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**Birth order characteristics of monozygotic and dizygotic twins**

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**The University of Arizona, 1991**

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**BIRTH ORDER CHARACTERISTICS OF  
MONOZYGOTIC AND DIZYGOTIC TWINS**

by

**Trudell van Burkleo Hampton**

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**A Thesis Submitted to the Faculty of the  
SCHOOL OF FAMILY AND CONSUMER RESOURCES  
In Partial Fulfillment of the Requirements  
For the Degree of  
MASTER OF ARTS  
WITH A MAJOR IN COUNSELING AND GUIDANCE  
In the Graduate College  
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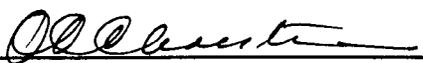
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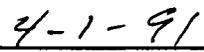
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**Chris**

**Betty**

**Jim**

**Buck**

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**Sabina**

**Mothers of twins**

**My deepest thanks.**

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### ABSTRACT

This study used a questionnaire designed to identify Adlerian birth order characteristics in twins. One hundred and ninety ( $n = 190$ ) mothers of twins completed surveys requesting general demographic information as well as descriptive accounts of each sibling within the family constellation. An adjective checklist of birth order descriptors was completed for each twin. The resulting data were statistically analyzed using Friedman and Nemenyi's tests to compare the number of characteristics associated with birth order categories for each ordinal position.

Results seemed to indicate that twins display Adlerian birth order characteristics indicative of their ordinal placement though this was not the case for every position. The largest number of characteristics for three out of five ordinal positions were those of "youngest." In contrast, twins uniformly scored lowest on "middle" characteristics.

## CHAPTER 1

### INTRODUCTION

**That is special which is out of the ordinary; that is particular which is considered in and for itself, as contrasted with others of the sort.' Twins are special. Each twin is particular (Gehman, 1965, p. 9).**

Myth and mystery have frequently accompanied the phenomenon of twin-ship. There exists a massive body of twin lore, fables, and fiction--rich in descriptive accounts of 'magical' twins (Rosambeau, 1987).

Twin divinities are commonly encountered in ancient narratives. Apollo and Diana, Romulus and Remus, and Castor and Pollux are several of the remarkable twin pairs popular in Greek and Latin mythology (Gedda, 1961).

These early sagas often emphasized the differences in character between the twins. In Scandinavian legend, the gods Balder and Höder came to deathly blows over romantic interest in a beguiling goddess. Höder, though blind, slew Balder (Watson, 1981).

The Bible is another source of early descriptions. Jacob and Esau, twin sons of Isaac and Rebecca, were the first notable pair. Their differences became apparent prior to birth as both struggled within Rebecca's womb to be first born (Watson, 1981).

"And the first came out red, all over like a hairy garment; and they called his name Esau. And after that came his brother out, and his hand took hold of Esau's heel; and his name was called Jacob" (Gen. xxx; Gedda, p.18).

A legend often recounted in similar style and theme among various Native American tribes originated with the Pueblos. It described an original pair of humans,

similar to Adam and Eve, who produced five sets of twins. Widespread myths among these tribes recount the conflicts between the first and second born twin. The hero is generally the first born. The second born is often depicted as a wicked scoundrel having recourse to sorcery and magic (Watson, 1981).

Myths displaying hostility to or fear of twins could probably be attributed... to such factors as: inadequate food supply; the need to deny that humans bear the kind of litters that many animals do; the mother's presumed adultery; concern for the overburdening of a mother whose work was needed to ensure tribal survival; a nomadic or other such precarious existence; and birth order quandaries in tribes which revered their elders (Cassill, 1982, p. 9).

Often the arrival of twins signified evil omens and portents for the family and tribe.

"The fear of producing twins was so great that Hottentots about to marry were said to amputate one testicle in the belief that this would prevent such a misfortune" (Strong & Corney, 1967).

Superstitious fears of incest, adultery, bestiality, and an enemy's malediction supported various forms of infanticide (Gedda, 1961).

Often ". . . the ritual of the tribe demanded the death of the twins and sometimes that of the mother also. Where she was spared she was regarded as having been tainted and was excluded from the tribe altogether. In areas where this has been practiced in the recent past, 'May you become the mother of twins!' is still held to be a very potent curse" (Rosambeau, 1987, p. 14).

The West African Ashanti tribe killed twins born into the royal family, ". . . resolving the problem of succession by killing off the younger twin at birth" (Watson, 1981, p. 70). Only the first born received a name among some of the Zulu tribes of Africa (Watson, 1981). Certain California Indians smothered the second born twin at birth. Because they associated the birth of twins with the multiple births common to the animal kingdom, the Zuni and Navaho tribes killed both twins. This, in fact, was common

practice in tribes as diverse as the Australian aborigines, the South American Indians, and the Eskimos (Rosambeau, 1987).

Until this century, a similar animal association was accepted in Japan. There the mother was regarded as having propagated a litter. The occasion brought humiliation and shame on the family (Ingram, 1988). Twinship was consequently disguised. Similarities were concealed. Twins made separate social appearances. Often one of the pair would be given away (Rosambeau, 1987).

Myths that held twins in high esteem, even deifying them, appeared to grow out of a more stable society in which the arrival of more than one infant at a time threatened neither survival nor long established tribal customs and in which there was a less stringent treatment of females, especially in regards to sexual matters (Cassill, 1982, p. 9).

Where twins were welcome they were expected to fulfill a special role in the tribal ritual and were regarded with respect throughout their lives. Their mother was also highly honored. Among the kaffirs of southern Africa, for example, she was the only women allowed to sit with the men at social gatherings (Rosambeau, 1987, p. 13).

Cultures that heralded the arrival of twins with excitement, celebration, and respect included the Yoruba and Benin of Nigeria, the Dahomeans and Ewa of West Africa, the Baronga of south-eastern Africa, the Kwakiutl, Nootka, Thompson, and Tsimshian Indians of Canada, and the Akwaala, Yuma, and Mohave tribes of the United States (Watson, 1981). These and other tribes viewed twins as important and direct connections to the animal kingdom and nature in general. They were regarded as possessing supernatural powers manifesting in the abilities to control weather and fertility (Ingram, 1988).

Current beliefs and attitudes continue to reflect the essence of fantastic and poetic descriptions of twins. ". . . the usual screen version of twins is either psychopathic or science-fictional in general tone. Many of the film tales of twins wind up with a

confrontation in which one twin is the embodiment of good and the other pure evil " (Gehman, 1965, p. 28).

Though many ancient superstitions have been allayed by modern empirical data, exotic as well as stereotypical views of twins continue to exist. The idea of twinship has strong symbolic power (Rosambeau, 1987).

"We really want to be amazed by their similarity. . . . It seems as though our society expects every twin to do his or her duty as a symbol of closeness. Perhaps this is what is required that they do for the tribe of today" (Rosambeau, p. 15).

And yet twins are unique and different. Their lives begin and are conducted under a set of very different circumstances than those of singletons.

Factors that distinguish twin development include: the reception of curious and often superficial attention--attention that may not be especially sensitive to feelings and needs; the exposure to minimal stimulation and variety due to the interdependence and closeness within twin pairs; the reception of "equal" treatment; and the constant comparisons often magnifying similarities (Koch, 1966). "Differences often are seen as eccentricities and similarities are singled out for approval. Each twin is compared to the other, and in some instances, one comes off as 'second best.' Although twins often try to see themselves as unique individuals, they also recognize that they are part of a whole" (Cassill, 1982, p. xix). Significantly, the most commonly emphasized theme among twins is individuality (Rosambeau, 1987).

"No two human beings are born completely equal or the same--not even identical twins--and it is impossible for two people to live identical lives from birth to death. Every experience changes the course and texture of one's life" (Forer, 1976, p. xiii).

Numerous variables are known to influence individual development. In addition to genetic inheritance, parental attitudes and attention, spacing, physical differences and/or disabilities (Leman, 1985), gender, socioeconomic status, and religiosity (Manaster, 1977) are among the many contributing factors shaping personality (Forer, 1976).

Alfred Adler, the founder of Individual Psychology, was the first to consider birth order as one of the most significant and influential facets affecting self-perception, social relationships, and world view (Croake & Olson, 1977). Adler's initial presentation on birth order was made in 1918 (Ansbacher & Ansbacher, 1956). In 1927 Adler wrote,

An important moment is the position which a child occupied in his family constellation. Frequently we can catalogue human beings according to this view point after we have gained sufficient expertness, and can recognize whether an individual is a first born, an only child, the youngest, or the like (p. 149).

Upon Adler's death, Rudolf Dreikurs became the leading proponent of Adlerian Theory (Corey, 1991). Dreikurs (1956, p. 41) stated that birth order was "the only fundamental law governing the development of the child's character: he trains those qualities by which he hopes to achieve significance or even a degree of power and superiority in the family constellation."

The assumption underlying the theory of birth order suggests that a child specializes in a particular birth order position which, in turn, influences his or her perspective of the world. Resulting attitudes and behaviors correspond to those perceptions. Adlerian theorists "... assume then that children might, or might probably, rise to the common challenges of their own birth order positions. Therefore similarities may be found among persons occupying each birth order position and differences may be found between holders of the various birth order positions" (Manaster, 1977, p. 4).

The Adlerian birth order model identifies five birth order positions: First, second, middle, youngest, and only. Each is representative of specific psychological features, characteristics, or traits (Corey, 1991). These are, in turn, influenced by factors including parental personalities and relationships, socioeconomic factors, religiosity (Manaster, 1977), family size, available role, age and gender difference, extrafamilial competitors, death and survivorship, and special siblings. These factors determine the extent of sibling rivalry, younger and older group classifications, competition for parental favoritism, gender roles, standards of comparison, the creation of special roles, and finally, role conflicts (Shulman & Mosak, 1977).

Twins represent a curious anomaly in birth order research. "They are a twosome that is different from that of any other two siblings. They are together from birth on. There is no real senior or junior, although one will have been born a little earlier than the other" (Toman, 1969, p. 122).

#### Purpose of the Study

Twin studies attribute approximately half of the variance in personality characteristics to a genetic source. The portions of remaining deviations are ascribed to family environment. Those that remain are left unexplained (Scarr, 1981).

The purpose of this study was to determine if Adlerian birth order characteristics would be observed through maternal report of monozygotic (MZ) and dizygotic (DZ) twins--thus providing a partial explanation for the variance in personality traits.

It was hypothesized that the twin delivered first would assume the available position within the existing family constellation at the time of birth. If there were a surviving first born singleton prior to the birth of twins, for example, the first delivered

twin would assume the position of 'middle' child. The twin delivered second would take on the status of 'youngest' within the sibling group. Basic personality traits or differences would then be observed in the case of twins.

### Statement of the Problem

Most scientific studies concerned with twins have been conducted chiefly in order to learn, through them, more about human beings generally. . . . At the same time, most scientists have given little heed to the practical and personal problems going with or faced by twins and not encountered with or by singletons (Scheinfeld, 1966, p. 16).

Considerable research has been conducted on twins as well as on various birth order variables. Pursuing the elusive 'nature verses nurture' controversy comprises the bulk of twin studies while the stereotypical views of researchers color the investigative approach. "Whatever one's view may be on the nature:nurture question, monozygotic twins can be thought of as parallel forms of the same individual and this is extremely handy for the researcher" (Lykken, 1981, p. 362). "Studies of twins exaggerate the degree to which personality differences in the population are explained by genetic differences and underestimate slightly the importance of environmental differences among families" (Scarr, 1982, p. 118).

Birth order research often emphasized the 'first born' sibling position - examining the relationships between personality, achievement, aptitude, and socialization with reference to family constellation. Successive sibship positions receive dwindling consideration. Twinship, if addressed, is given 'honorable mention' in few studies. The results most often reflect conventional views. In The Birth Order Book, Leman (1985) referred to twins as ". . . an interesting mix of competitor and companion. The 'first born' often takes an assertive role of leader while the 'second born' follows along. I say often

but not always" (p. 53). In some studies twin pairs are considered single units and their ordinal position is regarded as that of a singleton. "Twins were the first born children in about 14% of the cases. In two-thirds of the cases twins were second, third, or fourth born children" (Brown, Stafford, & Vandenberg, 1967, p. 1056)

This study addresses the effect of birth order on twins as perceived by mothers.

### Research Hypothesis

The research hypothesis was as follows: The twin delivered first will display characteristics of the birth order position available within the existing sibling constellation at the time of birth regardless of zygosity. The twin delivered second will display characteristics of the next available and consecutive position within the sibship regardless of zygosity.

### Definition of Terms

Because a variety of terms are used throughout this study, the following definitions are provided.

**Adlerian birth order position:** The birth order position one occupies in his/her family of origin. Influential variables of age, family size, extrafamilial competitors, gender differences, death and survivorship, special siblings, and available roles are considered inherent components.

There are five possible birth order positions. The 'first' refers to the oldest of two or more siblings. The 'second' of two or more siblings could be the youngest of two or the middle of three, or the second of four or more in a sibling group. The 'middle' position refers to any child that came after the second born and

before the youngest child. The 'youngest' is the last born of two or more children in a family. The 'only' child has no other siblings.

**Adlerian birth order characteristics:** Personality traits characteristic of a particular birth order position.

**Adlerian theory:** The concepts posited by Alfred Adler that people are self-created with social urges as motivating forces; personality is united and all behavior is purposeful; life expresses goals.

**Available roles:** The niches open to family members and created by family atmosphere and values (Shulman & Mosak, 1977).

**Death and survivorship:** The concept of deceased siblings who are idealized in family myths and used as a standard of comparison for surviving siblings.

**Dizygotic twins:** Twins resulting from the fertilization of two separate ovum. Also known as fraternal twins.

**Extrafamilial competitors:** Extended family members, such as cousins, who are in competition for parental attention (Shulman & Mosak, 1977).

**Family constellation:** Specific family characteristics including family size, gender, values, and personalities.

**Family of origin:** The family of one's birth.

**Family size:** The number of nuclear family members.

**Gender difference:** Sexual distinctions.

**Gender roles:** Patterns of behavior specific to one's sexual identity.

**Maternal report:** Written and reported observations by mothers of twins.

**Monozygotic twins:** Twins resulting from the division of a single fertilized ovum. Also known as identical twins.

**Nature vs. nurture:** The distinction between factors of heredity and environmental influences.

**Nuclear family:** One's parental and sibling group at birth.

**Ordinal:** One's numerical position at birth.

**Parental favoritism:** A parent's preference for a particular child(ren).

**Scored birth order position:** Ranking received as a result of the compilation of tallied percentages of total responses to the adjective checklist used in this study.

**Sibling:** One's brother and/or sister.

**Sibling rivalry:** Competition between brother(s)/sister(s).

**Singleton:** One conceived and born alone.

**Spacing:** Chronological intervals between sibling births.

**Standard of comparison:** Idealized measures of value.

**Special siblings:** Brother(s)/sister(s) affected by mental retardation, chronic physical illness and/or disabilities, unique physical identifiers, etc. (Shulman & Mosak, 1977).

**Twin:** Two born at the same birth.

**Twinning:** The giving of birth to twins.

**Twinship:** The relationship--resemblance and distinction--between a twin pair.

**Younger/older group classifications:** The tendency within large families to classify sibling groups according to age.

### Chapter Summary

Twinning has inspired numerous legends which reflect exotic and poetic beliefs. The essential qualities of those ancient narratives are discernable in current stereotypical views and expectations. Differences were originally emphasized in twin accounts. Over time, this has evolved into a social insistence for similarity.

Of prominent concern among twins is the recognition of individuality within the twin pair. Birth order was considered by Adler to be a prime factor in the determination and distinction of individuality.

Though extensive research has been conducted on birth order factors and twinship separately, studies are rare that combine the two variables.

Determining Adlerian birth order characteristics as displayed by MZ and DZ twins is the purpose of this study. "Twins, and only twins, can allow us to understand . . . how an individuality is formed, an individuality in its relation with others" (Scarr, 1981, p. 228).

Chapter 2 reviews pertinent twin and birth order research. This analysis incorporates the consideration of various interpretations of birth order data including Adlerian, Konigian, and Ordinal paradigms. Limitations to the review are discussed. Research studies considering the birth order of twins are specifically addressed. Included are brief critiques of both the history of twin and birth order injuries.

## CHAPTER 2

### LITERATURE REVIEW

This chapter contains a review of relevant birth order and twin research. It begins with a concise critique of the history of twin inquiries. This is followed by an overview of the origins of birth order theory and research. Distinct birth order theories are examined. These include the Adlerian, Ordinal, and Konigian models. Limitations to the evaluation of birth order research are considered next. Finally, investigations considering the influence of birth order on twins are evaluated. A brief summary concludes the chapter.

#### History of Twin Research

"Long before medicine developed into a full-fledged science, doctors, naturalists, and other scholars focused attention on twin births and attempted to find an explanation for this phenomenon" (Gedda, 1961, p. 21). Explanations extended between the concept of sperm division to the juxtaposition of stars at conception. Until the nineteenth century, twins were in a class by themselves and held an interest all their own. Depending on the circumstances, they aroused either alarm or idle curiosity.

Sir Francis Galton was the first scientist to propose twins as essential components in the nature verses nurture controversy (Gedda, 1961). They represented a perfect set of controlled variables. Scientists were long brewing over the roles of genetic and environmental influences in the determination of individual differences. To date the

majority of twin research studies continue to focus on this debate (Daniels, 1990; Hay & O'Brien, 1983; Lykken, 1982; Torgersen & Kringlen, 1978; Herman, 1964).

"Twins are among the most sought-after subjects for psychological and medical research. Everything about them fascinates researchers--from their footprints to the hair on their heads" (Powledge, 1983, p. 25). "Almost any experiment one might think of doing with human subjects will be more interesting and yield more valuable results if one does it with twins" (Lykken, 1982, p. 361).

During the Third International Congress of Twin Studies held in Jerusalem in 1980, the following were research questions under investigation: What factors influence our selection of mates? Are certain behavior patterns genetically determined? What do the lives of twins reveal about which diseases are inheritable and which are not? What can the habits of separated twins tell us about the dangers of smoking and drinking? Does the enrichment of education change the native I.Q. inherited by the individual? Under what conditions do such maladies as allergies, alcoholism, myopia, depression, or cancer appear to be inherited? And, how much does a poor environment affect the course of creativity? (Cassill, 1982).

Results of twin studies provide revelations about human beings in general. Simultaneously, little heed is given to the advantages and challenges encountered by twins themselves (Scheinfeld, 1967). These benefits and demands impact twin development and give the twinship its particular character. Though they are not exclusive to twinships, they do determine the twin condition. "Although twins have been the subject of considerable research, we know relatively little about the psychological characteristics of twins or the

effects of the twin situation on their development . . . we lack adequate conceptualization of twin development" (Ainslie, 1985, p. 51).

### Origins of Birth Order Theory

Just as Sir Francis Galton figures prominently in the development of twin research, so too does he play an important role in the development of birth order theory.

In 1874, Galton published English Men of Science and noted that eminent British scientists tended to occupy, almost exclusively, the two birth order positions of "only" and "first born" (Altus, 1966). He theorized that this positioning was indicative of differences in parental treatment. "He believed that this was especially true of sons. Galton pointed out that there was a close parental relationship with the first child because he was the only child, at least for a time, and that the first one was given more responsibility" (Forer, 1976, p. 5). Several studies have since confirmed evidence that mothers do indeed relate differently to their first born than to latter born children (Thoman, Turner, Leiderman, & Barnett, 1970; Tulkin & Kagan, 1970; Hilton, 1967).

Striking linkages to birth order were also noted by Havelock Ellis 30 years after Galton discussed his findings. In his book, A Study of British Genius, Ellis reported a higher incidence of genius and eminence amongst first born children than amongst other birth order positions (Altus, 1966). Since Galton's examinations, birth order has been explored as researchers seek to establish ". . . parameters of relationship to developing and crystallized life styles" (Forer, 1976, p. 6).

Alfred Adler, long recognized as the first theorist to consider the impact of family constellation on personality development, regarded birth order not as a determinant of one's basic value to self and/or others, but rather as an exerting influence in the creation

and synthesis of personal identity. The Adlerian view is one of several theories that consider the effect of birth order on personality development.

Adlerian, Ordinal, and Konigian  
Birth Order Theories

Adlerians utilize the term "birth order" in reference to five possible positions within the sibling constellation. These are: only, first, second, middle, and youngest. Each birth order position is assumed to represent certain circumstances and demands, recognizable traits or predictable characteristics. Though these are common to a position, they are distinct from all others. These circumstances, demands, traits, and characteristics flavor the behavior and attitude of each sibling within a constellation. "Birth order is one of the lenses through which children develop a view of themselves and the world, and create their story or identity" (Richardson, 1990, p. 20). Birth order influences one's perceptions of personal goals, orientation, roles, interpersonal responsibilities, and social interactions (Hoopes & Harper, 1987).

General descriptions of the five Adlerian birth order positions within a "normal" family structure are:

1. **Only child:** S/he never had a rival. Peers tend to be curiosities rather than competitors. However, s/he may have been pampered and never learned to share with others.
2. **Firstborn:** S/he once had it all to her/himself and would still prefer to be the first and foremost. S/he tends to feel entitled to rank and privilege.
3. **Second child:** Started late and has to catch up. Someone always seems to be ahead of her/him, a standard bearer against whom s/he measures herself/himself.

4. **Middle child:** There is a standard bearer in front and a pursuer in the rear. S/He is surrounded by competitors. S/He may feel squeezed into a small area in his/her search for a significant place.
5. **Youngest child:** The trail is well broken and the guidelines are clear. S/he is never dethroned. On the other hand, s/he has a lot of ground to cover in order to catch up (Shulman & Mosak, 1977).

Because evaluation of personal development is viewed within a social context, one's family constellation represents the original and primary social field of a child. The identification of birth order positions provides a basis for the examination of sibling relationships (Shulman & Mosak, 1977). "Each sibling is born into a different family. Each new child needs to create a unique identity, separate from the others. But this new identity is created within a context of those who are already there" (Richardson, 1990, p. 3).

That each child of the same family is born into a unique environment is one of the classic descriptions of birth order effects (Shulman & Mosak, 1977).

The people in a family change in many ways between the birth of each child. Their physical circumstances are different, their emotional life is different, and the world around them is different. These differences mean that each child is treated in a different way by parents and siblings, usually unintentionally (Richardson, 1990, p. 3).

Several other basic descriptions of birth order effects include:

1. Greater age difference between siblings seems to reduce conflict and competition.
2. Birth order is an influence not a determinant.

3. **Actual birth order is of no particular importance. Rather it is the psychological environment one encounters at birth and thereafter which has the greatest impact (Adler, 1929).**

Though Adlerians may view order of birth as inconsequential, it is the basis of Ordinal birth order theory. "Ordinal position refers to the actual order in which the child was born; i.e., first, second, third . . . tenth, eleventh, and so on" (Shulman & Mosak, 1977). It is mathematically based. And though it may provide ". . . a reference point for locating the child in relation to siblings as well as adults" (Shulman & Mosak, 1977, p. 114), it does not include in its consideration the physical, emotional, nor psychological environments existing at the time of one's birth and early development. "The situation counts, not the mere order of birth. In a large family a later child is sometimes in the situation of an oldest" (Adler, 1932, p. 111).

Rather than hypothesize that one birth order position could, due to special circumstances, eclipse another position, Konig (1963) posited a different theory. He suggested that triadic patterns of sibling birth order positions established a definite relationship between personality development and the assignation of birth order positions (Konig, 1963).

Unlike the five Adlerian birth order positions, Konig's theory postulates four: only child, first born, second born, and third born.

The first, second, and third positions repeat themselves in a triadic pattern for successive siblings. The first born is described as being ambitious, aggressive, independent, a leader, and a defender of the family's attitude. More casual, leisurely, and harmonious is the second born. The third born is pensive, tends to be a little withdrawn, overly sensitive, and often feels left out and lonely. The other position, that of the only child, is a combination of traits of the first born and the third born (Very & Hine, 1969, p. 94).

The Konigian model is less familiar than the Adlerian and Ordinal models. Nevertheless, it has been the basis of several birth order studies (Very, Goldblatt, & Monacelli, 1973; Very & Prull, 1970; Very & Hine, 1969).

There is no solid evidence supporting the repetition of triadic patterns, according to Simpson (1990). He postulated that this could account for its near absence in research literature.

### Limitations

There is considerable theorizing and research on the concept of birth order within and beyond the greater field of psychology. Over a thousand birth order studies have been conducted in the United States during the past 50 years (Forer, 1977). There exists little consistency in the manner and methods of conducted and reported research (Simpson, 1990). Conflicting views abound. Some authors suggest that birth order theory is vague and incoherent (Ernst & Angst, 1983; Hoopes & Harper, 1990).

Three major limitations were encountered in the preparation of literature for review:

1. A variety of birth order models were used. Only one study identified its theoretical orientation (Very & Hine, 1969).
2. Terminology was used interchangeably. For example, studies identifying themselves as birth order research may in fact be considerations of ordinal position (Koch, 1966; Allen, Pollin, & Hoffer, 1971; Ernst & Angst, 1983; Hay & O'Brien, 1984). Varying terminology included: birth rank (Bossard, 1956; Ernst & Angst, 1983), ordinal position (Adams & Phillips, 1972), order of birth (Altus, 1970), and birth sequence (Brown et al., 1967; Matheny & Brown, 1971; Werner, 1973).

3. Birth order was usually a secondary research variable. Because it was regarded with less emphasis than the primary variable, results concerning its impact in studies were reported sparingly. In one study for example, 78 twin pairs, 49 older siblings, and 26 sibling pairs ranging in age from 3 to 19 constituted the projects population (Sandbank, 1988). Results were reported according to those categorizations and were not particularly useful for this study.

#### Birth Order Studies of Twins

In their study on behavioral differences in twins, Brown et al. (1967) reviewed data from 140 mothers of twins. The children ranged in age from 1 month to 6 years. Birth weight, birth sequence, and behavioral differences were analyzed for interrelation-ship. They concluded that:

While there is evidence that both birth weight and birth sequence may be related to behavioral variables, their influence should not be confounded by assuming a correlation. . . . The only variable which might be construed as a measure of dominance in the present study would be which twin was more successful in getting his way when there was a contest for toys. This variable showed no relationship at all to birth sequence (p. 1063).

Very and Hine (1969) published the only located study in which birth order was the primary variable in an investigation of personality development of twins.

Using the Konigian model to determine if the theory would be applicable to twins, they hypothesized that "the twin actually delivered from the mother first would assume the appropriate ordinal position (first born if there were no prior children, second born if there were one prior child, and the like) and that the twin born second would assume the next ordinal position" (p. 93). Twenty-four twin pairs were evaluated in terms of descriptors identifying each birth order position. Adjectives applicable to the first born

were: leader, responsible, adult oriented, ambitious, mature, and aggressive. Second born descriptors were: cheerful, easygoing, light-hearted, stubborn, gentle, and unconcerned. Self-conscious, withdrawn, immature, quiet, emotional, and distrustful were descriptive of the third born child. The experimenter and mother completed identical checklists. Birth order predictions were based on adjectives checked and were then compared to actual ordinal positions. Results were determined to be significant for birth order matches.

Allen et al. (1971) conducted a longitudinal study of 10 twin pairs. The primary purpose of the study was to clarify nongenetic determinants in personality development. Birth order was one of many variables believed responsible for twin differentiation. Others included birth size, neurological competence, occurrence of a significant traumatic experience, parental linkage, and physical development. The study began with prenatal interviews of the parents. After delivery, infants were observed and nursing staff interviewed. Home visits were then conducted three to four times during the first year. Some of the differences observed in twin pairs were a:

1. clear-cut difference in the relative ease of adaption to new stimuli and, in this regard, a difference in initial fearfulness (dependence-independence);
2. tendency for one twin to be more methodical and thoughtful, the other more excitable and emotional;
3. greater person-orientation (sociability) in one twin and greater object-orientation in the other;
4. tendency for one twin to explore the environment patiently and thoroughly, and for the other to search more actively for some new stimulus;

5. tendency for one twin to be more passive, the other more confident and dominant. Such differences, though often subtle, are frequently clear-cut and impressive (p. 1601).

The authors concluded that twin pairs do not share the same living environment though they live in the same family situation.

They have different experiences, starting with birth. They are viewed and treated differently by their parents, eat different foods, develop at different rates, and often have different physical problems. And within the twin relationship, one twin is frequently more dominant, and/or larger, and/or more social, and/or more independent, and/or more active-curious (p. 1601).

Mathney and Brown (1971, p. 252) hypothesized that "if behavioral differences existed within a twin pair, some of these differences might be accounted for by the within pair birth/weight differences." Data were gathered through maternal interviews. Forty-nine same sex twin pairs with contrasting birth/weight differences were examined in the study. Birth sequence was considered insignificant as a contributor to within pair differences.

Fourteen twin pairs were compared for behavioral differences in a multiracial study conducted in Hawaii (Werner, 1973). It commenced at the twins' birth and continued over a ten year period. Perinatal stress scores, maternal interviews, and various psychological instruments (Cattell Infant Intelligence Scale and Doll's Vineland Social Maturity Scale) were methods used in the study. Werner concluded that birth sequence was related to within pair differences. She noted that first born twins were more active and second born twins were more affectionate and sociable.

In the Showers and McCleery (1984) review of twin literature, a dominant-submissive relationship between twins was proposed. This view echoes Leman's (1985) observations of twin interrelationships.

Many sets of twins have several roles in which one twin is dominant in some, and his/her co-twin is dominant in others. For example, one twin may excel in academics, while the other chooses a more active social life. Some twins demonstrate an alternation of general dominance and submissiveness between them; that is, one may be dominant for a while then switch with his/her co-twin and assume a submissive role (p. 396).

The la Trobe study began recruiting families in late 1978 and currently includes 418 families comprising 375 sets of twins, 7 sets of triplets, 464 siblings, 114 cousins of twins, and 7 survivors of twin pairs where one had died, a total of 1356 children. The children entered the program between the ages of 3 and 15 years and thereafter were tested on successive years with a comprehensive physical and behavioral test battery (Hay & O'Brien, 1984). Noncognitive behavioral data were assessed by questionnaires, the Bristol Social Adjustment Guide, the Behavior and Attitude Checklist, and qualitative scores on the Porteus Maze Test.

Hay and O'Brien (1984) suggested that parents may use birth order as a means of distinguishing twins. Birth order "... seems to be an illustration of the 'subtle differences' between the twins which may have lasting effects on the parents' perceptions" (p. 197).

While examining the influence of twins on family relationships, Sandbank (1988) published a study in which several questionnaires were developed to solicit background information on twins, older siblings, parents, and family interactions. It contained a temperament/personality checklist for both twins. Questionnaires were completed by parents of 78 twin pairs, 49 older siblings and 26 sibling pairs ranging from 3 to 19 years of age. The Bene Anthony Family Relations Test (FRT) was given to 30 older siblings

and 23 pairs of siblings. (The FRT was reviewed as an objective device exploring emotional relationships within the family.) Results indicated, ". . . that weight and birth order can effect not only personality and the way in which twins interact with each other, but can also effect family interaction" (p. 161).

Richardson (1990) predicted that "if there are no other children in the family, twins will act like two siblings of whatever sex they are, without the age conflict" (p. 190). If, on the other hand, the twins are part of a greater sibling constellation, ". . . the twins will both have most of the characteristics of the birth position they share" (p. 190).

#### Research Summary

Though birth order was found to be a possible influence on personality and behavioral distinctions within twin pairs, the extent of its effects are unknown. Whether or not twins occupy the same birth order position as an entity or find separate placement as singletons is also obscure.

#### Chapter Summary

This chapter reviewed pertinent birth order and twin research emphasizing those studies addressing the influence of birth order on twins. A critique of the history of twin research was first discussed. This was followed by an overview of the origins of birth order theory. The three birth order models of Adlerian, Ordinal, and Konigian were examined. Limitations to the evaluation of relevant birth order literature were presented. Specific investigations into the effect of birth order on twins concluded the chapter.

Chapter 3 presents the methodology and procedures utilized in this investigation. The population and sample are describe, instrumentation is identified, and data analyses are discussed.

## CHAPTER 3

### METHODOLOGY

The general approach to this investigation was based on the assumption that the differing birth order positions of MZ and DZ twins could account for behavioral and character variances within the twinship.

The purpose of this chapter is to present and discuss the various methods and procedures utilized in this study. Initially, a synopsis of Chapters 1 and 2 is provided. This is succeeded by descriptions of the population and sample, instrumentation, procedures, and data analyses. A summary concludes the chapter.

#### Background

This study began with a consideration of the legends and stereotypes surrounding the phenomenon of twinship. Chapter 1 also provided an overview of the Adlerian birth order model. It was reviewed as a means of explaining personality variance amongst siblings. It was noted that family environments are altered each time a new sibling enters and assumes a birth order position. One's perception of placement within the family as a child is an important determinate in personality development.

Common terms used in this study were defined. The lack of pertinent research considering the impact of birth order on twins and their twinship was discussed.

It was the purpose of this study to determine if Adlerian birth order characteristics would be displayed by MZ and DZ twins.

In Chapter 2, an indepth analysis of various birth order interpretations was considered. These included the Adlerian, Ordinal, and Konigian models. Twin and birth order research was reviewed historically. Limitations to the consideration of birth order research were evaluated prior to the examination of specific studies.

### Population and Sample

The population of this study consisted of mothers of twins. It was approved by the Human Subjects Committee of the University of Arizona (Appendix A). The sample included 190 mothers, responding to surveys considering the birth order characteristics of 190 twin pairs. The mothers were members of various organizations throughout the states of Arizona and Nevada. They were identified by several "Officers and Information Sheets" provided to the researcher by club officials.

### Instrumentation

A questionnaire (Appendix B) was developed in order to gather observational reports from mothers of twins. Anastasi (1988, p. 643) commented that "maternal observations will yield results unaffected by the presence of an unknown observer. Such observation techniques have proven useful especially if the observer is someone else who fits readily into the normal setting."

A variety of sources was used for the development of the instrument. These included: Corey (1990), Dinkmeyer & Dinkmeyer (1987), Leman (1985), Ainslie (1985), Hay & O'Brien (1984), and Forer (1976).

Information was gathered regarding common factors thought to influence twin development as well as information identifying standard birth order characteristics.

Central to the questionnaire format was a composite checklist identifying birth order characteristics. This was composed of a random assortment of 64 adjectives - each descriptive of one of four birth order positions considered in this study. (The birth order position of "only" was assumed to be inappropriate for inclusion.) Each position was represented by 16 adjectives.

Selection of these descriptors began from a total list of 347 adjectives. These were placed into a card-sort. Two experts in Adlerian theory (Appendix C) were asked to arrange the total number into five categories: "oldest," "second," "middle," "youngest," and "n/a." Adjectives were chosen from matching responses for inclusion in the survey's checklist. Results of the card sort are presented in Appendix F.

The questionnaire solicited information concerning basic demographics, pregnancy, delivery, and hospitalization. It included open-ended questions and requests for descriptions of all the children in the family.

### Procedures

#### **Selection of Subjects**

The population for this study was obtained from Mothers of Twin Club rosters provided to the researcher by club officials. Officers of each club were contacted by telephone and informed of the study. The requested number of questionnaire packets was sent to each officer for membership mailing.

#### **Questionnaire**

A total of 355 questionnaire packets were sent to club officers. The packets included a cover letter to the contacted officer (Appendix D), cover letters to the mothers

explaining the study (Appendix E), and stamped self-addressed envelopes for the return of completed surveys. Two hundred and one questionnaires were completed and returned by the stated deadline. Of these, 11 were determined to be inappropriate for inclusion in the study. One of the 11 was completed 2 weeks prior to the mother's delivery of twins; one described quadruplets as two twin pairs; and in another, the twins were 61 years old and not representative of the sample. The remainder returned incomplete checklists.

### Research Hypothesis

The research hypothesis was as follows: The twin delivered first would assume the birth order position available within the existing sibling constellation at the time of the twin's birth regardless of zygosity. If a first-delivered twin were born into a family where an older singleton existed, for example, that first-delivered twin would assume the birth order position of "middle." The twin delivered second would then assume the birth order position of 'youngest.'

Each birth order position has an associated set of general personality characteristics. For example, the 'first born' is usually viewed as conservative, approval seeking, conforming (Forer, 1976), loyal, and reliable (Leman, 1985). The 'second born' ". . . often develops a personality that is the opposite of the first child's personality, particularly if the two children are close in age and of the same sex" (Dinkmeyer & Dinkmeyer, 1987).

Vulnerable to maladjustment, socially ambitious (Forer, 1976), victim, and martyr (Leman, 1985) are several characteristics associated with the "middle child". The "youngest" may be characterized as spoiled, demanding (Forer, 1976), charming, and absentminded (Leman, 1985).

It is the display of these and other birth order characteristics that was the focus of this study.

### Data Analysis

To test the hypothesis and to answer the questions concerning birth order characteristics of twins, statistical and descriptive procedures were utilized for data analyses.

First, responses to the adjective checklists were tabulated. The position receiving the greatest percentage of total responses was considered the birth order position of each twin.

Next, Friedman tests (Linton & Gallo, 1975, p. 115) and Nemenyi's tests (Linton & Gallo, p. 311) were used to compare the number of characteristics associated with each birth order position and corresponding ordinal positions.

Descriptive procedures were used to report both the data acquired from open ended questions addressing sibling descriptions and to recount information collected from questions specific to demographic data.

### Chapter Summary

Chapter 3 began with a brief review of Chapters 1 and 2. The remainder of the chapter focused on an indepth presentation of the population and sample, instrumentation, and procedures of this study.

The purpose of this investigation was to determine if Adlerian birth order characteristics would be evidenced in maternal reports of MZ and DZ twins.

Two authorities on Adlerian Psychology participated in an adjective card-sort. Matching responses were used in the construction of an adjective checklist central to the study's investigation. Results of checklist responses were tabulated and compared to ordinal positions using several statistical procedures.

Chapter 4 presents the results obtained in the course of this investigation. A review of the hypothesis and procedures are followed by a statistical and descriptive presentation of data.

## CHAPTER 4

### RESULTS

The purpose of this chapter is to present the results obtained in the course of this investigation. It begins with a sample description. A restatement of the hypotheses is included. Statistical and descriptive presentations of collected data follow. Two statistical analyses are examined. Both compare the characteristics of birth order positions with each ordinal position. Unanticipated findings are reported. The chapter concludes with a summary.

#### Description of the Sample

The following information was compiled from responses indicated on surveys used for this study (Appendix B):

The mean age of mothers responding to the survey was 32 (item 1). The mean age of fathers was 35 (item 2). The mean age of twins was three (item 6).

Twin fetuses were medically confirmed at an average of 16.6 weeks into the pregnancy (item 3). First delivered twins averaged 5.41 pounds at birth (item 4). The average birth weight of second delivered twins was 5.47 pounds (item 5). Normal pregnancies were reported by 58% of the mothers (item 8).

Of the twins in this study, 73% were delivered prematurely by an average of 4.3 weeks (item 9 and 10). Of the mothers, 67% reported normal deliveries (item 11). Sixty percent (60%) of the twins were delivered via Cesarean section (item 12). All births occurred in the hospital (item 17) and 70% of the twins accompanied mothers home (item

19). Of those twins remaining hospitalized following delivery, 64% were first delivered twins (item 22). The average hospital stay was 21 days (item 22).

Of the 190 twin pairs taking part in this investigation, 114 (60%) were dizygotic (item 41). Of these, 32 were male pairs, 40 were female pairs, and 41 were male/female pairs (items 4 and 5).

Sixty-six twin pairs were monozygotic (item 34). Of these, 32 were male pairs and 34 were female pairs (items 4 and 5). There were 11 twin pairs of undetermined zygosity. Of these, 6 were male pairs and 5 were female pairs (Appendix G).

Eighty-four twin pairs were the only two children in the family. The remaining twin pairs were part of sibling constellations with an average of 3.5 siblings (Appendix H).

The distribution of ordinal birth positions of individual twins was as follows: 98 were first born; 5 were the second of four or more siblings; 107 were middle born; 84 were the last born of two; and 86 were the last born in sibships of three or more (item 7).

Of the mothers, 66% indicated that they would like to be a twin (item 14); 65% thought that it was important that the twins be best friends while 22% viewed it as unimportant (item 13); 88% recognized different abilities between twins within a pair (item 23); 51% saw the twins as very similar (item 27); 36% did not think the twins were very different from each other (item 35); 20% referred to the pair as "the twins" (item 33) and 80% tried to treat each twin the same (item 37); and 68% enjoyed dressing the twins alike (item 40). Twins had separate bedrooms in 14% of the represented pairs (item 26).

Forty-two (42%) indicated that one of the twins was easiest to care for (item 18). Of those, 60% identified the first delivered twin as the easiest (item 18). Thirty-seven

percent (37%) of the mothers indicated that they felt protective of one of the twins (item 20). Of these, 72% felt protective of the second delivered twin (item 20). Twenty-six percent (26%) felt closest to the second delivered twin (item 15) while 12% felt closest to the first delivered twin (item 31). Twenty-six percent (26%) viewed the first delivered twin as closest to the father (item 21) while 17% viewed the second delivered twin as closest to the father (item 39). Of the fathers, 87% were involved in basic care of the twins (item 24). Ninety-eight percent (98%) of the mothers viewed twins with a positive attitude (items 16, 29, and 38).

### Research Hypotheses

The research hypothesis was as follows:

1. The twin delivered first would assume the birth order position available within the existing sibling constellation at the time of birth regardless of zygosity.
2. The twin delivered second would assume the next available and consecutive position regardless of zygosity.

### Statistical Data Analysis

As indicated, the hypothesis sought to identify direct ordinal and birth order placement of twins within the sibling constellation. Table 1 shows the mean number of characteristics associated with each birth order category assigned to twins grouped by ordinal position. Figure 1 presents the information graphically. Since "lastborn" twins (in families where the twins represent the only two children in the sibship) could also be considered "second", their data are presented separately from "lastborns" in constellations of three or more children.

Table 1

The Number<sup>1</sup> of Characteristics Associated with Each  
Birth Order Category Assigned to Twins Grouped  
by Ordinal Position of Birth

Ordinal Position of Birth	Birth Order Category			
	Oldest	Second	Middle	Youngest
Firstborn (N=98)	5.70 ± 0.34	4.41 ± 0.28	2.46 ± 0.19	5.59 ± 0.26
Second (N=5)	6.40 ± 1.39	6.80 ± 1.09	4.80 ± 0.75	6.40 ± 1.05
Middle (N=107)	5.67 ± 0.27	5.28 ± 0.31	3.55 ± 0.27	6.01 ± 0.24
Lastborn ("Only's") <sup>2</sup> (N=84)	3.89 ± 0.28	4.86 ± 0.35	2.64 ± 0.26	6.66 ± 0.29
Lastborn (not "Only's") (N=86)	4.66 ± 0.25	6.28 ± 0.36	2.71 ± 0.24	7.01 ± 0.27

<sup>1</sup> Values are means ± standard errors of the mean number of characteristics of each birth order category.

<sup>2</sup> "Only's" are families in which the twins are the only children in the family.

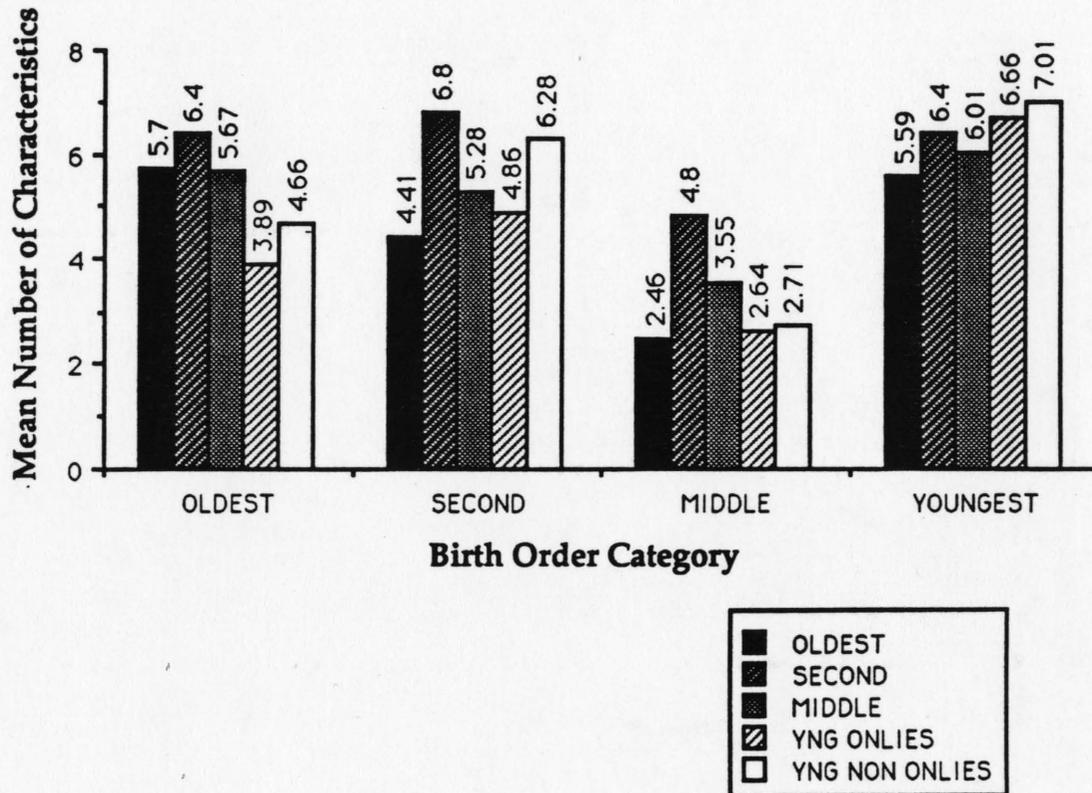


Figure 1. Birth order characteristics of twins grouped by ordinal position of birth

These data were statistically analyzed using Friedman tests to compare the number of characteristics associated with the birth order categories of "oldest", "second", "middle", and "youngest" for each ordinal position. Friedman tests indicated significant differences ( $p < .05$ , all tests) for all ordinal positions except "second." This position had such a small value that the statistical test was of questionable value.

In order to compare the characteristics of each birth order category within each ordinal position, Nemenyi's tests were conducted. The complete results of these tests are presented in Table 2 as pairwise comparisons between birth order categories for each ordinal position. These comparisons exclude the position of "second", since the Friedman test for this ordinal position was not significant.

As shown in Table 1, descriptions of twins tended to incorporate a large number of characteristics of "youngest" children--regardless of ordinal position. In fact, the largest number of characteristics for three out of five ordinal positions ("middle," "last born--only," and "last born--not only") were those of "youngest."

By contrast, twins uniformly scored lowest on "middle" characteristics. This was even true for twins whose ordinal position was "middle," which constituted the largest single group in the study.

In addition to scoring high on "youngest," firstborns also scored high as "oldest." Twins whose ordinal position was "middle" scored high on every category except "middle," which was significantly lower than the other three categories.

"Lastborn only's" scored highest in the "youngest" category, followed by the "second" category. The "lastborns" who were not "only's" scored highest on the "youngest" and "second" categories, which were statistically significant.

Table 2

Summary of Pairwise Comparisons<sup>1</sup> between Birth Order Categories for Each Ordinal Position

**Ordinal Position—Firstborn**

		Oldest	Second	Middle	Youngest
<b>Mean Ranks</b>		3.12	2.35	1.51	3.03
Oldest	3.12	—	0.77*	1.61*	0.09
Second	2.35		—	0.84*	0.68*
Middle	1.51			—	1.52*
Youngest	3.03				—

**Ordinal Position—Middle**

		Oldest	Second	Middle	Youngest
<b>Mean Ranks</b>		2.83	2.50	1.78	2.90
Oldest	2.83	—	0.33	1.05*	0.07
Second	2.50		—	0.72*	0.40
Middle	1.78			—	1.12*
Youngest	2.90				—

**Ordinal Position—Lastborn "Only's"**

		Oldest	Second	Middle	Youngest
<b>Mean Ranks</b>		2.14	2.64	1.64	3.58
Oldest	2.14	—	0.50	0.50	1.44*
Second	2.64		—	1.00*	0.94*
Middle	1.64			—	1.94*
Youngest	3.58				—

**Ordinal Position—Lastborn Not "Only's"**

		Oldest	Second	Middle	Youngest
<b>Mean Ranks</b>		2.23	2.92	1.39	3.45
Oldest	2.23	—	0.69*	0.84*	1.22*
Second	2.92		—	1.53*	0.53
Middle	1.39			—	2.06*
Youngest	3.45				—

<sup>1</sup> Nemenyi's Test. Numbers in the table are the absolute values of differences in mean ranks, \* =  $p < .05$

Data revealed that 75 twin pairs received dual birth order characteristic scores. Sixty-two twin pairs scored highest as "youngest." Eleven twin pairs scored highest as "second." And one twin pair each scored highest as "oldest" and "middle."

### Descriptive Data Analysis

An analysis of the written descriptions of children within sibling constellations revealed characteristics of birth order positions represented in this study. The following are several verbatim maternal descriptions:

#### Family A:

My twins are my only children at the moment. The first born seems to be the leader. He is always telling the other what to do. The second born twin has caught up in weight and is just as smart! Yet he seems to not need me as much as the first one. He is very independent and loves to be around his brother. They play well together most of the time.

#### Family B:

I have three kids--my twins are 4 1/2--identical girls, and my son is 3 1/2. The twins are so different. The oldest is like a little mother. The other is so sweet and into everything. My son - I love him to death, but what a monster!

#### Family C:

My twins have had different personalities since day one. The first twin has always been demanding of attention. The second twin is affectionate. The first twin has excellent reading abilities. The second twin excels in math. The first twin spends a lot of time doing art work and science projects. The second twin loves Nintendo."

#### Family D:

The first delivered twin is a tomboy. She is very active and determined. She will try until she succeeds if it is something she really wants to do. The second delivered twin is very feminine. She loves fixing hair and playing 'mommy' with dolls. She is very neat. She quits easily. And she likes to be babied."

**Family E:**

The oldest twin is outgoing, generally happy and content. The youngest twin is more sensitive, quieter in nature, and more physically explorative.

These brief accounts portray birth order characteristics indicative of each position considered in this study. Though they may not demonstrate consistency with ordinal placement, they do indicate role distinctions within twin pairs.

**Unanticipated Findings**

An occurrence of high "youngest" ("Y") scores was noted for 62 twin pairs. Although the percentage of tallied "Y" responses varied, each twin within the pair received "Y" scores. Of the 62 pairs, 52 received secondary scores accurately ranking their position within the twinship. The first delivered twin score was "youngest"/"oldest" and the second delivered twin score was "youngest"/"second." Of these 52 pairs, 31 were "onlyies," the only two children in the family.

Eleven twin pairs received "second" ("S") scores as their highest birth order ranking. Of these pairs, 6 were "onlyies". Of the 6, "Y" was the secondary ranking of 9 twins and "oldest" ("O") was the secondary ranking of 3. The secondary scores of 3 pairs represented accurate birth order ranking within the twinship.

There were 107 twins in the ordinal position of "middle" ("M"). Twenty-two twins received high "M" scores. Of the 22, 14 scores were actually consistent with ordinal placement. Of the remaining 8, 6 were part of twin pairs in which there was a special sibling. Cerebral Palsy, blindness, hearing loss, asthma, frail health, and developmental disorders were cited as disabilities requiring special care and consideration.

Twenty-two pairs of twins received birth order rankings indicating their position within the twinship while disregarding their placement within the total sibling constellation. Of these 22 pairs, 2 were "onlyies" and comprised a second sibship due to age differentiation of 6 (+/-) years.

### Summary

This chapter has provided an analysis of results obtained in the course of this investigation. An overview of the study was followed by a review of procedures and a restatement of the study's hypothesis. Several statistical analyses were conducted. Data were subjected to Friedman and Nemenyi's tests to determine if birth order characteristics were consistent with ordinal positions.

Unanticipated results were discussed. These included incidents of dual "youngest" and "second" rankings for both twins within a pair, the low occurrence of "M" scores despite substantial ordinal occurrence, and the phenomenon of birth order ranking within a twinship regardless of sibship size.

Chapter 5 summarizes the study's findings. Summaries for Chapters 1-4 begin the consideration. This is followed by a discussion of the study's limitations and implications. The chapter concludes with a consideration of recommendations for further research.

## CHAPTER 5

### SUMMARY

This study proposed an investigation to determine if Adlerian birth order characteristics would be identified in maternal observations of twins. Results would then provide a partial explanation for personality variance within twin pairs.

Chapter 1 examined the exotic and poetic beliefs that comprise twin lore. The modern insistence for similarity between twins was traced back to historical times. The current expectations of similarity within twin pairs replaced an original emphasis on distinction.

Differentiation of individuality was a prime factor in Adler's birth order model. Birth order position was viewed as a significant and influential factor altering self-perception, social relationships, and world view.

A review of pertinent twin and birth order research was presented in Chapter 2. This included brief accounts of the history of twin and birth order inquiries. Examinations of distinct birth order models followed. Adlerian, Ordinal, and Konigian models were compared. Several limitations to birth order research were examined. The absence of uniformity in the use of models, research methodology and reported conclusions were discussed. Terminology that is used interchangeably was seen to confound researchers while creating puzzling results. A review of research linking birth order and twins followed the consideration of limitations.

Chapter 3 presented the methods and procedures utilized in this study. Descriptions of the population and sample, instrumentation, and procedures for data analyses were addressed.

A questionnaire was designed and sent to 355 mothers of twins. 190 were completed, returned, and considered usable for this investigation. Responses to an adjective checklist were tabulated. The birth order position receiving the highest percentage of total responses was considered the birth order score for each twin. Data were then subjected to Friedman and Nemenyi's tests for statistical analyses.

Chapter 4 reported results from the tabulated surveys, and the statistical and descriptive analyses. The largest number of characteristics for three out of five ordinal positions were those of "youngest." Twins scored uniformly low on "middle" characteristics though this ordinal position constituted the largest single group in the study. Those in the "middle" position ordinally scored high on every category except "middle." First borns also scored high as "oldest." The last born of two ("only's") scored highest in the "youngest" category. Last borns who were not "only's" scored highest on the "youngest" and "second" categories.

Unanticipated findings included the occurrence of dual "youngest" ("Y") and "second" ("S") scores within twin pairs, limited "middle" ("M") scores despite ordinal placement, and birth order scores that indicated placement within the twinship while disregarding placement within the total sibling constellation.

### Conclusions

In this section, the hypothesis is reviewed in the light of the study's findings.

### **Research Hypothesis**

The research hypothesis stated that the twin delivered first would display birth order characteristics of the position available within the sibling constellation at the time of birth. The second born twin would assume a successive position with corresponding characteristics.

The results of the present study generally confirm the hypothesis with the exception of twins born into the "middle" ordinal position. That is, firstborns scored highest numerically as "oldest," and last borns, regardless of sibship size, scored highest as "youngest." Even last borns who could have assumed the position of "second" (i.e., the "only's") received significantly higher scores as "youngest." "Middle" born twins, as previously mentioned, scored lowest as "middle," contrary to the hypothesis. "Second" born twins (of four or more) could not be properly evaluated in the present study due to the small sample size.

It should be noted, however, that twin characteristics do not exactly fit the simple model implied by the hypothesis. That is, although firstborns scored highest as "oldest", they also scored very high as "youngest." These two categories were not significantly different statistically. Similarly, last borns who were not "only's" scored highest as "youngest" and also scored high as "second." The two categories were, again, not statistically different.

### **Implications**

#### **High "Youngest" Scores**

The incidence of high "youngest" scores may be partially accounted for by both the large number of "only" twins and the occurrence of dual "youngest" scores received by

both twins within a pair. As was cited previously, 62 twinships were rated as "youngest" regardless of ordinal position and/or sibship size. The tendency for a high "youngest" rating could be indicative of the special treatment and attention accorded twin pairs. That they are singled out and often find themselves as the center of attention is a position familiar to the last born child within a family constellation.

### **Low "Middle" Scores**

Though the "middle" position ordinally represented the single largest group in this study's sample, few twins received a birth order score of "middle." An explanation for this finding may include the suggestion that twinships as a unit represent a mighty force - unyielding to the pressures of surrounding siblings.

Several mothers indicated that the twinship itself was a source of disadvantage and pressure to other siblings. One mother attributed her son's learning and behavioral disorders to her twins. She stated that, "I have three children. My son is 7 years old. He has had several learning and social problems due to the attention people give to multiples and ignore siblings."

Another mother commented that, "I have three kids, a 9 year old son and 7 year old twin girls. The 9-year old is not too self-confident. He is often stubborn, but very mechanical, spatially creative; seemed to become somewhat withdrawn after the traumatic birth of the twins."

Those twinships in which one of the twins received a high "middle" score and was considered a special sibling, represented a circumstance for comparison in which characteristically "middle" perspectives of preferential treatment and unfairness could arise.

### **Dual Scores**

Adler (1929, p. 44) wrote that "just as one cannot find two leaves of a tree absolutely identical, so one cannot find two human beings absolutely alike. Nature is so rich and the possibilities of stimuli, instinct, and mistakes are so numerous, that it is not possible for two persons to be exactly identical." While dual "youngest" scores may be suggestive of the unique treatment received by the pair, dual "second" scores may reflect a primary awareness of and identification with the twinship.

Though the incidence of dual scores could be interpreted as data confirming the sameness within twin pairs, the large occurrence of dual scores accompanied by secondary scores indicative of birth order placement within the twinship suggests the contrary. It appears that though part of a "whole," twins are distinct from one another. That distinction seems to exist just beneath the apparent similarities.

### **Twinship Scores**

Scored birth order positions indicative of placement within the twinship while disregarding the existence of other siblings suggests that some twins may behave as if they are the only two children in the family. This finding again addresses the potent influence of twinship on the pair.

### **Limitations**

Interestingly enough, the birth order model itself constituted the primary limitation in this study. As was discussed in Chapter 2 the lack of consistency in methods, models, terminology, and reported results create major obstacles to birth order research. The all encompassing nature of variables cited as influences on birth order positioning renders

the theory nearly impotent as a research tool. Results are easily refuted based on those variables absent from consideration within a study.

A second limitation to the study included the sample. It was not representative of twinships as a whole. The subjects were drawn from mothers who are members of twin organizations--many of whom have access to considerable amounts of twin research information. These organizations also function as support groups and could influence perceptions and attitudes.

The instrument utilized in this study presented a third limitation. The validity and reliability of the questionnaire has not been established.

Though the adjective checklist was adequate for producing birth order scores, increasing the quantity of descriptors would increase its effectiveness.

The instrument would also benefit from the inclusion of adjective checklists for each sibling member within the constellation. The addition of questions addressing issues of competition, separation, and future predictions would improve the data revealed by survey respondents.

### Recommendations

The findings in this study suggest several possibilities for future research. The need to quantify birth order positions for research purposes represents an opportunity for further inquiry. A comparison of twin birth order scores with those of singletons would add to the clarification of twinship distinction. A comparison of birth order scores between families with two singletons and families with "only" twins would reveal the occurrence of dual scores in both constellations. Further, a study examining the impact of twinships on sibling constellations would contribute yet another perspective. Variables

influencing twin development seem to be as numerous as variables influencing birth order position. Any combination of the two could provide interesting results. For instance, how does parental favoritism influence twinship distinctions? Does zygosity influence birth order placement?

### Chapter Summary

An overview of the entire study was presented in this chapter. Specific findings were discussed, and alternative explanations and interpretations were proposed. It was determined that data supported the hypothesis while generating new considerations. Though, in a broad sense, birth order can be viewed as a determinant in the personality development of twins, the twinship itself was found to be a powerful birth order variable. Of the two, twinship and birth order, it was difficult to identify the most influential factor. Finally, limitations to the investigation were reviewed and recommendations for further research were presented.

**APPENDIX A**

**HUMAN SUBJECTS CONSENT LETTER**

Human Subject Committee



1690 N. Warren (Bldg. 526B)  
Tucson, Arizona 85724  
(602) 626-6721 or 626-7575

January 28, 1991

Trudell B. Hampton, B.A.  
c/o Betty J. Newlon, Ph.D.  
Division of Educational and Professional Studies  
School of Family and Consumer Resources  
Education Building, Room 240  
Main Campus

RE: ADLERIAN BIRTH ORDER CHARACTERISTICS OF MONOZYGOTIC AND  
DIZYGOTIC TWINS

Dear Ms. Hampton:

We have received documents concerning your above referenced project. Regulations published by the U.S. Department of Health and Human Services [45 CFR Part 46.101 (b) (3)] exempt this type of research from review by our Committee.

Please be advised that approval of this project and the requirement of a subject's consent form is to be determined by your department.

Thank you for informing us of your work. If you have any questions concerning the above, please contact this office.

Sincerely yours,

William F. Denny, M.D.  
Chairman  
Human Subjects Committee

WFD:rs

Enclosure

**APPENDIX B**

**MOTHER OF TWINS QUESTIONNAIRE**





28. Both twins remained at the hospital after I returned home. TRUE FALSE  
 If *TRUE*, how long were they hospitalized before you could bring them home?  
 \_\_\_\_\_
29. Twins are a miserable trick of nature on a woman and/or her family. TRUE FALSE
30. I address each twin by their individual names. TRUE FALSE
31. I feel closest to the first delivered twin. TRUE FALSE
32. I think my children are jealous of the attention I give to special people outside of our immediate family. TRUE FALSE
33. Often I refer to the pair as *The twins*. TRUE FALSE
34. The twins are identical twins. TRUE FALSE
35. I have noticed that the twins are very different from each other. TRUE FALSE
36. One or more of my children requires special care. TRUE FALSE  
 If *TRUE*, please explain briefly. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
37. I try to treat each twin the same. TRUE FALSE
38. Having twins is an exquisite, awesome experience. TRUE FALSE
39. The twins' father is closest to the second born twin. TRUE FALSE
40. I enjoy dressing the twins alike. TRUE FALSE
41. The twins are fraternal. TRUE FALSE

The following two pages include identical sets of descriptive words. There is one page for each twin. Some of the words may or may not describe the twin. It is important that you circle those words that you feel characterize each twin. Page 4 is to be filled out for the twin delivered first. Page 5 is to be filled out for the twin delivered second. Please don't spend more than a moment on any one word. If it strikes you as fitting your child, circle it. If you have to think about it, it probably doesn't fit anyway.

### First Delivered Twin

1. What is this twin's first name? (No last names, please.) \_\_\_\_\_
2. Approximately how much older is this twin than the twin delivered second? \_\_\_\_\_
3. In your opinion, who is this twin most like? Mother? Father? Other? (Please identify) \_\_\_\_\_
4. Quickly circle the following descriptive words that best portray the twin delivered first. Just circle the one's that make sense to you today.

NEAT	ASSERTIVE	ENTERTAINING	PRECOCIOUS
BOSSY	FRIENDLY	EXCITABLE	MOTIVATED
AMBIVALENT	UNCONCERNED	QUARRELSOME	FAIR MINDED
SHOW-OFF	GUARDIAN	CUTE	PERSEVERING
SUBMISSIVE	IMMATURE	SERIOUS	LEFT OUT
PICKY	TAKE CHARGE	MEEK	SINCERE
CAUTIOUS	UNDERSTANDING	CONTROLLER	COMPLAINING
PRINCE/PRINCESS	RELIABLE	BRIGHT	CAREFREE
SILENT	CALM	TEMPERAMENTAL	SOCIABLE
SPOILED	PERSISTENT	SECRETIVE	COORDINATED
TOUCHY	HELPFUL	CHARMING	DOMINANT
BLAMING	FUNNY	RESENTFUL	GENTLE
MATURE	EASILY FRUSTRATED	MILD	RESOURCEFUL
IMPATIENT	MYSTERIOUS	AFFECTIONATE	EMOTIONAL
INVENTIVE	APPROVAL SEEKER	OPTIMISTIC	CURIOUS
ENGAGING	HELPLESS	MEDIATOR	DETERMINED

### Second Delivered Twin

1. What is this twin's first name? (No last names, please.) \_\_\_\_\_
2. In your opinion, who is this twin most like? Mother? Father? Other? (Please identify) \_\_\_\_\_
3. Quickly circle the following descriptive words that best portray the twin delivered second. Just circle the one's that make sense to you today.

NEAT	ASSERTIVE	ENTERTAINING	PRECOCIOUS
BOSSY	FRIENDLY	EXCITABLE	MOTIVATED
AMBIVALENT	UNCONCERNED	QUARRELSOME	FAIR MINDED
SHOW-OFF	GUARDIAN	CUTE	PERSEVERING
SUBMISSIVE	IMMATURE	SERIOUS	LEFT OUT
PICKY	TAKE CHARGE	MEEK	SINCERE
CAUTIOUS	UNDERSTANDING	CONTROLLER	COMPLAINING
PRINCE/PRINCESS	RELIABLE	BRIGHT	CAREFREE
SILENT	CALM	TEMPERAMENTAL	SOCIABLE
SPOILED	PERSISTENT	SECRETIVE	COORDINATED
TOUCHY	HELPFUL	CHARMING	DOMINANT
BLAMING	FUNNY	RESENTFUL	GENTLE
MATURE	EASILY FRUSTRATED	MILD	RESOURCEFUL
IMPATIENT	MYSTERIOUS	AFFECTIONATE	EMOTIONAL
INVENTIVE	APPROVAL SEEKER	OPTIMISTIC	CURIOUS
ENGAGING	HELPLESS	MEDIATOR	DETERMINED

*Thankyou*

**APPENDIX C**

**EXPERT VALIDITY**

Two authorities on the Adlerian birth order model were consulted during the construction of instrumentation used for this study. Both were requested to participate in a card-sort of adjectives descriptive of each birth order position (Appendix F). The results of their categorizations were incorporated into a checklist central to the study's instrument (Appendix B).

The first authority was Dr. O. C. Christensen. He is recognized as one of the world's leading Adlerian psychologists. Corey (1991) credits Dr. Christensen with "... translating Adler's and Dreikur's principles into practical approaches in working with children, parents, teachers, and other human-services workers in the United States" (p 137). Dr. Christensen has been a Professor of Counseling and Guidance, in the school of Family and Consumer Resources at the University of Arizona since 1969. He has published extensively and has presented throughout the world at seminars, workshops, and conferences. He is the recipient of numerous awards and actively promotes the Adlerian philosophy.

Dr. Betty J. Newlon was the second consulted authority. Dr. Newlon was appointed the Head of the Division of Educational and Professional Studies at the University of Arizona in January, 1990. She is currently the Head of the School of Family and Consumer Resources. Dr. Newlon has published extensively and is an editorial board member of the Arizona Counselors' Journal, Journal of Adolescence, Journal of Preadolescence, and the Career Development Quarterly. "Often lecturing at national and international conferences, Dr. Newlon has been instrumental in promoting ongoing research into Adlerian Theory" (Simpson, p. 68).

**APPENDIX D**

**QUESTIONNAIRE COVER LETTER TO**

**CLUB OFFICERS**

Dear ( Name of officer ),

Thank you so very much for your kind assistance in this research project. We really appreciate it and are aware that it wouldn't be as successful without your help!

Enclosed are the questionnaire packets. Each packet contains two envelopes - the outside one is stamped and left blank for your member labels. Inside this envelope is the questionnaire, a letter explaining the study to your moms, and the second envelope - stamped and addressed for the return of completed questionnaires.

The cover letter to the Moms lists phone numbers in case there are any inquiries regarding the questionnaire, procedures for completing it, or questions about the study itself.

The results of the study will be sent to you in written form. A presentation to your club is also an option.

The deadline for receiving completed questionnaires is February 20, 1991. We regret that questionnaires received after this date cannot be included in the study.

We're really excited about this study and want to thank you for your significant help!

Sincerely,

Trudell Hampton  
Researcher

Dr. O. C. Christensen  
Professor  
Research Director

**APPENDIX E**

**QUESTIONNAIRE COVER LETTER TO**

**MOTHERS OF TWINS**

School of Family and Consumer Resources  
Division of Educational and Professional Studies

THE UNIVERSITY OF  
**ARIZONA**  
TUCSON ARIZONA

FAX: (602) 621-9445  
Tucson, Arizona 85721

Dear Mother of twins,

We are writing to you to ask for your help in a research project providing information on the personality development of twins. The information you and other Moms provide will be used for a Master's thesis.

Enclosed is a questionnaire. Please complete and return it to us in the enclosed, and stamped envelope as soon as possible. We ask that you share some of your special observations and insights with us concerning your twin children. The unique information that you provide will really help in our research.

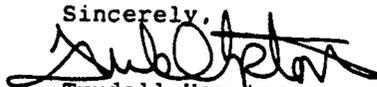
Participation in this study is completely voluntary. The information gathered from the questionnaire is entirely confidential. And it will be used for this study only. There is nothing to identify you on the questionnaire or return envelope. Any information you choose to share will remain anonymous.

The questionnaire should take between fifteen and twenty minutes to complete. With all the stuff you have to do, we know it's important to keep the time it takes brief.

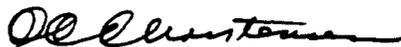
The cut off date for receiving completed questionnaires is February 20, 1991. We regret that questionnaires received after this date can not be included in this study.

We will be happy to answer any questions you may have regarding the questionnaire and/or study in general. You may contact Trudell at the following day time numbers: 621-3218; 299-7007; and 299-7000 (message phone). Thank you for your time, attention, and most of all, your contribution to this study!

Sincerely,



Trudell Hampton  
Researcher



Dr. Oscar C. Christensen  
Professor  
Research Director

**APPENDIX F**

**CATEGORIZATION OF BIRTH ORDER**

**DESCRIPTORS BY EXPERTS**

## Card Sort Responses

	O	S	M	Y	n/a		O	S	M	Y	n/a
absent-minded				✓		clown				✓	
accepting		✓	✓			cold	✓				✓
achiever	✓					comedian				✓	
adaptable		✓	✓			competitive	✓	✓			
advanced	✓					complaining			✓		
adventurous		✓		✓		compliant			✓		✓
affectionate				✓		compromising		✓	✓		
aggressive		✓	✓			compulsive	✓				✓
aloof	✓					conceited	✓				
ambitious	✓					confident	✓				✓
ambivalent			✓			conflict avoider		✓		✓	
analytical	✓					conforming	✓				
angry			✓			conscientious	✓				
antagonizer		✓	✓			conservative	✓				
anxious	✓	✓				considerate	✓	✓			
approval seeker		✓				consistent	✓				
argumentative		✓	✓			contented				✓	✓
arrogant	✓					controller	✓				
articulate	✓					conventional	✓				
artistic		✓		✓		cool	✓		✓		
assertive		✓				cooperative	✓	✓			
athletic	✓					coordinated	✓				
attention getter		✓		✓		courageous	✓	✓			
attractive	✓			✓		courteous		✓			
avoider			✓			cowardly				✓	✓
awkward	✓	✓				creative			✓	✓	
"baby"				✓		critical	✓		✓		
balanced		✓	✓			cruel			✓		✓
blaming			✓			curious				✓	
boastful	✓		✓			cute				✓	
bossy	✓					daring			✓	✓	✓
brash	✓			✓		demanding		✓		✓	
bright	✓					dependable	✓				
calculating	✓		✓			dependent	✓			✓	
calm				✓		determined				✓	
capable	✓					disciplined	✓				
carefree				✓		disorderly		✓	✓		
careful	✓					distracted			✓		✓
caregiver	✓					dominant	✓				
careless				✓		dreamy		✓		✓	
casual			✓	✓		driven	✓	✓			
cautious	✓					easily frustrated			✓		
changeable			✓	✓		easy going		✓		✓	
charming				✓		emotional			✓		
cheerful		✓		✓		energetic		✓			✓
clear-thinking	✓	✓				engaging				✓	
clever	✓	✓				enterprising		✓	✓		
clinging		✓		✓		entertaining				✓	

	O	S	M	Y	n/a
enthusiastic		✓			✓
exacting	✓				
excitable			✓		
fair-minded			✓		
fearful	✓			✓	
feminine	✓				✓
flirtatious				✓	✓
focused	✓				
follow		✓		✓	
forceful		✓	✓		
forgetful			✓	✓	
forgiving		✓			✓
formal	✓				
friendly		✓			
frustrated			✓		✓
fun-loving				✓	
funny				✓	
fussy	✓	✓			
generous	✓	✓			
gentle		✓			
gifted	✓				
goal oriented	✓				
good natured			✓	✓	
greedy		✓			✓
guardian	✓				
handsome	✓				✓
hard-headed		✓	✓		
hasty			✓		✓
headstrong	✓		✓		
healthy	✓				✓
helpful		✓			
helpless				✓	
high expectations	✓				
high strung	✓				✓
honest	✓				✓
hostile			✓		✓
humorous		✓		✓	
imaginative		✓		✓	
immaculate	✓				
immature				✓	
impatient	✓				
impetuous			✓	✓	
in-charge	✓				
in-control	✓				
independent	✓		✓		
indifferent			✓		
individualistic		✓	✓		
industrious	✓				
inferior			✓		
insightful		✓			✓
intelligent	✓				
inventive		✓			
irresponsible				✓	
irritable			✓		✓
jolly				✓	
kind		✓	✓		
ladylike	✓				
lazy				✓	
leader	✓				
left-out			✓		
light hearted				✓	
likable		✓		✓	
"little adult"	✓				
lonely	✓		✓		
loner	✓		✓		
loud		✓		✓	
loyal	✓	✓			
manipulating				✓	✓
martyr		✓	✓		
mascot				✓	
masculine			✓		✓
matter-of-fact	✓				
mature	✓				
maverick		✓	✓		
mediator			✓		
meek		✓			
messy		✓	✓		
meticulous	✓				
mild		✓			
mischievous			✓	✓	
model child	✓				
moderate	✓	✓			
modest		✓	✓		
moody			✓		✓
motivated		✓			
mysterious			✓		
natural		✓		✓	
neat	✓				
negotiator		✓	✓		
nervous	✓		✓		
nit-picker	✓				
noble	✓				
noisy		✓	✓		
"noncommissioned officer"	✓				✓
nurturer		✓			✓
obliging	✓	✓			
oblivious		✓		✓	
open		✓		✓	
opinionated	✓				

	O	S	M	Y	n/a
optimistic		✓			
orderly	✓				
organized	✓				
original		✓			✓
outgoing		✓		✓	
outspoken	✓		✓		
overachiever	✓				
pace setter	✓				
passive		✓	✓		
patient		✓	✓		
peace maker		✓	✓		
peaceable			✓	✓	
people pleaser				✓	
perfectionistic	✓				
performer				✓	
persevering		✓			
persistent	✓				
personable	✓			✓	
persuasive			✓	✓	
pessimistic			✓		✓
pestering		✓	✓		
picky	✓				
playful				✓	✓
pleasant	✓	✓			
pleasure-seeking				✓	
polished	✓				
polite	✓				
popular	✓	✓			
practical	✓		✓		
precise	✓				
precocious	✓				
preoccupied				✓	✓
"prince charming"				✓	
pushy			✓		✓
quarrelsome			✓		
quick	✓				✓
quiet	✓	✓			
quitting			✓	✓	
realistic	✓	✓			
reasonable	✓				
rebel		✓	✓		
rebellious		✓	✓		
reckless			✓	✓	
regal	✓				
relaxed				✓	
reliable	✓				
resentful			✓		
reserved	✓		✓		
resourceful		✓			
responsible	✓				
restless			✓	✓	
rigid	✓				
robust	✓	✓			
rude				✓	
"sales person"				✓	✓
scholarly	✓				
secretive			✓		
self controlled	✓				
self-centered				✓	✓
self-confident				✓	✓
self-denying	✓		✓		
self-pitying			✓		
self-reliant	✓	✓			
self-sacrificing	✓		✓		
selfish	✓				
sensitive		✓		✓	
sentimental				✓	✓
serious	✓				
severe	✓				
sharp-witted	✓	✓			
show-off				✓	
shy		✓		✓	
silent			✓		
simple				✓	✓
sincere		✓			
skeptical	✓		✓		
sloppy			✓		
slow			✓	✓	
sly			✓	✓	
smug	✓				
snobbish	✓				
sociable		✓			
soft-hearted		✓		✓	
sophisticated	✓				
space cadet				✓	
spiteful			✓		
spoiled				✓	
spontaneous		✓		✓	
spunky		✓	✓		
stable	✓				
steadfast	✓				
steady	✓		✓		
stern	✓				
stingy	✓		✓		
strong	✓		✓		
strong-willed	✓		✓		
structured	✓				
stubborn			✓		
submissive		✓	✓		
suggestible			✓	✓	

	O	S	M	Y	n/a
sulky			✓	✓	
superior	✓				
suspicious			✓		
sympathetic		✓	✓		
tactful		✓	✓		
take charge	✓				
talented	✓				✓
talkative	✓	✓			
temperamental			✓		
tense	✓				
thorough	✓				
thoughtful		✓	✓		
timid		✓		✓	
tolerant		✓	✓		
tom-boy	✓	✓			
touchy			✓		
trusting			✓	✓	
unambitious				✓	
unassuming		✓	✓		
uncomplicated				✓	✓
unconcerned				✓	
unconventional		✓	✓		
undependable				✓	
understanding		✓			
unemotional	✓				✓
unexcitable		✓	✓		
unfriendly			✓		✓
uninhibited			✓	✓	
unintelligent		✓	✓		
unkind			✓		
unpopular		✓	✓		
unselfish		✓	✓		
uptight	✓				
victim			✓		✓
vivacious		✓		✓	
warm			✓	✓	
wary		✓	✓		

Key: O = Oldest; S = Second; M = Middle; Y = Youngest; and n/a  
 ✓ = one expert selection, ✓ = both experts agree.

**APPENDIX G**

**ZYGOSITY DISTRIBUTION**

**Zygoty and Gender Distribution of Twin Pairs**

	<b>Zygoty</b>		
	<b>M2</b>	<b>D2</b>	<b>?</b>
<b>Male</b>	32	32	6
<b>Female</b>	34	40	5
<b>Mixed Gender</b>	0	41	0

**M2 = Monozygoty**

**D2 = Dzygoty**

**? = Undetermined Zygoty**

**APPENDIX H**

**SIBLING CONSTELLATIONS**

### Sibling Constellations of Twin Pairs

	Number of Siblings								
	1	2	3	4	5	6	7	8	9
Number of Twin Pairs Within These Constellations	0	85	70	27	4	2	0	1	1
Number of Constellations Consisting of 2(+) Separate Sibships <sup>1</sup>	0	6	24	10	3	2	0	1	1

<sup>1</sup> As indicated by age differentiation of 6(+/-) years.

**APPENDIX I**

**RAW DATA: ORDINAL, SCORES, AND  
TRUE BIRTH ORDER PLACEMENTS  
OF TWIN SAMPLES**

**Birth Order Scores, Ordinal Positions and Sibling Constellations  
within Twin Pairs**

Survey Number	1st & 2nd Twin ( <i>see key</i> )	Total # of Siblings
001	1O & 2S	2
002	3O & 4S	4
003	2O & 3S	3
004	3O & 4S	4
005	1S & 2S	2
006	2O & 3S	3
007	2O & 3S	3
008	3Y & 4Y	4
009	1O & 2Y	2
010	2O & 3S	3
011	1O & 2M	3
012	2O & 3S	3
013	2S & 3S	3
014	1Y & 2Y	2
015	1O & 2Y	2
016	2S & 3Y	3
017	2S & 3M	4
018	2O & 3S	3
019	1Y & 2Y	2
020	1Y & 2Y	2
021	1O & 2Y	2
022	1O & 2S	2
023	5O & 6M	8
024	1S & 2Y	2
025	1O & 2S	2
026	3O & 4S	4
027	2M & 3Y	3
028	2Y & 3Y	3
029	1Y & 2Y	2
030	2S & 3M	3
031	2O & 3S	3
032	2Y & 3Y	3
033	1O & 2Y	2
034	2Y & 3Y	3
035	2O & 3S	3
036	1S & 2S	2
037	3O & 4S	4
038	1O & 2Y	2
039	2Y & 3Y	3
040	2S & 3M	3
041	2O & 3Y	3
042	1Y & 2Y	2

Survey Number	1st & 2nd Twin ( <i>see key</i> )	Total # of Siblings
043	1Y & 2Y	2
044	4Y & 5Y	5
045	1O & 2S	2
046	1O & 2S	3
047	1Y & 2Y	2
048	2Y & 3Y	3
049	1Y & 2Y	2
050	3Y & 4Y	4
051	2O & 3S	4
052	2S & 3Y	3
053	5O & 6S	6
054	1Y & 2Y	2
055	1Y & 2Y	2
056	1Y & 2Y	2
057	2Y & 3Y	3
058	8Y & 9Y	9
059	2M & 3Y	3
060	2S & 3Y	3
061	1Y & 2Y	2
062	1Y & 2Y	2
063	1O & 2Y	2
064	2Y & 3Y	3
065	1Y & 2Y	2
066	1O & 2S	3
067	2Y & 3Y	3
068	1S & 2Y	2
069	2O & 3S	3
070	1Y & 2M	2
071	1O & 2S	3
072	1O & 2Y	2
073	3O & 4S	4
074	3Y & 4Y	4
075	2O & 3Y	3
076	2M & 3Y	3
077	2Y & 3Y	3
078	2O & 3M	4
079	1O & 2Y	2
080	1O & 2M	2
081	2S & 3S	3
082	2Y & 3Y	3
083	2Y & 3Y	3
084	1Y & 2O	2

Survey Number	1st & 2nd Twin (see key)	Total # of Siblings
085	1O & 2M	3
086	1S & 2S	2
087	1Y & 2Y	2
088	2Y & 3Y	3
089	2Y & 3Y	3
090	1Y & 2Y	2
091	1O & 2Y	2
092	1S & 2M	4
093	1Y & 2Y	3
094	2O & 3Y	3
095	1Y & 2Y	2
096	1Y & 2Y	2
097	1O & 2Y	2
098	1Y & 2Y	2
099	1O & 2Y	2
100	2M & 3Y	3
101	1O & 2Y	2
102	1O & 2Y	2
103	2O & 3S	3
104	1Y & 2Y	2
105	1Y & 2Y	2
106	1Y & 2Y	2
107	2O & 3S	3
108	1Y & 2Y	2
109	1O & 2O	2
110	4O & 5S	5
111	1Y & 2Y	2
112	3Y & 4Y	4
113	1Y & 2Y	2
114	2S & 3Y	3
115	2Y & 3S	3
116	1O & 2S	2
117	2Y & 3Y	3
118	1O & 2Y	2
119	1Y & 2Y	3
120	1Y & 2Y	3
121	2S & 3Y	3
122	1O & 2S	2
123	2S & 3Y	3
124	1O & 2S	2
125	1Y & 2Y	2
126	1O & 2Y	2
127	2M & 3Y	3
128	1O & 2Y	2
129	1Y & 2Y	2
130	4O & 5S	5

Survey Number	1st & 2nd Twin (see key)	Total # of Siblings
131	3O & 4S	4
132	3O & 4Y	4
133	2S & 3Y	3
134	2O & 3S	3
135	1M & 2M	3
136	3O & 4Y	4
137	1O & 2S	2
138	1O & 2Y	2
139	1O & 2Y	2
140	2Y & 3Y	3
141	1Y & 2Y	2
142	3S & 4S	4
143	1O & 2Y	2
144	2S & 3Y	3
145	2O & 3S	3
146	1O & 2S	2
147	3S & 4S	4
148	1O & 2S	2
149	1O & 2Y	2
150	3Y & 4Y	4
151	3S & 4S	4
152	1Y & 2Y	2
153	2O & 3Y	3
154	2S & 3Y	3
155	1S & 2S	4
156	1O & 2Y	2
157	1O & 2Y	2
158	2Y & 3Y	3
159	3O & 4S	4
160	1S & 2Y	2
161	1O & 2S	2
162	1O & 2Y	2
163	1M & 2S	3
164	2O & 3S	3
165	1O & 2Y	2
166	1O & 2M	2
167	3M & 4Y	5
168	1Y & 2Y	2
169	2S & 3Y	3
170	1O & 2S	3
171	1O & 2M	3
172	3M & 4Y	4
173	3Y & 4Y	4
174	3Y & 4Y	4
175	1S & 2S	2
176	1Y & 2Y	2

Survey Number	1st & 2nd Twin (see key)	Total # of Siblings
177	1S & 2S	2
178	1Y & 2Y	2
179	2Y & 3Y	3
180	2O & 3Y	3
181	1O & 2S	3
182	1O & 2S	2
183	1O & 2S	2
184	1O & 2Y	4
185	3Y & 4Y	4
186	2S & 3Y	3
187	1O & 2M	2
188	5O & 6S	6
189	1O & 2Y	2
190	1Y & 2Y	2

**Key:** *TwinValue1* & *TwinValue2*;

where *TwinValue#* = (Ordinal Position within Pair of Twin #)(Birth Order Score of Twin #)

**Ordinal Position:** 1 - 9.

**Birth Order Score:** O = Oldest  
 S = Second  
 M = Middle  
 Y = Youngest

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