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The Effects of Family Size and Birth Order on Students' Social Emotional and Cognitive Development

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Honors Capstone Thesis Project

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Abstract

This project sought to analyze and understand the differences in student's cognitive and social emotional development based on their number of siblings (also referred to as family size) and birth order. To accomplish this, a 130-question survey was created and emailed to approximately 125 teachers. 27 survey responses were received, which is a response rate of approximately 21.6%. The response data was categorized by only child, oldest child, youngest child, child with one or two siblings, child with three or four siblings, and child with five or more siblings. Though the responses were varied, the data showed that oldest children had a slight cognitive advantage compared to only children and youngest children. It also showed that youngest children were less likely to take control in a group setting. Finally, the data showed that children with five or more siblings had lower cognitive development, but higher social emotional development. These findings are similar to previous research studies, which leads to the conclusion that teachers may need to differentiate support in the classroom based on the variables of family size and birth order.

Introduction

The idea for this project originated while I was studying abroad in England for a semester, because I met a girl there (who later became one of my best friends) who was an only child. I am one of six children, and I can honestly say that I've never had a friend who was an only child before my semester abroad. It was mind-opening to compare our life experiences, and I was fascinated by the way our lives were different due to the absence or presence of siblings. That fascination sparked the idea to study the social emotional and cognitive differences in students due to the number of siblings that they have. It was a topic to which I felt a personal connection, and I was curious to see how growing up with a plethora of siblings had possibly affected my development.

In addition to my personal curiosity about growing up with vs. without siblings, I'm naturally interested in child development because I'm a future early childhood educator. I want to understand why my future students have some of their characteristics and tendencies, so that I can find the most effective ways to teach and guide them. I yearn to differentiate instruction in order to support each of my students and their needs. Therefore, I decided to focus on the effect of siblings, family size, and birth order on children's cognitive and social emotional development. The problem that guided my honors project is that students who have different numbers of siblings have different cognitive and social emotional growth experiences, yet they are expected to learn in the same way and in the same environment at school. The questions that directed my research endeavors are as follows: In what ways does the family size/number of siblings affect a student's social emotional and cognitive development? In what ways does birth order affect a student's social emotional and cognitive development? How can we support students with no siblings, students with a multitude of siblings, students who are the oldest child, and students who are the youngest child to help them achieve similar outcomes and receive the same social emotional support in school?

Literature Review

There are some debates in the current literature in regards to the effects of siblings and family size, particularly for a child's cognitive development. Many sources cited the resource dilution theory, which states that having more children spreads parents' resources more thinly and therefore each child receives less resources especially if they are later-born (Workman 2017), and the confluence model, which is a theory that states first-born children are born into a more intellectual environment at home, because there are no newborn or younger siblings to bring down the average household intelligence. Each child contributes more intellectual resources to the family as they grow up, which brings the family intelligence back up. But if more children are added to the family, each new child is born into a progressively diminished intellectual environment. It also states that older siblings benefit from intellectual stimulation by acting as teachers to their younger siblings. Last-born children and only children do not receive the teaching benefit because they have no younger siblings to teach (Kihlstrom, 2019). These two models were used as hypotheses to explain why children in larger families and later-born children have lower cognitive development. There have been a multitude of studies done that support these theories; however, there have also been studies that found data to disprove these theories.

Workman (2017) conducted a study on children ages 9-24 months and 48 months-kindergarten who had up to four siblings to see if the number of siblings affected cognitive development. He found that the number of siblings did not have an inverse or negative effect on a child's cognitive or educational outcomes. Furthermore, the data showed that resources were not necessarily diluted by the addition of siblings in a child's early years of life, which brings into question the resource dilution theory. Similarly, Sandberg and Rafail (2014) conducted a study to measure the effect of family size on cognitive development. They measured three types of resources that could be diluted with the addition of siblings based on the resource dilution hypothesis: children's time spent with parents and siblings, time spent using household

resources (such as books and toys) and time spent engaging with the outside world through activities such as sports, visiting museums, social groups, etc. They jointly tested the resource dilution model and the confluence model, and much like Workman, they concluded that larger family size did not result in a negative cognitive effect for children.

Song & Wang (2019) compared the cognitive development of only children vs. children with siblings. They conducted their study in China because there was a plethora of families with only one child living there due to the one-child policy. They found that much of the observed differences in cognitive ability between only-children and children with siblings were induced by subgroup differences that could potentially influence children's cognitive development, such as parental level of education and area of birth (hukou). They recognized that there were more factors at play than just the child's number of siblings. However, it was discovered that only-children had a much higher cognitive advantage over non-firstborn children than over firstborn children. This supports the confluence model because firstborn siblings can benefit from teaching their younger siblings. (Song & Wang, 2019). Another study conducted by Moshoeshoe (2019) found that children who were born first or sooner in the birth order had higher educational attainment based on higher enrollment rates and schooling progression and more years of education completed than children born later in the birth order. These findings also support the confluence model because older children have a higher family intellectual environment and the opportunity to teach younger siblings, which aids their own educational attainment. This study also found that the birth order effect on schooling progression was significantly smaller in smaller families than in larger families; birth order effects got larger as sibship size increased (Moshoeshoe, 2019).

Other studies found data to show that children in larger families had lower intelligence and cognitive development. Kanazawa (2012) used multiple regression analyses to analyze data from his longitudinal study of people from birth through age 46, and the results showed a significant negative association between birth order and a child's intelligence. However, once a

child's number of siblings became a variable in the study, birth order was no longer significantly associated with a child's intelligence. Instead, the number of siblings became significantly negatively associated with a child's intelligence. These results indicate that the initially evident negative effect of birth order on intelligence is actually caused by family size, rather than birth order. This supports the admixture model, which implies that a larger family size negatively affects a child's intelligence regardless of birth order (Kanazawa, 2012). Symeonides, Vuillermin, Sciberras, Senn, Thomson, Wardrop, Anderson, Pezic, Sly, & Ponsonby (2021) agree with Kanazawa (2012) that overall family size has a significant influence on a child's cognitive development, but their findings further expand upon the effect of siblings. They found that the differentiation of specific ages of siblings had differing influences on a child's expressive language development and emotional behavior in the forms of internalizing and externalizing behavior. Having a greater number of siblings and having a larger total household size were both associated with lower cognitive and language scores for children, but they were also associated with less internalizing behavior. Internalizing behaviors are actions that direct problematic behavior towards the self, so less internalizing behavior is a positive thing (Symeonides, Vuillermin, Sciberras, Senn, Thomson, Wardrop, Anderson, Pezic, Sly, & Ponsonby, 2021).

Other studies focused on theory of mind, which is: "...our capacity to understand others' mental states including beliefs, desires, and knowledge, and the ability to comprehend that these may differ from our own" (Calero, Semelman, & Sigman, 2013). A study carried out by Farhadian, Abdullah, Mansor, Redzuan, Kumar, & Gazanizad (2010) showed that having at least one sibling has a positive impact on theory of mind. Furthermore, children who were second-born showed a higher theory of mind performance in comparison to first-born children. Having older siblings correlated with a higher theory of mind performance for the participant child (Farhadian, Abdullah, Mansor, Redzuan, Kumar, & Gazanizad, 2010). This study shows advantages for later-born siblings, which conflicts with findings from other studies such as the

work done by Moshoeshoe (2019) and Song & Wang (2019). However, theory of mind isn't necessarily the same thing as intelligence or cognitive development, which may explain the discrepancies.

Many studies besides the one conducted by Farhadian, Abdullah, Mansor, Redzuan, Kumar, & Gazanizad (2010) focused on other areas of child development in relation to number of siblings and birth order. Nagar, Talwar, & Williams (2019) completed a study about the relationship between birth order and lie-telling tendencies. They found that the presence of a sibling was predictive of initial lie-telling; specifically, children with an older sibling were more likely to lie. Some potential reasons that children with an older sibling were more likely to lie include the fact that they have the opportunity to adopt the social skills and behaviors exhibited by their older sibling, they have more opportunities to witness the use of lie-telling as a conflict strategy (for example, they could learn how to avoid punishment by lying from watching an older sibling), and they may learn how to lie from an older siblings and internalize it as an acceptable action for future use (Nagar, Talwar, & Williams, 2019). Another study done by Leach, Howe, & DeHart (2017) found an additional effect of having an older sibling: At age 4, children with an older sibling referenced goals (which are defined as words related to desires, intents, or attempts) and cognitions (defined as words that reflect a child's beliefs, thoughts, or knowledge) while playing with their sibling more often than children with a younger sibling did.

The literature shows more of a consensus about the effect of siblings on a child's social emotional development than it does for cognitive development. Wikle, Ackert, & Jensen (2019) conducted a study that investigated companionship patterns and emotional states of adolescents with and without siblings. The results showed that only children spent substantially more time alone than children with siblings. Only children were less happy than children with siblings when they were spending time with other adolescents, and for only children there was a positive correlation between stress and spending time with other children. Additionally, only children were less happy when they were spending time alone than adolescents with siblings

were when they were alone (Wikle, Ackert, & Jensen, 2019). Downey, Condron, & Yucel (2015) elaborate upon the benefits of sibling interaction: they found that children without siblings lagged behind in interpersonal skills and self-confidence and displayed more externalizing behaviors in kindergarten than children with siblings. Children without siblings did not gain more interpersonal skills, gain more self-control, or experience less externalizing behaviors between kindergarten and fifth grade than children with one, two, three, or four or more siblings, which suggests that sibling interactions at home provide socialization benefits that peer interactions in the classroom do not (Downey, Condron, & Yucel, 2015). Additionally, Lam, Solmeyer, & McHale (2012) explored the development of empathy in adolescents, and revealed that adolescents who had closer relationships with their siblings were more empathetic individuals overall. This is yet another aspect of the benefits of sibling interaction.

A study by Black, Grönqvist, & Öckert (2018) differs from Downey's, Condron's, & Yucel's (2015) study because they measured social emotional development based on birth order, rather than family size. Black, Grönqvist, & Öckert (2018) found that firstborn children had higher noncognitive abilities in the areas of emotional stability, persistence, social outgoingness, willingness to assume responsibility, and ability to take initiative. There was a negative birth order effect for these noncognitive abilities: second-borns performed worse than first-borns, third-borns performed worse than second-borns, and so on. This brings into question whether family size or birth order more significantly impacts a childs' social emotional characteristics and development.

Research Design and Methodology

In order to collect data to answer my research questions, I created a 130-question survey using Qualtrics. This survey had to be approved by the IRB board, and I went through a few rounds of revisions before it was approved. Then my primary advisor, Dr. Thomas, emailed the survey to approximately 125 elementary school teachers that she knows from previous classes, studies, and personal connections. She also posted a blurb about my honors project

and a link to my survey and all other relevant materials (such as the consent form) on her Facebook page. I collected responses over the three-week period of January 18th through February 8th. To look at the comprehensive data for each question, I created a report using the "Reports" tab in Qualtrics and then analyzed the questions as a whole by studying that report; to look at the individual responses, I used the "Data & Analysis" section of Qualtrics, where I could filter out questions and see the individual answers for each particular question that I needed for my findings.

In my survey, I included questions about the number of siblings and the birth order of the students in the teacher's classroom. I also included questions about the family's SES, mother's educational level/occupation (if known to the teacher), home status (for example, does the child live with two parents, divorced parents, step parents, adopted, etc), sex and race of the child, and the spacing of siblings so that I'm cognizant of the other factors that may be influencing the child's development. Then, I used questions in the survey about the students' cognitive and intellectual abilities, and I also asked questions regarding social emotional abilities of the students that the teacher has observed. To measure cognitive abilities, I asked questions about the child's vocabulary and language expression, abilities in math, and general test scores. To measure social emotional abilities, I asked questions regarding the students' abilities to share, work in a group, play in a group, show compassion and empathy towards peers, and take control and/or responsibility in a group setting. In response to my research question of: "How can we support students with no siblings and students with a multitude of siblings to help them achieve similar outcomes and receive the same social emotional support in school?", I incorporated questions on the survey about any interventions the teachers have tried. I asked if they support their students differently based on their cognitive and social emotional needs, and I asked if they think the students' number of siblings and/or birth order affect these needs.

Findings/Results

Only Children

The first type of students which I asked about in my survey questions were only children. I received 18 responses about only children, and I recorded the numerical responses (which ranged from 1-5; one being “not well at all” and five being “extremely well”) for the ten categories of behavior. The categories of behavior were as follows:

- On a scale of 1 to 5, how well does the child share with others?
- On a scale of 1 to 5, how well does the child work in a group?
- On a scale of 1 to 5, how well does the child play in a group?
- On a scale of 1 to 5, how well does the child show compassion and empathy towards peers?
- On a scale of 1 to 5, how well does the child take control and/or responsibility in a group setting?
- On a scale of 1 to 5, how well does the child understand and utilize vocabulary?
- On a scale of 1 to 5, how well does the child show language development?
- On a scale of 1 to 5, how well does the child understand and complete math assignments?
- On a scale of 1 to 5, how well does the child perform on ELA assessments?
- On a scale of 1 to 5, how well does the child perform on math assessments?

Once I had recorded the responses, I found the mean score for only children in each category. The data is as follows:

- Share with others: 2,2,3,3,3,3,4,4,4,4,5,2,2,3,3,3,4,4
    - Mean: 3.22
- Work in a group: 2,2,2,3,3,3,3,4,4,4,4,1,1,2,3,3,4,4
    - Mean: 3.89
- Play in a group: 2,3,3,3,3,3,3,3,3,4,4,1,1,3,3,3,4,5

    - Mean: 3.00
- Show compassion and empathy to peers: 1,2,3,3,3,3,4,5,5,5,5,2,3,3,4,4,4,4
    - Mean: 3.50
- Take control/responsibility in a group setting: 1,1,2,4,4,5,5,5,5,5,5,1,1,2,3,3,5,5
    - Mean: 3.44
- Understand/utilize vocabulary: 2,2,4,4,5,5,5,5,5,5,5,2,2,3,3,3,4,4
    - Mean: 3.78
- Show language development: 1,2,4,4,4,4,5,5,5,5,5,1,2,3,3,3,4,5
    - Mean: 3.61
- Understand/complete math assignments: 2,2,2,3,3,3,3,4,5,5,5,1,2,2,3,3,4,4
    - Mean: 3.11
- Perform on ELA assessments: 1,2,3,3,4,4,4,4,5,5,5,2,2,2,2,4,5
    - Mean: 3.35
- Perform on math assessments: 1,2,2,2,3,3,1,5,5,5,1,2,2,3,4,4,4
    - Mean: 2.88

Six of the ten categories fell in the range of 3.0-3.5 for the mean score; it was interesting to note that there were only three categories in which the mean score was above 3.50, and only one category in which the mean score was below 3.0.

Oldest children

The second type of students which I asked about in my survey were oldest children. I received 17 responses about oldest children, and I recorded the numerical data and found the mean for each category as follows:

- Share with others: 3,3,4,4,4,4,4,5,5,5,3,3,3,4,4,4,5
    - Mean: 3.94
- Work in a group: 3,3,4,4,4,4,4,4,4,5,3,3,3,4,4,4,4

    - Mean: 3.76
- Play in a group: 3,3,3,4,4,4,4,4,5,5,3,4,4,4,4,4,5
    - Mean: 3.94
- Show compassion and empathy to peers: 3,4,4,4,4,4,5,5,5,5,2,3,3,3,4,4,5
    - Mean: 3.94
- Take control/responsibility in a group setting: 1,3,3,4,5,5,5,5,5,5,3,3,3,3,4,4,4
    - Mean: 3.82
- Understand/utilize vocabulary: 1,3,3,3,4,4,4,5,5,5,2,4,4,4,4,4,5
    - Mean: 3.76
- Show language development: 1,3,3,3,3,4,4,5,5,5,2,3,3,4,4,4,5
    - Mean: 3.59
- Understand/complete math assignments: 1,3,3,3,4,4,4,5,5,5,3,3,3,4,4,4,5
    - Mean: 3.71
- Perform on ELA assessments: 1,3,3,3,4,4,4,4,5,5,2,2,3,3,4,4,4
    - Mean: 3.41
- Perform on math assessments: 1,2,2,3,4,4,4,5,5,5,3,3,3,3,4,4,5
    - Mean: 3.53

When analyzing my data, I noticed that every category except for one had a mean in the range of 3.5-4.0. The only category that had a mean below 3.5 was “On a scale of 1 to 5, how well does the child perform on ELA assessments?”. It was interesting to compare this set of means to the previous set of means; there was a clear increase in the mean score in most categories from only child to oldest child.

Youngest children

The third type of students which I asked about in my survey were the youngest children. I received 15 responses about youngest children; this slight decrease in response rate may be

because the survey was lengthy, and youngest children were the last students included on the survey. Much like for the previous two types of children, I recorded the numerical data and found the means for each of the ten categories:

- Share with others: 3,3,3,4,4,5,5,5,1,3,4,4,4,4,4
    - Mean: 3.73
- Work in a group: 1,3,3,3,4,4,5,5,1,1,2,3,3,4,5
    - Mean: 3.13
- Play in a group: 3,3,3,4,4,5,5,5,1,2,3,3,4,4,5
    - Mean: 3.60
- Show compassion and empathy to peers: 3,4,4,4,5,5,5,5,1,3,3,3,4,5,5
    - Mean: 3.60
- Take control/responsibility in a group setting: 2,3,3,3,3,4,4,5,1,1,2,2,2,3,4
    - Mean: 2.80
- Understand/utilize vocabulary: 3,3,3,3,4,4,4,5,1,1,2,3,4,5,5
    - Mean: 3.33
- Show language development: 2,3,3,3,4,4,4,5,1,1,2,3,3,4,5
    - Mean: 3.13
- Understand/complete math assignments: 1,3,3,3,4,5,5,5,1,1,2,3,3,3,4
    - Mean: 3.07
- Perform on ELA assessments: 1,3,3,3,3,4,4,5,1,1,3,3,3,4,5
    - Mean: 3.07
- Perform on math assessments: 1,3,3,3,4,5,5,5,1,1,2,3,3,3,4
    - Mean: 3.07

For this set of data, there were six out of the ten categories that were within the range of 3.0-3.5. Three categories were between 3.5-3.75, and most interestingly, there was one category in which the mean was 2.8. That category was “On a scale of 1 to 5, how well does the

child take control and/or responsibility in a group setting?". During my initial research, I found some sources that stated that oldest children were more able and willing to take initiative and assume responsibility, and this sentiment was echoed by some of the teachers who gave responses to the open-ended questions on my survey. My quantitative data appears to back up this statement that youngest children are less likely to take responsibility in a group setting.

Children with 1-2 siblings

One of the questions which I asked in my survey for the categories of oldest child and youngest child was "How many siblings does the student have?". These responses weren't grouped together like the responses for the previous three types of students were, but I combed through the individual responses and recorded the answers for the ten categories based on number of siblings this time, rather than birth order. There were 21 students who has one or two siblings, and their data is recorded below:

- Share with others: 5,5,5,3,4,4,3,4,3,4,3,3,5,5,3,3,4,3,4,4,3
    - Mean: 3.76
- Work in a group: 4,4,4,4,4,4,5,3,4,4,3,4,5,4,3,1,3,3,2,4,1
    - Mean: 3.48
- Play in a group: 5,5,4,3,4,3,4,5,4,4,3,4,5,5,3,3,4,3,2,4,3
    - Mean: 3.81
- Show compassion and empathy to peers: 5,5,5,5,4,3,4,3,3,4,2,3,5,4,4,3,4,5,4,3,3
    - Mean: 3.86
- Take control/responsibility in a group setting: 5,3,3,5,1,5,5,3,4,4,3,3,5,4,4,2,3,3,3,4,2
    - Mean: 3.52
- Understand/utilize vocabulary: 3,5,5,5,1,4,4,4,4,4,5,4,5,4,4,3,3,4,5,5,3
    - Mean: 4.0
- Show language development: 3,5,5,5,1,4,4,5,4,3,4,4,5,4,4,2,3,4,3,5,3

    - Mean: 3.81
- Understand/complete math assignments: 3,4,5,3,1,4,3,3,4,4,5,3,5,5,4,1,3,3,3,3,1
    - Mean: 3.33
- Perform on ELA assessments: 4,4,5,5,1,3,3,3,4,4,2,4,5,4,4,1,3,3,3,5,1
    - Mean: 3.38
- Perform on math assessments: 2,4,5,3,1,4,2,3,4,4,5,3,5,5,4,1,3,3,3,3,1
    - Mean: 3.24

These students had mean scores in the range of 3.5-4.0 for six out of the ten categories. The four categories in which the mean scores were below 3.5 (but not lower than 3.0) measured how well the student performed on math and ELA assessments and assignments, and how well they worked in a group.

Children with 3-4 siblings

I followed the same procedure to collect and analyze my data for children with three or four siblings as I did for children with one or two siblings. There were only seven children who had three or four siblings, so I didn't have as much data work with, but I have recorded the results below:

- Share with others: 1,4,5,4,4,4,4
    - Mean: 3.71
- Work in a group: 1,3,5,3,4,3,3
    - Mean: 3.14
- Play in a group: 1,4,5,4,4,3,4
    - Mean: 3.57
- Show compassion and empathy to peers: 1,5,5,4,4,4,4
    - Mean: 3.86
- Take control/responsibility in a group setting: 1,2,3,3,4,5,5

    - Mean: 3.29
- Understand/utilize vocabulary: 1,4,3,4,4,3,3
    - Mean: 3.14
- Show language development: 1,4,3,3,3,3,3
    - Mean: 2.86
- Understand/complete math assignments: 1,4,5,4,4,5,5
    - Mean: 4.0
- Perform on ELA assessments: 1,4,3,3,4,4,3
    - Mean: 3.86
- Perform on math assessments: 1,4,5,3,4,5,5
    - Mean: 3.86

Once again, these students had mean scores in the range of 3.5-4.0 for six out of the ten categories. The data collected for students with three or four siblings did not vary too greatly from the data for students with one or two siblings.

Children with 5+ siblings

The final category of students which I studied was children with five or more siblings. There were only four responses about students with this many siblings, which isn't unexpected, since it is less common to have five or more siblings than it is to have one to four siblings. The recorded results are as follows:

- Share with others: 5,4,4,5
    - Mean: 4.50
- Work in a group: 4,4,3,5
    - Mean: 4.00
- Play in a group: 4,4,3,5
    - Mean: 4.00

- Show compassion and empathy to peers: 5,5,3,5
    - Mean: 4.50
- Take control/responsibility in a group setting: 4,3,2,1
    - Mean: 2.50
- Understand/utilize vocabulary: 2,3,2,1
    - Mean: 2.00
- Show language development: 2,3,2,1
    - Mean: 2.00
- Understand/complete math assignments: 3,3,2,3
    - Mean: 2.75
- Perform on ELA assessments: 2,3,3,3
    - Mean: 2.75
- Perform on math assessments: 3,3,2,3
    - Mean: 2.75

Since I had a small pool of responses for this type of student (especially in relation to the previous categories), my data may not be as reliable. However, some interesting patterns have emerged in my data for children with five or more siblings. The mean scores were in the range of 4.0-4.5 for the categories of sharing with others, working in a group, playing in a group, and showing compassion and empathy to peers, which all relate to the student's social/emotional development. On the other hand, the mean scores were in the range of 2.0-2.75 for the other six categories, which include the cognitive development categories which measured assessment and assignment performance and language and vocabulary development. These scores reflect some of the previous research that has been done on the effect of a child's number of siblings. Some studies have found that an increase in the number of siblings has a negative effect on a child's cognitive and language skills, but it has a positive effect on a child's social emotional

skills. Children with more siblings show less problematic behaviors, exhibit more empathy towards others, and are happier and less stressed when spending time with other children.

Open-Ended Questions

I included some open-ended questions at the end of my survey to collect qualitative data and see if teachers have noticed any cognitive or social/emotional differences in the students in their classrooms, based on birth order or number of siblings. The questions I asked were as follows:

- Have you noticed differences in social/emotional development for children with and without siblings?
- Have you noticed differences in social/emotional development for oldest vs. youngest children?
- Have you noticed differences in cognitive development for children with and without siblings?
- Have you noticed differences in cognitive development for oldest vs. youngest children?
- Do you differentiate the support for your students based on social/emotional and cognitive needs?
- Do you think a student's number of siblings affects their social/emotional and/or cognitive needs? Explain.
- Do you think birth order affects a student's cognitive and/or social emotional needs? Explain.
- What could teachers do to address any varying needs caused by family size or birth order to ensure that each child is receiving sufficient support? Is this feasible for teachers to implement?

I received a varied mix of results; there was no consensus for the first four questions, but I did get some responses stating things such as, "only children have a harder time interacting in

a large group setting", "oldest children have the best cognitive development of their siblings", and "students with siblings have an easier time forming relationships and sharing". Every teacher reported that they differentiated support in some way based on their student's cognitive and/or social emotional needs, and all except one teacher reported that they think a students' number of siblings affects their cognitive needs and/or social emotional needs. They explained their answers with statements such as "Students who don't have siblings have a harder time relating to other children and sharing, and are closer to adults. Students who have siblings are more flexible in their routines and share better with peers. Cognitively, students with siblings sometimes know things that their siblings are learning in class", "Having more siblings affects how they treat others because they see the pain and joy of others more often", and "Some students with many siblings (especially if they're the youngest) are used to having things done for them". However, only one teacher reported that they think birth order affects a student's cognitive and/or social emotional needs. The rest of the teachers stated that it depends more on the child's home life and the parents' involvement. The teachers had various ideas about how to address different needs potentially caused by family size or birth order; some responses included social emotional instruction, differentiation in instruction (which teachers do in their classrooms anyways), and communication with the parents.

Limitations

One challenge that I faced during my study was teachers' lack of knowledge of their students' family situations and home lives. Teachers have a unique perspective of students' cognitive and social emotional growth because of the amount of time they spend with their students and because of the opportunity to observe them in the classroom setting every day, but they may not know the full scope of their students' family situations. I noticed that the teachers that responded to my survey did not all fill out every part of the survey, and this is likely due to lack of knowledge. Another limitation that I faced is the intersectionality of multiple factors that contribute to students' development. I attempted to overcome this limitation by asking

questions in my survey about other factors so I could single out the factors of family size and birth order, but even so, I can't say with 100% certainty that the patterns I observed were due solely to family size and birth order. Another potential limitation is the scope of the study: I distributed my survey to a multitude of teachers, but I don't know the population of children in their classrooms (nor can I control this), so the data cannot be generalized to every child. Finally, a larger pool of data would have made my results more reliable, especially for the section about students with five or more siblings. My survey was slightly lengthy, so this may have turned teachers away from taking it and narrowed my field of data.

Conclusions

The aim of this study was to determine how a student's number of siblings (family size) and/or birth order affects the student's cognitive and/or social emotional development. Through the distribution of a survey and the collection and analysis of the responses it yielded, I have compiled data that leads to several conclusions. First, the number of siblings that a child has does not seem to have an overall significantly larger or smaller effect on either domain of development than birth order does. In regards to birth order, students who were the oldest child scored higher overall in nearly every category than only children or youngest children. Youngest children scored lower in all five of the cognitive development categories than oldest children and only children, with the exception that only children scored lower than youngest children in the category of performance on math assessments. This suggests that oldest children have a cognitive advantage over only children and youngest children. Also, out of all ten categories, the youngest children scored the lowest in the category of "taking control and responsibility in a group setting". Their average mean score for that category was also 0.64 and 1.02 points lower than that category for only children and oldest children, respectively. This echoes previous research which has shown that oldest children are more able and willing than youngest children to take initiative and responsibility. In the open-ended questions that I asked on the survey, some of the teachers reported similar patterns that they observed in the behavior of youngest

and oldest children in regards to taking control or stepping into leadership roles in a group setting.

In regards to a student's number of siblings, there wasn't much variation in cognitive or social emotional development between students with one to two siblings and students with three to four siblings. However, there was a drastic difference in both domains of development for students with five or more siblings. The mean scores for the categories of sharing with others, working in a group, playing in a group, and showing compassion and empathy to peers were much higher (some scores were over one full point higher) than the scores in these categories for children with less than five siblings. Additionally, the mean scores for the categories of understanding/utilizing vocabulary, showing language development, understanding/completing math assignments, performance on ELA assessments, and performance on math assessments were all much lower (some scores were over one full point lower) than the scores in these categories for children with less than five siblings. Those categories are all related to cognitive development, and some of the previous research also found that having more siblings can negatively affect cognitive development. My data (though it was limited) shows that having more siblings has a positive effect on social emotional development and a negative effect on cognitive development.

Due to these findings, it can be concluded that differentiation in the classroom may be helpful in meeting students' differing cognitive and social emotional needs due to varying family size and birth order. Most teachers who responded to the open-ended questions on the survey stated that they do use differentiation to meet the needs of their students who may, for example, be struggling academically, need to learn to be leaders, or need to learn how to interact with other students. If teachers understand the potential family-size- and birth order-related reasons why these differences in performance and behavior are occurring, they will be better equipped to support the growth and development of all their students.

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