no hypothesis.	Only children spend more time with others (parents, friends, etc.).	Only children have higher quality interactions, especially with parents, and may find time with others to be more meaningful and beneficial.

Table 2

Household and Individual Demographics[a]

	Adolescents without siblings (N_1 = 1,273)		Adolescents with siblings (N_2 = 4,904)	
Variables	Mean	Std. Dev.	Mean	Std. Dev.
Age	16.17	0.79	16.58***	1.08
Enrolled in school	0.84	0.37	0.80*	0.40
White	0.60	0.49	0.56*	0.50
Black	0.16	0.37	0.14*	0.35
Hispanic	0.18	0.39	0.24	0.43
Household income:				
Less than $40,000	0.28	0.45	0.24***	0.43
$40,000–$100,000	0.51	0.50	0.50***	0.50
Over $100,000	0.27	0.44	0.30***	0.46
Lives in Non-metro area	0.18	0.38	0.15	0.36
Family structure:				
Lives with mother	0.48	0.50	0.64***	0.48
Lives with father	0.09	0.29	0.09	0.28

Note. [a]Asterisks represent significance of two-sample unpaired *t*-tests with unequal variances comparing adolescents without siblings to adolescents with siblings, non-nuclear families with nuclear families. *$p < .05$. **$p < .01$. ***$p < .001$. Categorical definitions explained in the text.

Table 3

Incidence and Duration of Activity Companions[a]

	Only children (N_1 = 1,273)				Adolescents with siblings (N_2 = 4,904)			
Companions	Fraction with time > 0	Std. dev. of fraction	Mean time[b]	Std. dev. of time	Fraction with time > 0	Std. dev. of fraction	Mean time	Std. dev. of time
Mother	0.67	0.47	123.40	168.97	0.71***	0.46	124.33*	171.58
Father	0.47	0.50	81.46	145.62	0.51***	0.50	83.48	150.03
Family time	0.77	0.42	154.57	180.54	0.77	0.42	149.92	185.40
Parent(s) without others	0.63	0.48	81.03	119.18	0.48***	0.50	42.56***	90.49
Household sibling	0	0	0	0	0.69***	0.46	160.41***	204.11
Household sibling only	0	0	0	0	0.41***	0.49	45.51***	91.23
Any household member	0.84	0.37	166.86	181.63	0.88***	0.32	234.44***	223.77
Adult relatives	0.21	0.40	43.73	128.19	0.19	0.39	32.60**	103.07
Child relative	0.13	0.34	28.84	100.89	0.11*	0.31	24.17	96.63
Mentor adults	0.38	0.48	33.96	72.68	0.31***	0.46	31.54	77.41
Adult acquaintances	0.06	0.23	8.59	52.67	0.06	0.24	8.40	47.50
Friends	0.54	0.50	122.65	187.39	0.53	0.50	129.01	195.82
Alone	0.95	0.21	243.14	191.61	0.91***	0.29	205.96***	181.47
Total[c]	—	—	1,088.23	1,529.37	—	—	1,272.33	1,818.51

Note. [a]Asterisks represent significance of two-sample *t*-tests with unequal variances for frequencies and intensities. Being an only child is the base of comparison in all tests. *$p < .05$. **$p < .01$. ***$p < .001$. [b]Averages are not conditioned on having interaction in the day with the companion type. Measured in minutes per day. [c]Represents the average amount of time a teen spent with companions in non-sleep activities.

Table 4

Adolescent's Emotional Self-Reporting—Descriptive Statistics[a]

	Full sample (N_1 = 822)[b]		Only child respondents (N_2 = 345)		Respondents with siblings (N_3 = 477)	
Variable	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Meaningfulness	3.43	(1.975)	3.26	(2.038)	3.52	(1.937)
Happiness	4.24	(1.559)	4.23	(1.626)	4.24	(1.524)
Sadness	0.48	(1.109)	0.43	(1.070)	0.50	(1.128)
Stress	1.23	(1.596)	1.28	(1.674)	1.20	(1.554)

Note. [a]Asterisks represent significance of two-sample unpaired *t*-tests with unequal variances comparing columns 2 and 3 for each row. *$p < .05$. **$p < .01$. ***$p < .001$. [b]Averages are calculated at the activity level and include approximately three activities per adolescent.

Table 5.

OLS Estimates of the Duration with Different Activity Companions by Sibling Structure (*N* = 6,177)

Variables	Alone	Family time	Parent(s) without others	Non-household adult	Children (not siblings)	Children (any)
Only child	45.2***	13.2*	71.3***	14.7*	7.9	-129.3***
	(6.9)	(6.3)	(5.2)	(5.9)	(7.6)	(7.9)
Intercept	44.9	339.1***	40.3	148.1***	239.8***	657.8***
	(50.7)	(49.4)	(34.2)	(44.5)	(61.0)	(66.5)
R^2	0.07	0.11	0.10	0.03	0.05	0.11

Note. All regressions include companion, location, and timing controls. The base responder type is adolescents with siblings who is male, not black, not Hispanic, not low-income, not in high school, not living in a metropolitan area, not employed, not living with a biological mother or father, and all coefficients are in relation to the base group. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 6.
Adolescent Well-Being—Impact of Companions on Emotional Reporting, Adolescents with No Siblings (*N* = 5,137 *activities*, 1,730 *teens*)

Variables	Meaning		Happiness		Sadness		Stress	
Family time	0.67***	0.72***	0.38***	0.37***	-0.08	-0.02	-0.32***	-0.34***
	(0.10)	(0.10)	(0.08)	(0.08)	(0.05)	(0.05)	(0.08)	(0.08)
Parent(s) without others	-0.34**	-0.37**	-0.17	-0.31**	0.06	0.09	0.20*	0.33**
	(0.13)	(0.14)	(0.10)	(0.11)	(0.06)	(0.07)	(0.10)	(0.10)
Non-household adult	0.38***	0.50***	0.01	0.05	0.13*	0.14**	0.14*	0.17*
	(0.10)	(0.10)	(0.07)	(0.08)	(0.05)	(0.05)	(0.07)	(0.08)
Children (not siblings)	0.86***	0.80***	0.90***	0.84***	-0.12**	-0.07	-0.31***	-0.31***
	(0.07)	(0.08)	(0.06)	(0.07)	(0.04)	(0.04)	(0.06)	(0.06)
Other	0.44***	0.48***	-0.08	-0.08	0.10*	0.12**	0.21***	0.16*
	(0.08)	(0.09)	(0.07)	(0.07)	(0.04)	(0.05)	(0.06)	(0.07)
Interactions:								
Only child * alone		0.17		0.08		0.05		-0.45**
		(0.22)		(0.17)		(0.11)		(0.17)
Only Child * family time		-0.80*		-0.09		-0.72***		0.24
		(0.36)		(0.27)		(0.18)		(0.27)
Only Child * parent(s) without others		-0.14		0.18		-0.11		-0.10
		(0.31)		(0.24)		(0.16)		(0.23)
Only Child * non-household adult		-0.99***		-0.43		-0.28		0.06
		(0.30)		(0.24)		(0.16)		(0.23)
Only Child * children (not siblings)		-0.33		-0.12		-0.59***		0.49
		(0.35)		(0.27)		(0.18)		(0.26)
Only Child * other		-0.99		-0.60		-0.52*		1.01***
		(0.40)		(0.32)		(0.20)		(0.31)
Intercept	3.61***	3.72***	4.65***	4.72***	0.35	0.41*	0.71*	0.62*
	(0.39)	(0.39)	(0.31)	(0.31)	(0.20)	(0.20)	(0.30)	(0.30)
Overall R^2	0.75	0.75	0.74	0.74	0.80	0.80	0.79	0.79

Note. The base responder type is adolescents with siblings spending time alone, and all coefficients are in relation to the base group.
*p < .05. **p < .01. ***p < .001.