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The impact of psychological birth order on academic achievement and motivation

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This is to certify that the doctoral dissertation by

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Walden University
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Abstract

The Impact of Psychological Birth Order on Scholastic Achievement and Motivation

by

Alissa J. Combs-Draughn

MA, Virginia Tech, 2008

BA, Ellis College, 2005

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

General Psychology

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Abstract

Historically, research in the field of birth order yielded inconsistent and at times controversial results. Researchers have long been interested in the impact of birth order on both social and cognitive development, in part due to the research of Adler. The purpose of this quantitative study was to determine if psychological birth order directly impacts student achievement and motivation. The resource dilution theory and confluence model were used to investigate the relationship between sibling perception of family roles within familial settings and academic performance and motivation within the college setting. The quantitative study used an online survey to assess psychological birth order, assess motivation, and obtain demographic information including academic achievement measures. This study yields potentially helpful insight into the arena of differentiation of instruction by introducing a new variable for educators to take into consideration. Criterion sampling was employed with a sample (n = 183) of students in community, public, and private colleges. This study found that psychological birth order (first born, middle born, youngest, only child) predicted student motivation in the area of fun seeking (part of the motivation scales). Also, psychological birth order (first born, middle born, youngest child) predicted student motivation in the area of reward responsiveness (another subscale of motivation scales). To initiate positive social change for individual students and address their specific needs, teachers and administrators can use these results to understand student motivation and design strategies to motivate students to reach their full potential.

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Dedication

I would like to honor several people who have been supportive and encouraging throughout this process, which has been quite a labor.

To my husband, Shaun, thank you for the time you have given me to work on this life goal and for the never ending support and belief in me. You are most definitely God's blessing to me and without you, I am not sure I would have been able to complete this!

To my four children: Alessandra Jade, Raeli Jo and David Malachi and Jobie Grace – you four are the reason I kept going when I felt like I should just give up. I hope through this journey you have learned about perseverance and about the value of education. It is a gift that many take for granted and I want each of you to appreciate it! I also hope that I have instilled within you the same love of learning that I possess. I love you all!

To my parents – thank you so much for the support you have given me since birth. You have never doubted me and your belief in me has helped me become the woman I am today. I hope this brings you pride; it is not only my achievement, but yours as well.

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.

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Chapter 1: Introduction to the study

Background

Research has shown that the climate in which a child spends his or her childhood has a deep and lasting impact on his or her cognitive, emotional, and social development (Holmgren, Molander, & Nilsson, 2006; Leman, 2009). Most scientists and researchers acknowledge that a child's overall development is shaped and formulated by variables within the home environment, such as quality of parenting, and the resources which are readily made available to the family (Downey, 2001). Downey (2001) further stated that it may seem surprising to some researchers and laypeople to learn that "one of the most consistent predictors of educational outcomes is the number of siblings, or sibship size" (p. 497). As such, the importance of sibling relationships and impact of birth order cannot be overstated.

Since the works of Adler (1927, 1946; Ansbacher & Ansbacher, 1956) were published in the early 20th century, researchers have been working to find links between the family of origin and variables such as academic achievement, personality development and socioeconomic status (Fergusson, Horwood, & Boden, 2006). Adler (1927, 1946; Ansbacher & Ansbacher, 1956) believed that children's characters are primarily shaped by familial environment (Campbell, White, & Stewart, 1991). Children must work to create an individual and important role, or niche, which thus spurs and supports development (Sulloway, 1997).

In working to create a role unique from those of their siblings, children are naturally assisted by their birth orders (Sulloway, 1997). According to Adler (1927, 1946),

there are two types of birth order: biological and psychological. Biological birth order is defined as the placement into which one is born – first born, middle child, last born, or only child (Leman, 2009). Psychological birth order, which is the focus of this study, is defined as the birth order role with which one most closely identifies, regardless of one's biological position (Campbell, White, & Stewart, 1991). It is quite possible for one's biological birth order to differ from one's psychological birth order due to a variety of variables such as divorce or sibling handicap, which will be discussed further in Chapter 2 (Leman, 2009).

The purpose of this study is to determine if there is a relationship between psychological birth order and the variables of academic achievement and motivation and then from this relationship develop new methods for differentiating instruction in the education arena. The results of this study could also provide parents with additional techniques for child rearing, with specific focus in the area of academic motivation. While numerous studies have indeed found biological birth order effects in the area of academic achievement and intelligence, virtually none have considered the variable of psychological birth order, thus ignoring the writings of many researchers including Adler (Ansbacher & Ansbacher, 1956). Furthermore, as the American education system continues to struggle to reach all students, it is worth noting that students are not currently identified according to psychological birth order, which could be a key factor in differentiating instruction.

Psychological birth order is defined as an individual's perception of his or her role within the family (Adler 1927, 1946; Ansbacher & Ansbacher, 1956; Campbell,

White, & Stewart, 1991; Leman, 2009; Sulloway, 1997). Psychological birth order can be determined using the psychological birth order inventory (PBOI) that was developed by Campbell, White and Stewart (1991).

The remainder of this chapter will contain the following: a summary of the research related to birth order, academic achievement and motivation; a description of the gap in the literature prompting this study; relevance and significance of this study, and; and explanation on why this study is necessary for this field of study. Chapter 2 presents a review of current, as well as past, literature in the area of birth order, while Chapter 3 details the methodology of this study. Chapter 4 contains the results of this study and Chapter 5 contains conclusions, relevant limitations and researcher recommendations for the future.

Statement of the Problem

While there have been numerous studies in the area of birth order, few if any have focused on the specific area of psychological birth order (Campbell et al., 1991; Stewart & Campbell, 1998; Gfroerer et al, 2003). Yet Adler (1927, 1946), who is widely considered the grandfather of birth order research, remained quite emphatic throughout his publications that it is the individual's perception of his or her role within the family that truly impacts his or her development (Ansbacher & Ansbacher, 1956). Leman (2009) reiterated this belief when he stated that the variables surrounding birth order (i.e. divorce, remarriage, sibling deaths) are far too important in the life of a child to simply overlook or understate.

Booth and Kee (2009) noted that it is of upmost importance that legislators investigate and promote academic achievement. They further noted that simple family economics demonstrates the effect of family on educational achievement, stating that there exists very little probability that parents are able to devote equal amounts of resources to each child (Blake, 1981; Booth & Kee, 2009). The first born child is the most likely to receive a majority of parental attention as he or she remains the only child of the family until the next sibling arrives; siblings who follow then spend their lives involved in a competition for parental attention and resources (Badger & Reddy, 2009; Blair, 2011; Blake, 1981; Booth & Kee, 2009). However, it is equally possible that parents may mature and develop better parenting skills, as well as increase financial resources over time, suggesting that being the firstborn child is not without its disadvantages (Booth & Kee, 2009).

Nature of the Study

This study will expand upon current birth order research and literature and investigate the impact of sibling and parent-child relationships (psychological birth order) upon academic achievement and motivation in college students. The hypothesis that psychological birth order impacts the ability of a student to remain motivated and excel academically will be tested using standardized achievement tests, a psychological birth order inventory and motivation scales. The primary goal of this study is to provide educators (both teachers and administrators) and parents with a deeper insight into the effects of the family of origin upon scholastic achievement and motivation by providing them with correlational data, and in doing so, provide them with a new theory for the development of

teaching and child rearing methods. Providing teachers with additional methods of reaching students, particularly one that incorporates the home life, is believed to be essential to improving the current state of education.

Hypotheses

The purpose of this study was to investigate and discover the extent to which sibling and parent-sibling relationships impact student achievement and motivation. The following are the research questions and hypotheses used to guide this study:

In this research study, two research questions are answered.

Research Question 1: Do the confluence model and resource dilution theory explain the relationship between psychological birth order and scholastic achievement?

$H_0$1: Psychological birth order will not significantly predict student achievement scores.

H_a1*:* Psychological birth order will significantly predict student achievement scores.

Research Question 2: Do the confluence model and resource dilution theory explain the relationship between psychological birth order and motivation?

$H_0$2 birth order will not significantly predict student motivation scores.

H_a2: Psychological birth order will significantly predict student motivation scores.

Based on the confluence model (Zajonc, 1976) and the resource dilution theory (Blake, 1981) which were discussed previously in this chapter, it was predicted that first born and only children will score significantly higher than latter born children in the areas

of academic achievement and motivation. It is also predicted that second born children will score significantly higher than last born children in the areas of academic achievement and motivation.

Purpose of the Study

In answering the aforementioned research questions, this study could potentially contribute to the expansion of current educational practices. The concept of the family of origin impacting student achievement and motivation is based upon previously published literature which suggests that there does indeed exist a correlation between family environment and academic achievement. One of the purposes of this study was to mediate and investigate the current controversy between pro birth order and anti birth order researchers and practitioners.

Furthermore, the results of this research could further impact the current birth order theories and models, such as the resource dilution theory (Blake, 1981) and the confluence model (Zajonc & Markus, 1975). Blake's (1981) resource dilution theory states that with each new addition to the family, the resources available to siblings diminish significantly, thus impacting intellectual potential. Zajonc and Markus (1975) confluence model theorized that the effects of the family on cognitive development specifically address two main areas; first they theorize that the depth of the intellectual environment of the family impacts the cognitive development of each sibling. Secondly, the opportunity for siblings to be provided with the capacity to teach younger siblings can also contribute to cognitive and social development.

Published research in the area of birth order has demonstrated the links between family environment and children's academic achievement (Booth & Kee, 2001; Caceres-Delpiano, 2006; Carlson & Corcoran, 2001; Cicirelli, 1967; Downey, 2001; Eckstein, Aycock, Sperber, McDonald, Van Wiesner, Watts, & Ginsburg, 2010; Ermisch & Francesconi, 2001; Fergusson, Horwood, & Boden, 2006; Hatzitheologou, 1997; Holmgren, Molander, & Nilsson, 2006; Kantarevic & Mechoulan, 2006; Magnuson, 2007; Paulhus, Trapnell, & Chen, 1999; Rodgers, 2001) and motivation (Eckstein, Aycock, Sperber, McDonald, Van Wiesner, Watts, & Ginsburg, 2010; Gugl & Welling, 2010; Snell, Hargrove, & Falbo, 1986). As such, the main purpose of this study is to not only expand upon previous literature, but also add the component of psychological birth order in order to demonstrate a complete comprehension of the role of the family in children's cognitive development in the context of achievement and motivation.

Definition of Terms

Academic achievement: Academic achievement is defined as the ability level of students to excel within the academic setting (Noftle & Robins, 2007).

Achievement goal theory (AGT): Developed by Carette, Anseel and Yperen (2011), it is considered to be the most widely accepted theory currently explaining individual's motivation to achieve in a variety of settings, including both work and education. AGT has been utilized in numerous publications and dissertations (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). According to this theory, an individual's attitudes and thought processes pertaining to achievement are primarily developed with the individual's specific goal preferences (Elliot, 2005).

Biological birth order: Birth order is typically defined as the placement within the family into which one is born (Adler, 1927). For the purpose of this study, and to avoid confusion, the term biological birth order will be used to denote this relationship with the family of origin.

Confluence model: Theory propagated by Zajonc and Markus (1975) which states that the mental age of the family of origin lowers significantly with each sibling addition.

Family of origin: The family into which an individual is born or adopted (Whiston & Keller, 2004).

Psychological birth order: Psychological birth order is defined as the way in which one perceives one's role in the family within the context of birth order (Adler, 1927; Campbell, White, & Stewart, 1991). Both Adler (Ansbacher & Ansbacher, 1956) and Leman (2009) define birth order as simply the ability to comprehend one's place within one's family of origin.

Psychological birth order inventory (PBOI): Instrument developed by White and Campbell (1991) that measures one's psychological birth order.

Resource dilution theory: Theory propagated by Blake (1981) which suggests that with each addition to the family, parental resources, including financial, emotional and intellectual resources, diminish significantly.

Scholastic (or academic) motivation: Scholastic motivation is defined as the level of ambition of each student applied to the academic setting (Schunk, 1991).

Assumptions, Limitations and Scope

This study included several limitations. This study focused on college students who attend school on at least a part-time basis. In order to increase the generalizability of this study, it would be essential to produce proof of similarities between the particular colleges being studied and those throughout the rest of the country.

It was assumed that the students participating in this study would complete all evaluations to the best of their ability and answer questions truthfully. It was also assumed that the ACT/SAT and grade point average would be an accurate reflection of students' scholastic achievement.

This research intended to utilize ANOVA, based on the assumption that the variances of the dependent variables at each of the independent variable levels would be similar or equal (McGuiness, 2002). It was also assumed that the dependent variables will display a normal distribution when applied to each level of the independent variable. As these assumptions were not met, the researcher employed the use of the Kruskal-Wallis non parametric test.

Significance of the Study

A recent literature review demonstrated that the area of birth order remains highly controversial and the research in this area remains incomplete. Psychological birth order, particularly, has not been researched fully. While there is research in the area of birth order and academic achievement, there currently exists little to no research attempting to link psychological birth order with academic achievement. Furthermore, the area of motivation, as it relates to birth order, has been largely overlooked. While Adler (1927,

1946) strongly emphasized the importance of psychological birth order, the link between this variable and cognitive and social development is not clear. It is expected that this study will offer significant contributions to the area of education as well as to the existing literature pertaining to birth order.

There are also significant social changes linked to this study. If the results of this study conclude that there is a significant link between psychological birth order and scholastic achievement and motivation, these findings would potentially allow for the development of more comprehensive educational models. These models could lead to additional interventions for struggling students as well as interventions for school counselors to use with students who are lacking motivation. Gillard et al. (2015) believe that in order for students to once again become truly motivated to achieve success in school, it is necessary to allow them to do so autonomously, as this allows them to work as individuals and truly engage in academics. As they state in their abstract, "by restructuring the way educators approach the classroom, students can be provided an opportunity to explore further and become more successful" (Gillard et al., 2015, p.1). Psychological birth order could potentially be the variable that educators are able to utilize to better help at risk students become more motivated in the academic setting.

While many educational models and theories exist, it is clear that the American education system continues to struggle. As such, the development of a model that truly addresses students' needs is of upmost importance. Furthermore, despite the fact that there exists research on the effects of home environments on student success in school (Carette, Anseel, & Van Yperen, 2011; Downey, 1995, 2001; Ferguson, Horwood, &

Boden, 2006; Hester, Osborne, & Nguyen, 1992; Oberlander, Houlihan, & Jackson, 1970; Onabarino, Ositoye, & Adeyemi, 2010; Phillips & Phillips, 1994), it is unclear as to how exactly parents (as well as other siblings) impact a child's academic and social development.

Chapter 2 provides an extensive literature review and theoretical orientation of the research area and Chapter 3 details the methodology and research design used in this study. Chapter 4 discusses the results of this literature and Chapter 5 offers both a conclusion and recommendations for future research

Chapter 2: Literature Review

The Impact of Psychological Birth Order on Scholastic Achievement and Motivation

The purpose of this study, as mentioned in the previous chapter, is to determine if there is a relationship between psychological birth order and the variables of scholastic achievement and motivation and then from this relationship develop new methods for differentiating instruction in the education arena. Adler, a pioneer in birth order research, defined psychological birth order as the way in which one discerns one's place within the family (Campbell et al., 1991; Gfroerer et al., 2003). One's ordinal, or biological, birth order may in fact differ quite drastically from one's psychological birth order due to variables such as divorce, sibling or parent deaths or sibling handicaps (Leman, 2009). Psychological birth order is a representation of the roles individual's biological birth order may cause them to occupy (Adler, 1927; Ansbacher & Ansbacher, 1956). Adler (1927) stated, "What the child feels need not actually be the case. It does not matter what really has happened, whether an individual is really inferior or not. What is important is his interpretation of his situation" (p. 150). Adler believed that psychological birth order, then, played a much greater role in development, but this has yet to catch on in the scientific community (Leman, 2009).

Birth order remains one of the most highly researched, yet highly controversial topics in personality psychology, with many researchers claiming that birth order has little to no effect on social or cognitive development (Herrera, Zajonc, Wieczorkowska, & Cichomski, 2003; Leman, 2009; Sulloway, 1997). Yet research has shown that the climate in which a child spends his or her childhood has a deep and lasting impact on his or

her intellectual development (Holmgren et al., 2006). In fact, several studies have shown the relationship between firstborns (and only children) and achievement –in terms of both careers and academics (Carette, Anseel, & Yperen, 2011; Kantarevic, & Mechoulan, 2006; Melillo, 1983).

Of the numerous research studies performed in the area of birth order, few if any have focused on the specific area of psychological birth order (Campbell et al., 1991; Stewart & Campbell, 1998; Gfroerer et al, 2003). Yet Adler remained quite emphatic throughout his publications that it is the individual's perception of his or her role within the family that truly impacts his or her development (Ansbacher & Ansbacher, 1956). Leman (2009) reiterates this belief when he stated that the variables surrounding birth order (i.e. divorce, remarriage, sibling deaths) are far too important in the life of a child to simply overlook or understate.

The purpose of this review is to provide a detailed explanation of the differences in birth order positions and their effects on achievement and motivation. This review will also identify strengths and weaknesses of each birth order position. While all students are affected by birth order and niche within their nuclear family, very few teachers and parents have acquired the necessary knowledge in order to be able to utilize further teaching or parenting techniques. Leman (2009) believes that in understanding birth order, individuals can also understand not only themselves more comprehensively, but also those with whom they come in direct contact. As such, this knowledge can be considered useful not only in the areas of parenting and education, but also in the business world, the counseling arena and for couples.

The following review will provide the history and background of birth order, state the theoretical foundations for birth order research, differentiate between psychological and biological birth order, and demonstrate the importance of birth order as presented in research. Furthermore, this review will also provide relevant research-based information regarding birth order and achievement as well as birth order and motivation. This review will also discuss the methodologies of current and past birth order research, the findings of this research and the implications for future research.

History and background of birth order

The psychological, sociological and anthropological communities have researched birth order for over a century (Sulloway, 1996). While the strength of the effects of birth order seems to be random, it has been noted in numerous studies that these effects do in fact exist (Kluger, 2011). First born children have been found to be disproportionately represented in professions such as CEOs, presidents, astronauts, elected government positions, lawyers and doctors (Kluger, 2011; Leman, 2009). Last born children, on the other hand, are found in careers such as entertainers or entrepreneurs (Kluger, 2011).

Galton (1985) was one of the first scientists to venture into the field of birth order research (Kluger, 2011). While his primary motivation for doing so was to perfect the human race by eradicating those he considered undesirable, he did in fact uncover interesting statistical information through his creation of research involving birth order among scientists (Kluger, 2011). He found that within his sample of 99 scientists, over half were only children or first born children and went on to discover that as children, these scientists had received decisively different attention from their parents than had their siblings.

Historically, first born siblings have outperformed their sibling counterparts on achievement testing (Cicirelli, 1967; Leman, 2009). Typically, researchers have found that first born children not only identify with authority figures but also attempt to please these authority figures by performing well in scholastic activities (Paulhus, Trapnell, & Chen, 1999). Furthermore, first born children must continue to assert their work ethics in order to stay one step ahead of additional siblings (Gfroerer et al, 2003). The second born, then must find a way not only to differentiate him or herself from the first born, but also to compete with the first born for parental attention and favor (Gfroerer et al, 2003). These achievement differences, as well as other personality traits, have been found to differ among birth orders well into adulthood (Leman, 2009; Sulloway, 1999).

Scientists, who now accept the birth order effects, have devised several theories to explain birth order's impact on the family. The confluence model, which was devised by Zajonc (1976), states that there are three key factors in birth order effects: parents with fewer children have more time and attention for those children; firstborn children are exposed to more mature language, thus enabling them to be more successful academically, and; the family's intellectual environment becomes less mature and intelligent with each new addition to the family. The resource dilution theory, which was developed both by Blake (1981) and Downey (1995), states that parental resources are limited and as such, with each new addition to the family, these resource become stretched even thinner. These theories, among others, have enabled psychologists to approach birth order from a theoretical perspective, thus giving this research more scientific validity.

According to Stewart (2012), initial forays into birth order research utilized case studies. As the research area matured, descriptive statistic methodologies were employed (e.g., ANOVA, *t*-tests, and correlations). However, as biological birth order was easier to determine and quantify, Adler's advice to acknowledge the perception of the child within the family of origin was largely ignored (Stewart, 2012).

Characteristics of First Born Children

First born children are given the option of choosing the niche they want to develop within the family (Paulhus et al., 1999; Sulloway, 1997). Typically, the first born chooses to please parents and other authority figures by assuming responsibility and identifying with authority figures (Leman, 2009; Paulhus et al, 1999, Sulloway, 1997).

Leman (2009) characterizes first born children as being the most reliable and leadership oriented of the siblings. They are also deeply concerned with achievement and tend to be more serious than their sibling counterparts (Gugl & Welling, 2010; Herrera et al, 2003; Leman, 2009). First born children also tend to be perfectionistic, critical, and independent (Leman, 2009; Paulhus et al., 1999; Sulloway, 1997). According to Leman (2009), firstborns may be classified as either compliant or aggressive. Compliant firstborns are typically scholarly and hardworking and have a need for approval (Eckstein, 2000). Aggressive or assertive firstborns are leadership and achievements oriented and tend to be more critical than their compliant counterparts (Leman, 2009).

First born children serve several roles within the family. They are rough drafts for the parents (Leman, 2009; Whiteman, 2003) but also mentors to younger siblings (Leman, 2009; Zajonc, 1976). With this child, parents tend to be more anxious and push harder

for better performances than they do with proceeding siblings (Leman, 2009; Whiteman, 2003). Whiteman (2003) also points out that due to the relationships experienced with the first born, parents may become more adept in dealing with later born siblings.

Characteristics of Middle Born Children

Kidwell (1982) pointed to the exclusion of middle born children in empirical research. It is this birth order that remains the most mysterious of them all (Leman, 2009). Both Kidwell (1982) and Leman (2009) theorize that this may be due to the ambiguity surrounding the definition of middle born. While first born and last born are relatively simply defined terms, a child who is second of eight or fourth of seventh does not quite fit into one single category (Kidwell, 1982; Leman, 2009). Due to this undefined role, the middle child may struggle throughout childhood to find his or her place within the family (Kidwell, 1982; Leman, 2009; Sulloway, 1997).

Children born after the first born are challenged to find a way of competing with or differing from the firstborn's accomplishments (Gfroerer et al, 2003). Middle children will compete with older siblings if the older siblings exhibit a weakness; since older siblings are usually smarter, faster, and stronger, competition is not always the first choice (Leman, 2009). Typically if a first born excels academically, the next born sibling will compete athletically (Gfroerer et al, 2003; Leman, 2009). As a middle child, this sibling is in a constant race to stay ahead of the younger siblings and also compete with older siblings for parental attention (Gfroerer et al, 2003; Leman, 2009). Many middle children often feel that they do not have a place within their own family and thus feel more at home within their peer groups (Blair, 2011; Leman, 2009). In fact, as compared to their

sibling counterparts, middle children spend more time with peers than with family (Blair, 2011; Leman, 2009). However, middle children who are emboldened and reassured by their parents may find their place within the family as diplomats and peace makers (Gfroerer et al, 2003). Leman (2009) states that the most important principle to consider when analyzing the middle child is what he calls the branching out effect, which states that the second child is most likely to be more directly impacted by the first born child; likewise, the third born child is most likely to be directly impacted by the child born closest to he or she.

Middle children possess the unique experience of temporarily being the baby of the family (Blair, 2011). For a set amount of time, these children experience all the benefits usually given to the youngest children until the next sibling comes along. This experience may lead to resentment, however, researchers note that it is the middle child that is typically the easiest to get along with (Blair, 2011; Leman, 2009). Unlike first born children, who may have unrealistic expectations due to the amount of time spent with adults, middle children tend to base their comparisons on their peer groups, resulting in more realistic expectations (Blair, 2011). Blair (2011) and Leman (2009) further state that the middle child is usually the first of the siblings to leave home and typically feel more comfortable moving farther away from the family of origin.

Characteristics of Youngest Children

The youngest child of the family tends to be the family charmer (Leman, 2009). In comparison with other birth order ranks the youngest child is the life of the party, often seeking to be the center of attention and excelling in interpersonal relationships (Blair,

2011; Leman, 2009). However, the youngest child may also be perceived as spoiled, pampered by parents, and undisciplined (Leman, 2009). The youngest child does not face the challenge of being dethroned as do the oldest and middle siblings (Sulloway, 1997). Furthermore, the youngest child may also be manipulative and rebellious, becoming well accustomed to being ignored or insulted by older siblings (Cáceres-Delpiano, 2006; Leman, 2009). Campbell et al (1991) stated that because this child must overcome the most adversity and work the most to find a niche within the family, he or she may easily become discouraged or unmotivated. As compared to their sibling counterparts, lastborn children are typically more disorganized and less achievement oriented (Blake, 1981; Booth & Kee, 2009; Blair, 2011).

Blair (2011) pointed to parenting behaviors when analyzing the characteristics of each of these birth order positions. Just as parents delighted in each new development of their first born child, they also delight in those of the last born, as they may realize that this is the last time they will experience those milestones (Blair, 2011).

Characteristics of Only Children

Historically, it was deemed nearly unacceptable to have only one child, however, as times have changed, this birth order position has become increasingly common (Blair, 2011). Leman (2009) labeled only children as super firstborns, exhibiting many of the same characteristics of a first born child only to a much more exaggerated extent. Only children do not experience sibling rivalry or competition for parental attention or affection and resources, but they also miss out on the socialization opportunities afforded to children in larger families (Leman, 2009). As compared to other birth orders, the only

child may be considered more cautious, arrogant, mature and often, more articulate (Blair, 2011; Leman, 2009). Only children tend to excel academically and interact best with adults (Blair, 2011). Only children are also better able to entertain themselves and do not have the need for approval that first born children typically possess (Blair, 2011).

Biological versus Psychological Birth Order

Sulloway (1997) differentiated between various terms used through birth order literature. The term birth order is typically used to distinguish placement within the family (i.e. first born, second born, and last born). The term sibship size is used to describe the total number of children within the family. He further noted that birth order can be discussed as either biological or functional (also known as psychological). Within the field of psychology, birth order researchers are commonly divided into two groups: those termed Adlerian tend to adhere to Adler's belief that psychological birth order holds much more power and influence over an individual's development, while those termed non Adlerian firmly hold to the conservative belief that biological birth order is the only birth order that can be scientifically assessed (Eckstein et al., 2010). Adler (1927, 1946) hypothesized that every individual, regardless of the biological placement into which he or she is born, has a "self-perceived place" within the family (as cited in Ashby et al, 2003; Gfroerer et al, 2003; Melillo, 1983). This place, or niche, may or may not be congruent with his or her biological birth order, however, as Adler so adamantly stated on various occasions, it is this perception of one's role that deeply impacts development (Ansbacher & Ansbacher, 1956; Gfroerer et al, 2003).

Biological birth order is simply the placement into which one is born (Sulloway, 1997). A child who is born first becomes the firstborn child of his or her family. Psychological birth order, on the other hand, is the way in which one perceives his or her birth order (Ansbacher & Ansbacher, 1956). Adler believed that the biological effects of one's birth had little impact in comparison with the environment in which he or she is born (Ansbacher & Ansbacher, 1956). This implies that psychological birth order may in fact differ a great deal from one's biological birth order. The perceptions one forms about roles within the family are thought to be long lasting and have a deep impact on career choices and leadership styles (Whitbourne, 2013).

Leman (2009) defined firstborn children in a variety of ways: the first child born to a family is typically considered a firstborn child unless there are intervening variables; the first child of a particular gender born to family can be considered a firstborn child, regardless of biological placement and a child who is born more than 5 years after the sibling closest in age to him or her could also be considered a firstborn child. Leman (2009) further discussed the issues of child spacing, gender, multiple births and adoptions and how each of these variables affects perception and development.

Sulloway (1997) and Adler (1927, 1946; Ansbacher & Ansbacher, 1956) theorized that divorce, remarriage, adoption, death of parents and siblings, as well as a myriad of other circumstances that can greatly impact the familial environment, all affect how one views his or her role within the family. Since the 1960s, families in the United States have undergone a dramatic change due to divorce, changes in laws regarding adoptions and gay marriage, and fertility (Carlson & Corcoran, 2001). Adler (1927, 1946) hypothe-

sized in his initial research on birth order that in the event that an older sibling became handicapped or passed away, the responsibilities formerly placed upon that sibling would then fall upon the next in line, thus changing the family environment (Ansbacher & Ansbacher, 1956). Sulloway (1997) further pointed out that while many siblings may not experiences these life changing events, even issues as simple as child spacing may impact their perceptions of roles – for instance, a great span of years between children can in fact create two separate families (Leman, 2009; Sulloway, 1997). Leman (2009) specifically identified a span of 5 to 6 years as causing new familial roles; he believes this span creates a family containing two first born children. This familial environment is vital as it provides a continuous foundation in every aspect of a child's development (Stewart, Stewart, & Campbell, 2001).

Psychological Birth Order Inventory

In order to assess psychological birth order in a valid and reliable manner, the White-Campbell Psychological Birth Order Inventory (PBOI) was created (Gfroerer et al, 2003; Stewart & Campbell, 1998). The purpose of this inventory is to identify variations between biological and psychological placement in the family in a scientifically approved method (Stewart & Campbell, 1998). Initially, the PBOI consisted of 10 yes or no questions, which were derived from birth order literature, to distinguish between the four birth orders positions (Campbell, White, & Stewart, 1991). It has since been revised numerous times to now consist of 40 yes or no questions and has been studied for reliability and validity, and the derived coefficients ranged from .70 for the only child scale to .87 for the middle child scale (Stewart & Campbell, 1998).

Since the development of the PBOI, psychological birth order research is now enabled to proceed in an empirical and purely scientific manner. Prior to its development, the primary criticism of this type of research was the lack of a valid and scientifically tested instrument to use in data collection (Watkins, 1992). Its use has shown that there is in fact a need for research in this field as Campbell et al. (1991) found that while 39% of participants had the same position in terms of biological and psychological birth order, 61% had differing positions. These findings imply that the majority of participants (which in this study numbered close to 600), do not have mirroring psychological and biological birth order positions (Campbell, White, & Stewart, 1991).

Importance of Birth Order

Leman (2009) believed that the greatest influence on childhood development is that of the family. Alfred Adler (1927, 1946; Ansbacher & Ansbacher, 1956) believed this as well and firmly negated that the belief that children from the same family will be similar. Both Adler (1927, 1946) and Leman (2009) defined birth order as simply the ability to comprehend one's place within one's family of origin. Sulloway (1997) defined these familial places as niches, which play an extremely vital role in children's development. Each individual within a family possesses a separate perception of his or her role within the family, which may or may not align with biological placement (Campbell et al., 1991). This perception of one's familial role plays a far more important role than the actual biological role itself (Adler, 1927).

Research has shown that siblings raised in the same home often display fewer similarities than complete strangers (Buss, 1999; Kruger, 2011; Leman, 2009). While first born children most often find themselves identifying more with parents and authority figures, last born children are more likely to rebel against authority figures (Buss, 1999; Leman, 2009). Only children and first born children are more likely to have higher self-esteem and to experience closer relationships with parents (Kidwell, 1982; Leman, 2009). First born children are also more likely to be jealous (Eckstein et al., 2010) and to seek mental health services as they develop (Leman, 2009). Last born children, on the other hand are much more sociable than their first born counterparts and are also more empathetic and laid back (Eckstein, et al, 2010). Middle born children are the least understood of all birth orders (Kidwell, 1982; Leman, 2009), often feeling that parents demonstrate more negative feelings towards them and struggling to develop their own identities (Kidwell, 1982). Leman (2009) referred to middle born children as the diplomats or peace makers of the families, but also points out that they may be aggressive competitors, and further stated that these children are often the first to move out of the house and are also typically the child who moves the farthest from the family of origin.

The relationships experienced with parents and siblings forms an indelible mark on the lives of all individuals (Ansbacher & Ansbacher, 1956; Kluger, 2011; Leman, 2009). These relationships, as well as the perceptions of the relationships, cause individuals to form specific lifestyles and behaviors that then shape their cognitive and social development (Gfroerer et al, 2003). Leman (2009) further hypothesized that the most intimate relationships most people experience are those with one's family of origin. In fact,

Leman (2009) believed that sibling relationships and bonds can be stronger than marital relationships. The home in which children reside can provide children with rich resources for both academic and social development (Carlson & Corcoran, 2001).

Birth Order and Motivation

First born siblings have been found to be over-represented in fields which generally require greater levels of education and achievement (Adams & Phillips, 1972; Leman, 2009, Sulloway, 1997). Due to the fact that motivation and achievement are often linked, it is believed then that first born siblings also demonstrate higher levels of motivation (Adams & Phillips, 1972; Ashby et al, 2003; Atta et al, 2011; Badger & Reddy, 2009; Blair, 2011; Booth & Kee, 2009; Sulloway, 1997), although there is little recent empirical data with which to substantiate this theory. The studies of both Adams and Phillips (1972) and Ashby et al. (2003) found in their study that while first born siblings are in no manner superior to their sibling counterparts, due to personality differences, they may be more motivated to excel and achieve academically.

Carette et al. (2011) referred to Achievement Goal Theory, which they believe to be the most widely accepted theory currently explaining individual's motivation to achieve in a variety of settings, including both work and education. Elliot (2005) explained that one's thoughts and feelings pertaining to achievement are directly impacted by one's specific goal preferences. However, as these researchers pointed out, far more important than the theories that explain motivation and achievement are the ways in which these are formed and impacted by the environment (Carette et al., 2011).

Birth Order and Academic Achievement

Initially, the birth order effects observed by many researchers were thought to be provoked by the differing treatment that siblings received from parents, which in return would lead to differing levels of motivation and achievement (Hilton, 1967). The research of Sulloway (1997) however, shifted the birth order paradigm. Sulloway (1997) suggested that it was not in fact the parents that caused the conflict; instead, siblings must compete with one another to create a unique niche within the family. It is this competition that leads to personality and cognitive differences. These environmental influences that impact children's social and cognitive development are crucial and their effects last far beyond childhood (Holmgren et al., 2006).

When compared to other siblings, firstborns are most likely to be concerned with the pursuit of perfection (Ashby, et al, 2003; Leman, 2009). Firstborns also express a stronger need for achievement and respect for positions of authority (Ashby et al, 2003). Parents often put a great deal of pressure on the first born as they are the parents' guinea pig (Whiteman, McHale, & Crouter, 2003). Middle children, on the other hand, often feel surrounded and engulfed by competition (Ashby et al., 2003). Middle children may be diplomatic or may become rebels (Leman, 2009). The youngest child has the most competitors of all the siblings and often feels the most overwhelmed (Ashby et al., 2003). Leman (2009) pointed out that while the baby of the family may be overcome with competitors in terms of siblings, the parents typically dote on this child the most and discipline may become more lax, leading to less motivation and achievement when compared to first born siblings. However there are several theories that debate that the first born

will be the highest achieving of the siblings and suggest that the last born, due to the higher rate of competition, will in fact be a higher achiever (Silles, 2010).

The majority of literature suggests that as family size increases, sibling intelligence declines, which is commonly referred to as the resource dilution theory (Holmgren et al., 2006). Intelligence was measured by intelligence tests such as the 'block design and word comprehension' tests, and by measures of executive functioning, such as assessments of 'working memory and verbal fluency tasks' (Holmgren et al., 2006, p.53). Research has shown that first born children are typically exposed to more mature, adult language, which in turn increases language skills (Holmgren et al., 2006). When children are added to the family, the family atmosphere and environment slowly becomes less mature, thus reducing language skills (Holmgren et al., 2006). Silles (2010) stated that children with a larger number of siblings typically do not achieve as high as children with fewer siblings.

Theoretical Framework

Downey (2001) stated that researchers from various fields have been attempting for many years to theorize and understand the effects of birth order. While there are many areas of birth order research that have been considered highly controversial, one which has remained highly consistent is the area of size of family on academic success (Downey, 2001). While research has consistently proven that children with fewer siblings tend to perform better academically, researchers have not agreed upon the reasoning behind this relationship.

The resource dilution theory is perhaps the simplest of all the birth order theories (Downey, 2001). It theorizes that as family size grows, parental resources become increasingly depleted; because these resources are directly linked to academic success, it is then logical that children in families with fewer siblings will most likely experience a higher level of academic success than children in larger families (Downey, 2001). These resources include not only money, but also cultural opportunities, parental attention provided to each child, teaching and learning opportunities and socialization opportunities (Downey, 2001; Schmeer, 2009; Silles, 2010). As Booth and Kee (2009) noted, for any given family size, with each addition to the family, the capital resources previously established for academic investments will be reduced considerably. The first born child in each family is the child who benefits from parental time and monetary investments until dethroned by the next sibling (Booth & Kee, 2009; Downey, 2011).

However, in addition to this simplistic view of familial resources is the effect of the parental life cycle (Booth & Kee, 2009). Parents who are younger and perhaps economically disadvantaged with the birth of the first child may in fact be more economically advantaged when future children are born, thus leading to educational resources that were not available to the first born (Booth & Kee, 2009). Whiteman et al., (2003) added that parents may use the first child as a guinea pig to learn from rearing mistakes, which benefits additional siblings. Parents may also set higher standards for first born children due to inexperience with child development (Rothbart, 1971). Silles (2010) also added that while there may be numerous seemingly negative consequences for having larger

families, these may be quickly outweighed by the socialization opportunities provided by increases sibship sizes.

Perhaps the more complicated of the two more popular birth order theories is the confluence model (Zajonc & Markus, 1975). This model was developed in response to research published in a 1973 Dutch study involving approximately 386,000 male service members who were all approximately the same age (Retherford & Sewell, 1991). The confluence model observes that mental age will most likely decline within the family as the family continues to grow. The developers of this model, Zajonc and Markus (1975), theorized that the effects of the family on cognitive development were twofold: the depth of the intellectual environment of the family is one causal factor, as is the opportunity for siblings to be provided with the capacity to teach younger siblings (Retherford & Sewell, 1991). Retherford and Sewell (1991) stated that the intellectual environment of the family tends to decline with each addition to the family. These researchers further explained the importance of the teaching function as it pertains only to older siblings, explaining the tendency for older siblings to outperform younger siblings in intelligence testing; only children and last born children are not provided with opportunities to teach or mentor younger siblings (Retherford & Sewell, 1991). Mentoring and tutoring younger siblings have both been shown to provide older siblings with an environment that is rich with intellectual stimulation (Schmeer, 2009).

Buss (1995), a leading proponent of evolutionary psychology, believed the answer to the birth order effect is even simpler than the aforementioned theories. Buss (1995) theorized that birth order is another form of evolutionary adaptive technique in which

parents and siblings manage conflict. According to evolutionary theory, the human species is eternally managing conflicts between individuals and their surrounding environments (Sulloway, 1997). From an evolutionary perspective, parents procreate in order to ensure the survival of their genes (Buss, 1995). However, due to the percentage of shared genes (50%), conflict will undoubtedly arise from time to time between parents and their children. Historically speaking, first born children have always been valued more than other siblings as they were more likely to marry and produce heirs (Buss, 1995). Siblings, then, are driven to conflict by parental attention. While altruism does indeed exist among siblings, it is not without its limits; humans are inherently selfish and siblings must compete with one another for seemingly scarce parental resources (Sulloway, 1997). Parents unconsciously discriminate when making decisions about and caring for their children; and children are incredibly sensitive to this differential treatment (Sulloway, 1997). In fact, research shows that as many as 70% of parents report demonstrating favoritism within the home (Kluger, 2011; Sulloway 1997). Sulloway (1997), however, proposed that an increased number of children may actually lead to less conflict within the home and also stated that children without siblings are able to experience deep levels of conflict as well. It is clear from the abundance of ambiguity in existing birth order research that scientists remain unsure of the true and lasting effects of birth order.

Methodology of Review

The key words used in searching the Walden University Library databases were: birth order, psychological birth order, scholastic achievement, achievement, and motivation. The initial search yielded several hundred articles, dating back to the 1960s. The

keywords psychological birth order and achievement yielded one article and psychological birth order and motivation yielded one article as well. The key words birth order and achievement yielded 226 articles and birth order and motivation yielded 74 articles. An advanced search using articles published only within the past ten years was utilized in order to filter outdated articles. This review includes five books and 68 articles. While the majority of the articles utilized in this literature review are from the past ten to fifteen years, several articles describing earlier ventures into birth order research are included, as well as the work of Alfred Adler.

The EBSCO Host service through Walden University was utilized in this review in order to access a variety of research databases. Databases accessed include: ERIC, *PsycARTICLES, PsycINFO, SocINDEX with Full Text, Psychology: A SAGE Full-Text Collection,* and *Education Research Complete.* Of the articles reviewed, 31 are quantitative, three are qualitative and seven are mixed methods. There are also three reviews of other studies and seven explanatory articles (i.e. articles that explained a theory or previous findings). The books used in this literature review were obtained using the services of Amazon and were purchased either via mail or electronically (i.e. Kindle). A Google search was performed to locate the books.

Within this literature review there are a wide variety of participants ranging in age from early childhood (school years) to late adulthood. Many of these studies shared similar hypotheses and purpose statements and several shared common suggestions for future research. One of the common threads among birth order researchers in this review is the idea that siblings are often much more different than similar (Eckstein, 2000).

Methodologies

Kluger (2011) noted that the methodologies used in birth order research have caused much of the controversy in the past. Most, if not all, birth order research published to date has been purely quantitative in nature. This factor, in and of itself is not problematic; however, there have been several confounding issues identified in these studies. Many researchers point to the lack of control for mediating factors, such as socio-economic status or culture when birth order effects are found within research (Kluger, 2011). As such, many scientists continue to refute birth order findings.

Kluger (2011) further noted that another common critique of birth order research is that of between-family studies. Kluger (2011) stated that scientifically, it is impossible to compare families to one another and find valid effects. Within –family studies are the preferred methodology, although this methodology is much more time consuming, perhaps explaining in part why it has been overlooked by some researchers (Kluger, 2011). Rodgers (2001) asserted that the choice of within family or between family, when deciding how one will study birth order, may affect the entire outcome of the study as the patterns that have been found through one methodology in previous research have not been found using the other methodology.

Rogers (2001) further argued that much of the confusion surrounding the findings of birth order research derives from the use of cross-sectional data. Using this type of data provides the researcher with a brief and narrow view of a restricted number of people; as such, he stated, there is more inferring of data than observing of data when researchers review their results (Rodgers, 2001).

Findings of the Review

In the process of the literature review it was discovered that not only has psychological birth order been overlooked, but also the position of the only child. One research study (Paulhus et al., 1999), when discussing the coding of the birth orders, mentioned leaving out the only child position, perhaps feeling that only children and first born children are too similar. While only children do in fact share many characteristics with first born children, they also experience an increased amount of parental pressure and do not benefit from sibling socialization, and thus become miniature adults at young ages (Gfroerer et al, 2003).

Holmgren et al., (2006) found significant biological birth order effects in relation to its impact on adult intelligence and personality but mentioned the need for future studies to examine younger families. However, it remains unclear in the study as to how variables such as divorce, blended families, handicapped siblings or deaths of siblings, were controlled. Furthermore, because this study, as well as many others, relied upon standardized intelligence testing, it is quite possible that socioeconomic biases are prevalent throughout the majority of this research.

Implications and Future Research

Leman (2009) stated within the first chapter of his book that scientists erroneously believe biological birth order to be of upmost importance and thus overlook the powerful influence of psychological birth order. Gfroerer et al (2003) found that this trend bleeds over into the clinical arena as most clinicians are either reluctant to consider the use of psychological birth order or are poorly educated about its use. Even though Adler

(Ansbacher & Ansbacher, 1956) wrote of psychological birth order's potentially long-lasting impact in the early 20th century, the majority of literature reviewed pointed to a systematic failure of science to heed his theories (Ashby et al., 2003).

This literature review also identified a need for future studies concerning the areas of birth order and motivation as there were few found. When performing the search for motivation research, the majority of research pertaining to this study was found in the 1970s and 1980s, with very few articles returned pertaining to both birth order and motivation. Snell, Hargrove and Falbo (1986) noted in their research that further studies are needed in order to determine how the many variables of an individual's life (gender, parental involvement and sibling influences) may impact achievement. Cheng et al., (2013) also noted in their study that the many varying components affecting a family's development and interaction require further study. These are the type of variables which psychological birth order would take under consideration, thus demonstrating the need for this research study.

Gillard et al., (2015), upon completing a research study on intrinsic motivation in the classroom, noted that the current American education system is woefully overregulated. This has led to an increasing amount of pressure felt by administrators, teachers and students. Furthermore, these increasing pressures negatively affected student motivation, converting even those formerly high achieving students into mediocre at best. These researchers believed that in order to overcome this and help students to once again become motivated to achieve, it is necessary to allow them to participate in education autonomously. It is precisely in this area in which the knowledge of the relationship between

psychological birth order and motivation can help both parents and educators better design interventions to both motivate those who are not inclined to achieve and aid those who are currently struggling to achieve.

Conclusion

While numerous studies have indeed found birth order effects in the area of academic achievement and intelligence, virtually none have considered the variable of psychological birth order, thus ignoring the writings of many researchers including Adler (Ansbacher & Ansbacher, 1956). Gfroerer et al (2003) were quick to point out in their study analyzing the differences in psychological and biological birth orders that often these two are not congruent. Furthermore, although biological birth order can certainly provide practitioners with a great deal of information about those whom they intend to help, psychological birth order can offer insight pertaining to how these individuals perceive family differences (Gfroerer et al, 2003).

As these reviewed studies failed to address the relationship among psychological birth order and academic achievement and motivation, the results of this research study are all the more pertinent to the field of education. This research study focused solely on the impact that psychological birth order has on the variables of academic achievement and motivation and found that psychological birth order did impact certain areas of motivation. Armed with this information, educators could be given assessments for students to take at the beginning of the school year which could then be used to form lesson plans and activities. While the reigning theory in education to date has been learning styles, research has shown that this theory is flawed (Riener & Willingham, 2010); psychological

birth order research could provide educators with additional means of reaching out to students and helping them to achieve educational goals.

Not only can birth order be used as purely an academic variable but several links proposed between birth order and behavioral development suggest that it could also be used within the educational and familial settings (Herrera et al., 2003; Leman, 2009; Silles, 2010). As the family has changed a great deal over the past few decades, more interventions are greatly needed to help children both at home and at school. As Gugl and Welling (2010) found, if children's needs are being met at home, they are more likely to be successful outside the home. Furthermore, as birth order has also been linked to economic success, it is then proposed that understanding one's own birth order and its strengths and weaknesses could help one achieve an optimal status in the future (Kantarevic & Mechoulan, 2006; Lampi & Nordblom, 2009).

Chapter 3 details the quantitative methods that will be used in this study. It further outlines the research design and analysis that will be employed for this study.

Chapter 3: Research Method

Introduction

The primary goal of this research was to determine if a relationship exists between psychological birth order and the variables of scholastic achievement and motivation and then from this relationship develop new methods for differentiating instruction and interventions in the education arena. This section of the study will include a detailed description of birth order characteristics. The methodology utilized for this study, including a description of participant selection, and data collection, is also provided. Furthermore, rationale concerning the specific data collection and data analysis is discussed. Data quality and threats to validity are also considered. For this particular research, there was a guided research question and a related research question. The independent variable in this study was psychological birth order, as measured by the Psychological Birth Order Inventory (PBOI), with scholastic achievement and motivation as dependent variables. Scholastic achievement was measured both by the Scholastic Aptitude Test (SAT) and the American College Test (ACT); students were also asked for their most recent cumulative grade point average (GPA). Motivation was measured using the Behavior Inhibition System (BIS) Behavior Activation System (BAS Scales). The emphasis of this study was placed upon students, parents and teachers as seen through the Psychological Birth Order Inventory (PBOI), the (BIS/BAS Scales), SAT and ACT scores, GPA and a review of current literature.

The results of this section will provide the specific methodology, sampling, research design, and data collection procedures developed for this study. To conclude, the

researcher will summarize key details, including current research in favor of this study. Students in the American education system are not currently identified according to psychological birth order, which could be a key factor in differentiating instruction.

Research Questions and Hypotheses

The purpose of this study was to investigate and discover the extent to which sibling and parent-sibling relationships impact student achievement and motivation. The following research questions and hypotheses were used to guide the study.

Research Question 1: Do the confluence model and resource dilution theory explain the relationship between psychological birth order and scholastic achievement?

$H_0$1: Psychological birth order will not significantly predict student achievement scores

H_a1*:* Psychological birth order will significantly predict student achievement scores.

Research Question 2: Do the confluence model and resource dilution theory explain the relationship between psychological birth order and motivation?

$H_0$2*:* Psychological birth order will not significantly predict student motivation scores.

H_a2: Psychological birth order will significantly predict student motivation scores.

Based on the confluence model (Zajonc, 1976) and the resource dilution theory (Blake, 1981), it was predicted that first born and only children would score significantly higher than children born later in the areas of academic achievement and motivation. It was also predicted that second born children would score significantly higher than last born children in the areas of academic achievement and motivation.

Research Design and Rationale

The independent variable in this study was psychological birth order. The dependent variables in this study were academic achievement and academic motivation.

The research population was divided into four subgroups: a) first born children; b) middle children; c) youngest or last born children; and, d) only children. While Adler (1946) originally differentiated between middle and second born, the categories have since been reassessed (Gfroerer et al, 2003). The target population consisted of college students attending school on at least a part-time basis. The available population of students who met the requirements for this study was approximately 20.2 million (U.S Department of Education). There were no exclusionary qualifiers that prohibited students from participating. The target audience included educators of all disciplines and who instruct students of all ages.

This study consisted of quantitative methods and employed convenience sampling due to its reliance on volunteer participation (Creswell, 2009). While Creswell (2009) notes that criterion sampling restricts randomization in sampling, he states that in many experiments in the educational arena, convenience sampling is often employed to "use naturally formed groups" (Creswell, 2003, p.164). In this particular study, the participants were not randomly assigned to groups, but placed in naturally formed groups due to the psychological birth order results.

Cross-sectional survey design was used to collect data in this study. According to Creswell (2009), surveys aid researchers by providing "a quantitative or numeric descrip-

tion of trends, attitudes, or opinions of a population" (p.145). Researchers are able to take data collected from these surveys and generalize information and make inferences about the population. Cross-sectional surveys indicate that the researcher will collect data one time, unlike longitudinal surveys, in which researchers may collect data repeatedly over time (Creswell, 2009).

This study was a Type I Study, or what Stewart (2012) refers to as a Type I PBO Study, in which the PBO stands for psychological birth order. According to Stewart (2012), in this type of study, psychological birth order is always the (or an, depending upon how many variables are in the study) independent variable. He states that psychological birth order is evaluated using intervals and the four distinct birth order positions (Stewart, 2012). He further explains that in this Type I research, the goal is to "operationalize birth order effects when conducting either exploratory research or investigations that are meant to evaluate or test relationships that Adler or other scholars discussed" (p.80).

Setting and sample

The study focused on college students. The population for this study had no geographic barriers. This population differed across colleges as college students may fall into a variety of age groups. The population also included students in community colleges, public colleges, and private colleges.

Using GPower, a power analysis was performed to determine the target sample size in order to achieve .80 power. With an effect size of .25 and an alpha of .05, the minimum sample size needed was determined to be 180. The conservative effect size chosen

for this study was validated based on another similar birth order research study, which identified effect sizes ranging from .15 to .45 (Herndon, 2012). According to Gravetter and Wallanau (2009), when attempting to find a significant mean, the researcher simply wants to find a difference that most likely would not have happened "by chance" (p. 417). Therefore, in computing the effect size for the power analysis in this research study, the researcher used a conservative effect size to determine the sample size that would yield results that are less likely to happen simply by chance.

Herndon (2012) conducted a similar study related to psychological birth order and its effect on career decisions. In his study, he found that in terms of career decisions, individuals who display more psychological first born characteristics report greater self-efficacy (p. 56). Furthermore, he found that individuals experiencing "erratic" or "inattentive" home environments tend to report a lower "sense of belonging in the world" (p.57).

Recruitment took place using Facebook; a group page was created inviting students meeting the age and geographical criteria to participate in the study. An advertisement with information about the study was also posted on Facebook. The Walden IRB approved this recruitment method and gave this study the approval number 10-25-13-0177257. This advertisement targeted college students attending school at least part-time. Once participants contacted the researcher, they were given information about the purpose of the study, selection process and informed consent. Once the researcher received consent, the researcher asked for the email addresses of the participant so that the survey link could be sent. Students could also access the link directly via Facebook if they so

chose. If the student did not provide consent (which was located at the beginning of the student survey) their survey did not begin.

Students were not excluded on the basis of race, ethnicity, religion, or gender. Students were only allowed to participate once informed consent (see appendices F and G) was given. These consent forms were returned automatically as students were instructed to sign electronically by clicking next in the online survey. Letters of consent were attached to the online survey, with an explanation of the study. Before participating, each student was informed of his or her rights, the purpose of the study, and was given the choice to not participate. Students were asked to fill out a demographic questionnaire that consisted of questions pertaining to their age, race/ethnicity, grade, home life (i.e. parents married, divorced, separated), sibling relationships, SAT/ACT scores, current GPA, and socioeconomic status (i.e. type of housing structure currently living in). All inventories and demographic material were performed online in the place the student chose. After taking the birth order inventory and motivation scales, students were allowed to ask questions and were given the researcher's contact information in order to follow-up if necessary. Data will be stored in a secured location for 5 years in order to ensure confidentiality. Upon completion of the inventories, the researcher fielded questions from the students. Students were also directed to a website where they can check for research results. Schools of participating students received a special newsletter that contains the research results.

Measures

Psychological birth order inventory (PBOI)

The purpose of this study was to determine if there exists relationship between psychological birth order and the variables of scholastic achievement and motivation and then from this relationship develop new methods for differentiating instruction in the education arena. The results of this study could also provide parents with additional techniques for childrearing. In order to measure the relationship between psychological birth order and scholastic achievement, participants will take the Psychological Birth Order Inventory (see Appendix A) (Campbell et al., 1991). The Psychological Birth Order Inventory (PBOI) was developed by Campbell et al., (1991) for the purpose of identifying how individuals perceive their roles within their families of origin (Stewart & Campbell, 1998; Stewart, 2012). Furthermore, the PBOI works to identify the relationships and discrepancies between biological and psychological birth order (Stewart & Campbell, 1998; Stewart, 2012). In order to develop the PBOI, the creators utilized the Role Identity Model of McCall and Simmons (1978), which states that in all areas of an individual's development and activity, the primary goal is to develop and maintain "an idealized conceptualization of the self" (Stewart, 2012, p.88). Most importantly, these authors noted that the first and most important setting in which an individual's unique role begins to develop is within the family of origin (Stewart, 2012).

The PBOI exceeds previous instruments for measuring birth order, particularly when discussing effects of the family of origin; not only so, but the PBOI does not require clinical experience or diagnostic experience (Stewart & Campbell, 1998; Stewart,

2012). Furthermore, in developing this instrument, the creators intended to both include and amalgamate the individualistic characteristics of each of the four birth orders (Stewart, 2012). The authors considered it essential to consult the literature of Adler so as to correctly feature the theories and beliefs of Individual Psychology.

The PBOI consists of 40 items answered in yes or no format (Campbell et al., 1991; Stewart, 2012). Statements developed to identify first born children include the following characteristics: achievement-oriented, feelings of being dethroned by other siblings, and feelings of authority or power (Campbell et al., 1991; Stewart, 2012). Statements developed to identify middle children consist of the following characteristics: feelings of unworthiness or unimportance and competitiveness (Campbell et al., 1991). Youngest child statements include the characteristic of enjoying attention, while only child statements focus on anxiety over parental pressure (Campbell et al., 1991; Stewart, 2012). All statements were derived via literature pertaining to birth order characteristics. The following statements are some that are found on the PBOI: "Important to do things right, felt like I lived in a fish bowl, parents had high expectations, was pampered by family, and good grades were important" (Stewart & Campbell, 1991, p. 48). Based upon the participant's answers, he or she was then placed into a particular birth order grouping: Pleaser/Organizer (First), Neglected/Rejected (Middle), Charmer/Initiator (Youngest), or Scrutinized (Only). Themes identified in the statements for the first born (Pleaser/Organizer) include feelings of power and importance and a desire to follow rules and achieve goals (Stewart & Campbell, 1988). Themes identified in the statements for middle (neglected/rejected) include feelings of competition with both older and younger sib-

lings and general sense of inadequacy or inequality in the family (Stewart & Campbell, 1988). Themes identified in the statements for youngest (charmer/initiator) include feeling as though they are able to manipulate others and being able to charm and socialize well (Stewart & Campbell, 1988). Themes identified in the statements for the youngest (scrutinized) include feeling as though the entirety of the family's focus is on that sibling and feeling either overly protected or overly criticized (Stewart & Campbell, 1988).

The PBOI has been tested for validity in two ways, first with the use of four Ph.D. practitioners who were specifically trained in Adlerian psychology (Campbell et al., 1991; Stewart, 2012). Each of these practitioners was asked to evaluate the PBOI in its entirety and analyze its ability to distinguish among the birth order positions; this effort resulted in an editing for each of the birth order positions (Campbell et al., 1991). These researchers performed test-retest reliability over 5 weeks and derived coefficients which ranged from .70 for the only child scale to .87 for the middle child scale.

The second test was a test for construct validity, which involved a factor analysis of each of the 40 question items of PBOI (Stewart, 2012). The authors accomplished this with 600 students, both graduate and undergraduate. Stewart (2012) noted that further psychometric strength was established with the accumulation of additional research data and additional factor analysis of test items, specifically taking into consideration the variable of gender.

BIS/BAS Motivation Scales

Motivation was measured using the BIS/BAS scales (see Appendix D) which were developed by Carver and White (1994). Carver and White developed this scale by

creating a series of questions they believed specifically addressed the areas of BIS and BAS sensitivity (Carver & White, 1994). After developing this series of questions, they then began to edit or discard them after extensive testing, which led to the development of the final four subscales (Carver & White, 1994). The BIS subscale references a sensitivity or anticipation of punishment. The other three subscales are BAS subscales: Drive, which demonstrates an individual's desire to achieve goals; Fun Seeking, which demonstrates an individual's acceptance of new opportunities and; Reward Responsiveness, which demonstrates an individual's desire for rewards (Carver & White 1994).

This questionnaire consists of 24 questions which are answered on a 4 point Likert scale in which respondents must mark answers ranging from very true to very false, with no neutral responses (Carver & White, 1994; Levinson, Rodebaugh, & Frye, 2011). Questions consist of statements such as "I worry about making mistakes" and "It would excite me to win a contest" (Carver & White, 1994, p.323). Levinson et al (2011) further explain that the scales seek to investigate four different areas of behavior: response to criticism, goal seeking behavior, fun seeking behavior, and emotional responses. Once participants answer all questions on the scales, they were placed into one of four categories based on the answers they chose: Drive, Fun seeking, Reward responsiveness, or Anticipation of punishment. Examples of questions and how scoring is done for these scales are found in Appendix D.

BIS stands for *behavioral inhibition system*, which refers to a neurological brain function that specifically responds to punishments and negative consequences (Carver & White, 1994). BAS stands for *behavioral activation system* and is not as clearly defined

as the BIS. This particular system responds to rewards and positive consequences and is correlated with positive emotions (Carver & White, 1994; Leone et al., 2001). Researchers believe that the BAS may be the system responsible for greater motivation as it is directly related to positive feelings such as happiness and hope (Carver & White, 1994).

In order to validate their instrument, Carver and White (1994) executed several studies involving factor analysis (Leone et al, 2001). Not only were the scales found to be reliable (0.66-0.76), but the test-retest correlation, which was performed over an extended period, was also found to be significant (0.59-0.69) (Leone et al, 2001). Carver and White (1994) proceeded to investigate the ability of this instrument to predict outcomes. Their research found that the BIS/BAS scale is both reliable and valid (Leone et al, 2001). Levinson et al (2011) report that "support for the validity of the BIS/BAS scales includes a variety of correlations with psychophysiological measures" (p. 89). As such, it was determined that the BIS/BAS motivation scale was the best instrument to utilize for this research.

Measuring Scholastic Achievement

Scholastic achievement was measured by examining the ACT (American College Testing) and/or SAT (Scholastic Aptitude Test) and the students grade point averages (GPA). The researcher included both the SAT and ACT as colleges have differing requirements concerning the type of entrance exam students must take. The researcher then used converted SAT scores in place of the ACT scores that were provided by participants. These converted SAT scores were derived using a concordance table provided by

the SAT website. This allowed the researcher to synchronize all data and evaluate accordingly.

Screenshots of all measures used and how they were viewed by participants on www.surveymonkey.com are found in Appendix J. Upon viewing student test scores and GPA, the researcher compared participant biological and psychological birth order position, and then performed a Kruskal-Wallis analysis for each of the study's variables (i.e. scholastic achievement and motivation). The researcher initially planned to use ANOVA to analyze data but was unable to do so as the assumptions required to use ANOVA were not met. The researcher used a non parametric test after performing a Kolmogorov-Smirnov test for normality and finding that not all of the data of the study variables were distributed normally (Gravetter & Wallnau, 2009). With this information the researcher will be able to inform teachers if biological and psychological birth orders do indeed align and furthermore how they impact achievement and motivation.

Threats to Validity

According to McMillan (2000), there are numerous variables interacting at all times which may threaten the validity of scientific research. Inadequate sample size, bias and faulty expectations may all wreak havoc on research if not planned for in advance. Interestingly, McMillan (2000) also pointed out that in addition to the list of variables taught to all graduate students, rival hypotheses should be added as well. A rival hypothesis is a perception of the research that differs from the researcher's (McMillan, 2000).

This study presented a variety of threats to data validity. There existed a potential lack of homogeneity in the groups that are formed due to the type of sampling that is be-

ing utilized. As in all studies, there also existed a possibility for unaccounted for variables, as well as the potential for researcher bias (McMillan, 2000). Due to the type of sampling being used (i.e. convenience sampling), there was no randomization in the forming of groups, which posed a threat both externally and internally. While participants were not able to be randomly assigned to groups due to the parameters of this study, no cause-effect relationships could be conceived from this. While randomization did not take place, the researcher was still able to identify the amount of variance contributed by the independent variable.

In terms of data, there is a tendency for researchers to draw inaccurate conclusions or make assumptions in order to create relationships between variables. Stewart (2012) made this argument in particular in his article concerning issues that arise in birth order research. He stated, "Researchers using the PBOI or other indicators of psychological position should take care to protect against threats that would impede making clear inferences about the likelihood and magnitude of co variation between PBO and other study measures" (p. 93).

Students could have become uninterested or overwhelmed during participation, or may not have taken participation seriously, understanding that they are voluntarily taking part in an experiment. This could potentially have lead to what Street (1995) called "artificiality" (p. 185) in research. It is important that the researcher accentuates that participation in this study is entirely voluntary and students may leave at any time they no longer feel comfortable.

In terms of construct validity, Stewart (2012) stated that as with all psychological birth order research, there exists a need for more exploratory work to be done in order to more fully comprehend this area, but also to update theories as family demography has changed a great deal over the past 5 decades. Stewart (2012) also stated that while the PBOI is currently the only scientifically valid instrument in existence to measure psychological birth order, it is possible that revisions may need to be made in order to bring it up to date or make it culturally relevant.

Street (1995) explained that analysis of variance or ANOVA, can be used to statistically control for variables interfering with research. ANOVA allows research to manipulate multiple variables simultaneously. In this particular study, a non parametric test called the Kruskal-Wallis analysis was used to look at birth order, both biological and psychological, academic achievement, motivation and demographic information. The researcher used a non parametric test after performing a Kolmogorov-Smirnov test for normality and finding that not all of the data of the study variables were distributed normally (Gravetter & Wallnau, 2009).

Data Collection and Analysis

The researcher collected data from surveys via the Internet targeting college students attending school at least part time. These surveys were entirely computer based.

Quantitative data collected by the researcher was analyzed using SPSS. The researcher intended to use an analysis of variance (ANOVA) to establish significant relationships between variables. However, as previously stated, due to the limitations of the study and the violation of the normal distribution assumption, the researcher used the

Kruskal-Wallis non parametric test to analyze data. When the assumptions of ANOVA are not met, it is considered best practices to utilize non parametric testing in order to avoid the possibility of Type II error (Qualls, Pallin, & Schurr, 2010). Using SPSS, the researcher created a grouping variable by which to categorize psychological birth order (1= first born, 2= middle born, 3= last born, and 0= only child). The researcher also computed descriptive statistics, including, frequencies, percents, means, standard deviations, and standard errors.

As stated in Chapter 1, since this research intended to utilize ANOVA, it was assumed that the variances of the independent variable levels would be similar or equal (McGuiness, 2002). It was also assumed that the dependent variables would display a normal distribution when applied to each level of the independent variable.

Ethical Considerations

The researcher took appropriate steps to ensure confidentiality and APA alignment. The process of informed consent was reviewed with and signed by participants. Students were thoroughly educated about the purpose of the study. Research did not begin until approval was received from the International Review Board (IRB), and was assigned the following study number: 10-25-13-0177257. The researcher was available for questions via phone and/or email for participants. All data collected in this study was stored on a password protected computer and stored in a locked room when not in the direct possession of the researcher. All data will be stored for five years in a locked and confidential location.

Summary

Chapter 3 provided detailed information regarding the methodology of this research. Data collection was performed using computer-based surveys. The researcher used a computer software program (SPSS) to perform a statistical analysis of all collected data. The researcher used this analysis to make inferences about the studied population. This information will be found in Chapter 4.

Chapter 4: Results

Introduction

In this quantitative study, the relationship between psychological birth order (PBO) and academic achievement and motivation was assessed. PBO was assessed through participants' answers concerning their perceptions of family environment with the psychological birth order inventory (PBOI). Academic achievement and motivation were also assessed using separate measures; academic achievement was assessed using converted SAT scores and GPA and motivation was assessed using the BIS/BAS motivation scales. To promote participation, the research was announced through social media channels and the assessments were on a research Facebook page.

The objective of the study was to examine the relationship among PBO and academic achievement and motivation. The main research questions and hypotheses were intended to be tested using parametric tests; however, since the assumptions for conducting the parametric analyses were not met, the hypotheses were tested using non parametric analyses. This chapter provides a description about the sample, also detailed in tables. Then, data analysis for each hypothesis is provided, together with tables of the results. The chapter concludes with a summary of the results.

Demographic characteristics of study participants

As previously mentioned in Chapter 3, the participants in this study were college students attending school at least part-time. The total number of participants was 183. The beginning of the first survey stated, "If you consent to participate in this study, please click 'Next' below to begin the survey." Three of three surveys were completed. Data collection took place from July 2015 through October 2015.

In the proceeding demographic table (Table 1), demographic characteristics of the studied sample such as age, gender, race, and biological birth order are presented. The grade, or year, range was from first year undergraduate to second year graduate. The majority of the participants were female which consist of 141 (77%) out of the 183 participants. Participant race was divided as follows: 62.8% White/Caucasian, 11.5% Hispanic or Latino, 12% Black or African-American, and 8.2% Asian. First born children (as determined by biological placement) had the highest frequency with 40.4% and middle child was the second highest with 27.3%. Only children only had 11.5%. Only 2.7% or five out of the 183 participants reported being a twin. In terms of number of siblings,

10.9% of participants responded they had no siblings, 29.5% responded that they had one sibling; 26.2% responded that they had two siblings, 16.4% responded that they had three siblings and 16.99% of participants responded that they had more than three siblings.

When addressing the nature of sibling relationships, 81.4% of participants stated that none of their siblings were step siblings, 5.5% stated that they had one step sibling, 7.7% stated that they have two step siblings, and 5.5% stated that they have three step siblings. In terms of number of half siblings, 68.3% stated that none of their siblings were half siblings, 10.4% responded that one sibling was a half sibling, 7.1% responded that two of their siblings were half siblings, 7.7% responded that three of their siblings were half siblings, and another 6.6% responded that more than three of their siblings were half siblings.

In response to sibling gender, 18% of participants responded that they were a girl with only sisters; 18% responded that they were a girl with only brothers; 4.4% stated that they were a boy with only sisters; 7.1% stated that they were a boy with only brothers, and 52.5% stated that they did not belong to any of the listed groups. In describing their parent's relationships, 53% of participants stated that their parents were married and 34.4% responded that their parents were separated or divorced. In terms of housing prior to college, 53.5% of participants stated that they lived with both biological parents (in the same house) and 24% responded that they lived only with their mother.

In response to the mother's gestational age, 10.4% of participants responded that their mothers gave birth at an age younger than 19 years old; 36.1% responded that their mothers gave birth between the ages of 20 and 25; 23.5% responded that their mothers

gave birth between the ages of 26 and 30; 21.3% stated that their mothers gave birth between the ages of 31 and 35, and 8.7% stated that their mothers were over the age of 35 when they gave birth. In terms of responses of whether they are a first generation college student, 36.1% of participants reported being first generation college students while 6.6% were unsure. The following table, Table 1, summarizes the demographic data presented in the previous paragraphs.

Table 1

Summaries of Demographic Information

	Frequency	Percent
Grade		
1st year undergraduate	21	11.5
2nd year undergraduate	45	24.6
3rd year undergraduate	45	24.6
4th year undergraduate	49	26.8
1st year graduate	15	8.2
2nd year graduate	5	2.7
Other	3	1.6
Gender		
Female	141	77.0
Male	42	23.0

Racial/ethnic group		
American Indian or Alaskan Native	2	1.1
Asian	15	8.2
Black or African-American	22	12.0
Hispanic or Latino	21	11.5
Native Hawaiian or other Pacific Islander	1	0.5
Other	7	3.8
White or Caucasian	115	62.8

Table 2 presents the summaries of the demographic information as it relates to biological birth order.

Table 2

Summaries Related to Biological Birth Order Information

	Frequency	Percent
Birth order (Of all the children of your biological parents, which position are you)?		
First born child	74	40.4
Middle child	38	20.8
Last born child	50	27.3

(*table continues)*

Only child	21	11.5

Are you a twin?

No	178	97.3
Yes	5	2.7

How many siblings do you have?

0	20	10.9
1	54	29.5
2	48	26.2
3	30	16.4
More than 3	31	16.9

How many of your siblings are step siblings? (a child who is only related to you by marriage – example: your stepmother's son would be your stepbrother.)

0	149	81.4
1	10	5.5
2	14	7.7
3	10	5.5

How many of your siblings are half siblings? (a child who shares ONE parent with you – if your mom/dad had a child with your stepdad/stepmom, that child is your half sibling).

0	125	68.3
1	19	10.4
2	13	7.1
3	14	7.7
More than 3	12	6.6

Do you belong to one of the following groups?

A boy with only brothers	13	7.1
A boy with only sisters	8	4.4
A girl with only brothers	33	18.0
A girl with only sisters	33	18.0
None of the above	96	52.5
Describe your parents' relationship.		
a. Married	97	53.0
b. Unmarried but living together	10	5.5
c. Separated/divorced	63	34.4
Other	13	7.1
Who do you live with prior to beginning college?		
Adoptive parents	2	1.1

(*table continues)*

Both biological parents (in the same house)	98	53.6
Both biological parents (separated/divorced with shared custody)	8	4.4
Grandparent(s)	4	2.2
Only father	9	4.9
Only mother	44	24.0
Other (please specify)	18	9.8
What was your mother's age at your birth (how old was your mom when she gave birth to you?)		
19 or younger	19	10.4
20-25	66	36.1
26-30	43	23.5
30-35	39	21.3
Over 30	16	8.7
Are you a first generation college student?		
No	105	57.4
Unsure	12	6.6
Yes	66	36.1

Summary of Student Achievement Scores

Tables 3 and 4 present the summaries of the student achievement scores of the participants as reported. These include SAT scores, ACT scores, and GPA. Among the 183 participants, 67.8% of participants did not take the ACT. Of those who did, 1.1% score between 11 and 15; 3.8% scored between 16 and 20; 10.9% scored between 21 and

25; 10.9% scored between 26 and 30; and 5.5% score between 31 and 36. The mean ACT score was 8.29 (SD = 12.35). When responding to question regarding the SAT, 63.9% of participants reported they did not take the SAT. Of those who did, 1.36% scored between 400 and 800; 5.5% scored between 801 and 1200; 14.8% scored between 1201 and 1600; 10.4% scored between 1601 and 2000; and 3.8% scored between 2001 and 2400. The mean SAT score was 553.03 (SD = 773.03). Percentile rankings of SAT scores are available in Table 7.

When providing information regarding GPA, 1.1% of participants reported that their most recent GPA was between 1.6 and 2.0; 6.6% of participants reported that their most recent GPA was between 2.1 and 2.5; 21.3% reported a GPA between 2.6 and 3.0; 35% reported a GPA between 3.1 and 3.5, and; 36.1% reported a GPA between 3.6 and 4.0. GPA scores were given using a normalized 4-point scale, as demonstrated using the College Board GPA Conversion Chart (See Appendix K), in which a 4.0 would indicate grades of 93-100 and a 1.0 would indicate grades between 65 and 66.

Table 3

Summaries of Student Achievement Scores

	Frequency	Percent
ACT score		
Did not take	124	67.8
11-15	2	1.1
16-20	7	3.8

21-25	20	10.9
26-30	20	10.9
31-36	10	5.5
SAT score		
Did not take	117	63.9
400-800	3	1.6
801-1200	10	5.5
1201-1600	27	14.8
1601-2000	19	10.4
2001-2400	7	3.8
Current GPA		
1.6-2.0	2	1.1
2.1-2.5	12	6.6
2.6-3.0	39	21.3
3.1-3.5	64	35.0
3.6-4.0	66	36.1

Table 4 presents the demographic data for both the ACT and SAT raw scores.

Table 4

Descriptive Statistics of ACT and SAT Scores

	N	Minimum	Maximum	Mean	Std. Deviation

ACT Score (Raw)	183	0	34	8.29	12.35
SAT Score (Raw)	183	0	2400	553.03	773.03

Descriptive Statistics of Scores on PBOI Questionnaire

The PBOI questionnaire was used to identify how individuals perceive their placement within their families. Descriptive statistics were utilized to compare participant's biological and psychological birth orders. The PBOI has four subscales: Pleaser/Organizer (First), Neglected/Rejected (Middle), Charmer/Initiator (Youngest), and Scrutinized (Only). Descriptive statistics were computed for each of the PBOI subscales in order to determine the central tendency scores of the different measures.

After comparison of the *t*-scores, the psychological birth orders of the participants were obtained. This was obtained by determining which among the four subscales represent the psychological birth order of Pleaser/Organizer (First), Neglected/Rejected (Middle), Charmer/Initiator (Youngest), and Scrutinized (Only) has the highest *t*-score to determine the psychological birth order of the participant. A visual table , Table 5, demonstrating participants' psychological birth order is presented below. It can be observed that 31.1% of the participants perceived that they are first born or the Pleaser/Organizer, 26.1% perceived that they are last born child or the Charmer/Initiator, 23% perceived that

they are middle child or the Neglected/Rejected, and 19.7% perceived they are the only child or the Scrutinized.

Table 5

Frequency of Psychological Birth Order in Comparison with Biological Birth Order of Participants

	PBO Frequency	Percent	Biological frequency	Percent
Only child	36	19.7	21	11.5
First born child	57	31.1	74	40.4
Middle child	42	23.0	38	20.1
Last born child	48	26.2	50	27.3

Descriptive Statistics of Scores on BIS/BAS Motivation Scales

The BIS/BAS motivation scales were used to identify varying motivation levels related to four distinct areas of behavior: drive, fun seeking behavior, reward responsiveness, and anticipation of punishment (Levinson et al, 2000). Statements measuring BIS motivation pertain to one's feelings regarding potential negative outcomes as well as past negative events (Demianczyk et al, 2014). BAS is divided into three subscales: drive, fun

seeking, and reward responsiveness. BAS drive and fun seeking are each measured using four statements which target one's ability to persist in reaching goals and one's ability to engage in rewarding events (Demianczyk et al, 2014). BAS reward responsiveness is measured by five statements that target an individual's responses to rewards (Demianczyk et al, 2014). The average scores of scales items of each of the four distinct areas were obtained as measures of each of the four motivation items.

A visual table demonstrating participant motivation type is displayed below. In terms of mean comparison, it can be observed that 183 participants perceived that they were motivated in terms of drive, (M = 1.91), fun seeking (M = 1.97), reward responsiveness (M = 1.71), and anticipation of punishment (M = 1.85) since the mean responses were between the very true for me (1) and somewhat true for me (2) scales. These responses were given by a majority of first born (n=57) and only (n=36) children; as such, literature supports these findings as first born and only children tend to be more achievement oriented and focused on obtaining goals and less focused on avoiding punishment as are their sibling counterparts (Downey, 2001; Gugl &Welling, 2010; Holmgren, Molander & Nilsson, 2006; Kluger, 2011; Onabarniro, Ositoye & Adeyemi, 2010).

Normality Testing of Study Variables

Normality testing is conducted through the Kolmogorov-Smirnov test for normality. The result of the test is summarized in Table 6. The resulting Kolmogorov-Smirnov statistics showed that some of the p-values (sig.) of the Kolmogorov-Smirnov test results were less than the level of significance value of 0.05 implying that not all of

the data of the study variables were normally distributed. Thus, the parametric tests of ANOVA cannot be conducted due to the violation of the normal distribution assumption. With these results, the Kruskal-Wallis nonparametric test is employed to address the research.

Table 6

Results of Kolmogorov-Smirnov Tests of Normality

	Psychological Birth order	Kolmogorov-Smirnov		
		Statistic	Df	Sig.
BAS Drive	Only child	0.15	36	0.04
	First born child	0.16	57	0.00
	Middle child	0.16	42	0.01
	Last born child	0.13	48	0.04
BAS Fun Seeking	Only child	0.18	36	0.01
	First born child	0.14	57	0.01
	Middle child	0.16	42	0.01
	Last born child	0.13	48	0.04
BAS Reward Responsiveness	Only child	0.18	36	0.00
	First born child	0.12	57	0.04
	Middle child	0.19	42	0.00
	Last born child	0.13	48	0.03
BIS	Only child	0.15	36	0.04
	First born child	0.10	57	0.20*
	Middle child	0.14	42	0.03

	Last born child	0.15	48	0.01
ACT score	Only child	0.44	36	0.00
	First born child	0.44	57	0.00
	Middle child	0.41	42	0.00
	Last born child	0.41	48	0.00
SAT score	Only child	0.40	36	0.00
	First born child	0.40	57	0.00
	Middle child	0.39	42	0.00
	Last born child	0.37	48	0.00
Current GPA	Only child	0.21	36	0.04
	First born child	0.23	57	0.00
	Middle child	0.20	42	0.01
	Last born child	0.23	48	0.04

* This is a lower bound of the true significance.

a Lilliefors Significance Correction

Percentile Rankings

As previously mentioned, the participants who provided an ACT score received a converted SAT score using the conversion tables provided by the College Board (College Board, 2009). These were then combined with the participants who had already provided SAT scores and this variable was then labeled *converted SAT scores*. The percentile rank-

ings of the SAT score and current GPA are presented in Table 7. The percentiles include the 25th, 50th (median), and 75th ranking. For the SAT scores, the 25th percentile rank is the score range of 801 to 1200, the 50th percentile rank is the score range of 1201 to 1600, and the 75th percentile rank is the score range of 1601 to 2000. For the current GPA, the 25th percentile rank is the GPA range of 2.6 to 3.0, the 50th percentile rank is the GPA range of 3.1 to 3.5, and the 75th percentile rank is the GPA range of 3.6 to 4.0.

Table 7

Percentile Ranks of SAT Scores and Current GPA

	Percentiles		
	25th	50th (Median)	75th
SAT Score (Converted)	801-1200	1201-1600	1601-2000
Current GPA	2.6-3.0	3.1-3.5	3.6-4.0

Quantitative Results

The results in this section were used to answer research hypotheses 1 and 2, with the research questions being used as a guide:

Research Question 1: Do the confluence model and resource dilution theory explain the relationship between psychological birth order and scholastic achievement?

$H_0$1: Psychological birth order will not significantly predict student achievement scores

H_a1: Psychological birth order will significantly predict student achievement scores.

Research Question 2: Do the confluence model and resource dilution theory explain the relationship between psychological birth order and motivation?

H_02: Psychological birth order will not significantly predict student motivation scores.

H_a2: Psychological birth order will significantly predict student motivation scores.

Relationship between Psychological Birth Order and Student Achievement Scores

This section reports study findings that address Research Hypothesis 1. As previously mentioned in the third chapter of this dissertation, correlation analyses were utilized to investigate the relationship between students' psychological birth order and student achievement scores as measured by ACT/SAT scores and student GPA. There were only 107 SAT categorical scores, 59 ACT categorical scores, 59 ACT raw scores, and 71 SAT raw scores among the 183 participants. Due to the fact that not all 183 participants had taken the same standardized academic test, it was determined that the best method for measuring student academic achievement would be to convert the ACT raw scores to SAT scores. The converted SAT scores were used to represent the standardized academic scores. The ACT raw scores were converted to SAT converted data by using the concordance tables (College Board, 2009). This conversion measure was used in order to obtain a concordant and a larger sample of academic scores for the analyses.

A non-parametric test of Kruskal–Wallis analysis was conducted to determine the relationships between these variables by determining whether there are differences in the student achievement scores among the four categories of psychological birth order. The Kruskal–Wallis analysis compares the mean ranks of different student achievement

scores in each of the psychological birth order. A level of significance of 0.05 was used in the analysis. Significant relationship of difference is observed if the p-value of the chi-square does not exceed the level of significance value set at 0.05.

Table 8 summarized the mean rank comparison table. The mean rank comparison showed that the participants with the highest SAT converted scores were those that have psychological birth order of only child (62.38), the second highest were those that have psychological birth order of last born child (50.18), and the lowest scores were those that have psychological birth order of being the middle child (48.70). The mean rank comparison showed that the participants with the highest current GPA were those that have psychological birth order of first born child (96.72), the second highest were those that have psychological birth order of last born child (93.02), and the lowest scores were those that have psychological birth order of only child (86.58).

Table 8

Mean Ranks of Student Achievement Scores Across the Different Psychological Birth Order

	Psychological Birth order	N	Mean Rank
SAT Score (Converted)	Only child	20	62.38
	First born child	31	56.69
	Middle child	25	48.70
	Last born child	31	50.18
	Total	107	
Current GPA	Only child	36	86.58

(*table continues)*

First born child	57	96.72
Middle child	42	89.07
Last born child	48	93.02
Total	183	

Table 9 shows the results of the Kruskal–Wallis analysis of the differences existing between the student achievement scores among the different psychological birth order of the participants. Analysis of the chi-square statistics in Table 9 revealed that both the student achievement scores of SAT categorical score (X^2 (3) = 3.22; p = 0.36) and current GPA (X^2 (3) = 1.08; p = 0.78) were not statistically significantly different among the psychological birth order of the participants. Thus, the results of the statistical testing failed to support the hypothesis that psychological birth order will significantly predict student achievement scores. As such, this research retained the first null hypothesis of this study.

Table 9

Kruskal-Wallis Test Statistics for Differences of Student Achievement Scores Across the Different Psychological Birth Order

	SAT Score (Converted)	Current GPA
Chi-Square	3.22	1.08
Df	3	3
Asymp. Sig.	0.36	0.78

a. Kruskal Wallis Test

b. Grouping Variable: Psychological Birth order

Another Kruskal–Wallis analysis was conducted to determine the relationships between student achievement scores and psychological birth order by determining whether there are differences in the student achievement scores among the three categories of psychological birth order excluding the only child category. A level of significance of 0.05 was used in the analysis. Table 10 summarized the mean rank comparison table.

The mean rank comparison showed that the participants with the highest SAT converted scores were those that have psychological birth order of first born child, the second highest were those that have psychological birth order of last born child, and the lowest scores were those that have psychological birth order of being the middle child. The mean rank comparison showed that the participants with the highest current GPA were those that have psychological birth order of first born child, the second highest were those that have psychological birth order of last born child, and the lowest scores were those that have psychological birth order of middle child. Current literature tends to note that biological first born children tend to have an academic advantage over their sibling counterparts (Wichman et al., 2006). The results of the present study would be consistent with the general trend of students with first born characteristics (regardless of biological placement) achieving well academically.

Table 10

Mean Ranks of Student Achievement Scores Across the Different Psychological Birth Order without Only Child Category

	Psychological Birth order	N	Mean Rank
SAT Score (Converted)	First born child	31	47.76
	Middle child	25	41.28
	Last born child	31	42.44

(*table continues)*

	Total	87	
Current GPA	First born child	57	76.70
	Middle child	42	70.55
	Last born child	48	73.81
	Total	147	

Table 11 showed the results of the Kruskal–Wallis analysis of the differences existing between the student achievement scores among the different psychological birth order of the participants excluding the only child category. Analysis of the chi-square statistics in Table 11 revealed that both the student achievement scores of SAT categorical score (χ^2 (2) = 1.23; p = 0.54) and current GPA (χ^2 (2) = 0.56; p = 0.75) were also not statistically significantly different among the psychological birth order of the participants even when excluding the category of only child.

Table 11

Kruskal-Wallis Test Statistics for Differences of Student Achievement Scores Across the Different Psychological Birth Order without Only Child Category

	SAT Score (Converted)	Current GPA
Chi-Square	1.23	0.56
Df	2	2
Asymp. Sig.	0.54	0.75

a. Kruskal Wallis Test

b. Grouping Variable: Psychological Birth order

Relationship between Psychological Birth Order and Student Motivation Scores

This section reports study findings that address Research Hypothesis 2. As previously mentioned in the third chapter of this dissertation, analyses were utilized to investigate the relationship between students' psychological birth order and student motivation scores as measured by the BAS/BIS scales. A non-parametric test of Kruskal–Wallis analysis was also conducted to determine the relationships between these variables by determining whether there are differences in the student motivation scores among the categories of psychological birth order. A level of significance of 0.05 was also used in the analysis.

Table 12 summarized the mean rank comparison table. The mean rank comparison showed that the participants with the highest drive were those that have psychological birth order of first born child, the second highest were those that have psychological birth order of middle child, and the lowest scores were those that have psychological birth order of being the last born child. The mean rank comparison showed that the participants with the highest fun seeking scores were those that have psychological birth order of first born child, the second highest were those that have psychological birth order

of only child, and the lowest scores were those that have psychological birth order of being the last born child.

The mean rank comparison showed that the participants with the highest reward responsiveness were those that have psychological birth order of only child, the second highest were those that have psychological birth order of middle child, and the lowest scores were those that have psychological birth order of being the last born child. The mean rank comparison showed that the participants with the highest anticipation of punishment (BIS) score were those that have psychological birth order of last born child, the second highest were those that have psychological birth order of first born child, and the lowest scores were those that have psychological birth order of being the middle child. These findings are consistent with the findings of the literature review, in which Whiteman et al., (2003), Sulloway (1997), and Leman (2009), among others, noted that first born children tend to have the highest need for approval and also tend to experience the most stringent forms of discipline when compared with their sibling counterparts.

Table 12

Mean Ranks of Student Motivation Scores Across the Different Psychological Birth Order

	Psychological Birth order	N	Mean Rank
BAS Drive	Only child	36	91.26
	First born child	57	96.04
	Middle child	42	95.23
	Last born child	48	84.93
	Total	183	

BAS Fun Seeking	Only child	36	95.57
	First born child	57	106.05
	Middle child	42	95.05
	Last born child	48	69.97
	Total	183	
BAS Reward Responsive-ness	Only child	36	99.22
	First born child	57	96.17
	Middle child	42	98.96
	Last born child	48	75.54
	Total	183	
BIS	Only child	36	90.22
	First born child	57	92.20
	Middle child	42	81.82
	Last born child	48	102.00
	Total	183	

Table 13 showed the results of the Kruskal–Wallis analysis of the differences existing between the student motivation scores among the different psychological birth order of the participants. Analysis of the chi-square statistics in Table 13 revealed that the student motivation score of fun seeking (fun seeking (X^2 (3) = 12.84, p = 0.01) was statistically significantly different among the psychological birth order of the participants. This statistical testing resulted to the support of the hypothesis that psychological birth order

will significantly predict student motivation scores but for the fun seeking aspect only. On the other hand, the student motivation scores of drive (X^2 (3) = 1.39; p = 0.71), reward responsiveness (X^2 (3) = 6.55; p = 0.09), and anticipation of punishment (BIS) (X^2 (3) = 3.33; p = 0.34) were not statistically significantly different among the psychological birth order of the participants.

Another Kruskal–Wallis analysis was conducted to determine the relationships between student motivation scores and psychological birth order but by determining whether there are differences in the student achievement scores among the three categories of psychological birth order excluding the only child category. A level of significance of 0.05 was used in the analysis.

Table 13

Kruskal-Wallis Test Statistics for Differences of Student Motivation Scores Across the Different Psychological Birth Order

	BAS Drive	BAS Fun Seeking	BAS Reward Responsiveness	BIS
Chi-Square	1.39	12.84	6.55	3.33
Df	3	3	3	3
Asymp. Sig.	0.71	0.01*	0.09	0.34

a. Kruskal Wallis Test

b. Grouping Variable: Psychological Birth order

*Significant at level of significance of 0.05

Table 14 summarized the mean rank comparison table. The mean rank comparison showed that the participants with the highest drive were those that have psychological birth order of first born child, the second highest were those that have psychological birth order of middle child, and the lowest scores were those that have psychological birth order of being the last born child. The mean rank comparison showed that the participants with the highest fun seeking scores were those that have psychological birth order of first born child, the second highest were those that have psychological birth order of middle child, and the lowest scores were those that have psychological birth order of being the last born child. The mean rank comparison showed that the participants with the highest reward responsiveness were those that have psychological birth order of middle child, the second highest were those that have psychological birth order of first born child, and the lowest scores were those that have psychological birth order of being the last born child.

The mean rank comparison showed that the participants with the highest anticipation of punishment (BIS) score were those that have psychological birth order of last born child, the second highest were those that have psychological birth order of first born child, and the lowest scores were those that have psychological birth order of being the middle child. These findings conflict with most of the findings of the literature review in which Gfroerer et al (2003), Leman (2009), Paulhus et al. (1999), and Whiteman et al.

(2003) noted that first born children tend to be rough drafts for their parents and as such tend to experience more discipline than their sibling counterparts, especially the position of the last born child.

Table 14

Mean Ranks of Student Motivation Scores Across the Different Psychological Birth Order without Only Child Category

	Psychological Birth order	N	Mean Rank
BAS Drive	First born child	57	77.08
	Middle child	42	76.43
	Last born child	48	68.22
	Total	147	
BAS Fun Seeking	First born child	57	86.35
	Middle child	42	77.00
	Last born child	48	56.71
	Total	147	
BAS Reward Responsiveness	First born child	57	78.89
	Middle child	42	81.04
	Last born child	48	62.03
	Total	147	
BIS	First born child	57	73.81
	Middle child	42	65.11
	Last born child	48	82.01
	Total	147	

Table 15 showed the results of the Kruskal–Wallis analysis of the differences existing between the student motivation scores among the different psychological birth order of the participants excluding the only child category. Analysis of the chi-square statistics in Table 15 revealed that the student motivation scores of fun seeking (fun seeking (X^2 (2) = 13.16, $p < 0.001$) and reward responsiveness (X^2 (2) = 5.84; $p = 0.05$) were statistically significantly different among the psychological birth order of the participants when excluding the only child category. This statistical testing resulted to the support of the hypothesis that psychological birth order will significantly predict student motivation scores but for the fun seeking aspect and reward responsiveness only. On the other hand, the student motivation scores of drive (X^2 (2) = 1.36; $p = 0.51$) and anticipation of punishment (BIS) (X^2 (2) = 3.57; $p = 0.17$) were not statistically significantly different among the psychological birth order of the participants when excluding the only child category. In this particular area, the hypothesis that psychological birth order will significantly predict student motivation scores was not supported. As previous literature (Leman, 2009; Sulloway, 1997; Whiteman et al., 2003) notes, there are many similarities between first born and only children, particularly in the areas of drive and discipline. These findings, as such, are consistent with previous research.

Table 15

Kruskal-Wallis Test Statistics for Differences of Student Motivation Scores Across the Different Psychological Birth Order without Only Child Category

	BAS Drive	BAS Fun Seeking	BAS Reward Responsiveness	BIS
Chi-Square	1.36	13.16	5.84	3.57
Df	2	2	2	2
Asymp. Sig.	0.51	0.00	0.05	0.17

a. Kruskal Wallis Test

b. Grouping Variable: Psychological Birth order

Relationship between Biological Birth Order and Student Achievement Scores

This section reports study findings to investigate the relationship between students' biological birth order and student achievement scores as measured by ACT/SAT scores and student GPA. A Kruskal–Wallis analysis was also conducted to determine the relationship between these variables by determining whether there are differences in the student achievement scores among the four categories of biological birth order. A level of significance of 0.05 was also used in the analysis.

Table 16 summarized the mean rank comparison table. The mean rank comparison showed that the participants with the highest SAT categorical scores were those that have biological birth order of first born child, the second highest were those that have biological birth order of only child, and the lowest scores were those that have biological

birth order of being the middle child. The mean rank comparison showed that the participants with the highest current GPA were those that have biological birth order of only child, the second highest were those that have biological birth order of middle child, and the lowest scores were those that have biological birth order of first born child.

Table 16

Mean Ranks of Student Achievement Scores Across the Different Biological Birth Order

	Biological Birth order	N	Mean Rank
SAT Score (Converted)	Only child	16	55.06
	First born child	41	60.27
	Middle child	19	43.82
	Last born child	31	51.40
	Total	107	
Current GPA	Only child	21	102.33
	First born child	74	85.26
	Middle child	38	98.16
	Last born child	50	92.95
	Total	183	

Table 17 showed the results of the Kruskal–Wallis analysis of the differences existing between the student achievement scores among the different biological birth order of the participants. Analysis of the chi-square statistics in Table 17 revealed that the stu-

dent achievement scores of SAT categorical score (X^2 (3) = 4.41; p = 0.22) and current GPA (X^2 (3) = 2.81; p = 0.42) were not statistically significantly different among the biological birth order of the participants.

Table 17

Kruskal-Wallis Test Statistics for Differences of Student Achievement Scores Across the Different Biological Birth Order

	SAT score (Converted)	Current GPA
Chi-Square	4.41	2.81
Df	3	3
Asymp. Sig.	0.22	0.42

a. Kruskal Wallis Test

b. Grouping Variable: Birth order (Of all the children of your biological parents, which position are you)?

Relationship between Biological Birth Order and Student Motivation Scores

This section reports study findings that to investigate the relationship between students' biological birth order and student motivation scores as measured by the BAS/BIS scales. Kruskal–Wallis analysis was also conducted to determine the relationship between these variables by determining whether there are differences in the student motivation scores among the four categories of biological birth order. A level of significance of 0.05 was also used in the analysis.

The mean rank comparison showed that the participants with the highest drive were those that have biological birth order of last born child, the second highest were those that have biological birth order of middle child, and the lowest scores were those that have biological birth order of only child. The mean rank comparison showed that the participants with the highest fun seeking scores were those that have biological birth order of only child, the second highest were those that have biological birth order of last born child, and the lowest scores were those that have biological birth order of being the first born child. The mean rank comparison showed that the participants with the highest reward responsiveness were those that have biological birth order of middle child, the second highest were those that have biological birth order of last born child, and the lowest scores were those that have biological birth order of being the first born child. The mean rank comparison showed that the participants with the highest anticipation of punishment (BIS) score were those that have biological birth order of only child, the second highest were those that have biological birth order of first born child, and the lowest scores were those that have biological birth order of being the last born child.

These findings were consistent with the findings of the literature review in which Blair (2011) and Leman (2009) note that only children exhibit many of the same characteristics of firstborn children, only to a much more exaggerated level. Only children would be the sole recipients of the parental attention and discipline for their entire childhood, thus making their fear of punishment a rational one. First born children are also the sole recipients of parental attention and discipline for at least a period of time in the family environment; first born are likely to have experienced a harsher sense of discipline

style when compared with their sibling counterparts as well (Blair, 2011; Leman, 2009; Sulloway, 1997).

Table 18 showed the results of the Kruskal–Wallis analysis of the differences existing between the student motivation scores among the different biological birth order of the participants. Analysis of the chi-square statistics in Table 18 revealed that the student motivation scores of drive (X^2 (3) = 3.09; p = 0.38), fun seeking (X^2 (3) = 1.34, p = 0.72), reward responsiveness (X^2 (3) = 0.92; p = 0.82), and anticipation of punishment (BIS) (X^2 (3) = 3.36; p = 0.34) were not statistically significantly different among the biological birth order of the participants. As Harris (2000) pointed out, biological birth order trends are largely thought to be trends that only occur within the family; as such, when searching for between family trends and associations, researchers are less likely to find significant results.

Table 18

Kruskal-Wallis Test Statistics for Differences of Student Motivation Scores Across the Different Biological Birth Orders

	BAS Drive	BAS Fun Seeking	BAS Reward Responsiveness	BIS
Chi-Square	3.09	1.34	0.92	3.36
Df	3	3	3	3
Asymp. Sig.	0.38	0.72	0.82	0.34

a. Kruskal Wallis Test

b. Grouping Variable: Birth order (Of all the children of your biological parents, which position are you).

Summary

There were two research questions guiding this study: Do the confluence model and resource dilution theory explain the association between psychological birth order and academic achievement? And do the confluence model and resource dilution theory explain the association between psychological birth order and motivation? The first null hypothesis was retained for this study as there were no statistical findings to support the hypothesis that psychological birth order would impact academic achievement. The second null hypothesis was rejected as there were significant statistical findings showing that psychological birth order did impact certain areas of motivation.

The confluence model (Zajonc, 1976) states that there are three primary reasons causing birth order differences: parents with fewer children have more time for those children; first born children are exposed to more mature language, and; the family's intellectual environment becomes less mature with each new addition. In reviewing the results of this study, the confluence model would seem to explain many of the birth order differences seen. First borns reported the highest GPA and SAT (converted) scores while middle children reported the lowest SAT (converted) scores. First borns were also found to have the highest scores in the area of drive (motivation) while last borns scored last in this area. The confluence model would explain the differences seen in these results by suggesting that the first born children benefitted from the increased academic language and parental support. Last born children, on the other hand, most likely spent more time being babied when compared with their first born counterparts.

The resource dilution theory, proposed by Blake (1981) and Downey (1995) states that the family's resources deplete with each addition to the family. This theory, in many ways, goes hand in hand with the confluence model as it essentially means that first born or only children would have an advantage over children from larger families; however, this study found that last born children reported having the second highest GPAs and SAT scores, with the biological birth order of only child reporting the lowest GPA. Those who were placed in the psychological birth order position of middle child also were found to have lower SAT and GPA scores. Therefore, it is believed that the resource dilution theory may not explain the birth order differences seen in this particular study. There are many reasons for this. As previously noted, parents' resources may actually increase with time due to new job opportunities or changes in living arrangements, which in turn would increase the standard of living for children as well (Booth & Kee, 2009).

Chapter 4 outlined in detail the statistical significance of this study and presented a comparison with previously published literature. As this study's hypothesis of an association between psychological birth order and motivation was indeed confirmed, Chapter 5 will present recommendations for future research as well as implications for the ways in which the findings of this study could be applied in the education arena.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

Historically, research has shown that the environment in which a child spends his or her childhood has a lasting impact on his or her development, in both cognitive and social development (Holmgren et al., 2006; Leman, 2009). Perhaps most surprising to many researchers, is the fact that it has been commonly accepted that the quantity of sibling relationships has the most impact on educational development. While Adler (1927, 1946) initially introduced the idea of psychological birth order, it has been largely overlooked in the recent past. It is quite common for an individual's biological birth order to differ from his or her psychological birth (Campbell et al., 1991). The importance of considering the psychological birth order instead of the biological birth order and its role in academic achievement and motivation (Whitbourne, 2013) and the current lack of research in this area demonstrates the need for studies that investigate family relationships and academic achievement and motivation.

While literature pertaining to biological birth order is extensive, current literature fails to address the component of psychological birth order. Furthermore, there currently exists little to no research concerning psychological birth order's effects on achievement or motivation. As the definition and composition of family has changed quite a bit over the past 50-60 years, it is necessary that researchers also begin to view the family in broader terms. It is vital that research begin to account for the effects of blended families, sibling disabilities and/or deaths, and overall composition of family on child development in order to be able to fully address each child's individual needs. As previously stated in

Chapter 1 of this study, the aforementioned variables all play an important part in the psychological development of children; as such, the inclusion of these variables in the consideration of birth order roles can be seen as helpful in both the school and home environments.

The primary goal of this study is to provide educators (both teachers and administrators) and parents with a deeper insight into the effects of the family of origin upon scholastic achievement and motivation by providing them with correlational data, and in doing so, provide them with a new theory for the development of teaching. Providing teachers with additional methods of reaching students, particularly one that incorporates the home life, is believed to be essential to improving the current state of education. As this study did find significant results in the relationship between psychological birth order and motivation, the results of this study could also provide parents with additional insights and techniques for child rearing as they would provide parents with additional information as to how each individual birth order is motivated. Additionally, as the American education system continues to struggle to reach all students, it is worth noting that students are not currently identified by psychological birth order, which could be a key factor in differentiating instruction.

Using self-report style surveys and a participant sample of college students attending school at least part-time, this study compared students' perceptions of family environment (psychological birth order) and self-reported perceptions of academic achievement and motivation. By doing so, the findings from this research study are aimed at current educators and administrators who are considering other teaching methodologies

and ways in which to meet each individual student's needs; these findings are also aimed at parents who seek to help each of their children reach their full potential, regardless of their individual personality characteristics.

In this research study, two research questions are answered.

Research Question 1: Do the confluence model and resource dilution theory explain the relationship between psychological birth order and scholastic achievement?

$H_0$1: Psychological birth order will not significantly predict student achievement scores

H_a1: Psychological birth order will significantly predict student achievement scores.

Research Question 2: Do the confluence model and resource dilution theory explain the relationship between psychological birth order and motivation?

$H_0$2*:* Psychological birth order will not significantly predict student motivation scores.

H_a2: Psychological birth order will significantly predict student motivation scores.

The goal of this study was to address the gap found in this literature by investigating the effects of psychological birth order on academic achievement and motivation. The two research questions asked in this study determined the impact of familial environment on student achievement and motivation in school. The first null hypothesis was retained for this study as there were no statistical findings to support the hypothesis that psychological birth order would impact academic achievement. The second null hypothesis was rejected as there were significant statistical findings showing that psychological birth or-

der did impact certain areas of motivation. This quantitative study adhered to both the confluence model (Zajonc & Markus, 1975) and the resource dilution theory (Blake, 1981). Traditionally, the confluence model (Zajonc & Markus, 1981) postulates that the effects of the family on cognitive development address two specific areas; first, the depth of the intellectual environment of the scientific and education communities are ready to accept psychological birth order as a true phenomenon. Literature supported this study's research questions by identifying and discussing the importance of birth order as it relates to achievement. These studies demonstrate the continued need for research that investigates and analyzes how student perceptions of their placement within the family ultimately impacts student achievement and motivation.

The PBOI was used to measure the predictor variable, psychological birth order (student perception of roles within the family). This study used a population sample of college students attending school at least part-time. Using online surveys as the testing instrument, a total of 183 college students participated voluntarily in the study, giving this study a completion rate of 100%.

Interpretation of Findings

Inquiries of this study implicated four categories of student perceptions of family environment that impacted two areas of academic achievement and four areas of motivation: first born, middle child, last born, and only child. This study utilized the Psychological Birth Order Inventory (PBOI) to measure psychological birth order. This survey contains 40 questions answered in yes or no format and is considered the premiere evaluation for determining psychological birth order (Campbell, White, & Stewart, 1991; Stewart,

2012). This study also utilized the BIS/BAS motivation scales to determine differing levels of motivation. The BIS/BAS scales consist of 24 questions answered on a four point Likert scale, with answers ranging from very true to very false (Carver & White, 1994: Levinson, Rodebaugh, & Frye, 2011).

Due to the fact that not all participants in this study had taken both the SAT or the ACT, the researcher had to convert the scores from the ACT into SAT data using the concordance tables provided by the College Board (2009). This measure was performed in order to obtain a larger and more concordant sample of academic scores for the analyses.

In regards to psychological birth order and its impact on academic achievement, this study found no statistically significant difference among the psychological birth order groups. In regards to psychological birth order and its impact on motivation, an analysis of the chi-square statistics performed found that the student motivation score of fun seeking was statistically significantly different among the psychological birth order of the participants. This statistical testing resulted to support the hypothesis that psychological birth order will significantly predict student motivation scores but for the fun seeking aspect only. The aspects of drive, reward responsiveness, and anticipation of punishment were not statistically significantly different as a function of the psychological birth order of the participants. When excluding the only child position, analysis of the chi-square statistics revealed that the student motivation scores of fun seeking and reward responsiveness were significantly different among the psychological birth order positions. As such, this testing led to the support of the hypothesis that psychological birth order will signifi-

cantly predict student motivation scores but for the fun seeking and reward responsiveness aspects only.

Analysis of the chi-square statistics when studying the motivation scores revealed that the student motivation scores of drive, fun seeking, reward responsiveness, fun seeking, and anticipation of punishment were not statistically significantly different among the biological birth order positions of the participants. As Snell et al. (1980) discussed in their research, it is important to take into consideration the effects of extraneous variables such as "parental child-rearing practices, the presence of siblings, and sex-role variables" (p.438). Thus, the findings of this research align with the psychological birth order theory proposed by Adler (1927; 1946).

Limitations of the Study

There were a variety of limitations in this study. As this study did not include nonstudents (i.e., people unable to attend college for academic or financial reasons, people who entered directly into the work place) the data generated cannot be generalized to the mainstream public. While the study included both undergraduate and graduate students, both were not equally represented in the study (only 18 graduate students took part). The study was also overwhelmingly female. According to the Pew Research Center (2014), this may represent an overall trend in the college environment. As of 2012, 71% of women recently graduated from high school were enrolled in college, compared with 61% of their male counterparts (Pew Research Center, 2014). This study also consisted of a larger than average (8.2%) sample of participants who identified as Asian. According to the Pew Research Center (2013), the Asian population in the United States, including

Asians born in Asia and those born in the United States, is one of the fastest growing sections of the American population As of 2011, the total Asian population contributed to 5.8% of the overall American population (Pew Research Center, 2013). There were also limitations with using a self-report style of assessment, such as skipped questions, participant bias in responses and responses from participants in differing years of study. It was determined, however, that due to the data searched for in this study, a self-report survey was the most efficient tool to use.

Recommendations

Due to the limitations of this study, it is recommended that future research seek to broaden the scope of this theme. It is recommended that future research address the geographic and age limitations presented in this study by widening the participant pool. Previous studies have indicated that parents in the international community tend to invest more heavily in the first born child's education (Atta, Jamil, Baloch, & Ayaz, 2011). Not only so, but these studies have also found that family size, or number of siblings, is a strong predictor of both academic and economic achievement in the future. I make the following specific recommendations for future study.

Include a qualitative portion of the study to address the specific opinions of participants concerning their familial environment and its effect on their academic progress.

Include a broader demographic; expand upon the current geographic locale in this study, and include a variety of ages.

Supplement this research by including a qualitative analysis of the thoughts and opinions of educators who attempt to differentiate instruction every day. Consider including longitudinal data which would allow the researcher to examine the effects of psychological birth order over lifespan development as opposed to one era of life.

Implications

The central goal of positive social change can be seen if students, parents, educators, and legislators take into consideration the impact of this study on the education of all children. It is essential that teachers be provided with adequate training concerning the family environment and its potential impact on students in order to address the needs of all students. With the addition of this dynamic of student identification, teachers would be able to provide a more complete assessment of student needs. As the study revealed that psychological birth order does indeed predict student motivation in terms of reward responsiveness and fun seeking, it is recommended that teachers be shown how to use the PBOI and BIS/BAS scales to identify these key markers in students. With this information, they could better differentiate instruction. Likewise, school counselors and administrators could better develop academic and disciplinary plans if they were better able to pinpoint students' motivations.

In terms of educational leadership, psychological birth order should be seen as a valuable tool and should be made available to teachers via training workshops. As the PBOI and BIS/BAS are both psychological tests, it would be essential for teachers and administrators to be properly trained in both the administration and scoring of the test. It

is necessary that policy makers ensure through budgeting and availability that teachers are able to receive a well-rounded and diverse training in order to better help them achieve the goals of the No Child Left Behind Act (USED; 2004). NCLB (USED; 2004) is a reform act directed towards educators which focuses on students receiving a quality and rigorous education provided by highly qualified teachers.

Gillard et al. (2015) note in their study of intrinsic motivation in the classroom that the current American education system is overregulated, leading to increased pressures being felt by both teachers and students. These pressures have not led to positive outcomes but instead have converted students once thought to be highly motivated into mediocre students at best. These negative changes have also been noted among educators at the university level (Ganah, 2012). Gillard et al. (2015) believe that in order for students to once again become truly motivated to achieve success in school, it is necessary to allow them to do so autonomously, as this allows them to work as individuals and truly engage in academics. As they state in their abstract, "by restructuring the way educators approach the classroom, students can be provided an opportunity to explore further and become more successful" (Gillard et al., 2015, p.1). It is precisely this area in which knowledge of the relationship between psychological birth order and motivation can help parents and educators better design interventions to motivate those who are not inclined to achieve or who are currently struggling to achieve. Ganah (2012) notes that motivation is "essential for successful learning as less able students who are highly motivated can achieve greater success than more intelligent students who are not well motivated" (p.251). Furthermore, as student development does not simply happen at school, but also

within both the home and community, services such as family counseling or sibling counseling should be made available to parents. Training and education aimed specifically at parents could potentially lead to a more individualized approach to parenting each child, which in turn would allow children to flourish both at home and at school. Appropriate identification of student needs and individual characteristics leads to positive social change in both the education arena and the home.

Conclusion

In conclusion, the results of this study demonstrate the lack of adequate research in the field of psychological birth order as it relates to academic achievement and motivation. As this can be used to better reach individual students and address their specific needs, it is essential that teachers and administrators be provided with the necessary training to help students reach their full potential.

Given the results found in this study, it is advised that teachers and parents receive training or education in the area of psychological birth order and its impact on student motivation. It is also recommended that school districts provide the budget necessary for this training.

Future research is recommended in order to account for a wider geographical area as well as to include a wider age span. It is also recommended that a qualitative analysis of student and teacher responses to the birth order inventory. While this study did not find that psychological birth order will predict student academic achievement, it did in fact find that psychological birth order predicts motivation. Thus, the continued study of this particular area could benefit families, school counseling and the community.

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Appendix A: Psychological Birth Order Inventory

White-Campbell Psychological Birth Order Inventory (PBOI)

Instructions:
Please read each item and then circle YES or NO according to how you feel living with your family. If you live with several families, please think of the one with which you spend the most time as you respond to these items. If you have no brothers or sisters you may ignore items that refer to experiences you have with your siblings.

YES NO 1. I believe my parents have high expectations of me.

YES NO 2. I am babied by my family members.

YES NO 3. My family is more involved in my life than I want.

YES NO 4. It seems like I am in a race trying to catch up.

YES NO 5. It is important to me to please adults.

YES NO 6. My family does not respect my privacy.

YES NO 7. I feel isolated from others.

YES NO 8. It is easy to talk my brothers and sisters into giving me things.

YES NO 9. My parents worry a lot about me.

YES NO 10. I am taken less seriously than anyone in the family.

YES NO 11. It is important to me to advise my brothers and sisters about right and wrong.

YES NO 12. I am seen as being the most charming in the family.

YES NO 13. It seems like I never have my parent's full attention.

YES NO 14. My parents try to control me.

YES NO 15. I am more organized and structured than others in my family.

YES NO 16. I am pampered by my family members.

YES NO 17. Other family members see me as the least capable.

YES NO 18. It is important to me that others do things right.

YES NO 19. My parents try to manage my life.

YES NO 20. I am good at getting others to do things for me.

YES NO 21. It seems like I am less important than other members of my family.

YES NO 22. I want to satisfy my parents.

YES NO 23. My parents want to know about everything that is going on in my life.

YES NO 24. It is easy to talk my parents into giving me things.

YES NO 25. I often feel less loved than others in my family.

YES NO 26. I feel smothered by my parents.

YES NO 27. It is important to me to do things right.

YES NO 28. When I want to I can be the ruler of the family.

YES NO 29. I often feel that I am treated more unfairly than others in the family.

YES NO 30. I am good at getting what I want from my family.

YES NO 31. I feel like I live in a fishbowl.

YES NO 32. It is important to me to make good grades in school.

YES NO 33. I feel disconnected from others in my family.

YES NO 34. My parents consider everything that is my business, their business.

YES NO 35. It is important to me to be the best.

YES NO 36. I can be the boss in the family when I want to.

YES NO 37. I feel squeezed out by my brothers and sisters.

YES NO 38. My parents are busybodies.

YES NO 39. I like order more than other people in my family.

YES NO 40. I am seen as the most adorable in the family.

YES NO 41. It is important to me that my brothers and sisters do things right.

YES NO 42. I am treated less justly than others in my family.

YES NO 43. I want others in my family to do things properly.

YES NO 44. I feel like I am less valuable than other members of my family.

YES NO 45. I like doing things the correct way.

YES NO 46. I feel left out by my brothers and sisters.

Appendix B: Scoring the PBOI

Instructions: The PBOI is scored differently for women and for men. Find the items pertaining to each gender. Count the number of yes responses that were made for the items listed in each scale. It is recommended that you convert the raw scores into some standard score format (z-scores, *T*-scores, etc.) to facilitate comparisons between scales since the scales have different numbers of items.

Items for Women:

Pleaser/Organizer (First): 1, 5, 11, 15, 18, 22, 27, 32, 39, 41, 43, 45

Neglected/Rejected (Middle): 4, 7, 10, 13, 17, 21, 25, 29, 33, 37, 42, 44, 46

Charmer/Initiator (Youngest): 2, 8, 12, 16, 20, 24, 28, 30, and 40

Scrutinized (Only): 3, 6, 9, 14, 19, 23, 26, 31, 34, 38

Items for Men:

Pleaser/Organizer (First): 5, 18, 22, 27, 32, 35, 39, 41, 43, 35

Neglected/Rejected (Middle): 10, 13, 21, 25, 29, 33, 37, 42, 44, 46

Charmer/Initiator (Youngest): 2, 8, 12, 16, 20, 24, 28, 30, 36, and 40

Scrutinized (Only): 3, 6, 9, 14, 19, 23, 26, 31, 34, 38

Appendix C: Letter to Dr. Campbell for Consent to Use PBOI

July 6, 2012
Dr. Linda F. Campbell
Department of Counseling and Human Development Services
402 Aderhold Hall
The University of Georgia
Athens, GA 30602

Dear Dr. Campbell:

I am completing my PhD in General Educational Psychology from Walden University and am currently working on my doctoral dissertation titled "The impact of psychological birth order on scholastic achievement and motivation." I would like your permission to use in my research the Psychological Birth Order Inventory, which I uncovered reading many of the articles published by you and your esteemed colleagues, such as: Campbell, L., White, J., & Stewart, A. (1991). The relationship of psychological birth order to actual birth order. *Individual Psychology, 47*(1), 380-391.

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If you approve of these arrangements, please sign this letter where indicated below and return to me in the enclosed envelope. Thank you very much for the time you have taken to review this letter.

Sincerely,

Alissa J. Combs-Draughn
PERMISSION GRANTED FOR THE USE GRANTED ABOVE:

_____
(Name)

_____
(Date)

Appendix D: Letter to Dr. White for Consent to Use PBOI

Alissa J. Combs-Draughn

July 20, 2012
Dr. JoAnna White

Dear Dr. White:
I am completing my PhD in General Educational Psychology from Walden University and am currently working on my doctoral dissertation titled "The impact of psychological birth order on scholastic achievement and motivation." I would like your permission to use in my research the Psychological Birth Order Inventory, which I uncovered reading many of the articles published by you and your esteemed colleagues, such as: Campbell, L., White, J., & Stewart, A. (1991). The relationship of psychological birth order to actual birth order. *Individual Psychology, 47*(1), 380-391.

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If you approve of these arrangements, please sign this letter where indicated below and return to me in the enclosed envelope. Thank you very much for the time you have taken to review this letter.

Sincerely,

Alissa J. Combs-Draughn
PERMISSION GRANTED FOR THE USE STATED ABOVE:

_____
(Name)

_____
(Date)

Appendix E: BIS/BAS Motivation Scale

BIS/BAS

Each item of this questionnaire is a statement that a person may either agree with or disagree with. For each item, indicate how much you agree or disagree with what the item says. Please respond to all the items; do not leave any blank. Choose only one response to each statement. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses. Choose from the following four response options:

1 = very true for me
2 = somewhat true for me
3 = somewhat false for me
4 = very false for me

1. A person's family is the most important thing in life.
2. Even if something bad is about to happen to me, I rarely experience fear or nervousness.
3. I go out of my way to get things I want.
4. When I'm doing well at something I love to keep at it.
5. I'm always willing to try something new if I think it will be fun.
6. How I dress is important to me.
7. When I get something I want, I feel excited and energized.
8. Criticism or scolding hurts me quite a bit.
9. When I want something I usually go all-out to get it.
10. I will often do things for no other reason than that they might be fun.
11. It's hard for me to find the time to do things such as get a haircut.
12. If I see a chance to get something I want I move on it right away.
13. I feel pretty worried or upset when I think or know somebody is angry at me.
14. When I see an opportunity for something I like I get excited right away.
15. I often act on the spur of the moment.
16. If I think something unpleasant is going to happen I usually get pretty "worked up."
17. I often wonder why people act the way they do.
18. When good things happen to me, it affects me strongly.
19. I feel worried when I think I have done poorly at something important.
20. I crave excitement and new sensations.
21. When I go after something I use a "no holds barred" approach.
22. I have very few fears compared to my friends.
23. It would excite me to win a contest.
24. I worry about making mistakes.

Items other than 2 and 22 are reverse-scored.

BAS Drive: 3, 9, 12, 21
BAS Fun Seeking: 5, 10, 15, 20
BAS Reward Responsiveness: 4, 7, 14, 18, 23

BIS: 2, 8, 13, 16, 19, 22, 24

Items 1, 6, 11, 17, are fillers.

The fact that there are three BAS-related scales and only one BIS-related scales was not planned or theoretically motivated. The factors emerged empirically, from an item set that was intended to capture diverse manifestations of the BAS, according to various theoretical statements. It is likely that a broader sampling of items on the BIS side would also have resulted in more than one scale. I do not encourage combining the BAS scales, however, because they do turn out to focus on different aspects of incentive sensitivity. In particular, Fun Seeking is known to have elements of impulsiveness that are not contained in the other scales.

Appendix F: Letter to Dr. Carver for Consent to Use BIS/BAS Scale

Alissa J. Combs-Draughn

July 23, 2012
Dr. Charles S. Carver
Department of Psychology
P.O. Box 248185
Coral Gables, FL 33124-0751

Dear Dr. Carver:

I am completing my PhD in General Educational Psychology from Walden University and am currently working on my doctoral dissertation titled "The impact of psychological birth order on scholastic achievement and motivation." I would like your permission to use in my research the BIS/BAS Motivation Scale, which I uncovered reading many of the articles published by you and your esteemed colleague Dr. White, such as: Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology, 67*, 319-333.

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If you approve of these arrangements, please sign this letter where indicated below and return to me in the enclosed envelope. Thank you very much for the time you have taken to review this letter.

Sincerely,

Alissa J. Combs-Draughn
PERMISSION GRANTED FOR THE USE STATED ABOVE:

_____
(Name)

_____
(Date)

Appendix G: Letter to Potential Student Participants

Dear Student,

You have been selected to participate in a research study examining the effect(s) of family on academic achievement and motivation. Selection is based on your current enrollment in college. Your participation is strictly voluntary; there are no negative consequences should you choose to not participate.

This study was developed in the hopes of discovering additional methods of educating students. The researcher hopes to find a link between family environment and how well students perform at school, as well as how motivated students are to perform well in school. You will be asked to take two surveys – one that measures your specific birth order (or your role within your family) and one that classifies your type of motivation. These surveys are not lengthy; you should be able to complete all participation within 30 minutes. You will be able to access these surveys using the Internet. Using Surveymonkey.com, you will be given links to the surveys you have agreed to take. Once you have completed the surveys, your answers will be stored on a secured server and will not be shared with anyone else. The researcher is also asking permission to view your SAT/ACT scores and your GPA in order to classify your academic progress. It is important that you understand that your name will not be published at any time. Your answers on the surveys will also be kept confidential; they will not be shared with anyone other than the researcher.

The researcher of this study is a teacher working in North Carolina but this study is for her doctoral dissertation and is not related to her professional role as a teacher. The researcher will not use this teaching role to influence your participation in this study in any way.

The researcher will be on site as you take your surveys and will answer any questions you have related to this study at any time. You will also be provided with contact information should you have questions once the study has ended. If you would like more information about your rights as a participant in research studies please contact IRB@waldenu.edu. Please be sure to keep a copy of this form so you can review it at any time.

Appendix H: Online Informed Consent

Contact Information: Alissa J. Combs-Draughn, Doctoral Candidate at Walden University.

I, _____, do willingly agree to participate in the study titled, "The impact of psychological birth order on scholastic achievement and motivation." I understand that participation is completely voluntary and I have freely chosen (volunteered) to participate in study. I also understand that I am free to refuse to answer questions or participate in this research study if I so decide. I also understand that any information collected from me will remain confidential except as may be required by federal, state or local law.

Please click the Next button below to begin the study if you are comfortable being part of the study that is described above and was explained by the researcher via Facebook and email.

Appendix I: Demographic Survey

The following information will be used for statistical purposes only and will not be used, in any way, in an attempt to identify any individual student. Please answer each question to the best of your ability.

1. Which year of college did you most recently complete?
    a. 1st year undergraduate
    b. 2nd year undergraduate
    c. 3rd year undergraduate
    d. 4th year undergraduate
    e. 1st year graduate
    f. 2nd year graduate
2. What is your gender?
    a. Female
    b. Male
3. With which racial/ethnic group do you **MOST** identify?
    a. Caucasian
    b. Hispanic
    c. Black
    d. Asian
    e. Native American
    f. Other
4. What is your birth order (Of all the children of your biological parents, which position are you)?
    a. First born child
    b. Middle child
    c. Last born child
    d. Only child
5. Are you a twin?
    a. Yes
    b. No
6. How many siblings do you have?
    a. 0
    b. 1
    c. 2
    d. 3
    e. More than 3

7. How many of your siblings are step siblings? (a child who is only related to you by marriage – example: your stepmother's son would be your stepbrother.)
    a. 0
    b. 1
    c. 2
    d. 3
    e. More than 3
8. How many of your siblings are half siblings? (a child who shares ONE parent with you – if your mom/dad had a child with your stepdad/stepmom, that child is your half sibling).
    a. 0
    b. 1
    c. 2
    d. 3
    e. More than 3
9. Do you belong to one of the following groups? If so, please mark the group.
    a. A girl with only sisters
    b. A girl with only brothers
    c. A boy with only brothers
    d. A boy with only sisters
    e. None of the above
10. Describe your parents' relationship:
    a. Married
    b. Unmarried but living together
    c. Separated/divorced
11. With whom did you live prior to beginning college?
    a. Both biological parents (in the same house)
    b. Both biological parents (separated/divorced with joint custody)
    c. Only father
    d. Only mother
    e. Adoptive parents
    f. Grandparents
    g. Other
12. What was your mother's age at your birth (how old was your mom when she gave birth to you?)
    a. 15-19
    b. 20-25
    c. 26-30

d. 30-35
e. Over 30

13. Are you a first generation college student?
    a. Yes
    b. No
    c. Unsure
14. What was your ACT score?
15. What was your SAT score?
16. What was your most recent GPA?
    a. 1.0-1.5
    b. 1.6-2.0
    c. 2.1-2.6
    d. 2.7-3.1
    e. 3.2-3.6
    f. 3.7-4.0

Appendix J:Second Letter to Dr. Linda Campbell regarding verb tense

June 7, 2013
Dr. Linda F. Campbell
Department of Counseling and Human Development Services
402 Aderhold Hall
The University of Georgia
Athens, GA 30602

Dear Dr. Campbell:
I am completing my PhD in General Educational Psychology from Walden University and am currently working on my doctoral dissertation titled "The impact of psychological birth order on scholastic achievement and motivation." While you have graciously already provided your permission for me to use your evaluative tool, the Psychological Birth Order Inventory, I would also like to ask permission to change the verb tense in the questions from the past to the present as I will be using this tool with a sample of students.

The requested permission extends to any and all future revisions and editions of the above dissertation and includes the prospective publication by Walden University. Your signature on this letter confirms that you own (or you in part own) the copyright to the above-described material.

If you approve of these arrangements, please sign this letter where indicated below and return to me in the enclosed envelope. Thank you very much for the time you have taken to review this letter.

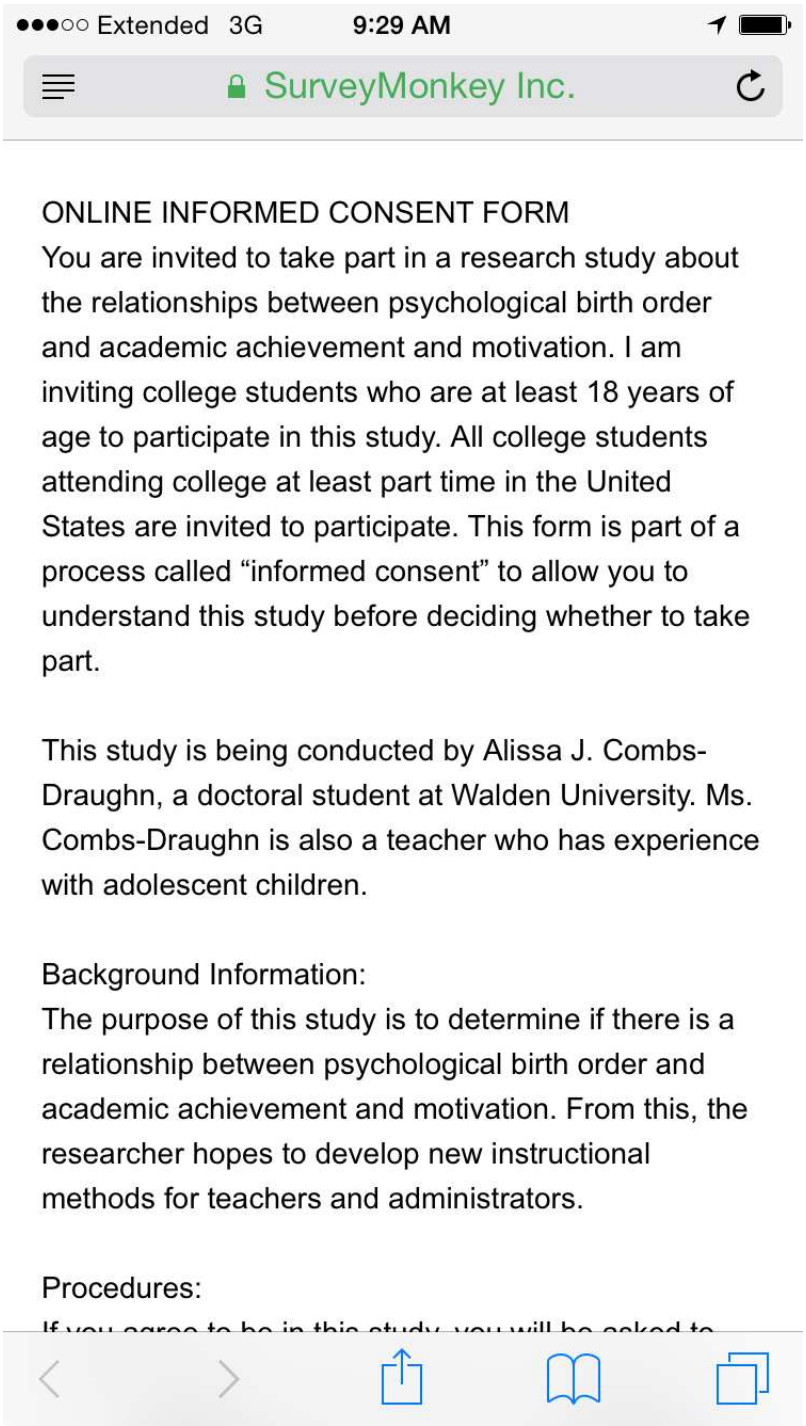
Sincerely,

Alissa J. Combs-Draughn
PERMISSION GRANTED FOR THE USE GRANTED ABOVE:

_____
(Name)

_____
(Date)

Appendix K: Screenshots of Measures Used in Study

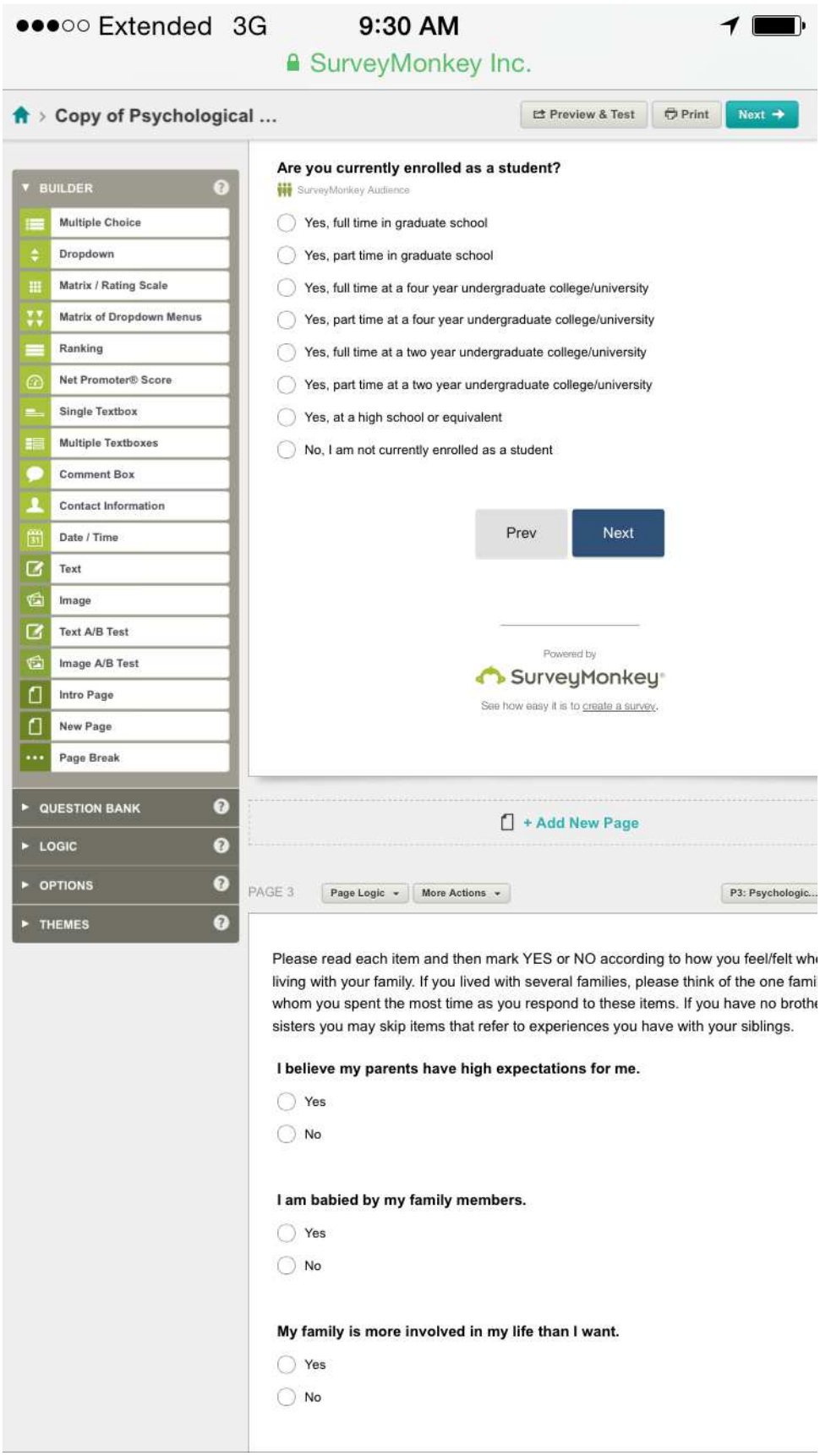


Procedures:
If you agree to be in this study, you will be asked to complete surveys which should take no longer than 30-45 minutes. The demographic survey will ask for information regarding your race, age, grade point average, and family make up. You will also be asked to take surveys related to psychological birth order and motivation.

Voluntary Nature of the Study:
This study is voluntary. Everyone will your decision of whether or not you choose to be in the study. Your decision to participate, or to not participate, will be respected. If you decide to join the study now, you can still change your mind during or after the study. You may stop at any time.

Risks and Benefits of Being in the Study:
Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as stress or becoming upset. Being in this study would not pose risk to your safety or well being. The data obtained from this study will be used to develop procedures and guidance for educators and administrators.

Payment:
There is no compensation for participation in this study.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Intro Page
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QUESTION BANK
LOGIC
OPTIONS
THEMES
Are you currently enrolled as a student?
SurveyMonkey Audience
Yes, full time in graduate school
Yes, part time in graduate school
Yes, full time at a four year undergraduate college/university
Yes, part time at a four year undergraduate college/university
Yes, full time at a two year undergraduate college/university
Yes, part time at a two year undergraduate college/university
Yes, at a high school or equivalent
No, I am not currently enrolled as a student
Prev
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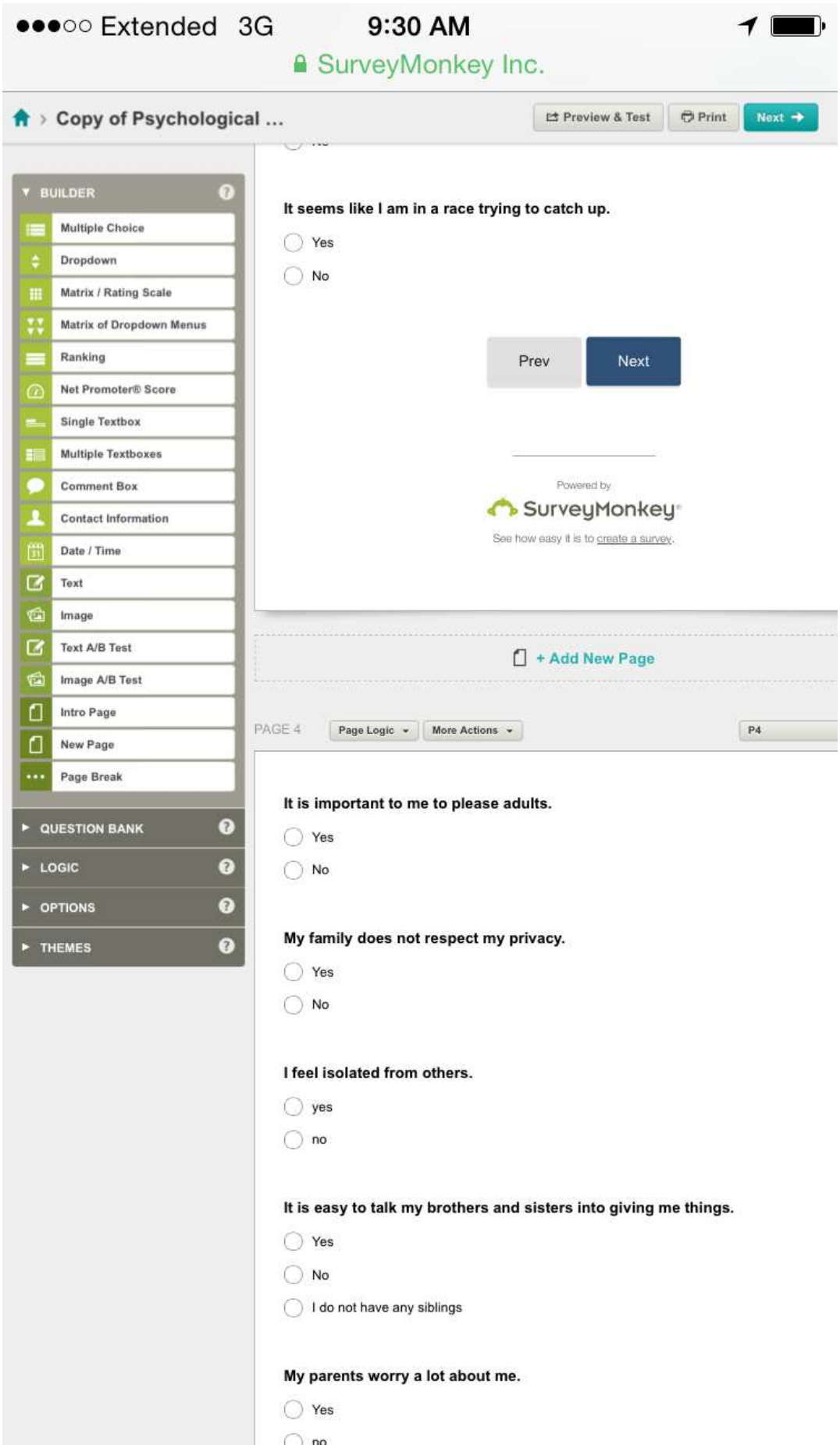
PAGE 3
Page Logic
More Actions
P3: Psychologic...
Please read each item and then mark YES or NO according to how you feel/felt wh
living with your family. If you lived with several families, please think of the one fami
whom you spent the most time as you respond to these items. If you have no broth
sisters you may skip items that refer to experiences you have with your siblings.
I believe my parents have high expectations for me.
Yes
No
I am babied by my family members.
Yes
No
My family is more involved in my life than I want.
Yes
No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It seems like I am in a race trying to catch up.
Yes
No
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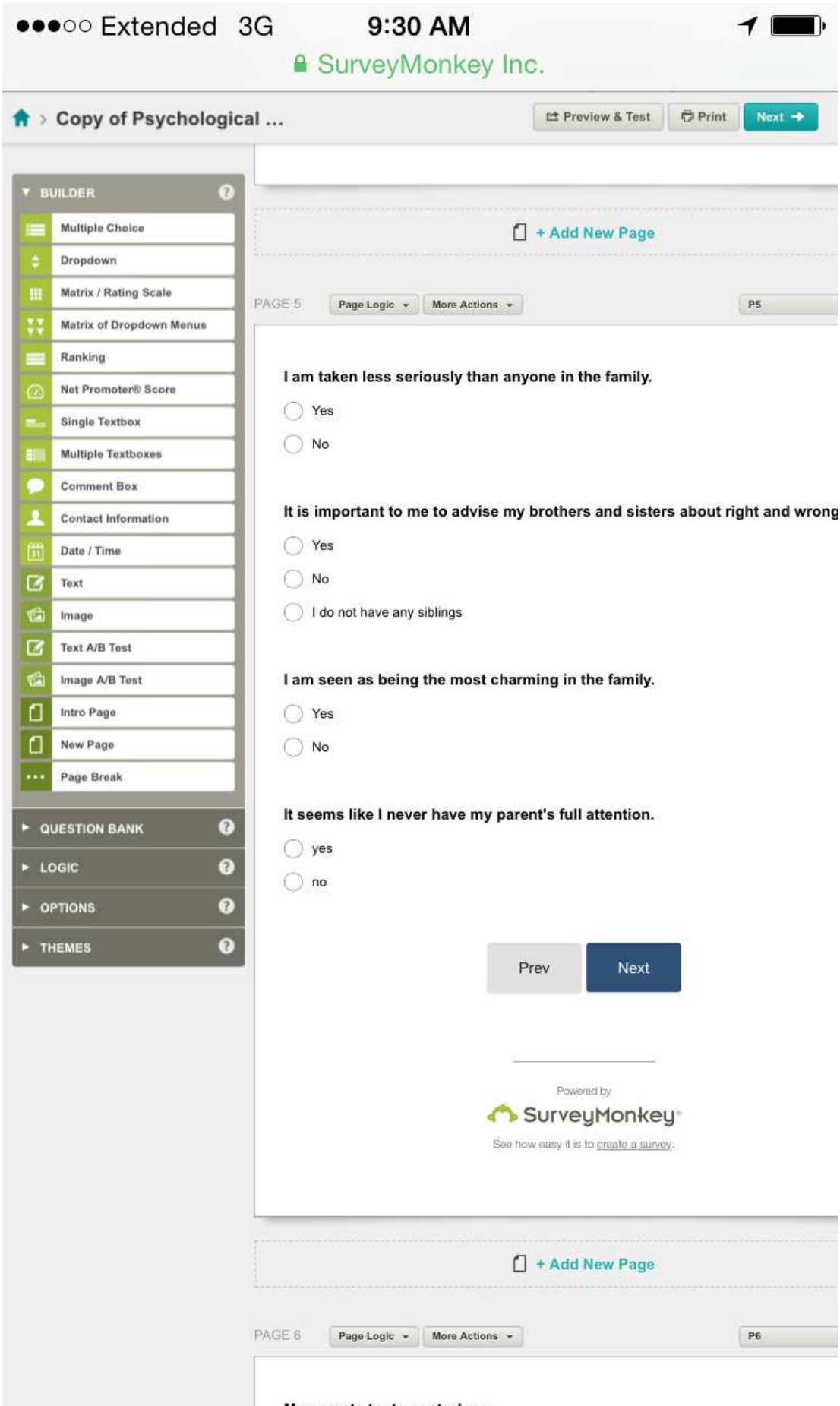
PAGE 4
Page Logic
More Actions
P4
It is important to me to please adults.
Yes
No
My family does not respect my privacy.
Yes
No
I feel isolated from others.
yes
no
It is easy to talk my brothers and sisters into giving me things.
Yes
No
I do not have any siblings
My parents worry a lot about me.
Yes
no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PAGE 5
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More Actions
P5
I am taken less seriously than anyone in the family.
Yes
No
It is important to me to advise my brothers and sisters about right and wrong
Yes
No
I do not have any siblings
I am seen as being the most charming in the family.
Yes
No
It seems like I never have my parent's full attention.
yes
no
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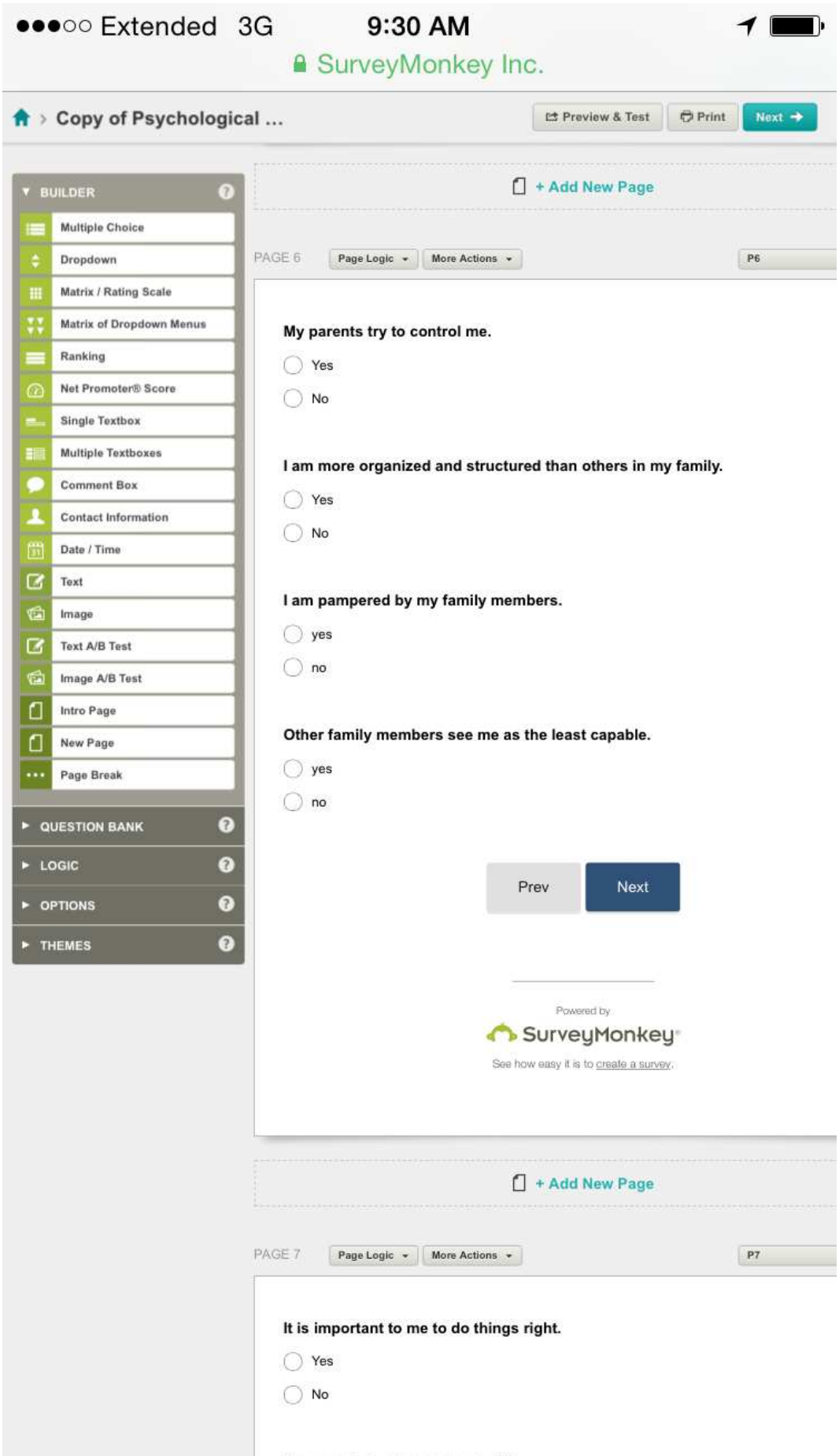
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PAGE 6
Page Logic
More Actions
P6
My parents try to control me.
Yes
No
I am more organized and structured than others in my family.
Yes
No
I am pampered by my family members.
yes
no
Other family members see me as the least capable.
yes
no
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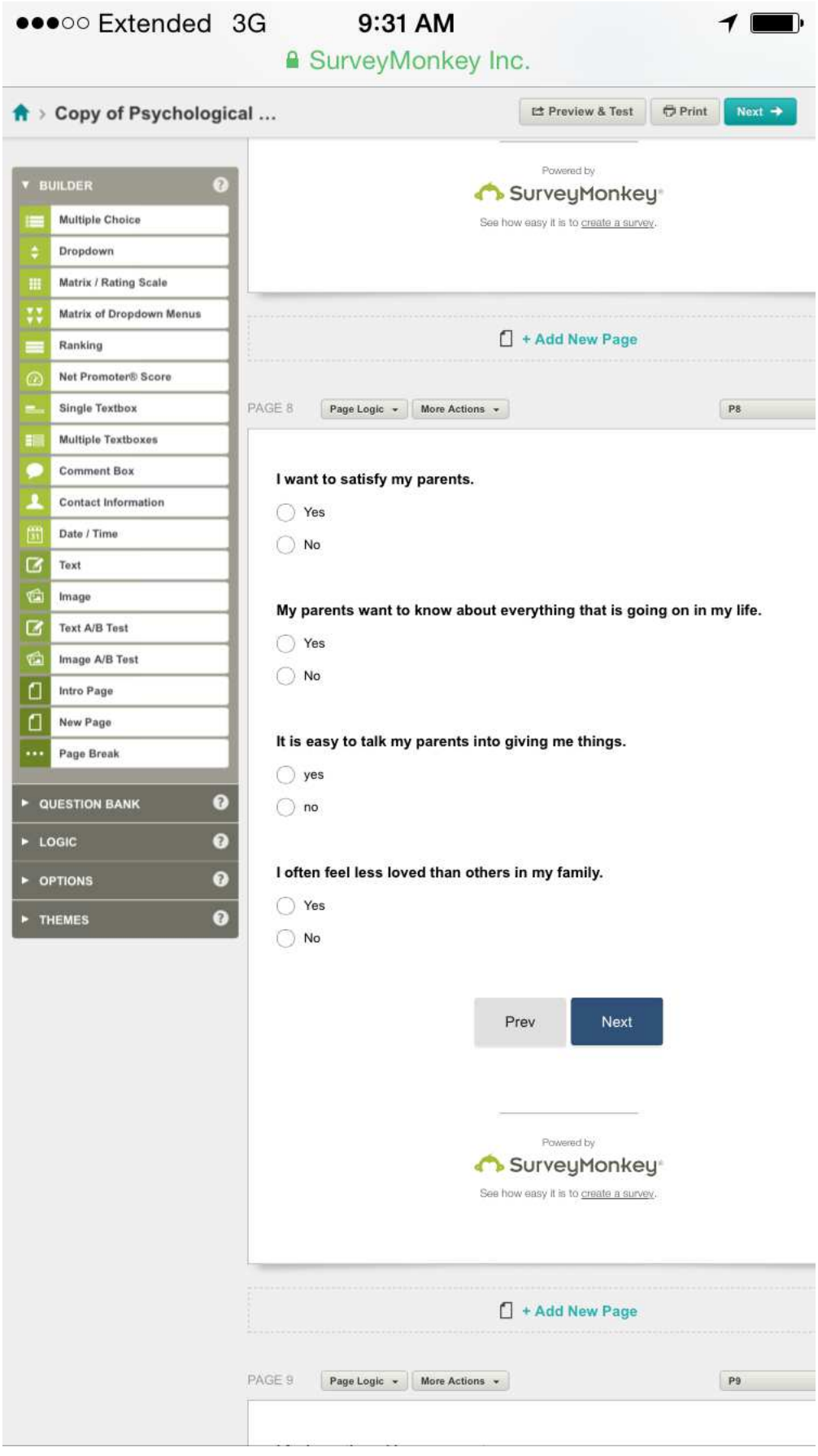
P7
It is important to me to do things right.
Yes
No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P8
I want to satisfy my parents.
Yes
No
My parents want to know about everything that is going on in my life.
Yes
No
It is easy to talk my parents into giving me things.
yes
no
I often feel less loved than others in my family.
Yes
No
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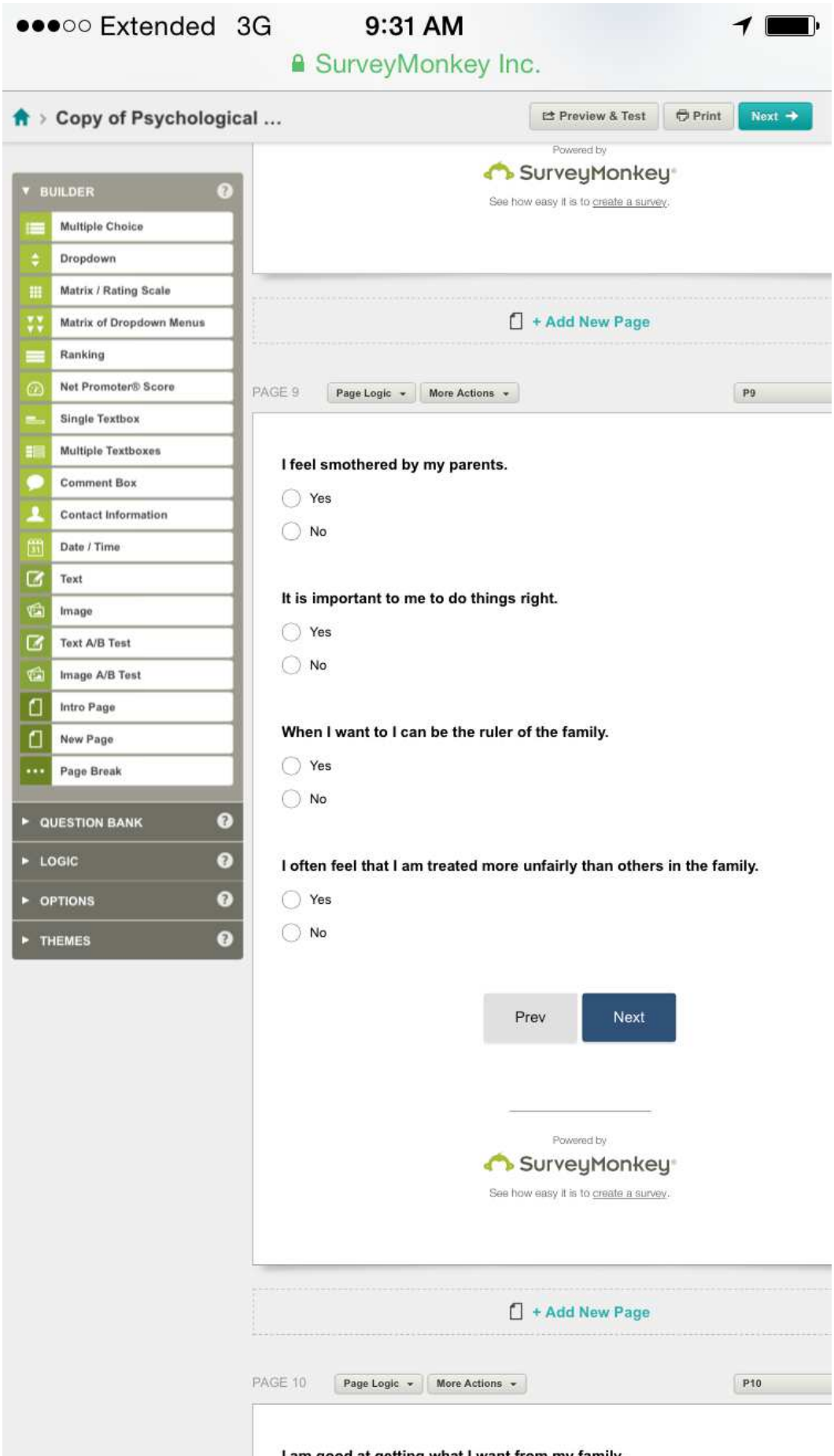
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P9
I feel smothered by my parents.
Yes
No
It is important to me to do things right.
Yes
No
When I want to I can be the ruler of the family.
Yes
No
I often feel that I am treated more unfairly than others in the family.
Yes
No
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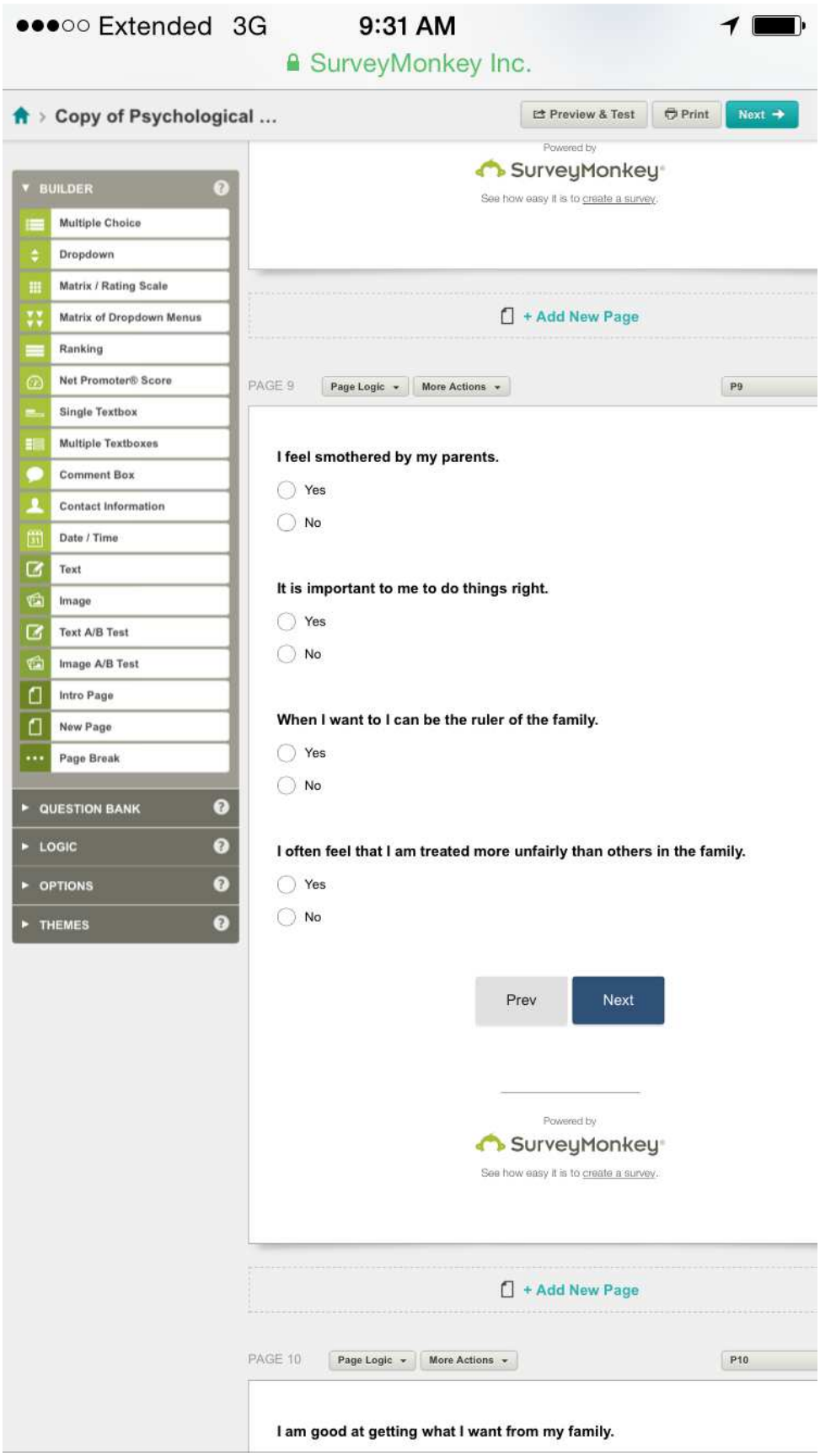
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P9
I feel smothered by my parents.
Yes
No
It is important to me to do things right.
Yes
No
When I want to I can be the ruler of the family.
Yes
No
I often feel that I am treated more unfairly than others in the family.
Yes
No
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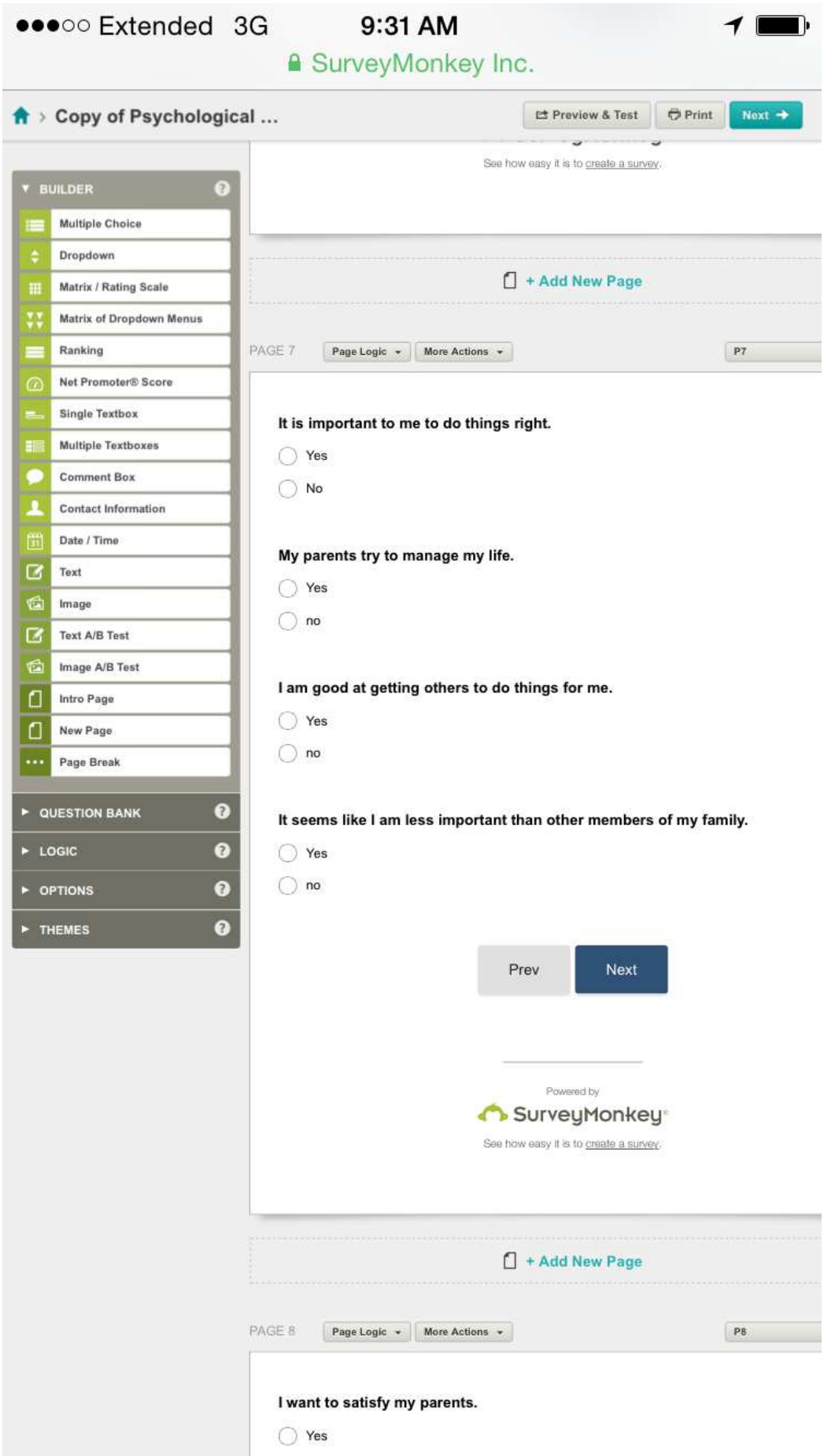
P10
I am good at getting what I want from my family.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PAGE 7
Page Logic
More Actions
P7
It is important to me to do things right.
Yes
No
My parents try to manage my life.
Yes
no
I am good at getting others to do things for me.
Yes
no
It seems like I am less important than other members of my family.
Yes
no
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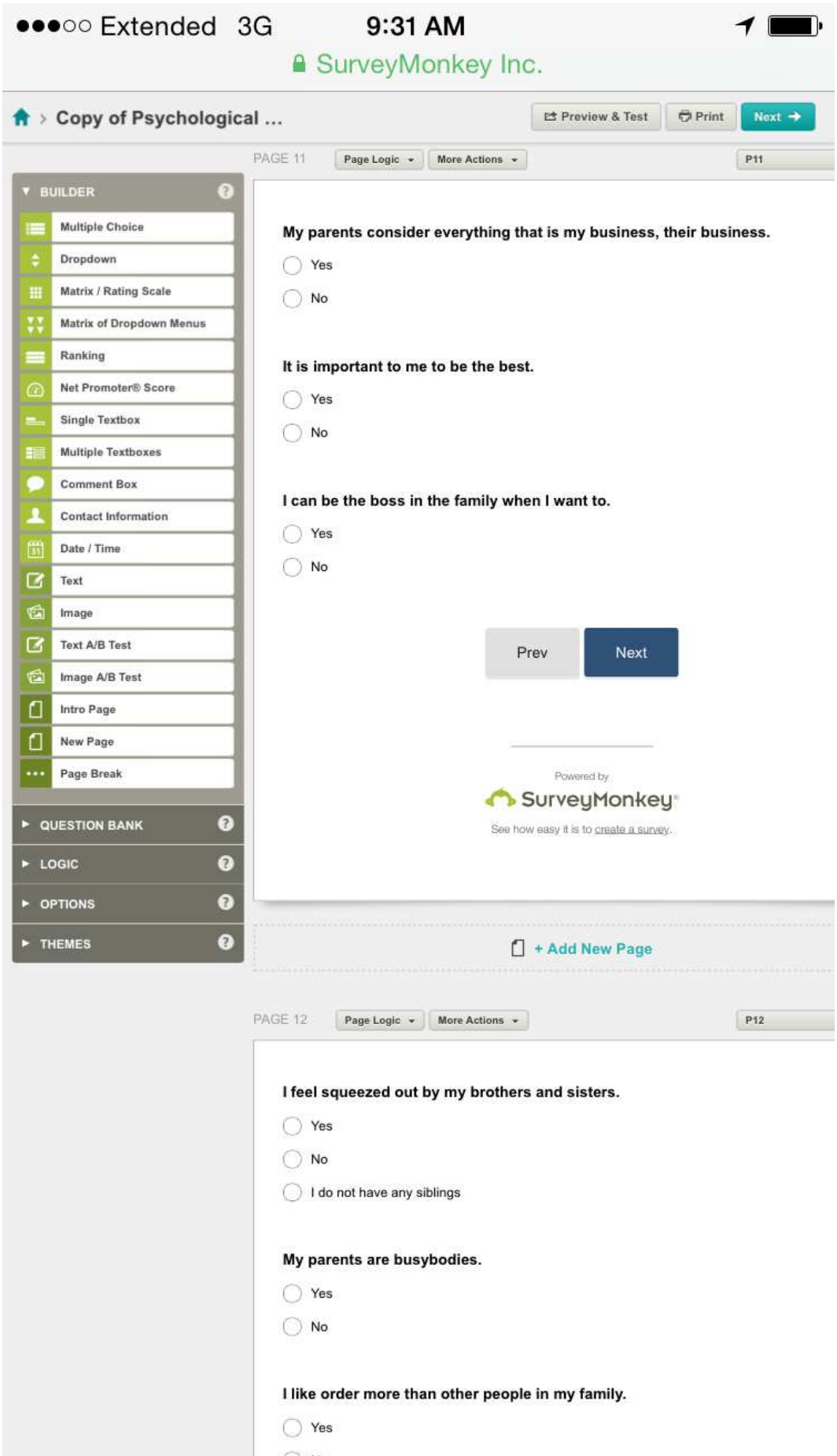
P8
I want to satisfy my parents.
Yes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QUESTION BANK
LOGIC
OPTIONS
THEMES
My parents consider everything that is my business, their business.
Yes
No
It is important to me to be the best.
Yes
No
I can be the boss in the family when I want to.
Yes
No
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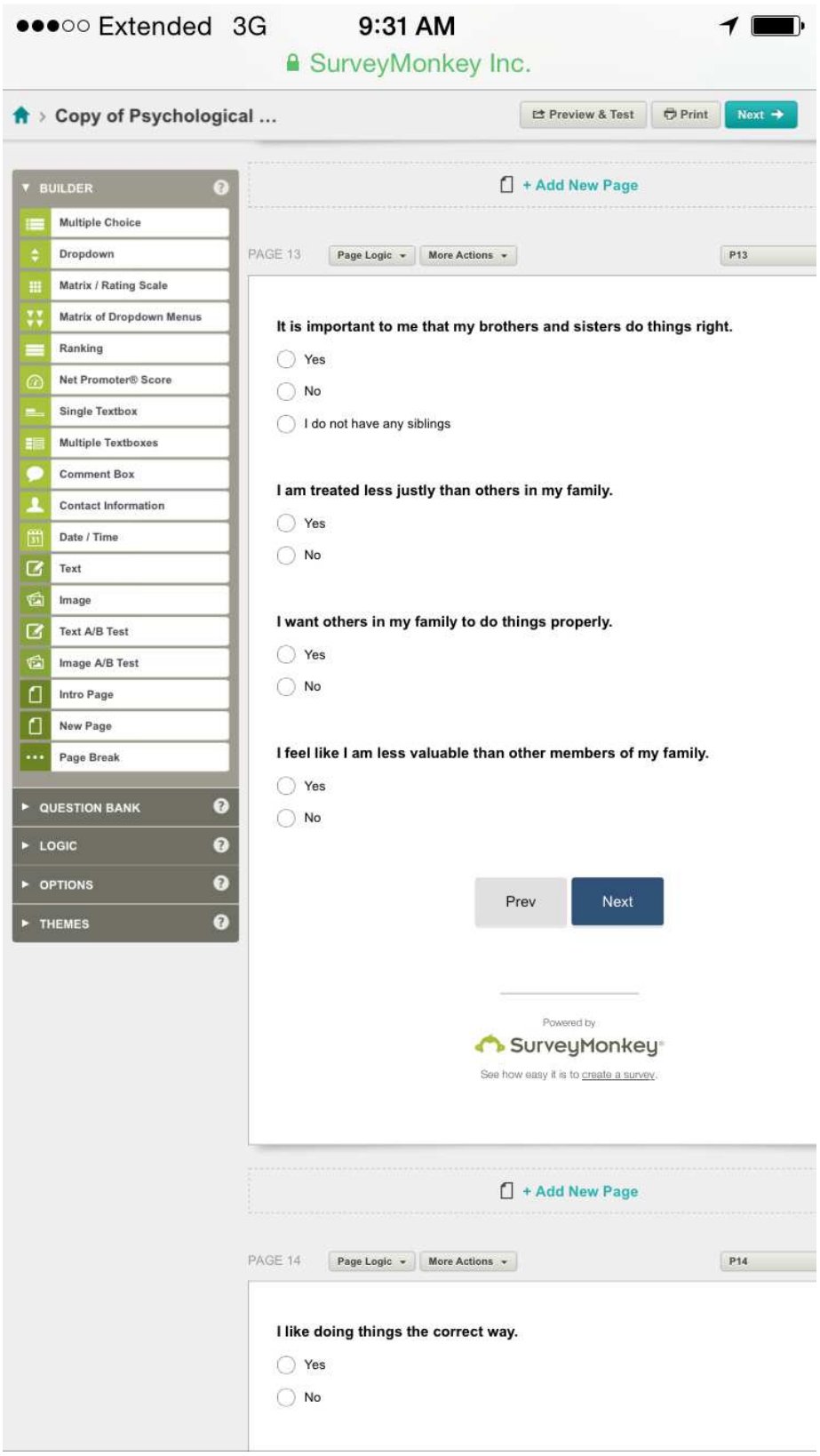
PAGE 12
Page Logic
More Actions
P12
I feel squeezed out by my brothers and sisters.
Yes
No
I do not have any siblings
My parents are busybodies.
Yes
No
I like order more than other people in my family.
Yes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QUESTION BANK
LOGIC
OPTIONS
THEMES
+ Add New Page
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Page Logic
More Actions
P13
It is important to me that my brothers and sisters do things right.
Yes
No
I do not have any siblings
I am treated less justly than others in my family.
Yes
No
I want others in my family to do things properly.
Yes
No
I feel like I am less valuable than other members of my family.
Yes
No
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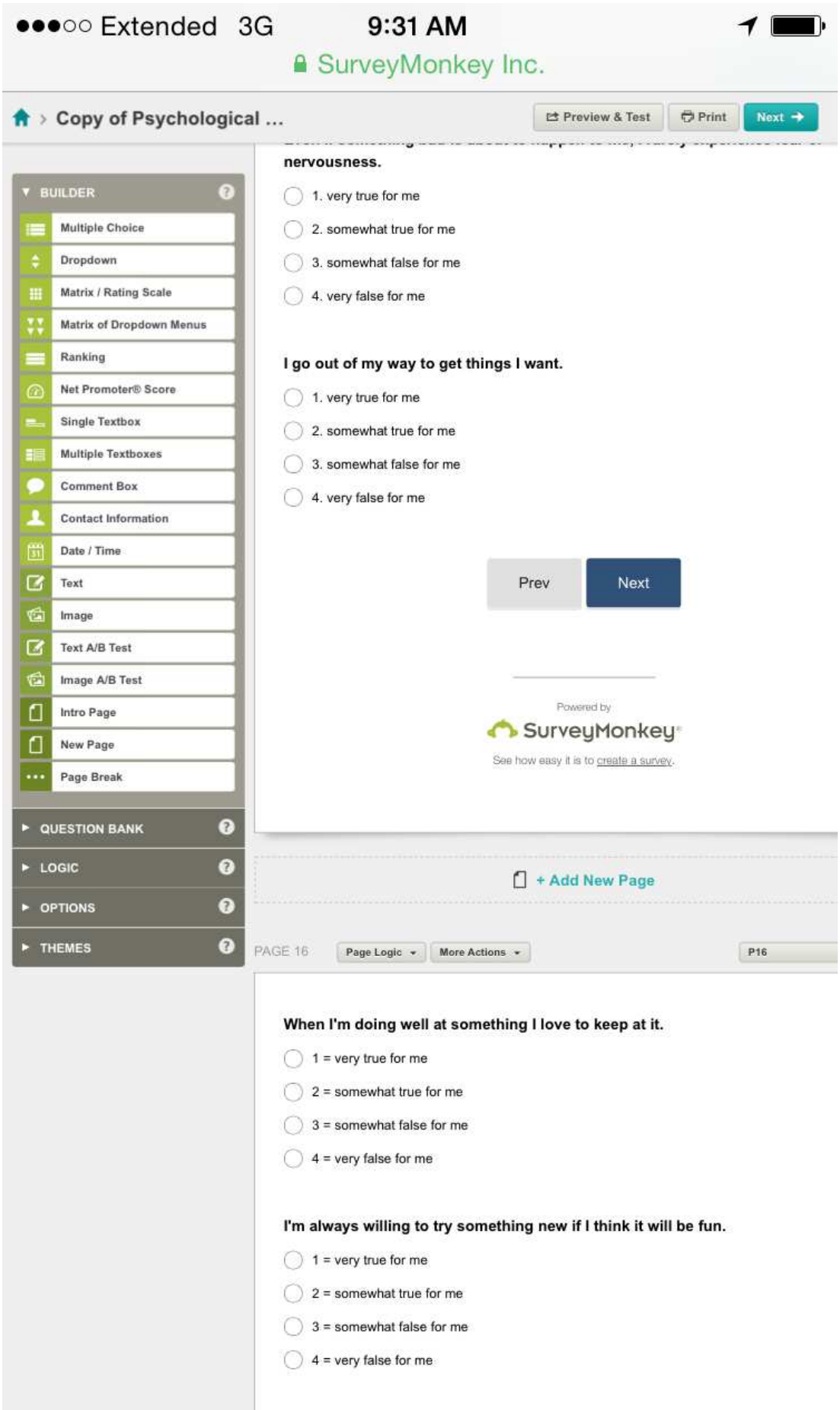
P14
I like doing things the correct way.
Yes
No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nervousness.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
I go out of my way to get things I want.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
Prev
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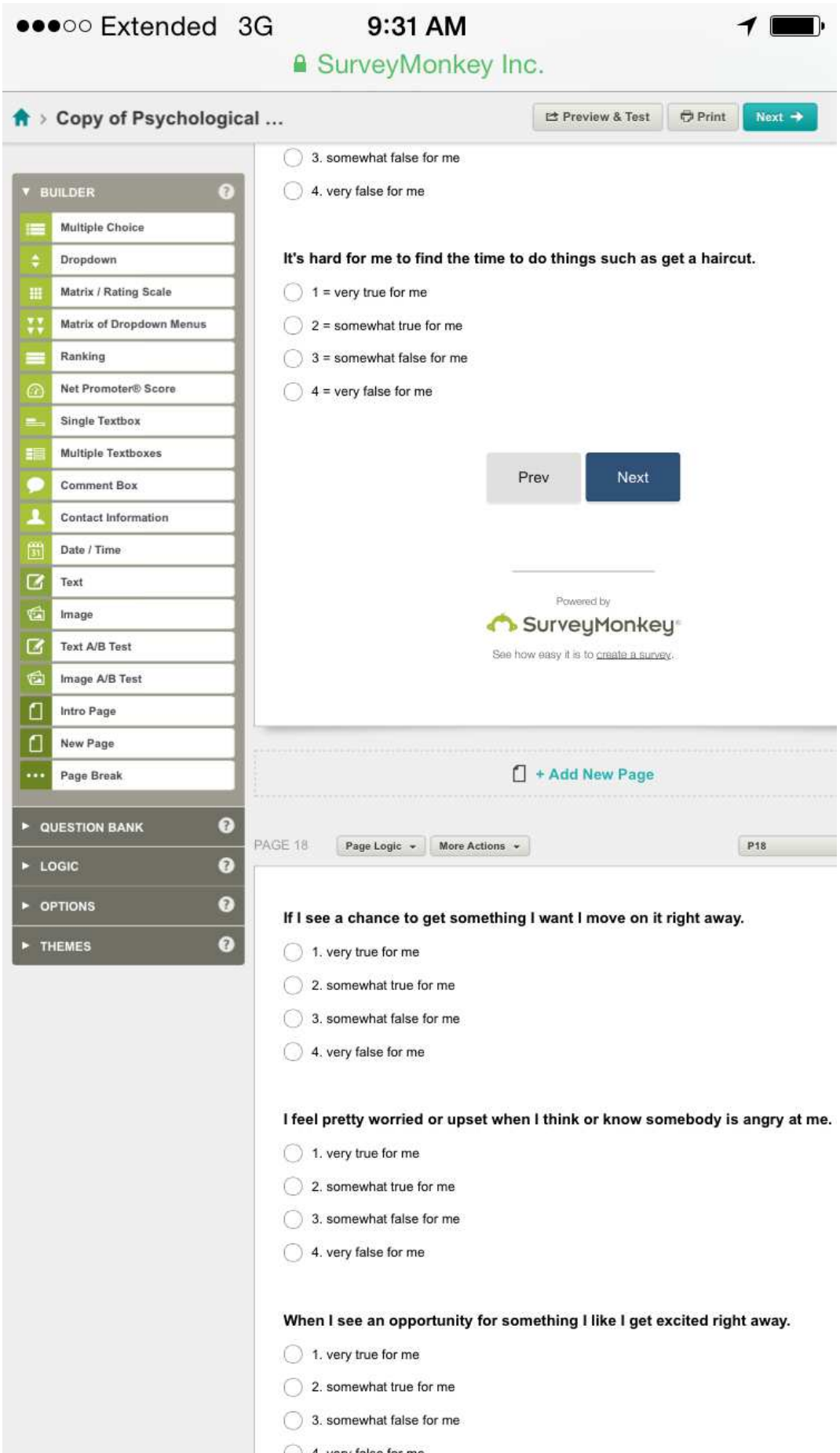
Page Break
QUESTION BANK
LOGIC
OPTIONS
THEMES
+ Add New Page
PAGE 16
Page Logic
More Actions
P16
When I'm doing well at something I love to keep at it.
1 = very true for me
2 = somewhat true for me
3 = somewhat false for me
4 = very false for me
I'm always willing to try something new if I think it will be fun.
1 = very true for me
2 = somewhat true for me
3 = somewhat false for me
4 = very false for me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OPTIONS
THEMES
3. somewhat false for me
4. very false for me
It's hard for me to find the time to do things such as get a haircut.
1 = very true for me
2 = somewhat true for me
3 = somewhat false for me
4 = very false for me
Prev
Next
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Page Logic
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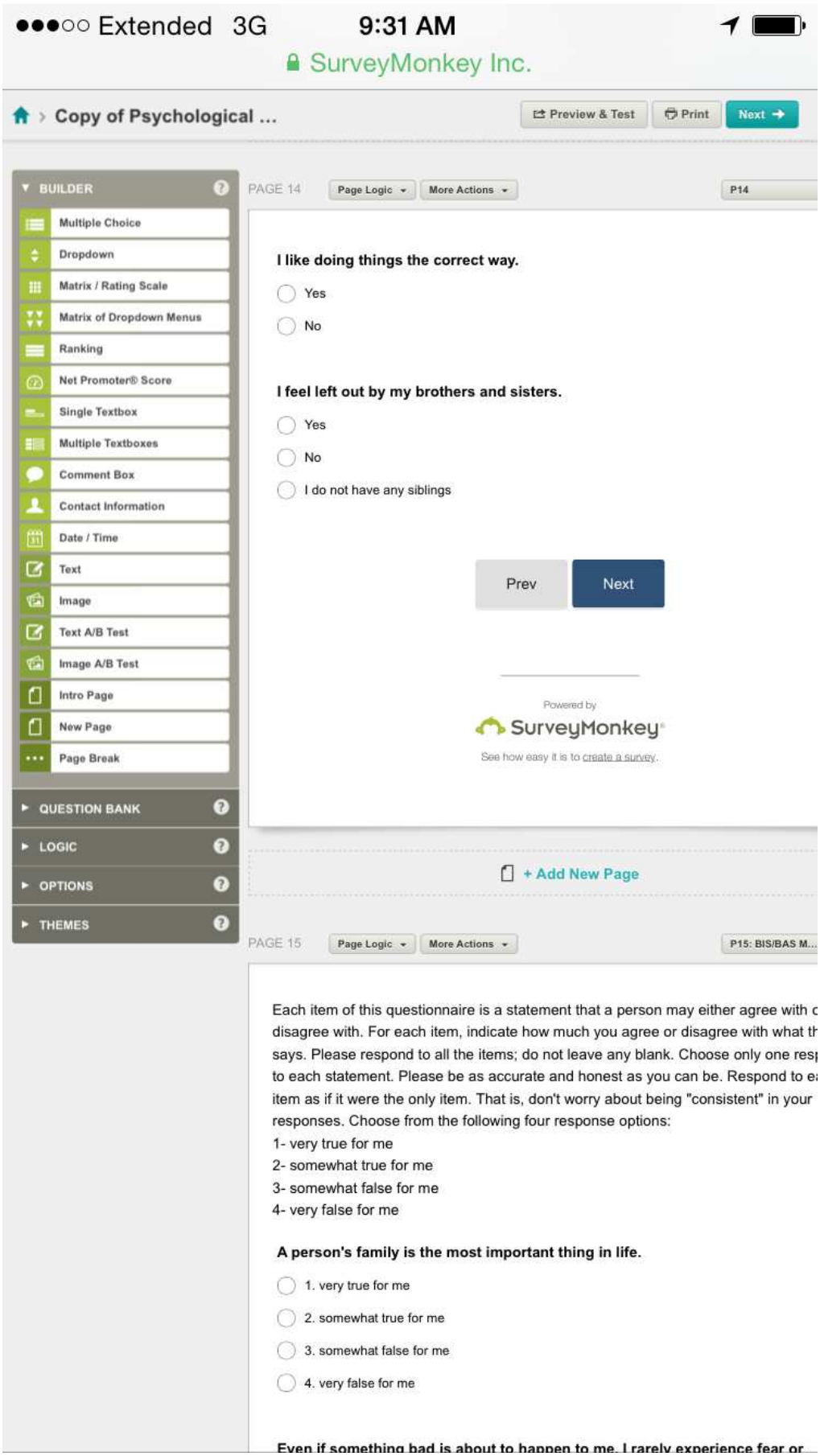
P18
If I see a chance to get something I want I move on it right away.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
I feel pretty worried or upset when I think or know somebody is angry at me.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
When I see an opportunity for something I like I get excited right away.
1. very true for me
2. somewhat true for me
3. somewhat false for me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QUESTION BANK
LOGIC
OPTIONS
THEMES
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P14
I like doing things the correct way.
Yes
No
I feel left out by my brothers and sisters.
Yes
No
I do not have any siblings
Prev
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See how easy it is to create a survey.
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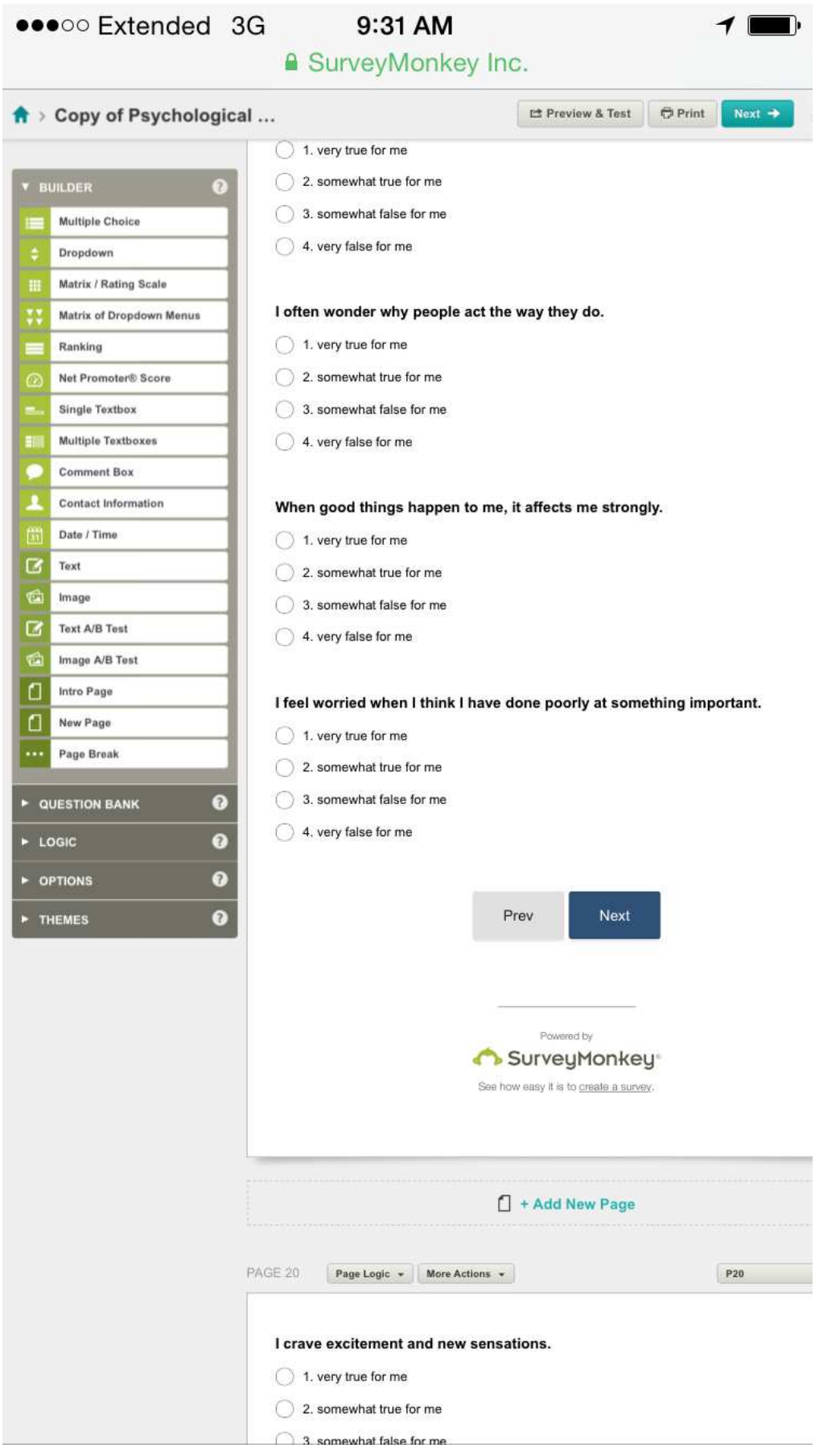
Page Logic
More Actions
P15: BIS/BAS M...
Each item of this questionnaire is a statement that a person may either agree with c
disagree with. For each item, indicate how much you agree or disagree with what th
says. Please respond to all the items; do not leave any blank. Choose only one resp
to each statement. Please be as accurate and honest as you can be. Respond to ea
item as if it were the only item. That is, don't worry about being "consistent" in your
responses. Choose from the following four response options:
1- very true for me
2- somewhat true for me
3- somewhat false for me
4- very false for me
A person's family is the most important thing in life.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
Even if something bad is about to happen to me, I rarely experience fear or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Page Break
QUESTION BANK
LOGIC
OPTIONS
THEMES
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
I often wonder why people act the way they do.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
When good things happen to me, it affects me strongly.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
I feel worried when I think I have done poorly at something important.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
Prev
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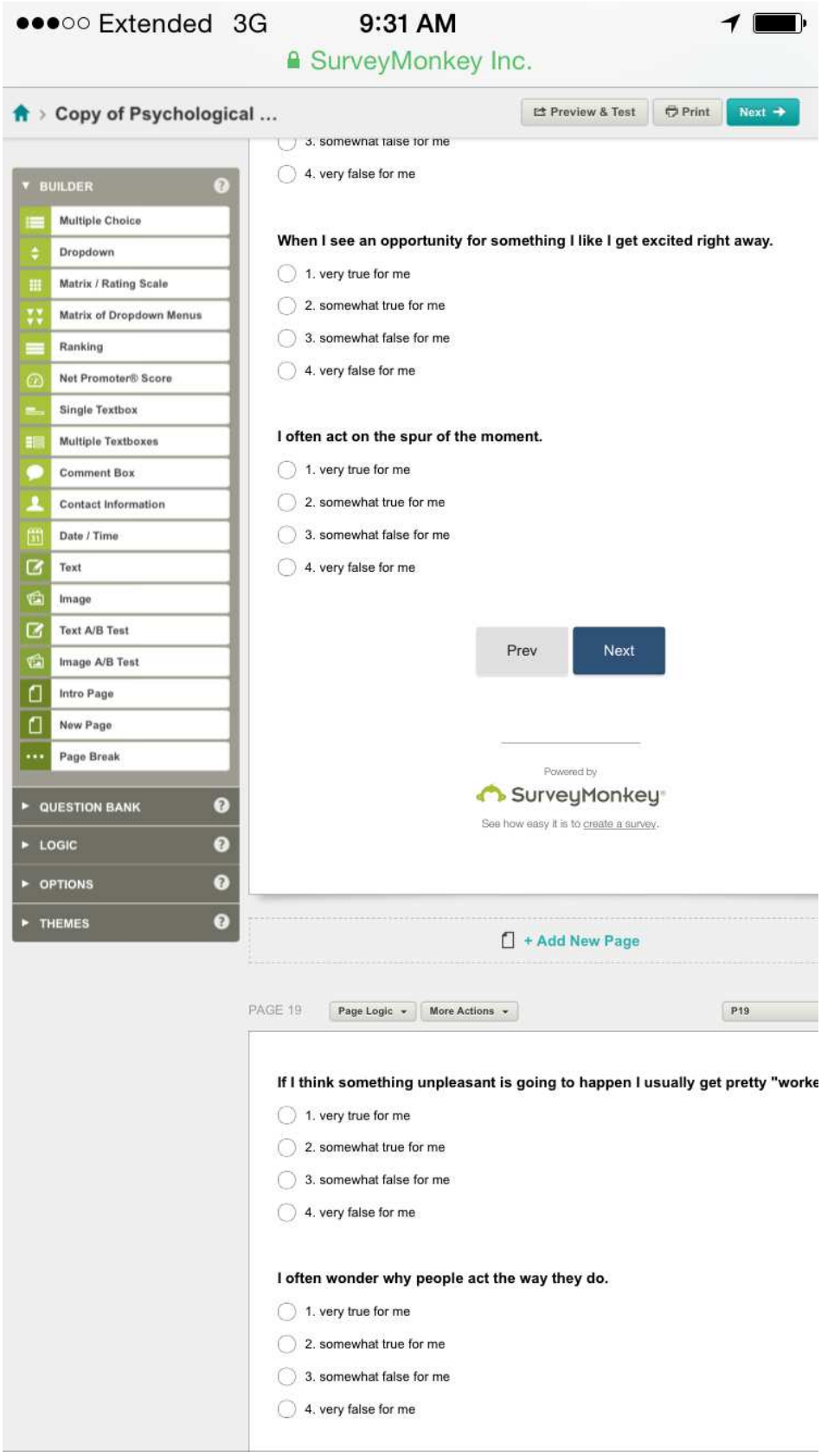
P20
I crave excitement and new sensations.
1. very true for me
2. somewhat true for me
3. somewhat false for me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3. somewhat false for me
4. very false for me
When I see an opportunity for something I like I get excited right away.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
I often act on the spur of the moment.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
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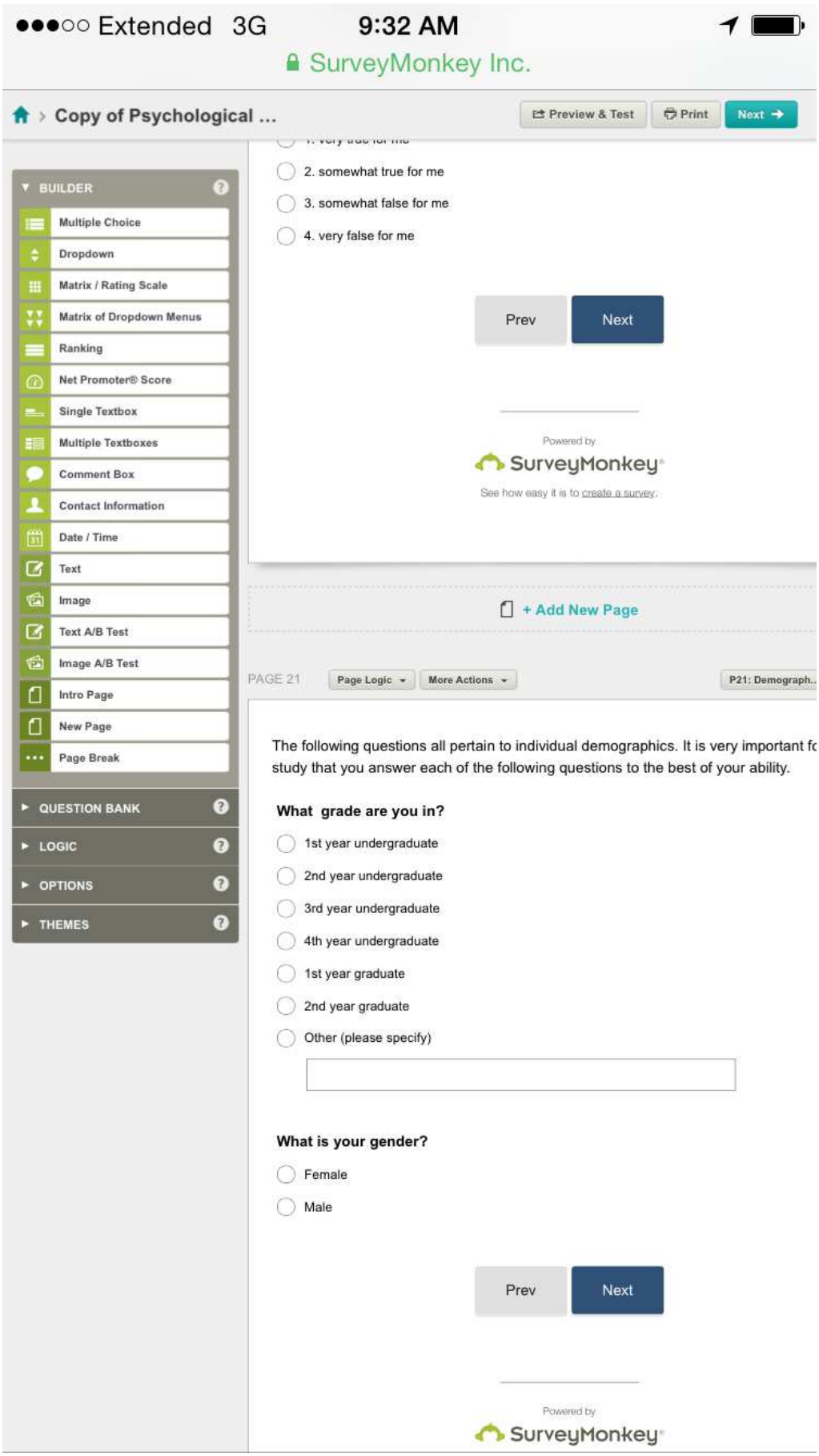
Page Break
QUESTION BANK
LOGIC
OPTIONS
THEMES
+ Add New Page
PAGE 19
Page Logic
More Actions
P19
If I think something unpleasant is going to happen I usually get pretty "worke
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
I often wonder why people act the way they do.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me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THEMES
2. somewhat true for me
3. somewhat false for me
4. very false for me
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P21: Demograph..
The following questions all pertain to individual demographics. It is very important fo
study that you answer each of the following questions to the best of your ability.
What grade are you in?
1st year undergraduate
2nd year undergraduate
3rd year undergraduate
4th year undergraduate
1st year graduate
2nd year graduate
Other (please specify)
What is your gender?
Female
Male
Prev
Next
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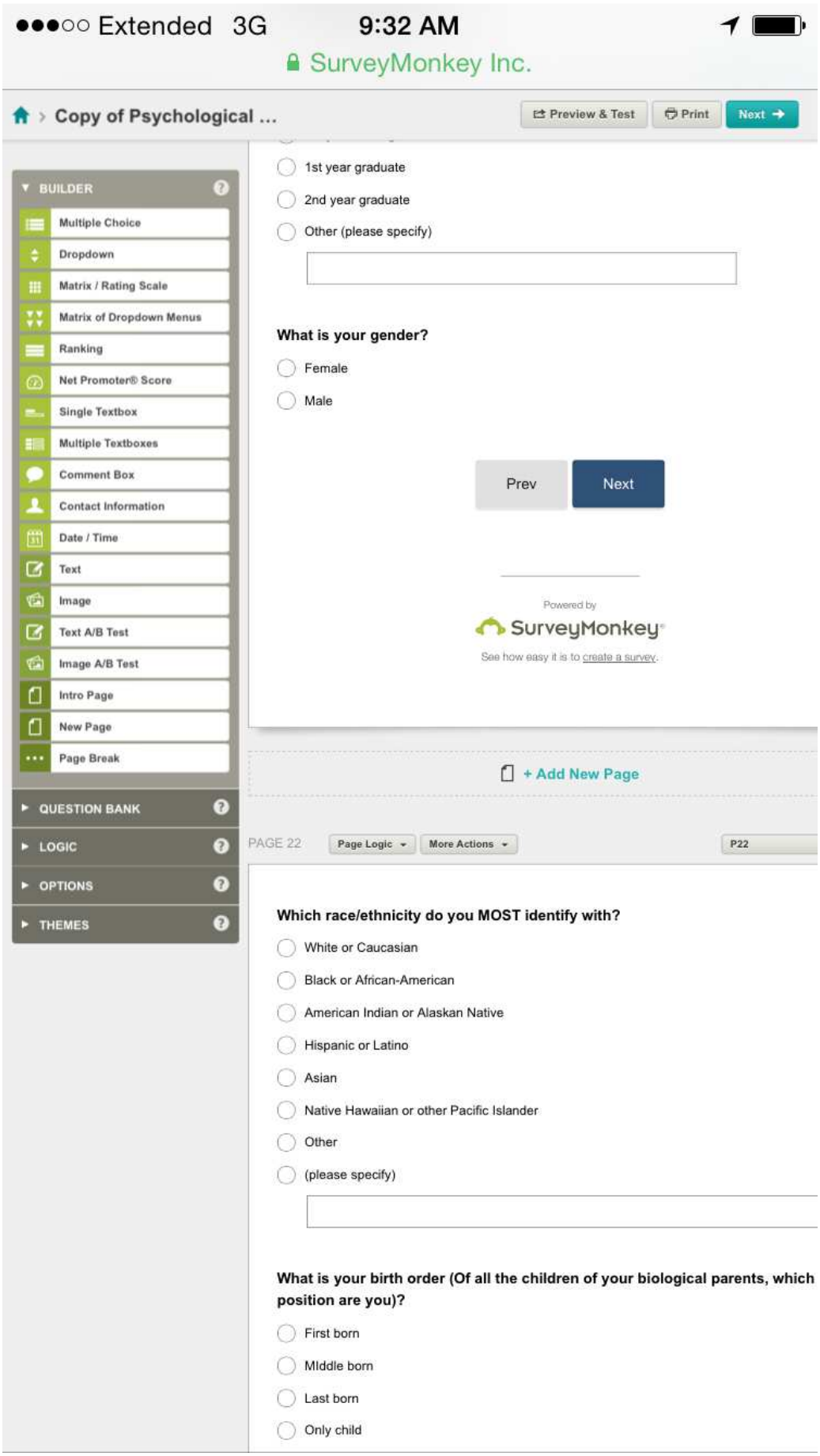
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Image A/B Test
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QUESTION BANK
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THEMES
1st year graduate
2nd year graduate
Other (please specify)
What is your gender?
Female
Male
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P22
Which race/ethnicity do you MOST identify with?
White or Caucasian
Black or African-American
American Indian or Alaskan Native
Hispanic or Latino
Asian
Native Hawaiian or other Pacific Islander
Other
(please specify)
What is your birth order (Of all the children of your biological parents, which position are you)?
First born
MIddle born
Last born
Only child


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QUESTION BANK
LOGIC
OPTIONS
THEMES
+ Add New Page
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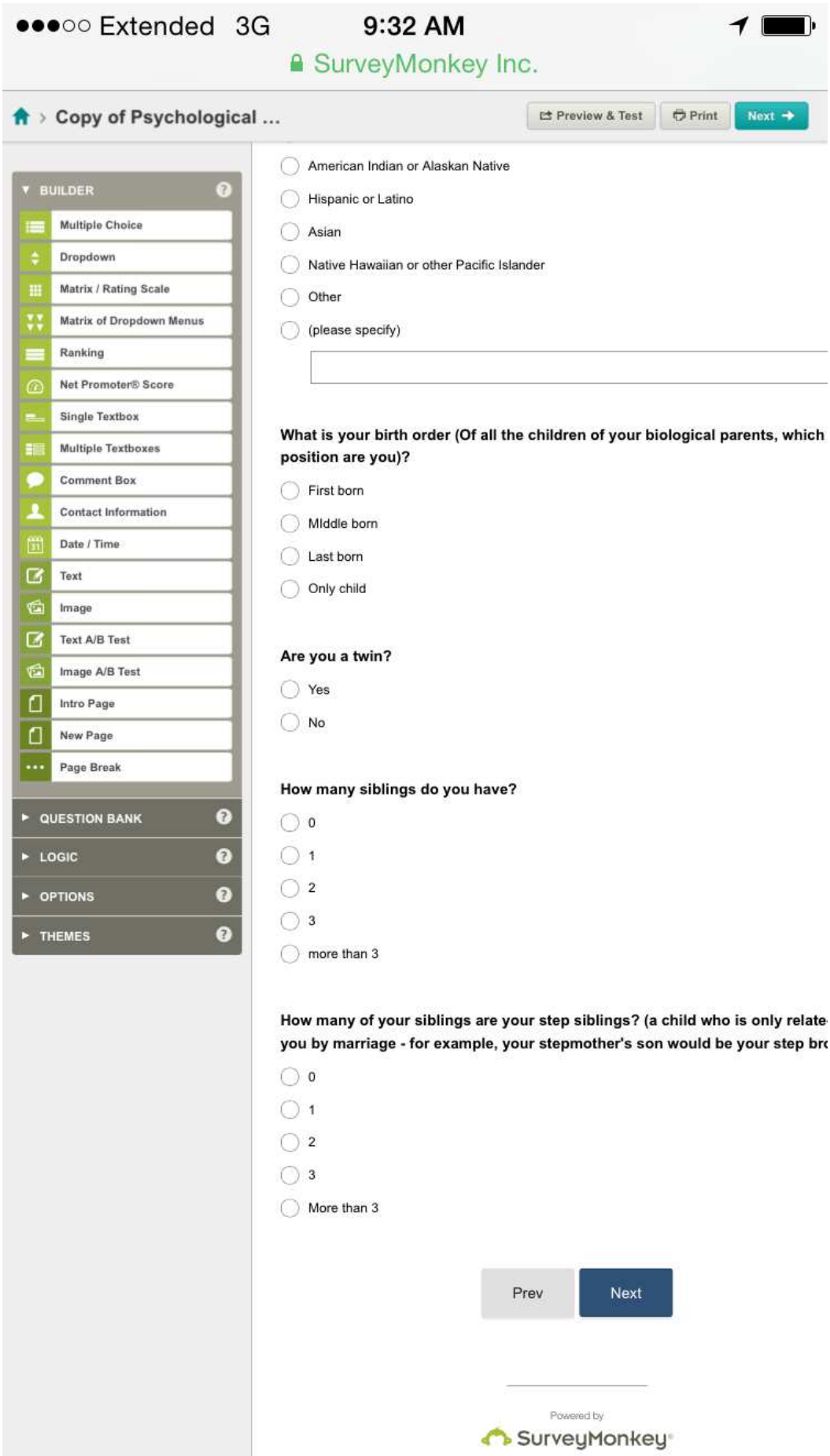
Page Logic
More Actions
P20
I crave excitement and new sensations.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
I worry about making mistakes.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
When I go after something I use a "no holds barred" approach.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
I have very few fears compared to my friends.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
It would excite me to win a contest.
1. very true for me
2. somewhat true for me
3. somewhat false for me
4. very false for me
Prev
Next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QUESTION BANK
LOGIC
OPTIONS
THEMES
American Indian or Alaskan Native
Hispanic or Latino
Asian
Native Hawaiian or other Pacific Islander
Other
(please specify)
What is your birth order (Of all the children of your biological parents, which position are you)?
First born
MIddle born
Last born
Only child
Are you a twin?
Yes
No
How many siblings do you have?
0
1
2
3
more than 3
How many of your siblings are your step siblings? (a child who is only relate you by marriage - for example, your stepmother's son would be your step bro
0
1
2
3
More than 3
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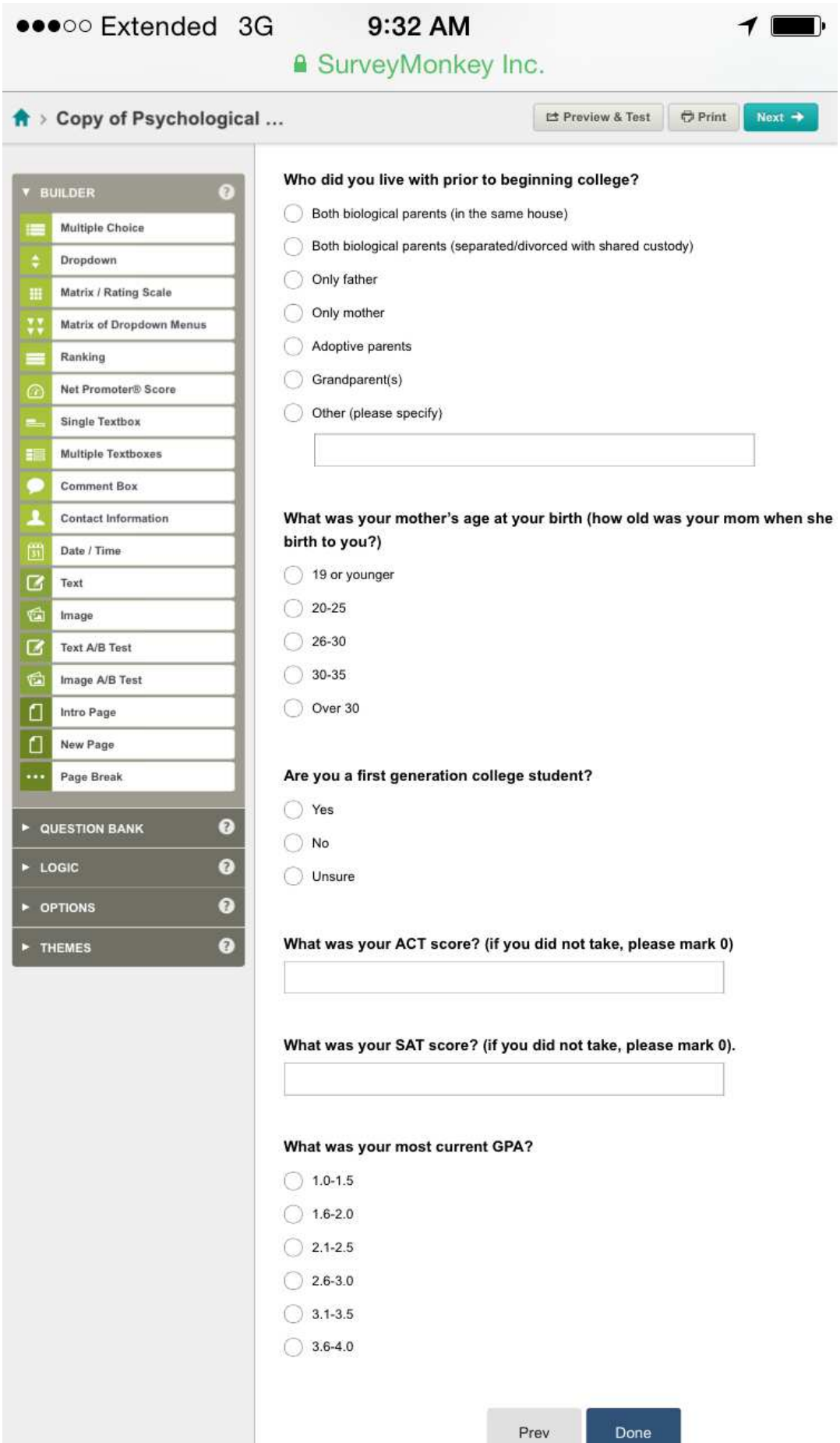
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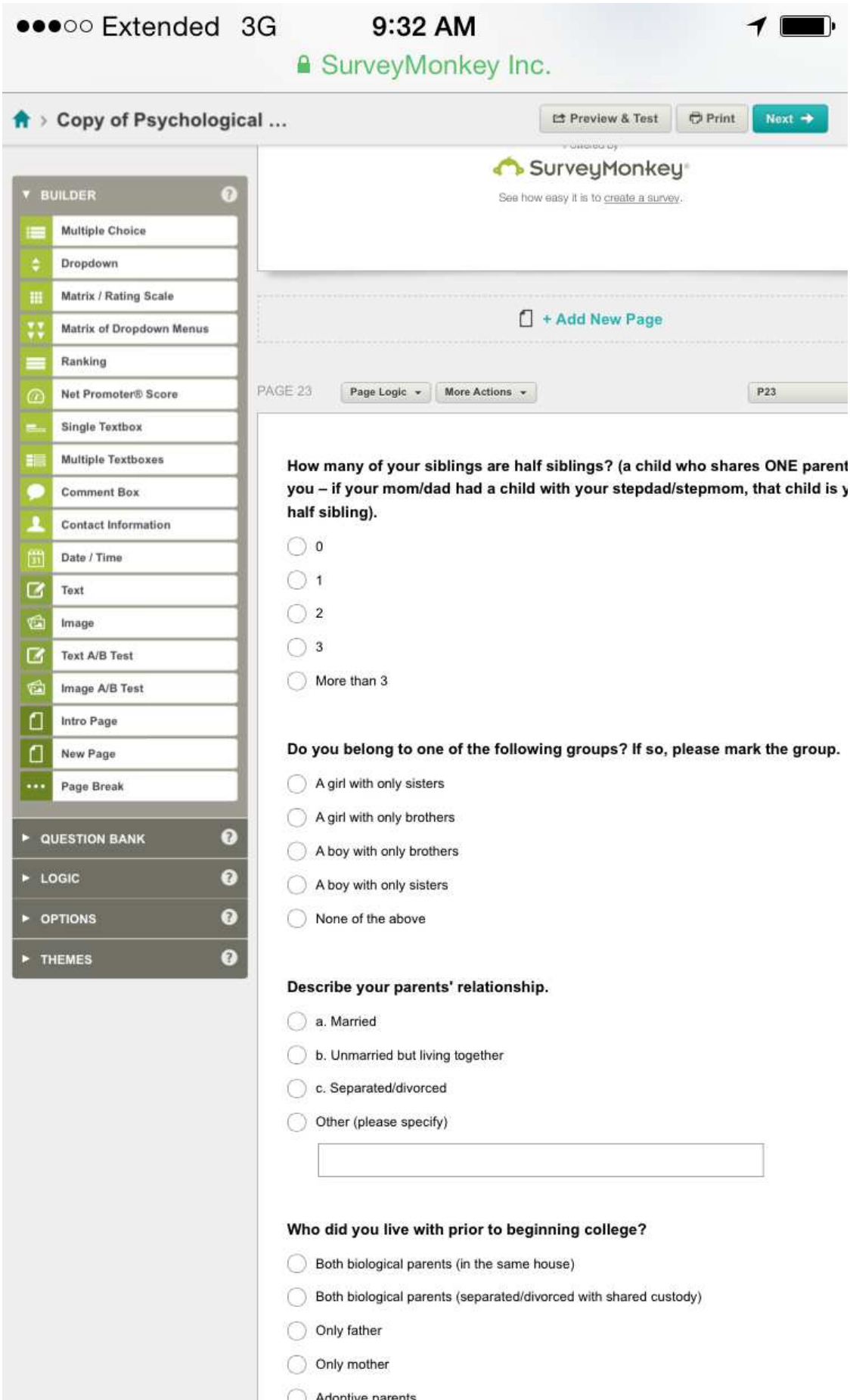
LOGIC
OPTIONS
THEMES
Who did you live with prior to beginning college?
Both biological parents (in the same house)
Both biological parents (separated/divorced with shared custody)
Only father
Only mother
Adoptive parents
Grandparent(s)
Other (please specify)
What was your mother's age at your birth (how old was your mom when she birth to you?)
19 or younger
20-25
26-30
30-35
Over 30
Are you a first generation college student?
Yes
No
Unsure
What was your ACT score? (if you did not take, please mark 0)
What was your SAT score? (if you did not take, please mark 0).
What was your most current GPA?
1.0-1.5
1.6-2.0
2.1-2.5
2.6-3.0
3.1-3.5
3.6-4.0
Prev
Done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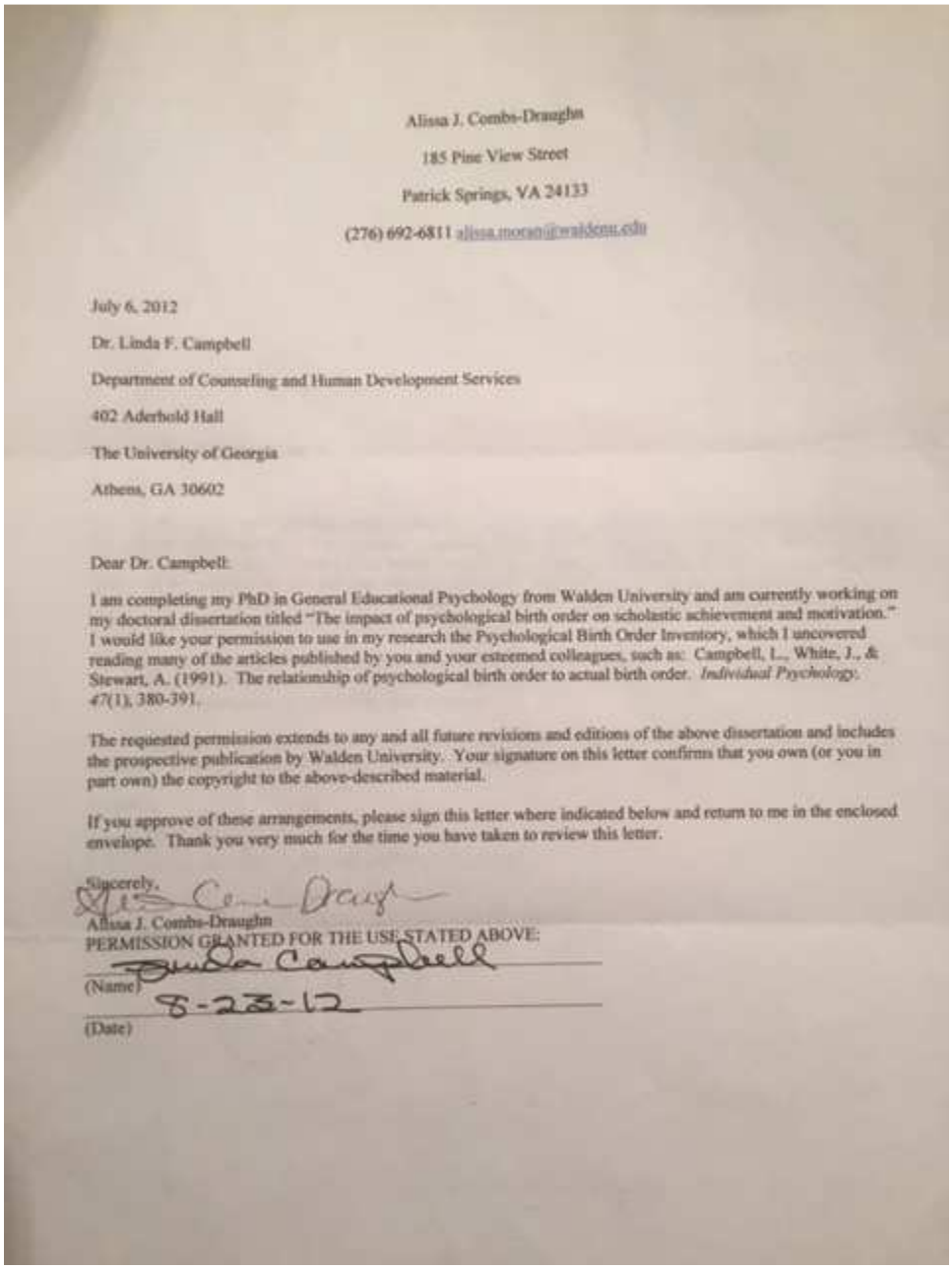
How many of your siblings are half siblings? (a child who shares ONE parent
you – if your mom/dad had a child with your stepdad/stepmom, that child is y
half sibling).
0
1
2
3
More than 3
Do you belong to one of the following groups? If so, please mark the group.
A girl with only sisters
A girl with only brothers
A boy with only brothers
A boy with only sisters
None of the above
Describe your parents' relationship.
a. Married
b. Unmarried but living together
c. Separated/divorced
Other (please specify)
Who did you live with prior to beginning college?
Both biological parents (in the same house)
Both biological parents (separated/divorced with shared custody)
Only father
Only mother

Appendix L: College Board GPA Conversion Chart®

Letter Grade	Percent Grade	4.0 Scale
A+	97-100	4.0
A	93-96	4.0
A-	90-92	3.7
B+	87-89	3.3
B	83-86	3.0
B-	80-82	2.7
C+	77-79	2.3
C	73-76	2.0
C-	70-72	1.7
D+	67-69	1.3
D	65-66	1.0

Letter Grade	Percent Grade	4.0 Scale
E/F	Below 65	

Appendix M: Permission to Use PBOI, Dr. Campbell



Alissa J. Combs-Draughn

185 Pine View Street

Patrick Springs, VA 24133

(276) 692-6811 alissa.moran@waldenu.edu

July 6, 2012

Dr. Linda F. Campbell

Department of Counseling and Human Development Services

402 Aderhold Hall

The University of Georgia

Athens, GA 30602

Dear Dr. Campbell:

I am completing my PhD in General Educational Psychology from Walden University and am currently working on my doctoral dissertation titled "The impact of psychological birth order on scholastic achievement and motivation." I would like your permission to use in my research the Psychological Birth Order Inventory, which I uncovered reading many of the articles published by you and your esteemed colleagues, such as: Campbell, L., White, J., & Stewart, A. (1991). The relationship of psychological birth order to actual birth order. *Individual Psychology, 47*(1), 380-391.

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If you approve of these arrangements, please sign this letter where indicated below and return to me in the enclosed envelope. Thank you very much for the time you have taken to review this letter.

Sincerely,

Alissa J. Combs-Draughn

PERMISSION GRANTED FOR THE USE STATED ABOVE:

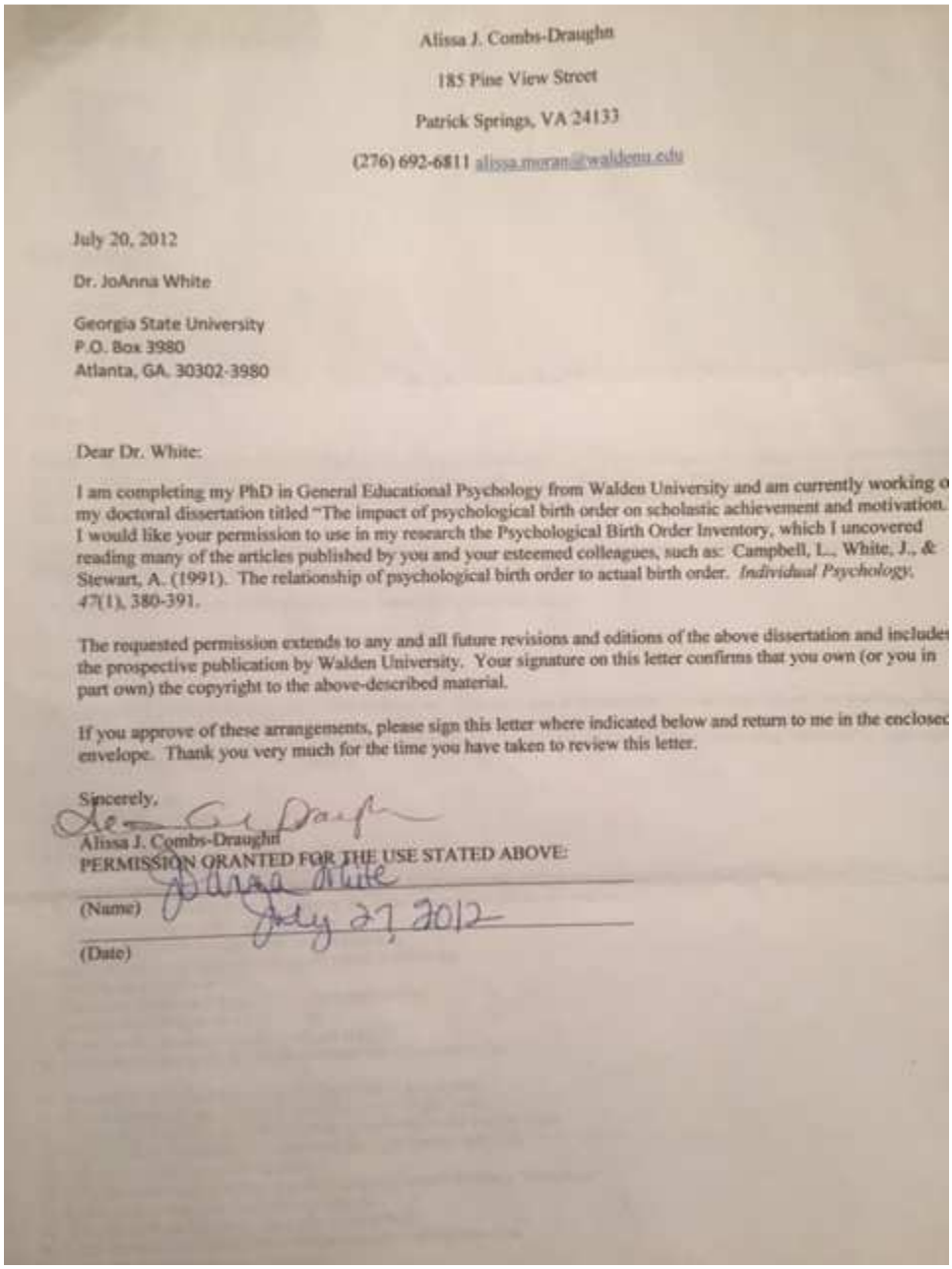
Linda Campbell

(Name)

8-23-12

(Date)

Appendix N: Permission to Use PBOI, Dr. White



Alissa J. Combs-Draughn

185 Pine View Street

Patrick Springs, VA 24133

(276) 692-6811 alissa.moran@waldenu.edu

July 20, 2012

Dr. JoAnna White

Georgia State University
P.O. Box 3980
Atlanta, GA. 30302-3980

Dear Dr. White:

I am completing my PhD in General Educational Psychology from Walden University and am currently working o my doctoral dissertation titled "The impact of psychological birth order on scholastic achievement and motivation. I would like your permission to use in my research the Psychological Birth Order Inventory, which I uncovered reading many of the articles published by you and your esteemed colleagues, such as: Campbell, L., White, J., & Stewart, A. (1991). The relationship of psychological birth order to actual birth order. *Individual Psychology, 47*(1), 380-391.

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Sincerely,

Alissa J. Combs-Draughn

PERMISSION GRANTED FOR THE USE STATED ABOVE:

(Name) JoAnna White

(Date) July 27, 2012

Appendix O: Permission to Use BIS/BAS Motivation Scales

Alissa J. Combs-Draughn

185 Pine View Street

Patrick Springs, VA 24133

(276) 692-6811 alissa.moran@waldenu.edu

July 23, 2012

Dr. Charles S. Carver

Department of Psychology

P.O. Box 248185

Coral Gables, FL 33124-0751

Dear Dr. Carver:

I am completing my PhD in General Educational Psychology from Walden University and am currently working on my doctoral dissertation titled "The impact of psychological birth order on scholastic achievement and motivation." I would like your permission to use in my research the BIS/BAS Motivation Scale, which I uncovered reading many of the articles published by you and your esteemed colleague Dr. White, such as: Carver, C. S., & White, T. L. (1994). Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: The BIS/BAS scales. *Journal of Personality and Social Psychology, 67*, 319-333.

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Sincerely,

Alissa J. Combs-Draughn

PERMISSION GRANTED FOR THE USE STATED ABOVE:

(Name)

(Date) 7/31/12