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Comfort Levels When Presented with Interpersonal Stressors as a Function of Sibling Status

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COMFORT LEVELS WHEN PRESENTED WITH INTERPERSONAL STRESSORS
AS A FUNCTION OF SIBLING STATUS

by

Emma R. Atherton

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of the Requirements for a Degree with Honors
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Abstract

This study was designed to examine how people with siblings and people without siblings (only children) handle situations of interpersonal tension and confrontation. In order to examine this additional data about sibling status was collected via a follow-up survey from participants in a previous study. In the previous study, University of Maine female students were told that they were going to be assessed on a two-minute speech about their future plans and goals by a male participant in another room. Throughout this experiment physiological and self-report measures were taken. The 137 participants in this study were contacted via telephone and email and were asked to participate in the follow-up survey regarding their sibling status. Thirty five women answered the survey, 6 of whom were only children. Most were between 18 and 21 years of age, although one participant was 42 years old. The major hypothesis was that only children would show greater indication of stress than children with siblings. Despite the small sample size, some interesting results were obtained. Although there was no significant difference between those with siblings and those without for the baseline resting blood pressure, we found that during the two minute speech task only children showed a lower mean blood pressure than children with siblings. We also looked at self-report measures and another interesting thing was discovered. Here again, contrary to the hypothesized outcome, children with siblings reported higher depressed mood after receiving critical assessment when compared with only children. Additionally, a significant correlation was obtained between the number of years a participant lived with her siblings and her positivity about the upcoming task as well as her level of certainty with regards to her performance. The longer participants lived with their siblings the more they felt that the upcoming task was

not a positive challenge and the more uncertain they felt about their performance on the task. A stress measure was computed by combining three of the stress questions: 1) the upcoming task is very stressful; 2) a poor performance on this task would be distressing to me; and 3) I think the upcoming task represents a threat. This stress measure correlated with the regularity with which siblings fought. The more a participant reported having fought with siblings, the more stress she reported about the upcoming task. Similarly, there was a positive correlation between the amount siblings fought and their blood pressure in the minute leading up to their speech task. Overall, the findings suggest that the experience with siblings during childhood may greatly affect the way those with siblings handle situations of interpersonal tension later on in life.

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The 2008 U.S. Census Bureau reported that 20% of Americans are only children, a number that is slowly rising as pregnancy in older women becomes more of a trend. Perhaps due to the fact that there are so many more people with siblings than without, there is much more research on the sibling relationship and birth order than on only children. Although only children compose a portion of the population which has been largely ignored by researchers, it is one that is very important and possibly quite different from the rest.

After having participated in an experiment as an undergraduate at the University of Maine, the researcher of the current study grew interested about the effects of interpersonal stress on those with and without siblings. Being an only child, the researcher felt that she might be at a disadvantage when dealing with situations of tension or confrontation, having not had to deal with them as often during childhood.

It is important to note that in this research article the term “sibling” will be used to describe any biological or non-biologically related children who have lived together in the same household for an extended period of time. Similarly, the term “parent” does not necessarily only refer to biological parents but also adopted parents or other primary caregivers. The term “family” will be exclusively used to describe the immediate family within the household, including parents and siblings. Additionally, when referring to conflict within the sibling relationship, this will focus on arguments, tension, confrontation, teasing, etc. However, this does not mean physical or abusive violence.

There is no lack of evidence that families influence a child’s behavior. This is an idea that most family researchers would agree upon. Of course there will always be the

age old question of “nature versus nurture” however, it is widely accepted that the family unit plays a large role in shaping actions and character of their children in interaction with inherited temperamental predispositions. Well known psychologist, Sigmund Freud based much of his psychosexual developmental theory on the early influences of parents on a child’s life. Currently, the media today is riddled with stories of young addicts that have experienced some kind of family tragedy early on in their life.

More specifically parents can have a great impact on the way a child grows up and lives his or her own life. Parents act as role-models, care takers, rule enforcers and even sometimes friends. Simply the quality of the relationship between a parent and child can influence the rest of that child’s life. As stated by Whiteman, McHale and Soli (2011), the quality of the parent- child relationship can have a great impact on the quality of sibling relationships. Emotionally secure parent-child relationships generally result in similar sibling relationships, whereas unstable parent child relationships can lead to other less satisfying sibling relationships.

One way in which parents impact a child’s life is through their own actions. Many researchers have found that the way in which parents handle certain stressful situations serves as a model for how their children will react in similar situations. Whiteman, McHale and Soli (2011) found that parents who modeled effective conflict resolution techniques within their marriage had a great influence on their children’s actions. Similarly Kramer, Perozynski & Chung (1999) found that parents who demonstrated adequate conflict resolution skills helped their children to learn effective resolution strategies as well.

Dunn and Munn (1985) also found that family conflict was generally the earliest exposure that a child had to conflict management. Because of this, it is quite common that children learn conflict management skills through watching and listening to how their parents interact with one another and with their siblings. More specifically children learned through observation how to listen to others, construct persuasive arguments, explore different points of view and reach toward resolution. Learning these skills at an early age is extremely beneficial to a child and can be used not only within the family but later on in life in other social situations (Eisenberg & Garvey, 1981)

Hartup (1989) summarizes many of the positive influences that family has on a child's life. Hartup writes:

Recent studies have suggested that a child's effectiveness in dealing with the social world emerges largely from experience in close relationships. In these contexts language emerges; so does a repertoire for coordinating one's actions with those of others, one's knowledge of oneself, and much of one's knowledge about the world. Relationships may affect these acquisitions because the child spends so much time with significant others. In addition, the transactions a child has within close relationships may also have special significance. (p. 120)

Clearly there are many ways in which the family unit influences their children's actions, social skills and coping mechanisms. I will briefly review literature in several areas of influence germane to this study including sibling relationships, sibling conflict, developmental benefits of sibling conflict, and research on the only child.

Sibling Relationships

As previously stated, family relationships are incredibly influential on a child's development. One relationship within the family structure that is particularly influential is the sibling relationship. There are many ways in which the sibling relationship is different from that of other family members or friends. Siblings serve many roles for one another. They can act as friends, confidantes, role models or even care takers and it is a relationship that lasts a life time.

As stated by Volling, Youngblade, and Belsky (1997) the sibling relationship has many nuances that make it different from other relationships. Unlike other relationships, it is one that does not usually end after an argument or due to some other type of conflict. This is not true of most other relationships. A friendship may end before it reaches a particularly intense level of conflict, but this is not possible for a sibling relationship.

Siblings also shape their own relationships themselves through reciprocal negative and positive reinforcement of one another's actions and through imitating each other (Whiteman, McHale & Soli, 2011). In this way siblings are able to learn and grow from one another's actions both directly and indirectly.

Patterson (1984) discovered the same idea of positive and negative reinforcement patterns. He calls this pattern a "Coercive cycle". An example of the coercive cycle is when siblings learn that by increasing their aggression they often get their way when in conflict with their siblings. Due to the fact that siblings learn that they can get their way through increasing their negativity, the sibling relationship is described by Patterson as a "training ground for aggression". While what Patterson describes is not a positive

outcome, it is clear that the actions of ones sibling's can have a great effect on the development of a child and their ideas of appropriate behavior.

An immense amount of research has been done on the effects of siblings on one another and the sibling relationship itself. Whiteman, McHale & Soli (2011) stated that the sibling relationship "...can be seen as a forum for social learning processes..." (p.21). Dunn (1988) stated that the specific quality of the sibling relationship can directly influence ones views and interactions with the rest of the world. However, it is important to look more deeply into specific facets of the sibling relationship that might be particularly influential to a developing child.

The quality of the sibling relationship can also influence the development of ones own personality. As stated by Whiteman, McHale & Soli (2011), Alfred Adler wrote about the effects of sibling conflict on the individual development of the child. He claimed that conflict is often a result of feelings of inferiority. In hopes of reducing the competitive nature of this relationship siblings often de-identify and develop their own unique personalities, different from their siblings. This is just another example of the incredible influence that siblings have on one another's development.

From the literature previously discussed, as well as from everyday life experience, it is evident that families, and more specifically siblings, have a great impact on a child's life. From this perspective it is interesting to look at aspects of the relationship that might have the greatest impact. Although there are many dimensions to the sibling relationship, a particularly common activity between siblings is conflict or argument. This is something that can be expected and is quite normal, especially in childhood (Dunn, 1983).

Sibling Conflict

There are many reasons why conflict within the sibling relationship is so unique. As previously stated, one unique feature of sibling conflict is that it is particularly intense (Volling, Youngblade, & Belsky, 1997). This intensity is due to many factors. The first being that the sibling relationship can not end after it has reached a certain level of conflict intensity, particularly in childhood. This is not true of other relationships such as friendship or romantic relationships (Bedford, Volling & Avioli, 2000).

Other factors contribute to the intensity of the sibling relationship. These include: 1) The extreme familiarity and physical closeness (usually living in the same home) of siblings; 2) parental expectation that there will be conflict between the siblings (Brody & Stoneman, 1987); 3) power between siblings not being equally distributed (Katz et al., 1992); and 4) and a long term, highly intense, forced relationship between siblings that occurs before sufficient social skills can be learned (Newman, 1994).

Dunn and Slomkowski (1992) explain that one of the earliest signs of social understanding starts with teasing which is a frequent occurrence in children as early as 16-18 months. Teasing demonstrates an understanding of what will upset and frustrate another child. Teasing is frequently seen in conflict between siblings. Teasing between siblings involves actions such as taking away a sibling's comfort object during a fight or exposing the other sibling to a feared object.

Campione-Barr & Smetana (2010), found that while sibling conflict was a common occurrence in the sibling relationship, it is generally more frequent than it is intense. In addition to this, they also discovered that arguments between siblings were

more often regarding possessions and invasion of one's personal domain as opposed to more substantial things such as equality and fairness.

There are many reasons for the frequency of conflict between siblings. As emphasized in research by Stocker, Dunn and Plomin (1989), one of the major reasons for conflict between siblings is the differential treatment of them by parents. In families where a parent, or more specifically a mother, shows more love or affection towards one child, less friendly and more conflictual sibling relationships have been reported (Brody, Stoneman & Burke, 1987).

Sibling conflict is often the result of many other factors within the family. Grych and Fincham (1990) found that marital conflict can often lead to adjustment difficulties in children and in turn sibling conflict. Insecure attachment in infancy can also lead to sibling conflict (Volling, 2001).

Stocker, Dunn and Plomin (1989), discovered that another factor that was correlated with sibling conflict was the personality characteristics of each child. In this study, families were visited in their homes and were videotaped for 30 minutes while performing different activities. There were six different play settings and the settings were designed to explore different aspects of the interaction between siblings.

In this video setting, Stocker, Dunn and Plomin (1989), discovered that the temperament of each sibling had a great effect on the sibling relationship as a whole. If older siblings displayed shy tendencies, this was correlated with less controlling and competitive sibling relationships. If the younger sibling showed more anger and emotional intensity, this would often lead to a more competitive sibling relationship. Similarly, Brody et al. (1987) found that during an observational session, children who

were emotionally intense, highly active and less persistent were more agonistic toward their sibling than children who did not possess these qualities. There are many reasons for the intensity level that is inherent in the sibling relationship, however, as stated by many researchers, this is a perfectly normal aspect of this type of relationship.

It is evident that families and siblings have a large influence on the development of a child. It is also clear that a certain degree of conflict within the family, specifically between siblings, is normal. However, what this study seeks to answer is what kind of effect does sibling conflict have on the development of a person both socially and personally? Is conflict beneficial to a child's development or is it detrimental to a child's future? These and other questions are ones that have been explored by many other researchers.

Developmental Benefits of Sibling Conflict

The current literature on conflict and tension specifically between siblings shows that this type of interpersonal stress has a tremendous effect on development. Conflict can be both beneficial and detrimental to a person's health, but nonetheless it is extremely influential. There are many ways in which this type of intense social interaction can effect a person's development.

One way that conflict is beneficial is through the outcome of personal self-improvement. Well known psychologists Erikson and Piaget both wrote about these types of benefits. Erikson (1959) discussed that both inner and outer oriented conflicts can help to develop a healthy personality "with an increase of sense of inner unity, good judgment, and an increase in the capacity to do well..."(Erikson, 1959, p. 51 as cited by Bedford 1998). Piaget explained that information that is incompatible with what we know and

understand challenges us intellectually and requires us to change and adjust to these differences.

Kohut was another well known psychologist and theorist who discussed similar ideas. Kohut stressed the idea of optimal frustration which said that in order to develop healthily, children need to experience a moderate level of frustration in their lives. Sibling conflict and tension could be an example of moderate frustration, which would help a child's development in the way that Kohut describes.

As previously mentioned, Alfred Adler also discussed the benefits of sibling conflict. Adler believed that rivalry between siblings resulted in de-identification of the siblings. In order to overcome feelings of inferiority, each sibling develops their own individual habits and personality traits that are specific to themselves. This de-identification process also helps to lessen competition between siblings (as cited in Whiteman, McHale & Soli, 2011). Other researchers similarly found that sibling conflict contributed to children's adjustment as opposed to the idea that problematic adjustment contributed to later sibling conflict (Stocker, Burwell, Briggs, 2002).

Bedford, Volling and Avioli (2000) were interested in the positive aspects of aversive sibling experiences. Specifically they wanted to study the ways in which siblings gained positively from these often negative sibling interactions. In their research of this idea they came across childhood sibling literature that described various benefits of conflict in sibling relationships. The researchers used these benefits to categorize responses from their empirical study.

Specifically, Bedford, Volling and Avioli in their descriptive study posed two questions to the participants. Participants were asked whether the stress that was

produced from sibling conflict in childhood was beneficial to them at the time or even when looking back at it retrospectively. Participants were also asked whether current sibling conflict had any positive effects on them. If the answer to either of these questions was affirmative, then the participants would be asked what the benefits of these conflicts were.

Bedford, Volling and Avioli found that there were many different benefits of conflict within the sibling relationship. They categorized these benefits into four groups. The benefit groups were:

- 1) links with children's social competence in the form of conflict resolution, tolerance of negative affect, and social understanding, such as affective perspective-taking, and recognizing ambivalent emotions,
- 2) self-development as self knowledge and identity formation,
- 3) the quality of the sibling relationship,
- and 4) sensitive and skilled parenting. (p. 59)

The results of this study demonstrated that a moderate amount of sibling conflict does in fact have beneficial qualities. Of those who responded to the study, only 22.5% reported no benefits, 35% of respondents reported one or two benefits and 44.5% of participants named three or more benefits. Of the four categories of benefits, personal development was the most reported benefit.

As displayed by the data in Bedford, Volling and Avioli's study, the benefits of conflict between siblings were immense. More specifically, these researchers discovered that self-control, compromise, self discovery, self defense, toleration of negative affect, affective perspective taking, social understanding, honest communication and improved

parenting skills were just a few of the many benefits that came from sibling conflict (Bedford, Volling & Avioli, 2000).

Many other researchers have found similar benefits resulting from sibling conflict. Under the category of self-improvement, Dunn and Slomkowski (1992) found that during sibling conflict, children became more aware of themselves and concerned with defending their self-interest. They also found that arguments between siblings (but not between mother and child) helped children learn to see things from another person's perspective or another point of view.

Hetherington (1988) also described the many benefits of conflict between siblings. Hetherington states that a sibling relationship that is both nurturing and yet conflictual, can provide the benefits of understanding others emotionally, the ability to manage anger and resolve conflict, as well as the ability to provide comfort to others. Hetherington also states that siblings who have been involved in this type of conflictual yet nurturing relationship are more socially skilled and have more positive relationships with their peers as compared with those children who have not experienced this type of relationship.

Cohen, Kessler and Gordon (1995) define stress as an experience where "environmental demands tax or exceed the adaptive capacity of an organism" (p. 3). They also say that when faced with a potentially stressful situation, one consults their coping responses. If the situation requires more than they feel they are able to cope with then they experience stress. However, if one does feel that they have the coping methods required to deal with the situation, then no stress response occurs.

This idea of appraising stress is one of the fundamental ideas that will be tested in this study with relation to sibling status and interpersonal stress. When confronted with a possibly stressful situation, will students with siblings feel stress or will they consult the coping methods that they have previously used in similar situations with their siblings? Will students who are only children show a stress response due to the fact that this is a situation that they have not dealt with as often?

Students with siblings, having developed and grown up in an environment which most likely included moderate conflict, may have adapted the coping mechanisms to deal with this type of situation. According to Cohen, Kessler and Gordon's (1995) definition of stress, this would mean that students with siblings would show less of a stress response to situations to which they have adapted.

Other studies have shown that after experiencing intense conflict, children learn ways to avoid it in the future (Brown & Dunn, 1996). These avoidance mechanisms may include learning to see the motivation and feelings behind another person's actions, learning patience, and learning self-control (Katz et al., 1992).

In the study by Bedford, Volling and Avioli (2000), participants discussed the benefits of sibling conflict. Several participants expressed that they learned that it was okay to disagree with their siblings, it was okay to discuss their disagreement, and it was helpful to understand that they did not have the same point of view on everything. Another participant indicated that he learned how to express himself more effectively and to develop better arguments. It is clear that the experience of conflict leads to understanding and further development in children who have dealt with it in the past.

There is an abundance of research and literature on the roles that siblings play in one another's lives as well as how conflict influences this relationship and a child's development. However, there is far less information about only children or singletons. This could be due to the fact that there are many fewer only children than children with siblings. As previously stated, according to the U.S. Census Bureau (2008) 20% of American children are singletons. This number has been rising however, primarily due to the fact that more and more women are waiting longer to have children (U.S. Census Bureau, 2008 as cited in Mancillas, 2011).

Research on the Only Child

The term only child can either mean literally a child without siblings or a child who is very far apart in age from their sibling or siblings. This is something that many other psychologists have discussed. Alfred Adler (1931) explained that a large span of time between the birth of children can result in the children having similar characteristics to that of an only child. Other psychologists have specifically said a 6-7 year age difference is the number of years that essentially give a child the singleton effect (Forer, 1969).

The role of the only child is one that can be both very advantageous as well as often detrimental to the development of the child. They generally receive the full attention of their parents, while not having to compromise or compete with another child or children in their household. However, many early psychologists strongly believed that being a singleton was seriously harmful to the child. This is a stereotype that is still very present today despite the fact that much research has challenged these early stereotypes.

Roberts and Blanton (2001) interviewed 20 only children regarding their experiences as only children. When asked what they believed the advantages of being an only child were, one of the most common answers was that they did not have to engage in competition or arguments with a sibling. They also often mentioned that not having to share their parents attention and resources with a sibling allowed them to engage in more activities than they might be able to with another child in the house (Roberts & Blanton, 2001).

While it may seem that not having to compete or argue with a sibling would be a benefit of being an only child, it may also be looked at as detrimental. Kitzmann, Cohen and Lockwood (2002) found that only children were not as well liked by their peers in comparison with their classmates who had siblings. The researchers also found that only children were described by their peers as being more aggressive and victimized.

Kitzmann, Cohen and Lockwood concluded from this information that one of the benefits of having siblings is the ability to practice negotiation and conflict resolution skills as well as other more general social skills. Only children are at a clear disadvantage with regards to this social ability. While they do experience conflict resolution with their parents, it is a very different experience and one that is less applicable to social situations with peers.

There have been very few studies that have compared social skills and sibling status. The majority of research in this particular area has been done on families with multiple children and the effects of birth order on child development (Kitzmann, Cohen, & Lockwood, 2002). However, the few studies that have compared social skills and

sibling status have discovered similar results to the previously mentioned study by Kitzmann, Cohen and Lockwood (2002).

Perner, Ruffman, and Leekam (1994) found that preschool aged children with siblings showed better perspective taking abilities than their peers who were only children. Similarly Baydar, Greek, and Brooks- Gunn (1997) found that children who experienced the birth of a sibling initially displayed more conflict and withdrawal in social settings. However, when given time to adjust, they showed better interactions with their peers than those children who had not experienced the birth of a sibling.

In a study by Phillips and Phillips (1994), achievement attribution and sibling status was studied and compared. The researchers discovered that the firstborns and only children showed much more internal attribution than their middle and later born peers. These firstborn and singletons took on much more responsibility for their actions and performance on tasks than the other participants. From these data, the researchers concluded that firstborn and only children could be described as “seclusive, serious and less socially oriented than later borns” (p. 122). Due to the fact that they place much less of an emphasis on external factors, Phillips and Phillips concluded that firstborn and only children became stressed more easily and were less likely to accept help from others.

The results of the studies mentioned suggest that only children may be at a disadvantage socially. While there are many benefits of not having to compete for resources or attention with another child, the sibling research as well as the singleton research seems to overwhelmingly support the positive aspects of having siblings. Based on the abundance of literature that states this, the hypothesis of this study is that when faced

with a situation of interpersonal tension, only children will display more signs of stress both physiologically and through self-report.

METHOD

Participants

Participants were female psychology department subject pool participants at the University of Maine. They were originally recruited via email after completing a prescreening questionnaire for a study run by Professor Shannon McCoy looking at the resilience of women who have been evaluated. This prescreen contained questions regarding opinions on ideology and meritocracy.

That study was conducted in 2009-2011; this follow up study was approved by the University of Maine Institutional Research Board for the Protection of Human Subjects in Fall 2010 (Appendix A). Subsequently participants were again contacted via telephone and then an email, which requested that they complete a short survey related to the experiment in which they had previously taken part. As incentive to participate in this survey participants were told their names would be entered to win in a lottery. Of the 137 students contacted, 35 responded. Of those 35, 6 were only children and 29 had siblings. Approximately 94% of the participants were between 18 and 21 years of age with one participant who was 42 years old. Additionally, 97% of participants were white/Caucasian while 3% were Native American.

Measures

Feelings at the Present Moment Questionnaire. This is a 44 item self-report survey designed to measure the participants feelings at the present moment. Each item is rated on a 7-point Likert scale ranging from 0 (not at all) to 6 (very much) and

participants are instructed to indicate the extent to which each item describes how they are feeling. Examples of items include “Happy”, “Attentive”, and “Anxious” (Appendix C).

Pretask-Appraisal: Impression Formation. This is designed to measure how the participant feels about the task they are going to complete. Each item is rated on a 7-point Likert scale ranging from 0 (Strongly Disagree) to 6 (Strongly Agree). Examples of items include “The upcoming task is very demanding” and “I am very uncertain about how I will perform during the upcoming task” (Appendix D). There was also a Post Appraisal which was essentially identical. However, it measured how the participants were feeling regarding the task they completed, looking back at it retrospectively. Examples of items are “The previous task was very demanding” and “I am very uncertain about how I performed during the task” (Appendix E).

Procedure

The majority of this methods section comes directly from Dr. Shannon McCoy’s study at the University of Maine. The procedure occurred as follows. Upon arrival to the lab, participants were taken into a small room to review the informed consent. They were then told that the study was examining ‘how people form first impressions of others’. Participants were then told that there was a male participant in another room with whom they would be interacting throughout the session. The participant then completed an initial self-report which measured their current mood.

Cardiovascular system reactivity was measured via measures of blood pressure, electrocardiograph (ECG) and impedance cardiograph. In order to measure blood pressure a wrist cuff was used. Spot sensors were placed on the lower left leg and the

right arm for the ECG, and for the impedance cardiograph, four Mylar band sensors were placed around the participants neck and torso. All of the sensors were applied by trained female experimenters. Readings were taken several times a minute during the session. The readings focused on in this study were at baseline, the minute before the speech task and two minutes during the speech task. The baseline measure was collected over the first five minutes while the subjects were at rest.

After this, participants were told that the goal of the experiment was to look at the formation of first impressions based on a limited amount of information. Participants were then told that they would either be giving a speech on their future goals or evaluating the other participant's speech on the same topic. All participants were "randomly" assigned to the speech-giving task.

Participants then completed an evaluation of the upcoming speech task. They then performed their speech and heard a recording of the "other participant's" evaluation of their speech. This evaluation involved critical assessment. Participants then completed a post task evaluation. After completing the post task evaluation, participants were asked to engage in a word search task with the "other participant". This section of the study will not be used for the present research. Following the word search task, participants completed questionnaires which measured their current emotional state as well as their state of self esteem.

In order to collect the additional data used for the present study, 137 of the participants from Dr. McCoy's study were contacted via the contact information that they provided during the pre-screen process. They were initially contacted by telephone and were told that a survey would be coming to the email which they provided. They were

then emailed with a link to the survey as well as the incentive to participate in the study which stated that if they completed the survey they would be entered into a lottery for a chance to win a gift card.

Participants were given between a week to two weeks to take the survey, and those who did not were contacted a second and third time. The survey which was used included an informed consent document and a short questionnaire regarding their sibling status. These items are included in Appendix F.

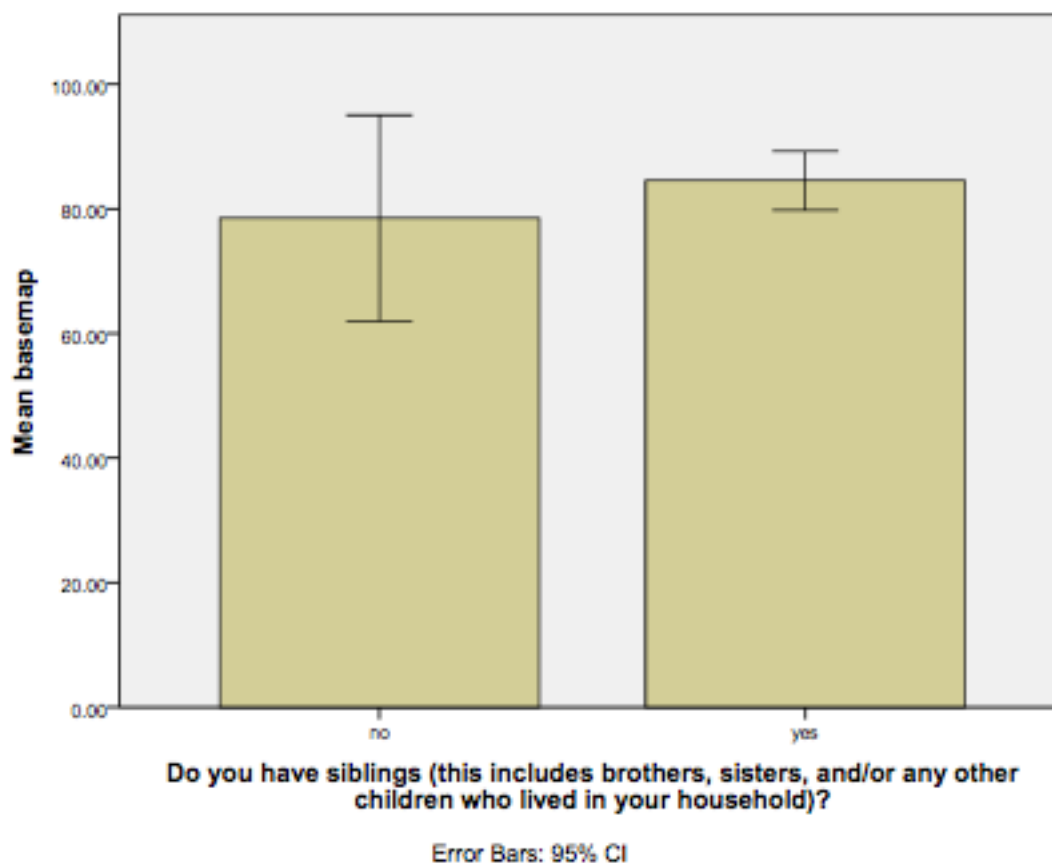
RESULTS

Analyses involving comparisons were conducted using T-tests, whereas analyses of continuous variables were conducted using Pearson correlation coefficients. Group comparisons all involved contrasting children without siblings and children with siblings. Continuous variables included questionnaire responses regarding family dynamics and outcome measures. Statistical tests were conducted using the conventional $\alpha=.05$ level. Several outcome variables that were analyzed did not show significant differences. These include blood pressure measures at some points throughout the study, heart rate data, cardiac output and some self report- measures. Statistically significant results will be featured in this results section.

In order to test the hypothesis that children without siblings would show less of a stress reaction than children with siblings, T-tests were conducted on the blood pressure data. The blood pressure variables analyzed were mean arterial pressures which include both the systolic and the diastolic blood pressure values. Two blood pressure variables were examined. The first blood pressure variable was the baseline value, calculated as the mean for the first five minutes of the study while the participant was at rest. There was no

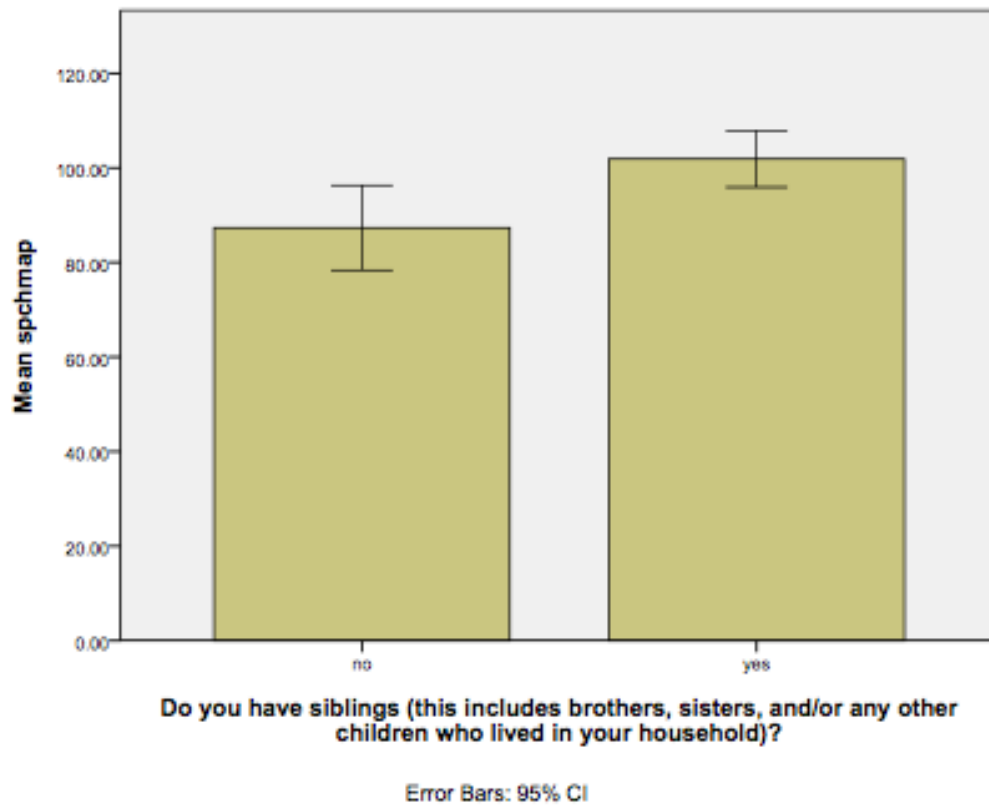
significant difference for the baseline blood pressure for only children ($M=78.5$ mmHg) and children with siblings ($M=84.6$ mmHg), $t(32) = -1.049$, $p=.302$ as shown in Figure 1.

Figure 1.



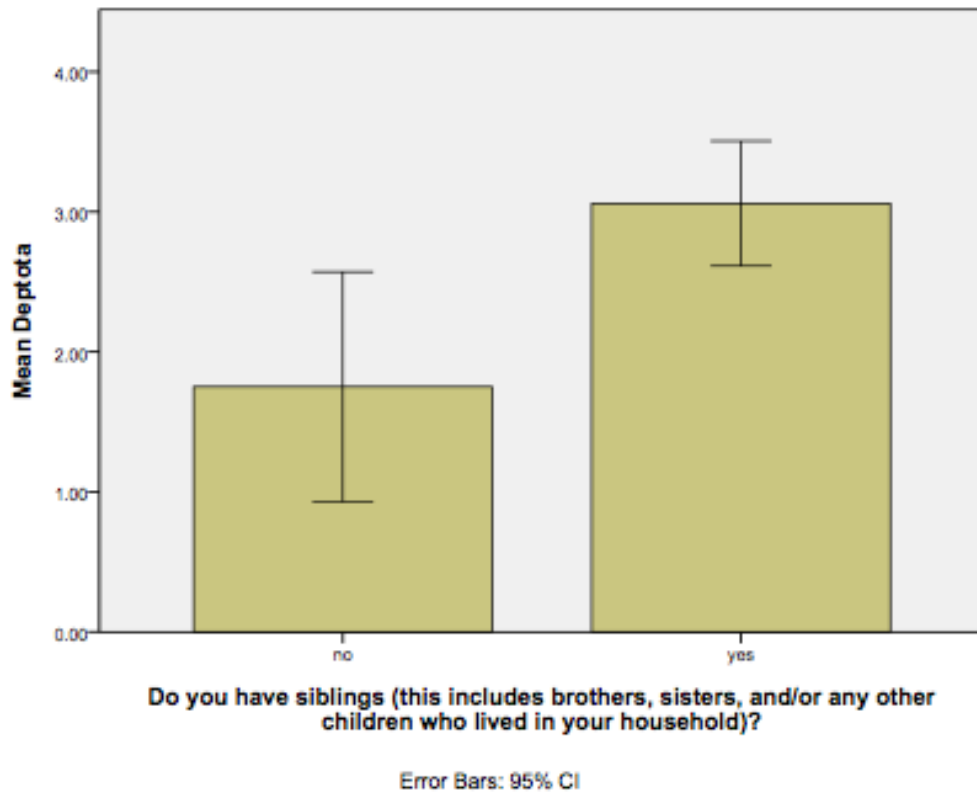
The second mean arterial pressure value used for analysis was a calculation of the mean across a two-minute span of time while the participant was performing her speech. This measure was the focus of the first hypothesis. However the significant difference obtained when looking at a t-test of participants' blood pressure while they made their speech was contrary to the hypothesized outcome as seen in Figure 2. The average blood pressure over the two-minute speech was higher in children with siblings ($M=101.9$ mmHg) than in only children ($M=87.3$ mmHg), $t(28) = -2.391$, $p=.024$.

Figure 2.



T-tests were also conducted in order to compare the two conditions with regard to self-report measures of depressed mood. The depressed mood measure was made up of four items on a current mood states evaluation. One significant result was observed for the measure of the following items: confident, proud, content and depressed. The first three items were recoded. Following the critical evaluation which participants received after having made the speech, children with siblings reported higher depressed mood ($M=3.1$) compared with only children ($M=1.8$), $t(31) = -2.452$, $p=.020$ as displayed in Figure 3.

Figure 3.



Correlational analyses were conducted (two-tailed) to relate questionnaire and physiological data. The self-report measures showed similar trends to the physiological data. A positive correlation was obtained between the number of years a participant lived with her sibling and her level of certainty with regards to her performance. The Pearson Correlation on a pre-task appraisal form showed that the longer a participant reported having lived with her sibling(s), the more uncertain she felt about her performance ($r=.417$, $p=.030$). In addition to this, the correlation analysis also showed that the longer participants lived with their siblings the more they felt the upcoming task was not a positive challenge ($r= -.353$, $p=.071$).

A stress measure was completed by combining three of the stress questions on the pre-task questionnaire: 1) the upcoming task is very stressful; 2) a poor performance on this task would be distressing to me; 3) I think the upcoming task represents a threat. The resulting stress measure correlated with the regularity with which siblings fought. The Pearson correlation showed that the more a participant reported having fought with siblings, the more stress she reported about the upcoming task ($r=.463$, $p=.011$). Similarly, there was a positive correlation between the amount siblings fought and their blood pressure in the 1 minute leading up to their speech task ($r=.461$, $p=.015$).

Discussion

In the current study, college age women performed a speech on their future goals and plans. After performing this task, they received critical assessments. The hypothesized outcome of this experience was that women who were only children would show more signs of physiological stress as well as reporting higher levels of anxiety. However, this was not the case. As displayed by the data, the opposite was found. Students with siblings displayed higher blood pressure, reported more depression after having been critiqued and reported more stress the more they fought with their siblings.

Both of the group conditions (only child vs. child with siblings) started out with baseline mean arterial pressure measures that were not significantly different. This finding was important in order to continue to examine and compare blood pressure measured at other times throughout the study. While blood pressure remained similar for the two groups throughout the study, one place where we did find a statistically significant difference was during the two minute speech task. Having started at around the same baseline blood pressure, while performing the speech task, children with

siblings showed higher blood pressure measurements than only children. Greater blood pressure increases are generally accepted as a reliable physiological indication of stress (Cohen, Kessler & Gordon, 1995).

Blood pressure also varied depending on the amount that participants reported having fought with their siblings. The more participants reported fighting in their sibling relationship, the higher their blood pressure was during the one minute before the speech task. This may have been due to the fact that they understood they were going to be assessed post-task, which may have triggered some type of unconscious competitive defense mechanism.

With regard to self-report measures, there were similar trends as were displayed in the physiological measures. Following the critical assessment that participants received regarding the speech task, participants filled out a current mood states assessment form. On a measure made up of items which indicated depressed mood (some of which were recoded), children with siblings reported higher depressed mood than children without siblings.

The level of security and positive outlook with regards to the speech task was also dependent on the length of time children with siblings lived together. Prior to performing the speech task, participants filled out a pre-task appraisal form. One of the items on this form stated "I am very uncertain about how I will perform". We found that the longer a student lived with their sibling(s), the more uncertain they were about their performance. Similarly, another item on the pre-task appraisal form stated "I view the upcoming task as a positive challenge". On this item we found that the longer a student lived with their sibling(s) the more they did not see the task as a positive challenge.

On the same pre-task questionnaire, three items were combined to make a stress measure. These items included “the upcoming task is very stressful”, “a poor performance on this task would distress me”, and “I think the upcoming task represents a threat”. We found that the more often siblings reportedly fought, the more stress they reported regarding the upcoming task. This may have again been some type of unconscious competitive habit.

There are many factors that may have contributed to the current findings. Firstly, as stated by many family researchers, one of the benefits of being an only child is not having to compete for the attention of ones parents (Roberts & Blanton, 2011). This may allow the only child more opportunities to engage in more realistic adult social interactions and to learn from watching their parents in social situations. Additionally, Roberts and Blanton (2011) state that another benefit of being an only child is not having to compete for parent’s resources. The ability to participate in more activities and experience a wider range of things might also expose only children to things that children with siblings do not get the opportunity to experience.

As previously stated, Campione-Barr & Smetana (2010) found that sibling conflict is frequent but not usually intense. This finding supports the results of this study in that those with siblings may not necessarily be immune to conflict but may be used to the frequency of it. The display of anxious symptoms such as higher blood pressure may be due to the competitive nature that has developed within them after years of sibling conflict.

Another reason why the results of this study may have been different than hypothesized could be due to the fact that only children can not rely on simply socializing

with their sibling(s). They are often forced to engage socially with many different types of people of various ages and backgrounds. This may expose them to situations of various intensities that could be seen as a training ground for future social interactions.

Limitations of the present study

While the present study has produced interesting and unexpected outcomes, we would like to acknowledge some of the limitations of the present study that may have affected the results. Certainly one of the largest limitations is the small number of participants. This may have greatly affected the results of the study particularly due to the fact that there were so few only children involved. Further research with a larger number of participants would be optimal.

Another limitation of the present study was the lack of gender, age and race diversity. One of the most obvious reasons for this is because it is difficult to generalize the data to the greater population when it is coming from such a small sample. Though this study did not focus on differences in sibling relationships between different racial groups, cultural differences may play a role in how siblings treat one another. Having a variety of cultures represented in the data would have been beneficial.

Another reason why the lack of diversity limits the study is due to the fact that age and gender changes the dynamic of the sibling relationship greatly. Whiteman, McHale and Soli (2011) found that children with siblings of the same gender are often more sensitive to rivalry and competition. This study focused solely on women due to the nature of the original study. Men were not represented as participants and this can be viewed as a limitation. Additionally, some of the women in this study may have had same sex siblings, opposite sex siblings, or both. This was not something that was asked in the

survey that the participants took. Not assessing this is, in retrospect, another limitation of the present study.

Another gender related factor is with respect to the nature of the method of stress induction. All the women in the study were told that a male participant would assess their speech. The fact that they received critical assessment from a male may have affected the way in which they reacted to the stressful stimulus.

Age is another factor that is influential in the sibling relationship. Stocker, Burwell and Briggs (2002) discovered that younger siblings were generally more influenced by their sibling relationships than older siblings were. Having had varying ages of participants may have been beneficial seeing as younger participants may presently continue to be strongly influenced by their siblings, more so than older participants. Additionally, there were women in the study who were eldest, middle and youngest siblings. While this was a question that was asked in the survey, due to the small sample size we were not able to compare birth order. There is a tremendous amount of literature discussing the effects of birth order. This was also something that Alfred Adler wrote about. Each child (youngest, middle and oldest) shows different characteristics from one another. Often eldest siblings show trait characteristics that are similar to only children, and even more so depending on the age differences between themselves and their siblings. For these reasons having had a more diverse sample of different age participants as well as analyzing the birth order factor, would have been beneficial to the study.

That interpersonal stress was induced in only one way is another limitation of this study. The paradigm used in Dr. McCoy's study is a well-established model for stress

induction. However, it may have been beneficial to use several different types of stress induction. Perhaps face-to-face confrontation would have produced different results. However, exposing participants to interpersonal stress in an ethical fashion is a difficult task.

One of the strengths of the present study is the variety of types of stress measures. As stated by Cohen, Kessler and Gordon (1995), a common problem of stress studies is that many of the stress measures are measuring identical concepts of stress. This study assessed different forms of physiological stress responses as well as varying self-report measures. In this way, we were able to examine changes in stress response in many different forms.

Though it is obvious that there are limitations to the present study, the hope is that we have been able to inform those who are interested in the topic and those who intend to conduct further research. While the hypothesized outcome was not supported, the results of this study have told an interesting story that we hope will spark a curiosity in others. As previously stated, the comparison of only children and children with siblings with regard to personal development and social skills, is a topic that has not be widely researched. However, the family relationship, and the sibling relationship in particular, is one that is incredibly influential to all that are involved, and it is one that should continue to be examined in more detail.

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Appendix: A

Addendum to “Meritocracy and Physiology” 2008-08-08

1. We are adding Emma Atherton as personnel to the project. Emma is an undergraduate research assistant who will be completing an honors thesis within our lab. For her undergraduate honors thesis project Emma Atherton is interested in assessing the relationship between birth order and women’s acceptance of negative feedback and their interpretation of sexist remarks. Gender identity may be another possible moderator on women’s response to sexism which we would also like to assess at the same time.
2. We would like to gain approval to contact participants via First Class who previously participated in the Meritocracy and Physiology study. We will be sending them a link to a Survey Monkey questionnaire with 5 questions assessing birth order and 20 questions assessing gender identity (attached). On the informed consent (attached) participants will be asked to indicate consent by entering their name. This will be used for matching purposes. Everyone who has participated in the Meritocracy and Physiology study will be eligible to participate.
3. When contacted participants will be informed that they are eligible to participate in a raffle for one of four \$25 Best Buy Gift cards in exchange for their participation in a brief 5-10 minute survey. Once participants consent to participate (enter their name in the informed consent page) they will automatically be entered. Thus participants who stop at any point during the survey will still be entered into the raffle.
4. The primary investigators (Shannon McCoy & Ellen Newell) will be responsible for matching information from subjects’ online survey and experimental session. Participant names will not appear in the data set. Subjects’ names on the informed consent survey will be used for matching purposes once matching has occurred names will immediately be deleted consistent with what is currently approved under the confidentiality section of the IRB.

Appendix: B

Informed Consent

You are invited to participate in a brief research project being conducted by Shannon McCoy, an Assistant Professor, Ellen Newell, a graduate student, in the Department of Psychology and Emma Atherton, an honors undergraduate student, as part of her honors thesis at the University of Maine. You are receiving this email because you previously participated in a study on "First Impressions". We would like to ask you a few follow up questions with regards to this previous study. This study will consist of a 5-10 minute online survey examining family dynamics (e.g. birth order) and feeling towards your gender group. You will receive one entry into a drawing for one of four \$25 best buy gift cards for your participation in this study.

What Will You Be Asked To Do?

If you decide to participate you will be asked to answer a series of questions about your family dynamics (e.g. Do you have siblings (this includes brothers, sisters, and/or any other children who lived in your household)?). You will also be asked a series of questions about your feelings towards your gender group (e.g. Being a woman is an important reflection of who I am). It will take approximately 5-10 minutes to complete this study.

Risks

- There is the possibility that you may become uncomfortable answering some of the questions. If at any time any question makes you feel uncomfortable you can skip it or end your participation in the study by clicking to the end of the survey.

Benefits

- There are no direct benefits to you from participating in this study. Your participation will however provide us with important information about women and birth order.

Compensation

As compensation you will receive one entry into a drawing for one of four \$25 best buy gift cards for your participation in this study. The drawing will take place at the end of the spring semester 2011.

Confidentiality

Your IP address will not be recorded. Your responses will be kept on a secure server or a password protected computer database. Your names will be used to match the online subject data with your experimental subject id. Once matching has occurred your name will not appear in the file. Your name and subject id will be kept separate from your responses in a password protected file on a secure computer in a locked laboratory. Only the primary investigators will have access to match names and subject ids. All data will be kept indefinitely.

Voluntary

Your participation in this study is completely voluntary. If at any time you choose to end your participation, you may stop without loss of compensation (you will still receive entry into the raffle). You may skip any questions that you do not wish to answer.

Contact Information

If you have any questions about the study, please contact Ellen Newell at ellen.newell@umit.maine.edu or Shannon McCoy at shannon.mccoy@umit.maine.edu. If you have any questions about your rights as a research participant please contact Gayle Jones, Assistant to the University of Maine's Protection of Human Subjects Review Board, at 207-581-1498 (or e-mail gayle.jones@umit.maine.edu.)

UMaine Institutional Review Board Approved for Use Through 09/18/2011

Appendix: C

Feelings at the Present Moment

Below is a list of different feelings that people sometimes experience. Please indicate the extent to which each item describes how you are feeling *Right Now* – that is *At This Moment*.

	0-----1-----2-----3-----4-----5-----6
Not at all	Very much
_____ 1. Happy	
_____ 2. Attentive	
_____ 3. Anxious	
_____ 4. Interested	
_____ 5. Afraid	
_____ 6. Disappointed	
_____ 7. Satisfied	
_____ 8. Distressed	
_____ 9. Excited	
_____ 10. Pleased	
_____ 11. Angry	
_____ 12. Upset	
_____ 13. Strong	
_____ 14. Hopeless	
_____ 15. Enthusiastic	
_____ 16. Jittery	
_____ 17. Sad	
_____ 18. Guilty	
_____ 19. Content	
_____ 20. Relaxed	
_____ 21. Nervous	
_____ 22. Determined	
_____ 23. Proud	
_____ 24. Tense	

- _____ 25. Successful
- _____ 26. Unhappy
- _____ 27. Scared
- _____ 28. Hostile
- _____ 29. Inspired
- _____ 30. Troubled
- _____ 31. Ashamed
- _____ 32. Active
- _____ 33. Glad
- _____ 34. Miserable
- _____ 35. Irritable
- _____ 36. Alert
- _____ 37. Humiliated
- _____ 38. Rejected
- _____ 39. Displeased
- _____ 40. Embarrassed
- _____ 41. Understood
- _____ 42. Accepted
- _____ 43. Confident
- _____ 44. Like a failure

Appendix: D

Pretask Appraisal: Impression Formation

Please write a number before each statement to indicate how you are feeling right now regarding the task you are about to complete.

0-----1-----2-----3-----4-----5-----6
Strongly Disagree Strongly Agree

- ____ 1. The upcoming task is very demanding.
- ____ 2. I am very uncertain about how I will perform during the upcoming task.
- ____ 3. The upcoming task will take a lot of effort to complete.
- ____ 4. The upcoming task is very stressful.
- ____ 5. I have the abilities to perform the upcoming task successfully.
- ____ 6. It is very important to me that I perform well on this task.
- ____ 7. I am the kind of person that does well in these types of situations.
- ____ 8. A poor performance on this task would be very distressing for me.
- ____ 9. I expect to perform well on this task.
- ____ 10. I view the upcoming task as a positive challenge.
- ____ 11. I think the upcoming task represents a threat to me.

Appendix: E

Post Appraisal: Impression formation

Please write a number before each statement to indicate how you are feeling right now regarding the task you just completed.

0-----1-----2-----3-----4-----5-----6
 Strongly Disagree Strongly Agree

- ____ 1. The previous task was very demanding.
- ____ 2. I am very uncertain about how I performed during the task.
- ____ 3. The previous task took a lot of effort to complete.
- ____ 4. The previous task was very stressful.
- ____ 5. I had the abilities to perform previous task successfully.
- ____ 6. It is very important to me that I performed well on this task.
- ____ 7. I am the kind of person that does well in these types of situations.
- ____ 8. A poor performance on this task would be very distressing for me.
- ____ 9. I performed well on this task.
- ____ 10. I viewed the previous task as a positive challenge.
- ____ 11. I think the previous task represented a threat to me.

Appendix: F

Birth Order Questions

1) Do you have siblings (this includes brothers, sisters, and/or any other children who lived in your household)?

no-0 yes – 1

2) If you answered yes, please indicate your birth order by selecting the appropriate choice

youngest	middle	oldest	Not applicable
1	2	3	4

3) If you answered yes, what was the maximum amount of time in years that you lived with any of these siblings or other children?

___ years

___Not Applicable

4) How close do you feel your relationship is with your siblings?

0-----1-----2-----3-----4-----5-----6
Not close Very Close

5) How often did you and your siblings fight growing up?

0-----1-----2-----3-----4-----5-----6
Never Very Often

Author's Biography

Emma Rose Atherton was born in New York City on June 16, 1989. She grew up in New York City and graduated from Convent of the Sacred Heart in June of 2007. She went on to start her undergraduate education at Bennington College in Vermont and after a year there transferred to the University of Maine. She went on to study Psychology at UMaine in Orono. Her undergraduate years have been marked by her three-year experience in the University Singers and experiences performing with the School of Performing Arts. She is a member of Phi Beta Kappa. Upon graduating, Emma will be working as a wardrobe intern at the Glimmerglass Theater Festival in Cooperstown, New York for the summer.