

Family Environment and Individual Chronotypes

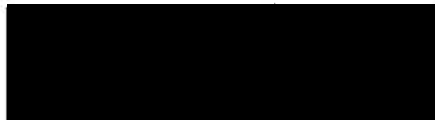
By

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A Master's Research Project

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The purpose of this study was to investigate family environment and individual chronotype (morningness-eveningness) preferences among the family members. The conceptual framework was drawn from two models. These two models were the Model of Ecology, and a Nursing Chronotherapeutic Model. The review of the literature consisted of studies of morningness-eveningness, and family dyads. The data were collected from nine families of three to four members each. The research design selected was single case study with replication.

The sample consisted of nine families with three to four members who lived in the same household where there were two parents. Tested children were biologically related to at least one parent. To be included in this study, children had to be 13 to 18 years of age and able to read at a fifth grade level. Families lived in rural Central Oregon, specifically Jefferson County.

Three data sets were collected for each family: (a) demographic information about the family unit and individual members, (b) individual scores from The Horne-Ostberg Morningness-Eveningness Questionnaire, resulting in individual chronotype, and (c) individual and family unit scores from The Family Environment Scale, resulting in individual perception of how the family environment is viewed.

The analysis consisted of intra family profiles cross family comparisons, as well as a focus on family incongruence scores, the subscale of conflict from the Family Environment Scale, and individual chronotype.

The family incongruence score expressed how much the sample family members disagreed about their family environment. An incongruence score of 61 or

greater is considered high.

The findings of the study showed that : Two variables in this study that affected the family incongruence score were childrens' age and years of marriage. Four of five families with a child 16 years and older had a incongruence score of greater than 61. Four of five couples who had been married greater than 20 years had a incongruence score of greater than 61.

The Family Environment subscale of conflict measured how much conflict each family member perceived in the family environment. Two variables in this study that affected how family members perceived conflict were family size, and gender. The average conflict score for four member families was 48. The average conflict score for three member families was 42.

In this study, 4 of 9 couples had opposite chronotype preferences. Past research was supported in that three of the four couples perceived conflict to be high on the Family Environment subscale of conflict. Of the four couples with opposite chronotype preferences, three of these families had the exact same chronotype configuration. Two of the three families had similar views of family conflict as evidenced by high conflict scores.

Out of nine families, one couple had the same chronotype preference. The level of conflict for the couple preferring the same chronotype was in the lower part of average on the subscale.





In 6 of 9 families where fathers preferred mornings and one child preferred evenings, these children perceived a higher level of conflict than the fathers. The average conflict scores for these six fathers and six children was above average.

This study demonstrates that there may be a link between time of day preference and family members perception of conflict.

**Examination Certification/
Research Approval
Form 110003**

1. Student Janice K. Monroe
2. Degree Master of Science Doctor of Philosophy
3. Title of Study
Family Environment and Individual Chronotypes
-

4. This is to certify that the student has been examined by the undersigned over the material contained in the Research Proposal which has been submitted in partial fulfillment of the requirements of the degree indicated in #2 above.

 _____ Research Advisor (signature)	 _____ (printed name)
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6. The final copy of this study has been approved and is ready for binding.

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CHAPTER I

INTRODUCTION

Families are the basic unit of society. Through families people are connected to the past, the distant times and places of ancestors, and to the future, our children's children. Individuals are born into a family, called the family of origin, and eventually may start a family of their own, the family of procreation (Garbarino, 1982). Children, parents, and the lifelong bonds of kinship make up the basic family unit. Considering the families of origin and procreation, most people spend much of their lives in family units, and virtually all of their lives as part of an active kin system of some sort. Within the family unit, needs for identity, relatedness, intimacy, and growth are usually met throughout life (Garbarino, 1982).

Environment was defined by Melson, (1980) as everything inside and outside of a system. For purposes of this study family environment is defined as a measure of family values and concerns among the individual family members that affect the entire family group. Certain demands are placed upon the family unit by the individuals that make up that family unit. These demands include particular roles and tasks assigned to individuals in the family, and rules for appropriate behavior (both learned and innate), that affect the family unit. Individual values and concerns also help create the environment known as the family unit. Family environment and family members' adaptation mutually influence each other. Each family member's personal characteristics, coping skills, and well-being can affect the quality of family environment (Moos & Moos, 1994). Within the family environment there are many dimensions that contribute to the total picture. Such dimensions have the potential to

cause, or contribute to problems among individuals in the family. Individuals contribute to the family environment by their presence, their activities, and the by-products of their actions. Family members encounter stressors at home, work, and play that may be biological, chemical, cultural, physical, psychological, or social in nature. The exposure to stressors may come from within the individual or be relayed to them from another (Bomar, 1996). Some individual environmental stressors that contribute to the family environmental unit are moods, temperament, health, age, sibling rivalry, or gender difference issues. Family unit stressors such as work schedules, child care concerns, financial issues, and cultural differences, also impact the family environment. This is not meant to be an all inclusive list, but rather examples of what stressors or variables can influence the family environment.

Because the family unit is composed of individuals, regardless of what occurs in the family unit, there are individual variables that affect the family unit. One of these variables of interest to the investigator is that of chronotype. Chronotype is a term used that relates to preferences people have for morning or evening activity. In popular literature this may be referred to as "morningness" or "eveningness", or "larks" or "night owls". Family members can all be the same chronotype, or be different chronotypes.

Findings from the literature have shown that there are variations of morning and evening preferences among individuals. Carol Hoskins, (1989) was a prominent investigator in the study of morningness-eveningness in dyads. To date, her research has been limited to the family dyad of adult men and women. Hoskins postulated that when there were differences among individual family members' preferences for

morning or evening, there were likely to be disturbances in relationships within the family environment. Though not yet tested, she postulated there is also likely to be problems in parent-child relationships where one or more children have opposite morning-evening preferences of their parent(s) (Hoskins, 1981b).

Purpose

The purpose of this study is to investigate family environment and individual chronotype (morningness-eveningness) preferences among the family members.

Importance to Nursing

Nursing can be viewed as a profession that considers families who may be experiencing any number of stressors, both from within and without the family unit. Nursing includes knowledge of relationships within and among humans, the environment, and reaction to stress and the maintenance of stability and integrity. (Bomar, 1996).

An understanding of how family environment is affected by chronotype can be important to nursing. As health care providers become more aware the element of chronotype and how this variable may relate to treatments and their outcomes on individuals, and families, these providers may also want to consider family environment and how the family environment influences health and well-being of its members.

An environmental assessment is particularly important when a family is encountering a life crisis or transition, or when an individual or a setting needs to change. These assessment can help people better understand their life in context; learn how other individuals, such as family members, perceive the environment; and

become more aware of how their behaviors and ways of coping affect their environment, and how people are influenced by and adapt to the environment (Moos and Moos, 1994).

Nurses work on a daily basis with individuals, dyads, and families. As family nursing becomes more of a focus, nurses will be working more with family units than exclusively with individual family members. As nurses learn to use the concepts of family environment and family patterns of chronology in their work with families, there could be a change toward healthier family environments. This may be accomplished by giving the people with whom one works a framework for thinking about their dynamic environment, instead of viewing the environment as "good" or "bad". Family environment and individual chronotype are aspects that are not often recognized by nurses as potential sources of strength within families. Studying family environment and individual chronotype preferences provides a new approach in nursing, and may have utility for improving the quality of family life. Nurses can assist families with healthier ways of relating that may influence what is passed on to the next generation.

CHAPTER II

CONCEPTUAL FRAMEWORK

Chapter two summarizes the conceptual framework used in this study. The two models used will be a model of ecology (environment) and a nursing chronotherapeutic model.

The purpose of this study is to investigate family environment and individual chronotype (morningness-eveningness) preferences among the family members.

Model of Ecology

The first part of this conceptual framework is built on Bronfenbrenner's (1979) model of ecology. In this model, ecology refers to family environment as being subjected to and affected by internal (immediate family) environment, and subjected to and affected by all elements that are external to the immediate family. This model is a systems approach to the development of humans within these environments. The ecological approach includes not only the immediate family and home environment, but also the wider social and cultural world as it affects the family (Garbarino, 1982). Bronfenbrenner sees an individual's experiences as a set of nested structures, each inside the next. At each level of the environment, interactions take place among family members, and in many ways they affect each other. The forces in the environment that affect and influence individual and family development include not only the family and home environment, but also the social and cultural world of the family (Garbarino, 1982). Individuals, family groups and their environments are mutually shaping systems, each changing over time, each adapting in response to changes in the other.

An ecological map developed by Bronfenbrenner, offers a picture of this

conceptual framework (see Figure 1). Within this framework, there are four levels: (a) microsystem, (b) mesosystems, (c) exosystems, and (d) macrosystems. The level most immediate to the developing individual is the microsystem, the actual setting in which the individual experiences and creates day-to-day reality. This microsystem may be the home, involving interaction with only one or two people at a time. Though this interaction varies by age and person, it involves eating, sleeping, bathing, playing, working and loving. Then, too, depending on a persons age and situation, the microsystem becomes more complex as more people and activities are involved in the persons environment.

The second level in the model of ecology is the mesosystem. Mesosystems are relationships between contexts or microsystems in which the person experiences reality. This is measured by the number and quality of connections. The central principle here is that the stronger and more diverse the links between settings, the more powerful the resulting mesosystem will be as an influence on the individuals development.

The third level in the model of ecology is the exosystem. Exosystems are situations having a bearing on development but in which the developing individual does not actually play a direct role. The exosystems are those settings that have power over ones life, yet in which there is not participation. They include the work place of the parents (for most children, since they are not participants there) and those centers of power (such as federal, state and local government) that make decisions affecting day-to day life.

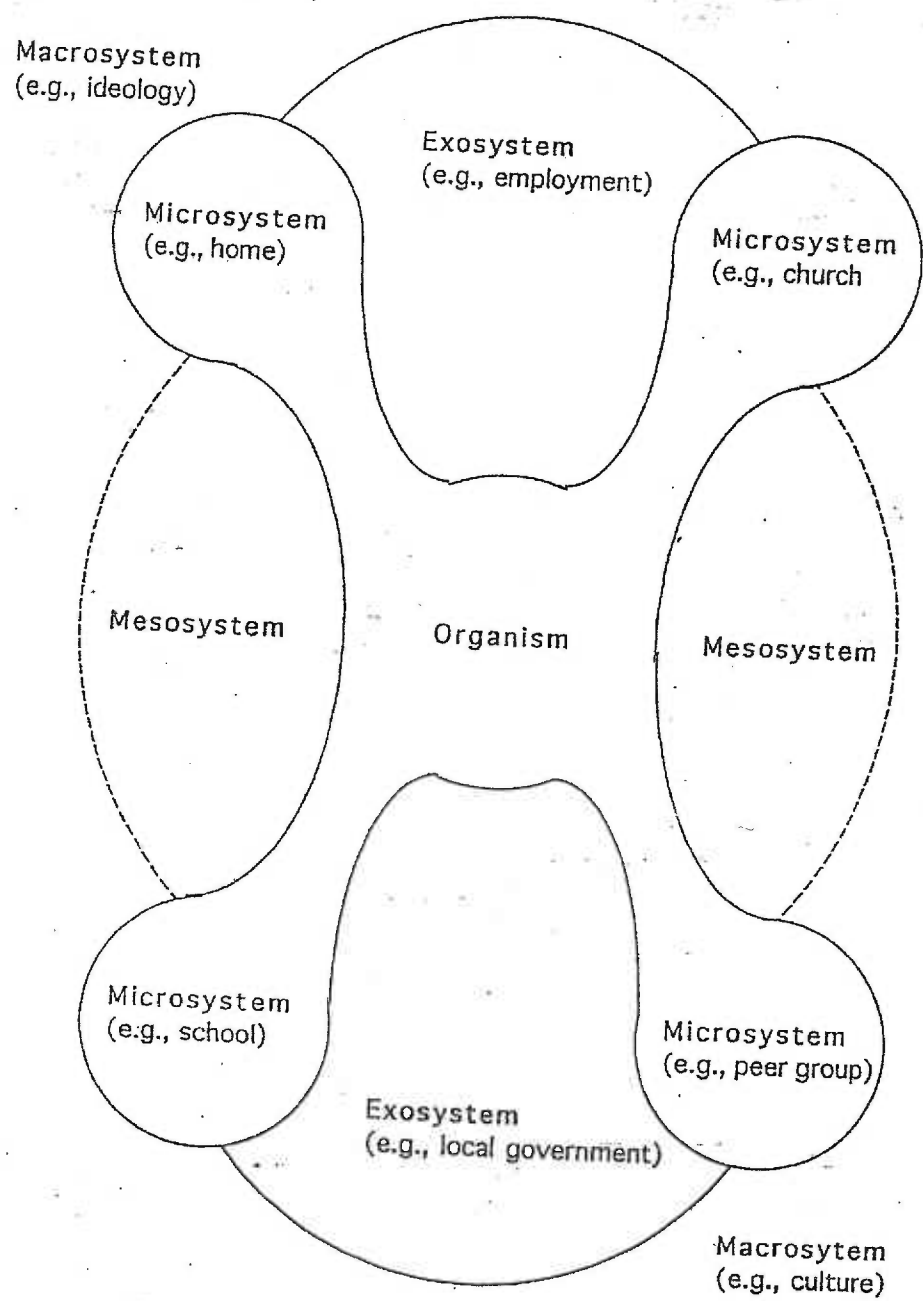
The fourth level in the model of ecology is the macrosystem. Macrosystems

refer to the general organization of the world as it is and as it might be. Macrosystems are the "blueprints" for the ecology of humans development. These blueprints reflect a people's shared assumptions about how things should be done.

The model of ecology fits well with The Family Environment Scale (FES) developed by Rudolf and Bernice Moos (1974). The FES assesses the social environment of families from an interactionist framework. This framework presents behavior as an interaction between people and the environment. The domains and subscales of the FES correspond with the levels in the model of ecology. The domains of the FES are relationships, personal growth, and system maintenance.

Findings from the FES have shown how the family environment and family members' adaptation mutually influence each other. Each family member's personal characteristics, coping skills, and well-being can affect the quality of family relationships, the family's emphasis on personal growth goals, and the family's focus on system maintenance. The relationship domain is measured by how involved people are in a family setting, how much they help each other, and how spontaneously they express feelings. Family relationships in the FES are divided into three subgroups cohesion, expressiveness, and conflict. Cohesion is the way family members support one another, how much energy they put into what they do at home, and how much feeling of togetherness there is in the family. Expressiveness means how openly family members talk around home, and how freely they discuss their personal problems. Conflict includes how frequently family members fight, and how often they criticize each other.

The personal growth domain measures ways in which an environment



The ecology of human development

Figure 1.
Model of Ecology.
(From Garbarino, J., 1982. *Children and Families in the Social Environment*. Aldine: NY, p. 26.)

encourages or stifles a given member's growth. Growth of the family is affected by the FES subscales of individual independence, achievement, intellectual-cultural orientation, active-recreational orientation, and moral-religious emphasis.

Independence includes how strongly family members are encouraged to be think things out for themselves, and how freely they come and go in the family.

Achievement includes how important individuals in the family feel it is to do their best and to get ahead. Intellectual-cultural orientation expresses how often family members talk about political or social problems, how often they go to the library, and how much they like music, art, and literature. Active-recreational orientation is how often friends come to the home, how often family members to out to movies, sports events, camping and so on. Moral-religious emphasis is on how strict family members ideas are of what is right and wrong.

The system maintenance domain assesses the family's emphasis on organization, structure, rules, and procedures in running family life. Included in this subscale is organization, and control. Organization means how carefully activities are planned, and how clearly each person's duties are defined. Control includes how much one family member makes the decisions, and how much emphasis is on following rules in the family.

Nursing Chronotherapeutic Model

The second concept in this study is built on a conceptual framework model for nursing chronotherapeutics, developed by nurse researcher Westfall, (1992). This conceptual framework provides a model for nurses to better understand temporal patterns, including the concept of morningness-eveningness. This model adapted

from the work of Heitkemper and Shaver, (1989) and presented by Westfall, (1992) suggests that timing can be considered as a nursing therapeutic. (see Figure 2).

This model presents individual factors and environmental cues, individually and collectively, that lead to individual responses. Individual factors include those things that are person-specific and may be modifiable or nonmodifiable. Examples of such factors include endogenous rhythms, age and chronotype. Within this model, selected individual factors can feed through an internal time keeping system that contributes to individual rhythmic responses. Such responses are often affected by environmental cues. Environmental cues can be internal or external to the individual, e.g., hormonal levels, periodic light and dark cycles, eating, and social ecology. Environmental cues may directly influence individual response, or may interact with individual factors leading to individual responses. These responses may be rhythmic or nonrhythmic. Additionally these responses may be categorized as physiologic, pathologic, behavioral, and experiential when focusing on temporal patterns.

Using this chronotherapeutic model, nursing actions can be targeted toward specific aspects such as environmental cues, or individual responses. These targeted nursing actions may help to attain or maintain a balance within the individual, between the person and family, and the person and environment.

These two conceptual frameworks coalesce in this research proposal. The family environment is affected by both internal and external stimuli. These stimuli affect the individual's ability to cope with stressors, individual well-being, and determine the outcome of the family environment in the areas of relationships, growth, and maintenance as defined previously by Moos & Moos (1994). The nursing

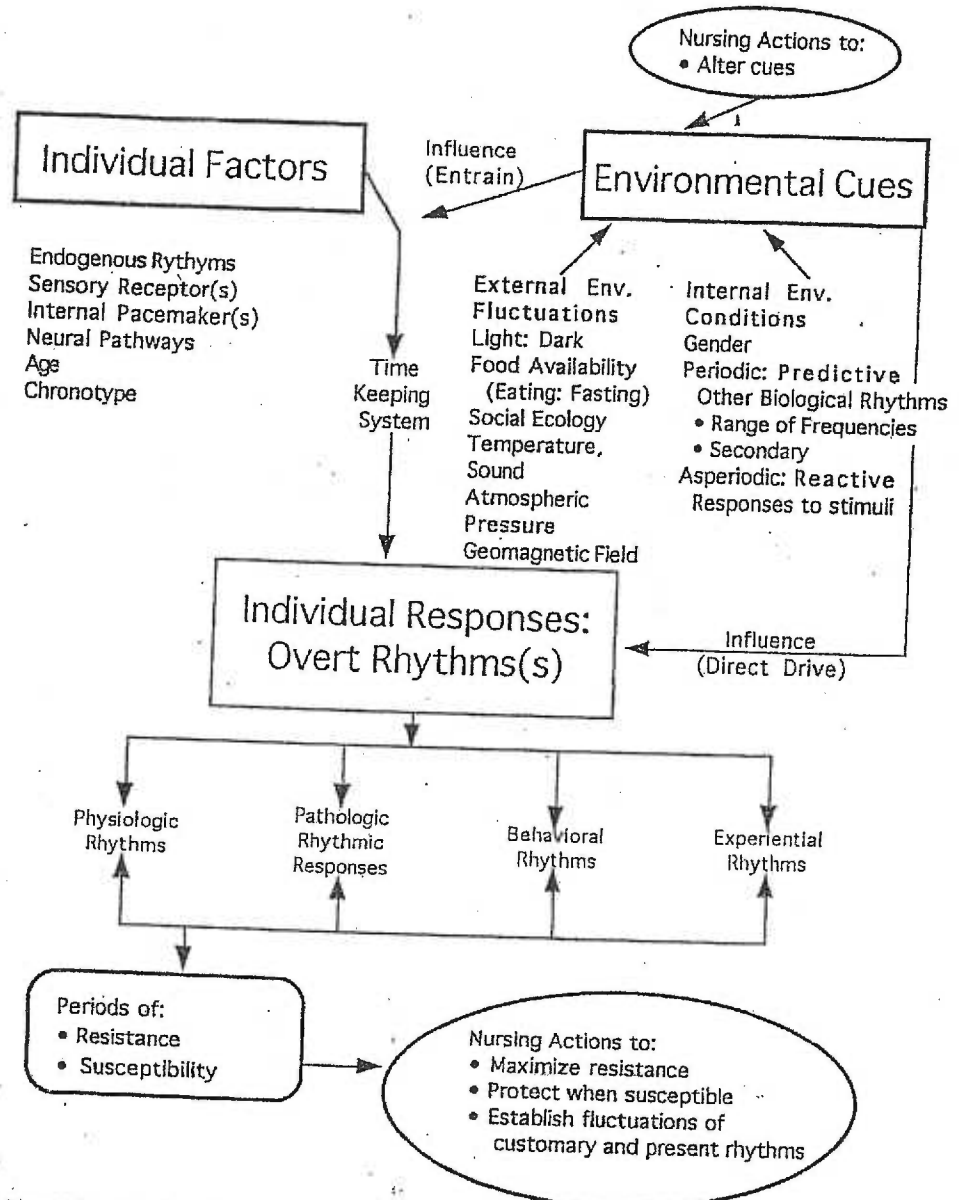


Figure II. Nursing Chronotherapeutic Model. (From Westfall, U.E., 1992. Nursing chronotherapeutics: a conceptual framework. *IMAGE: Journal of Nursing Scholarship*, 24 (4), 307-312.)

chronotherapeutic model fits into the model of ecology in two areas. Individual factors and many environmental cues correspond with the microsystem. Other environmental cues may be part of the mesosystem, exosystem, or macrosystems.

CHAPTER III

REVIEW OF THE LITERATURE

This review of the literature will focus on materials on family environment, and chronotype (morningness-eveningness). There is no literature available to link these two concepts together. Findings are available in studies done by Hoskins & Halberg (1983) and Hoskins (1989) using dyads. Research by Hoskins did not include the broader concepts of family environment, or children as subjects.

Studies of Family Environment

The study of family environment benefits the family in at least three key areas: education, research, and service. The field of family environment recognizes the fundamentals of family life and the day-to-day inputs, processes, and outputs that are the substance of individual and family functioning, developmental and environmental outcomes (Boss, Doherty, LaRossa, Schumm, Steinmetz, 1993).

Each family member may be characterized by his or her own individual style, but is still responsive to changing developmental needs and to environmental influences. Just as individual and family systems may be thought of in terms of sets of demands upon surrounding environments, these environments themselves place certain demands upon both individual and family members (Friedman, 1992). An example of this is the different sensory needs of individual family members. For instance, a young child will desire support, closeness and touch which gradually decreases with age. The aging individuals sensory needs are less sharply defined and more slowly paced. Thus, each person will see a somewhat different world and it is a challenge for the family when integrating these separate worlds into a family world

(Melson, 1980).

Family Relationships

Findings from nursing literature show that families who are able to be structured and show stability yet at the same time allow for change and flexibility will have the most effective functioning ability as a family (Bomar, 1996). It is postulated that family members who can communicate their differences to each other in a constructive manner can resolve conflict and learn to adjust to and compliment each others differing morningness-eveningness preferences, and live together more harmoniously (Bomar, 1996). Findings from practice and research have shown that disrupting the usual morningness-eveningness pattern of individuals will cause disorganization that may cause increased physiologic stress, anxiety, irritability and decreased concentration (Hoskins, 1981b).

Adolescence is a difficult time for families. Adolescents fluctuate from wanting privileges in keeping with near-adult status to wanting the support and protection afforded them in childhood (Freiberg, 1992). To establish autonomy they need to become gradually more responsible for their own decision making and yet feel the security of parental guidance (Carter & McGoldrick, 1989). Sibling order influences achievement of independence. The oldest child is generally kept dependent longest. Younger children strive to have more privileges to be like the older siblings at earlier ages (Freiberg, 1992).

Studies of Morningness-Eveningness in Dyads

Some studies of morningness-eveningness have focused on differences between couples preferring morningness or eveningness (Hoskins, Halberg,

Merrifield, & Hillman, 1979; Hoskins, 1981b; Hoskins & Halberg, 1983; Hoskins, 1984; Hoskins, 1989). The data collected have indicated that these temporal preference differences can create disharmony in a family dyadic environment.

Hoskins has been the sole nurse investigator to study morningness-eveningness patterns of married couples. Her question of interest was whether there was a temporal pattern to marital dissonance. Her research was based on the assumption that rhythms with different frequencies are found at all levels of individuals, even down to the subcellular structure. Frequencies can be defined as how often events occur, i.e., periods of time. Among the basic concepts Hoskins used were role perception and role expectation, communication patterns, mood alterations, activity and dissimilarity between partners in their preferences to morningness-eveningness.

One study by Hoskins and Halberg (1983), gathered data over 35 consecutive days. The subjects were one couple who had been living together for two years in a relationship that was functional (without clinically relevant problems). Data were collected from the partners for activation, body temperature and conflict. Interpersonal conflict was measured at the same time during the day on the six alternate forms of the Interpersonal Conflict Scale (ICS) developed by Hoskins (1979). Nine subscales within the scales are: (a) agreement in thinking, (b) communication, (c) disagreement in behavior, (d) perception of the other's feelings, (e) companionship and sharing, (f) perception of behavior, (g) emotional satisfaction, (h) security, and (i) recognition. The ICS is designed to measure the degree of fulfillment of interaction, emotional and sexual needs by partners based on the perception of those needs. Pearson product-moment correlations were used to calculate the scores. The results of the study

indicated that the male partner, who had higher levels of activation in the morning perceived greater fulfillment of his needs for interaction ($r=.60$, $p=.002$) and sexual satisfaction ($r=.52$, $p=.007$) at that time of the day whereas the woman, who increased in wakefulness later in the day, experienced less fulfillment in her interaction ($r=-.54$, $p=.007$) and emotional needs ($r=-.50$, $p=.01$). As in previous studies, the findings indicate variations both within and between individuals and their perceived satisfaction in response to needs (Hoskins, 1989).

A second study by Hoskins (1989) was done to determine whether differences in activation between partners in a family system are related to perceived degree of fulfillment of interactions, emotion and sexual needs. This study used a convenience sample of five student-couples at a university in New York. Again in this study, Hoskins used her Activation Check List developed in 1979. Activation was measured four times a day for 28 days to permit determination of a circadian rhythmicity that had been documented in the previously described 1983 study of one couple. The means and standard deviations showed good variance in the activation scores that were relatively consistent between individuals. A wide range in peak times 8:30 AM to 6:30 PM were noted indicating a marked difference in morning - evening orientation.

In prior studies, such as the one by Connolly (1975) in which rats were used as subjects, it was suggested that a dominate partner will alter certain rhythmicities in the submissive partner (Hoskins, 1989). Adams and Cromwell (1978) noted that greater stress occurs among couples in which one partner is a morning person whose peak in activity and alertness occurs early in the day and the other an evening person whose peaks are late in the day (reported by Hoskins 1989). This study concluded that such

couples share fewer pleasant occasions and have less satisfying communication and sexual activity than couples who are similar in orientation to morning or evening. Hoskins (1989), cited studies by Cromwell (1976) and Karacan (1982) on empirical observations of differences in sleep-awake patterns in relation to conflict: a desynchrony between partners was related to a greater incidence of behaviors conducive to conflict and poor family functioning. Hoskins (1979), cited a study by Halberg (1977) that noted biological rhythms may differ in a number of ways which are noteworthy in relation to interpersonal conflict. For example, the rhythm of one individual may follow a nocturnal pattern, such as can be observed in a nocturnal creature or in an individual on a night-shift routine, whereas the partner's rhythm may follow a diurnal pattern. One partner may have a rhythm period that differs from the 24 hour period (Hoskins, et al., 1979).

Because there can be marked differences among individuals patterns and preferences for morning or evening, members of a family may be out of phase or in a state of desynchrony with one another. The individual who rises slowly in the morning and takes a long time to become fully active and responsive, may therefore have a delayed ability to perform. Such an individual has an evening orientation and is likely to experience direct conflict with a partner who is characterized by a morning orientation (Hoskins, 1981a).

To determine their orientation to morning or to evening preferences, individuals have been studied using questionnaires with verifying data from body temperature (Horne & Ostberg, 1976; Mason, 1988; Kerkhof, 1985) and adrenalin secretion levels (Kerkhof, 1985). Studies to date, have not included how children in

the family are affected, or how children's preferences for morning or evening might affect the adults of the family, or the family functioning. The degree of disharmony and dissatisfaction in the family environment has not been determined. To date family members have not been asked to describe their morningness-eveningness preferences and how these preferences affect their family environment.

Family Perspective in Nursing

The study of families has been of interest to nurses since the days of Florence Nightingale. In an effort to be both a practice and a scholarly discipline, nursing has been increasingly concerned with delineating a theoretical base for family nursing practice (Whall & Fawcett, 1991). This concern has led family nurses to borrow theoretical perspectives from other disciplines. One such borrowed theory that has become extremely influential in nursing knowledge and understanding of family is von Bertalanffy's (1968) general systems theory (Hartrick, 1995).

Within this theory process, the family is considered a unit, and interaction among family members is encouraged.

Summary

The study of family environment with individual chronotype has not been studied in nursing. Through one nurse researcher we have been able to gain some insights about the effects of morningness-eveningness differences seen in family dyads. The study of the two concepts together is new in family nursing. The concepts of individual chronotype and family environment will help us as nurses to gain an understanding of what family is, and assist us to discover a more comprehensive meaning and the experience of family in the lives of people with whom we work.

CHAPTER IV

METHODS

This chapter contains a description of the methods used in this study. Study design, sample, setting, instruments, data collection procedures, analysis and protection of human subjects are included. The purpose of this study is to investigate family environment and individual chronotype (morningness- eveningness) preferences among the family members. The question statement for this study is: How do individual chronotypes affect the family members perception of family environment?

Design

A case study design with replication was selected to investigate the relationship between family environment and individual chronotype. For purposes of this study, a case study is an in-depth investigation of a family. According to Polit & Hungler (1995), case studies are a useful way to explore phenomena that have not been rigorously researched. The information obtained through such a design can be useful in producing insights and hypotheses to be tested in subsequent research. Case studies focus on the relationships between or differences in concepts (Woods & Catanzaro, 1988). The unit of analysis in this case study was the family. Quantitative data were collected from all individual family members meeting study criteria. The same data were gathered from nine families.

A case study of a single family is not generalizable to a population of families. This is a limitation of the case study design.

Sample and Setting

Families were defined in this study as "two or more individuals who depend on

one another for emotional, physical, and/or economic support," (Hanson & Boyd, 1996, p. 6) and who consider themselves to be a family. For the purpose of this study, a family consisted of two parent households, with the adults married or cohabitating. The parents were either both biological, or one was a step parent. Same sex parents were excluded. Children were biologically connected to at least one parent, thus adopted children were excluded.

Nine families of three to four members each participated in this study. Family members included male and female adults and children biologically related to at least one of the adults. Members of the immediate family who did not meet the criteria were excluded from the study. A total of 31 subjects completed all questionnaires and returned them to the investigator.

Families were recruited from the Central Oregon area known as Jefferson County and consisted of rural families. The United States Bureau of the Census (1994) defines rural as a area with less than 10 people per square mile. Subjects were recruited by word of mouth. When subjects indicated interest, an appointment was made in the subjects home for an explanation of the study project. The family was screened to determine if inclusion criteria were met.

Inclusion criteria for participation in this study were: (a) ability of all qualified family members to participate, (c) willingness of all qualified family members to participate, (b) ability to read and understand English at a fifth grade level, (d) willingness of all qualifying family members to participate, (e) family resides in the Oregon county known as Jefferson County, and (f) children are 13 to 18 years old.

Pilot project

A pilot project to test the instruments had been conducted on two families, each with four members. The pilot project was designed to give the investigator experience in administering, timing, and scoring the instruments. Families participating in the pilot were not eligible for the proposed study.

Instruments

Three instruments were used to collect data for this study. The three instruments were: (a) Demographic Questionnaire, (b) the Horne-Ostberg Morningness-Eveningness Questionnaire, and (c) the Family Environment Scale (FES).

Demographic Questionnaire

The first instrument, an adult demographic questionnaire developed by the investigator, contained eleven items which included: family member's ages and genders; number of years married or living together, time of day adults work, number of children in the family, ages of the children in the family, education, occupation, income, and length of time subject has lived in Jefferson County, Oregon (see Appendix A). A modified demographic questionnaire was provided for adolescents in the family. This questionnaire contained only four items about age, gender, and length of time the individual has lived in Jefferson County Oregon (see Appendix C). Data gathered from the demographic questionnaire were used to determine each individual's position in the family according to age, gender, and family size. Other items in the demographic questionnaire were used to describe each individual family in this study.

The Horne-Ostberg Morningness-Eveningness Questionnaire

The second instrument was The Horne-Ostberg Morningness-Eveningness Questionnaire. Subject responses on The Horne-Ostberg Morningness-Eveningness Questionnaire provided a way to measure subject's time of day preferences. (see Appendix E). The Horne-Ostberg Morningness-Eveningness Questionnaire was developed by Horne and Ostberg (1976). It is comprised of 19 questions, of which the majority are multiple choice with four options. The final question is a forced choice item asking: Which type do you consider yourself to be: (a) Definitely a "morning" type, (b) Rather a "morning" type than an "evening" type, (c) Rather more a "evening" type than a "morning" type, or (d) Definitely an "evening" type. Five of the 19 questions use a time scale, marked in intervals.

Two scoring options are available. One is based on three classes of responses as (a) preferring morning, (b) preferring evening, or (c) no preference. The second is based on five classes: (a) definitely morning type, (b) moderately morning type, (c) neither type, (d) moderately evening type, or (e) definitely evening type. The Horne-Ostberg Morningness-Eveningness Questionnaire has not been tested with children up to the age of eighteen (Horne-Ostberg, 1976).

Horne and Ostberg (1976) completed a study to test for criterion-related validity of the questionnaire using time-sampled data from 48 randomly selected subjects. Subjects took their oral temperatures routinely at half-hour intervals for three weeks. Temperatures were recorded from the time of awakening until retiring. In the sample there were 18 moderate to definite morning types, 20 moderate to definite evening types, and 10 of neither type. The results of the study demonstrated that the average

temperature curve of morning types peaked earlier than the curve of the evening types.

The questionnaire was given to a total of 259 college students at an American college over a period of three months. The study demonstrated an internal consistency reliability level of .89 (Posey & Ford, 1981).

Horneck & Mackey-Feist (1992) conducted a study comparing the Horne-Ostberg Morningness-Eveningness Questionnaire with a Short (one- question) Assessment of Morningness-Eveningness developed by Fелver and Lundstedt. The sample consisted of 71 males, aged 19-66 years ($M=30$, $SD \pm 12$). The Cronbach's alpha of the Horne-Ostberg Morningness-Eveningness Questionnaire scores showed internal consistency reliability at .87.

For the current study, the Horne-Ostberg Morningness-Eveningness Questionnaire was scored using the three point scoring criteria. This scoring criteria was used due to size and configuration of the data (see Appendix F for complete scoring criteria).

Family Environment Scale

The third instrument used in this study was the Family Environment Scale (FES), developed by Moos & Moos,(1974). (see Appendix G) The FES contains 90 true-false questions. The FES was used in this study because it allowed for measurement of relationships between family members and family environment, including roles and social functioning.

The FES measures three domains: Quality of interpersonal relationships domain, personal growth domain, and system maintenance domain.

The first domain, the quality of interpersonal relationships, contains three subscales: cohesion, expressiveness, and conflict. Cohesion is the degree of commitment, help, and support family members provide for one another. Expressiveness is the extent to which family members are encouraged to relay their feelings directly. Conflict is the amount of openly expressed anger and frustration among family members.

The second domain emphasizes personal growth goals. Within this domain are five subscales: independence (the extent to which family members are assertive, are self-sufficient, and make their own decisions), achievement (how important activities such as school and work are to the family), intellectual-cultural (the level of interest in these activities within the family), active-recreational (the amount of participation in social activities), and moral-religious (the emphasis on ethical issues and values).

The third domain is labeled system maintenance. The two subscales in this domain are organization (the degree of importance of structure in planning family activities and responsibilities), and control (how much set rules and procedures are used to run family life).

Another element of the FES is the family incongruence score. This score shows the extent to which family members disagree about their family environment. Moos & Moos (1994) developed a table of normative data derived from 1,432 normal and 788 distressed families. The normal families were selected from all areas of the country, and were of various sizes and structures. The distressed families came from a family clinic and a probation and parole department. By calculating the Family Incongruence

Score, one can describe the level of disagreement shown in the families tested and compare it to the normative data (see Appendix D).

The FES was tested on 904 individuals in depressed and case control families, 356 individuals in alcoholic and case control families, and 386 individuals in families of children with rheumatic disease. The families included parents and children. The internal consistency reliability of the ten subscales ranged from .61 for independence to .78 for cohesion. A two-month test-retest for stability reliability ranged from as low as .68 for independence to a high of .86 for cohesion (Moos & Moos, 1994).

As part of a major longitudinal project on psychiatric patients and case controls (Moos, 1991) information was obtained on subscale stability reliability for samples of individuals who were in the same family for 1 year ($n=529$), 3 to 4 years ($n=219$), 6 years ($n=167$), and 9 to 10 years ($n=127$). These samples included depressed patients, their spouses, and children. Alcoholic patients, their spouses, children and case controls their spouses and children. Internal consistency reliability was moderately high for the 1-year interval, (independence being the lowest at .53, organization .74, conflict .71, control .73, and moral-religious the highest at .84) reflecting an overall stability in family climate over this time span. Stability decreased somewhat as the number of years increased. In 9 to 10 years, the moral-religious subscale .77 and organization .65 were the most stable. Conflict .47, independence .38, and control .43 were the most unstable (Moos & Moos, 1994).

For the current study, the FES was scored by the investigator using the criteria of Moos & Moos, (1994). (see Appendix H). For example, using the scoring guide the higher the number, the higher the perceived conflict. One family member may

perceive the family conflict to be a .79 and another family member may perceive the same family conflict to be a .45. The score of .79 reflects a higher degree of conflict than the score of .45.

Data Collection Procedures

Potential subject families were identified through the investigators own social network. Access to subjects was gained by networking. Word went out to the community about the project and need for subject participation. Potential subjects then contacted the researcher and an appointment was made to meet the family and establish if they were eligible for the study.

The investigator met with members of the participant family in their home, answered questions about the study and obtained a signed consent from all family members prior to participating in the study (see Appendix K).

A questionnaire packet was given to each family member participating in the study. This packet was comprised of the following: a consent form with carbon copy, a demographic data record, the Horne-Ostberg Morningness-Eveningness Questionnaire, and the Family Environment Scale (see Appendices A,C,E,G &K).

Each subject in each family group was asked to complete all portions of the instruments in the following order: the Demographic Questionnaire, the Horne-Osberg Morningness-Eveningness Questionnaire (Horne & Osberg, 1976), and the Family Environment Scale (Moos & Moos, 1974).

Participation in the study was voluntary. Each individual in the family departed to different rooms in the home to complete the questionnaires to minimize being influenced by other family members when completing the instruments. All subjects

were able to complete these forms in less than sixty minutes, with an average being forty-five minutes.

Upon completion of the questionnaires, the subjects placed the questionnaires in one box and the consent forms in a separate box, provided by the researcher. A parent signed with each adolescent in the study. The same procedure for distribution of the forms was followed.

Protection of Human Subjects

The study was presented to the Oregon Health Sciences University Institutional Review Board for approval (see Appendix L). Informed consent procedures were followed and participation was strictly voluntary. No costs were incurred by the subjects.

The questionnaires did not contain the subjects' names and data were kept in the possession of the researcher. This process was to insure the confidentiality of the data. For data identification, each family received a number, and family members were identified by 'F' for Father, 'M' for Mother, C-1 for the oldest child, and C-2 for the youngest child.

The subjects did not benefit directly from the study, but their participation provided information which might be useful to introduce providers to the concept of how family environment, is affected by family member difference in preference to either morning or evening.

CHAPTER V

RESULTS

The purpose of this study was to investigate family environment and individual chronotype (morningness-eveningness) preferences among the family members. The data were collected from nine families of three to four members each. The research design selected was single case study with replication. There were three data sets for each family: (a) demographic information about the family unit and individual members, (b) individual scores from The Horne-Ostberg Morningness-Eveningness Questionnaire, resulting in individual chronotype, and (c) individual and family unit scores from The Family Environment Scale, resulting in individual perception of how the family environment is viewed. Family profiles were developed for each family's data.

The demographic questionnaires were summarized by family to obtain information about the family unit and individual members using the criteria shown in Appendices B & D. These data are displayed in tables for the profile of each family. The Horne-Ostberg Morningness-Eveningness Questionnaire data were tabulated using the three point scoring criteria of Horne and Ostberg (1976; see Appendix F), and presented in a table in each family's profile. Each individual within the family unit was categorized into preference for morning, or evening, or no preference by the score obtained on the 19 item questionnaire. The Family Environment Scale was scored for individual family members using a template to obtain a raw score. The calculated individual mean raw score for each individual and each domain were converted to a standard score using a conversion table provided by Moos & Moos (1994; see Appendix I). A family unit incongruent score was then calculated using the criteria provided by Moos & Moos (1994; see Appendix H). This sum of differences expressed the extent to which family members disagreed about their family environment, and was then compared with the preferred individual chronotype within each family.

Data were entered into Microsoft excel 5.0 statistical program for Macintosh. A separate graph was constructed for each family from the data. Each graph was labeled with the family identification number. The ordinate contained the standard scores from the Family Environment Scale. The possible span of scores was from zero to eighty. The abscissa exhibited the Family Environment Scale subscales of cohesion, expression, conflict, independence, achievement, intellectual-cultural, active-recreational, moral-religious, organization, and control. Each family member's standard scores were plotted on the graph.

The individual preference calculated from the Horne-Ostberg Morningness-Eveningness Questionnaire was coded for each member. A score below 42 indicated evening preference; a score above 58 indicated a morning preference; and a score between 42 and 58 indicated no preference for morning or evening. The symbol for the father was a circle; for the mother, a triangle; for the first child, a diamond; and for the second child, a square. A family member who had no morning or evening preference was coded using an symbol, X. Open symbols indicated a preference for morning and shaded symbols indicated a preference for evening.

Analysis focused on each families findings. In the nine individual families studied, differences became more apparent as the scores from the Family Environment Scale, of each family member were plotted on a graph.

In the analysis of the Family Environment Scale, the following degrees were used for interpretation of the family members' scores, and for the family incongruence score. A standard score of 0 to 30 is low; a standard score of 31 to 60 is average; and a standard score of 61 to 80 is high. For each subscale, a high score represented a high perception of the subscale by the family member. A high family incongruence score had a negative connotation, representing the family had a lot off disagreement.

Family ProfilesFamily I

Family I was comprised of four members. The entire family were present during data collection. There were not adopted children, or children in the family too young or old to qualify for the study. The father of the family had a Degree in marine biology, and worked as a marine biologist. The mother had a degree in Education and was a school teacher. The family moved to Jefferson County ten years ago.

Table 1

Family I: Individual Demographic Variables

Individual	Father	Mother	Child #1	Child #2
Gender	Male	Female	Female	Female
Age	44	45	17	13
Education	Masters	Bachelors	--	--
Occupation	Marine Biologist	Teacher	--	--
Work Hours	0830-1530	0800-1600	--	--
Years lived in Jefferson County	10	10	10	10

Note: Dashes indicate that the data did not apply.

Table 2

Family I: Family Demographic Variables

Number of Years Married	21
Number of Children in Family	2
Family Income	Greater than \$40,000

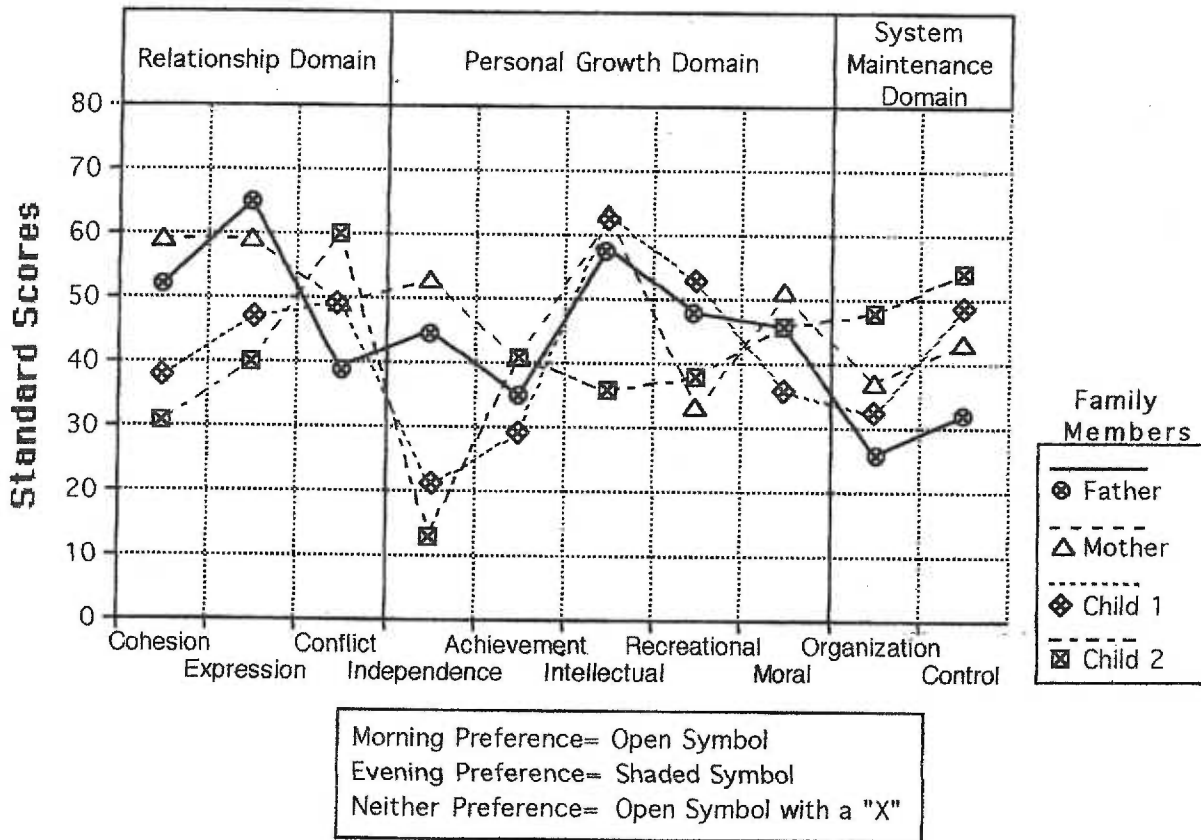
Table 3

Family I: Individual Chronotypes

	FATHER	MOTHER	CHILD #1	CHILD #2
Morning / Evening Score	50	63	44	45
Morning / Evening Type	No Preference	Morning	No Preference	No Preference

Table 4

Family I: Family Environment Scale



Family Environment ScaleRelationship DomainCohesion

The standard individual scores were from 59 to 31, resulting in a range of 28. The mother had the highest score; child # 2 the lowest. The father's score was 55; 4 points lower than the mother, 15 points higher than child #1, and 21 points higher than child # 2.

Expression

The standard individual scores were from 65 to 40, resulting in a range of 25 points. The father had the highest score; child # 2 the lowest. The mother's score was 59; 6 points lower than the father, 11 points higher than child # 1, and 19 points higher than child # 2. Child # 1 had score of 48 which is 17 points lower than the father, 10 points lower than the mother, and 8 points higher than child # 2.

Conflict

The standard individual scores were from 60 to 40, resulting in a range of 20 points. Child # 2, had the highest score; the father the lowest. The mother and child # 1, both scored the subscale at the value, 50.

Personal Growth DomainIndependence

The standard individual scores were from 53 to 13, resulting in a range of 40 points. The mother had the highest score; child # 2 the lowest. Child # 1 had a score of 21. The father's score was 49, four points lower than the mother's score.

Achievement

The standard individual scores were from 41 to 30, resulting in a range of 11 points. The family members were close to agreement with scores of 41 from both the mother and child # 2, to a score of 30 by child # 1. The father 's score was 35, which is 6 points lower than the mother and child # 2 and 5 points higher than child # 1.

Intellectual-cultural

The standard individual scores were from 62 to 36, resulting in a range of 26 points. The mother and child #1 both scored this subscale at the high value, 62; , to a score of 36 by child # 2. The father perceived family perception of intellectual-cultural at 58, which is 4 points lower than the mother and child # 1, and 22 points higher than child # 2.

Active-Recreational

The standard individual scores scores were from 52 to 33, resulting in a range of 19 points. The greatest difference was between mother and child # 1. The father's score was 49 which is 3 points lower than child # 1, 10 points higher than child # 2, and 16 points higher than the mother. Child # 2 had a score of 39, which is 13 points lower than child # 1, 10 points lower than the father, and 6 points higher than the mother.

Moral-Religious

In the subscale for moral-religious perceptions all scores fell into the average range on the scale. The mother of the family had the highest score of 51, and child # 1 had the lowest score of 36. The difference was 15 points. The father and child # 2 both scored this subscale at an average value, 46.

System Maintenance DomainOrganization

The standard individual scores were from of 49 to 27, resulting in a range of 22 points. Child # 2 had the highest score; the father the lowest score. The mother and child # 1 were five points apart, with the mother scoring a 38 which was 11 points below child # 2 and 11 points higher than the father.

Control

The standard individual scores were from 54 to 32. Child # 2 had the highest score; the father the lowest. Child # 1's score was, five points lower than child # 2. The mother's score of 43, was 11 points higher than the father, 6 points lower than

child # 1, and 11 points lower than child # 2.

Family Incongruence Score

Incongruence Score

The family incongruence score was 63. A standard score of 61 or more is classified as a high level of incongruence within the family.

Family II

Family II was composed of five members. This was a blended family, with two children who were not eligible to participate in this study because of their age (greater than 18 years old) and absence from the home. The father of the family, had two years of college, and was a farmer who worked long hours during the spring, summer, and fall. The mother had a degree in nursing. She works 12 hour day time shifts, 3 days a week. The mother and child also spent time working at home on the farm. The couple and their children have lived in Jefferson County all their lives.

Table 5

Family II: Individual Demographic Variables

Individual	Father	Mother	Child #1
Gender	Male	Female	Male
Age	55	45	17
Education	Associates	Bachelors	--
Occupation	Farmer	Nurse	--
Work Hours	Varies	0530-1800	--
Years lived in Jefferson County	55	45	17

Note: Dashes indicate that the data did not apply.

Table 6

Family II: Family Demographic Variables

Number of Years Married	22
Number of Children in Family	3
Family Income	Greater Than \$40,000

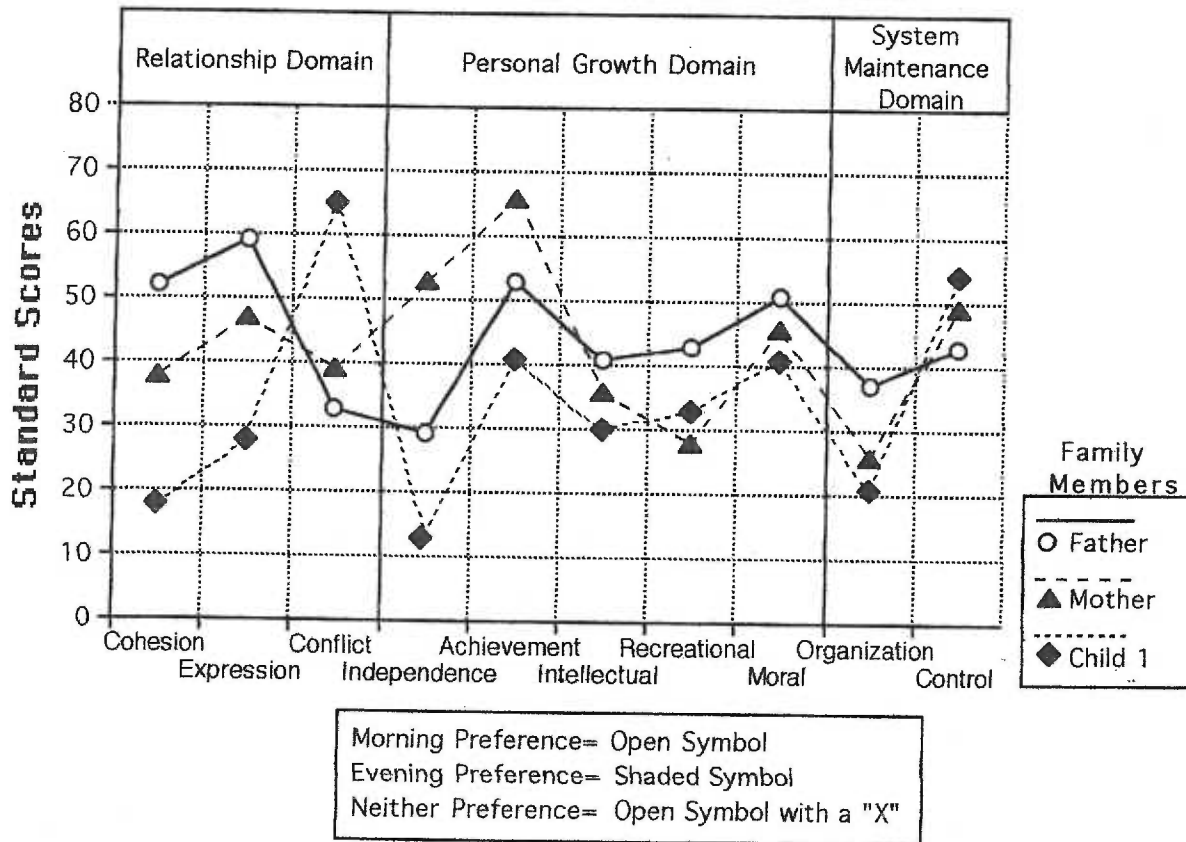
Table 7

Family II: Individual Chronotypes

	FATHER	MOTHER	CHILD #1
Morning / Evening Score	69	34	28
Morning / Evening Type	Morning	Evening	Evening

Table 8

Family II: Family Environment Scale



Family Environment ScaleRelationship DomainCohesion

The standard individual scores were from 52 to 19. The father perceived the highest family cohesion; the child perceived the lowest. The mother perceived family cohesion with a score of 38 which is 14 points lower than the father, and 19 points higher than the child.

Expression

The standard individual scores were from 59 to 28, resulting in a range of 31. The father's score was the highest; the child's score the lowest. The mother of this family scored 48 which is 11 points lower than the father, and 10 points higher than the child.

Conflict

The standard individual scores were from 65 to 33, a range of 32. The child's score was the highest; the father's score the lowest. The mother's scored 39, is 5 points higher than the father, and 26 points lower than the child.

Personal Growth DomainIndependence

The standard individual scores were from 52 to 12. The mother's score was the highest; the child's the lowest. The father's score was 30, which is 18 points higher than the son, and 22 points lower than the mother's score.

Achievement

The standard individual scores were from 65 to 41, resulting in a range of 25 points. The greatest difference was between the mother and the child. The father of the family scored a 52, which is 13 points lower than the mother, and 11 points higher than the child.

Intellectual-cultural

The standard individual scores were from 41 to 30, resulting in a range of 11

points. The father had the highest score; the child the lowest. The mother's score was 35, which is 6 points lower than the father, and 5 points higher than the child.

Active-Recreational

The standard individual scores were from 42 to 29, resulting in a range of 13 points. The father had the highest score; the mother the lowest. The child's score was 32, which is 10 points lower than the father, and 3 points higher than the mother.

Moral-Religious

The standard individual scores were from 51 to 41, resulting in a range of 10 points. The father's score was the highest; the child's score the lowest. The mother's score was 45, which is 6 points lower than the father, and 4 points higher than the child.

System Maintenance Domain

Organization

The standard individual scores were from 38 to 21, resulting in a range of 17 points. The father had the highest score; the son the lowest. The mother's score was 26, which is 5 points higher than the son and 12 points lower than the father.

Control

The standard individual scores were from 53 to 43, resulting in a range of 10 points. Control in the family is perceived to be the highest by the child, and lowest by the father. The mother's score was 6 points higher than the father, and 4 points lower than the son.

Family Incongruence Score

Incongruence Score

The family incongruence score was 61. A standard score of 61 or more is classified as a high level of incongruence within the family.

Family III

Family III was composed of five members. The youngest child was adopted, and diagnosed with Attention Deficit Hyperactivity Disorder. He did not qualify for this study because he was adopted. The father of the family had completed two years of college and was a mechanic. The mother had a two year degree in nursing. She works 12 hour night shifts, three days a week. The family had lived in Jefferson County for 10 years.

Table 9

Family III: Individual Demographic Variables

Individual	Father	Mother	Child #1	Child #2
Gender	Male	Female	Male	Female
Age	50	52	17	15
Education	Associate	Associate	--	--
Occupation	Mechanic	Nurse	--	--
Work Hours	0900-1730	1745-0615	--	--
Years lived in Jefferson County	10	10	10	10

Note: Dashes indicate that the data did not apply.

Table 10

Family III: Family Demographic Variables

Number of Years Married	22
Number of Children in Family	3
Family Income	Greater Than \$40,000

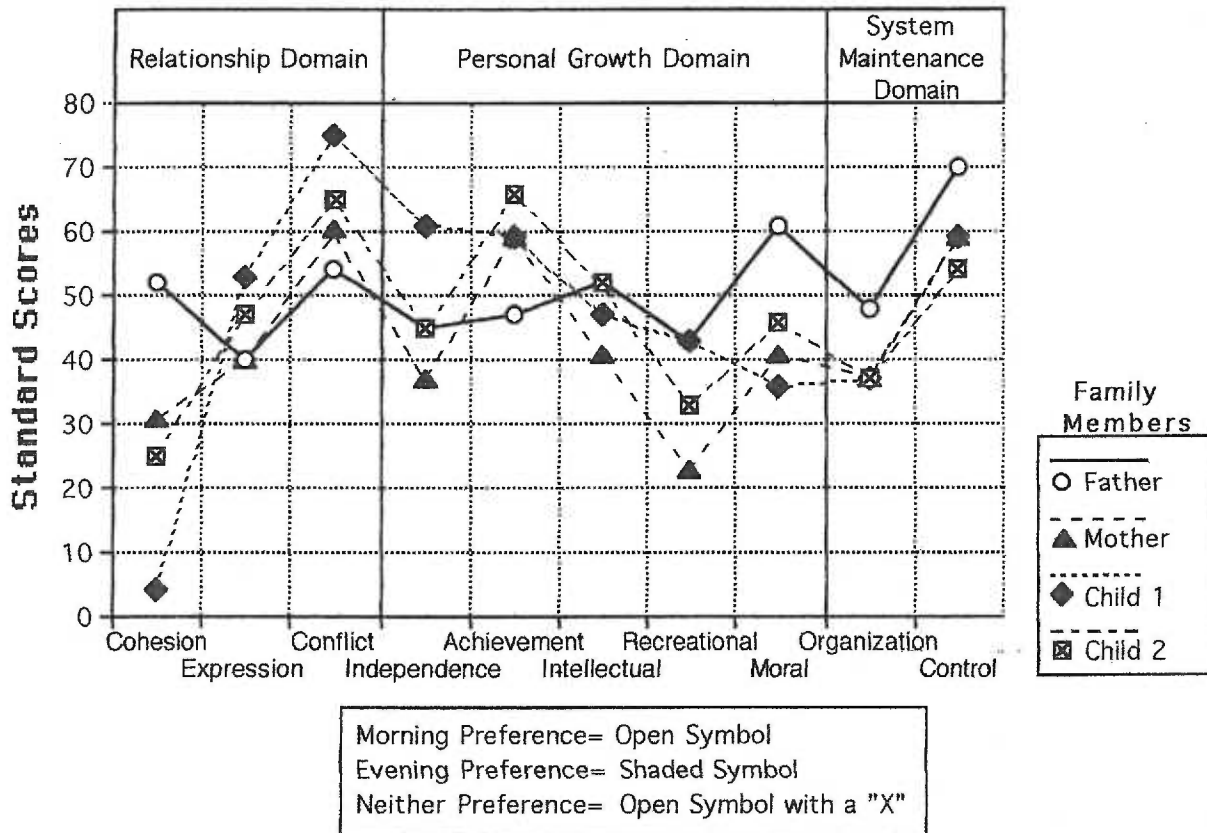
Table 11

Family III: Individual Chronotypes

	FATHER	MOTHER	CHILD #1	CHILD #2
Morning / Evening Score	78	41	39	47
Morning / Evening Type	Morning	Evening	Evening	No Preference

Table 12

Family III: Family Environment Scale



Family Environment ScaleRelationship DomainCohesion

The standard individual scores were from 52 to 4 resulting in a range of 48 points. The father's score was the highest; Child # 1's the lowest. The mother and child # 2 scored at 26 and 30 respectively a difference of 4 points. Child # 2 perceived family cohesion as 22 points higher than child # 1, and 26 points lower than the father. The mother perceived family cohesion as 26 points higher than child #1, and 22 points lower than the father of the family.

Expression

The standard individual scores were from 52 to 40, resulting in a range of 12 points. Child # 1 had the highest score, and the parents both scored this subscale in the average level, 40. Child # 2's score was 48 which is 4 points lower than child # 1 and 8 points higher than the parents.

Conflict

The standard individual scores were from 75 to 54, resulting in a range of 21 points. Child # 1 had the highest score; the father the lowest. The mother's score was 6 points higher than the father, 4 points lower than child # 2, and 15 points lower than child # 1. Child # 2 perceived family conflict as 11 points higher than the father, 4 points higher than the mother, and 10 points lower than child # 1.

Personal Growth DomainIndependence

The standard individual scores were from 61 to 38, resulting in a range of 23 points. The father and child # 2 both scored this subscale at the same value,45; which is 7 points higher than the mother, and 16 points lower than child # 1.

Achievement

The standard individual scores were from 66 to 48, resulting in a range of 18

points. The mother and child #1 both scored this subscale at the high value, 60. Their score is 6 points lower than child # 2, and 12 points higher than the fathers score.

Intellectual-Cultural

The standard individual scores were from 51 to 41, resulting in a range of 10 points. The father and child # 2 both scored this subscale at 51. The mother's score's was 41. Child # 1 had a score of 48 which is 3 points less than the highest score, and 7 points higher than the lowest score.

Active-Recreational

The standard individual scores were from 43 to 22, resulting in a 21 point range. The father and child # 1 both scored this subscale with 43. The mother's score was 41. Child # 2 scored a 32 which is 11 points lower than the father and child # 1 and 10 points higher than the mother.

Moral-Religious

The standard individual scores were from 61 to 37, resulting in a range of 24 points. The mother's score was 41 which is 20 points lower than the father, 4 points higher than child # 1, and 5 points lower than child # 2. Child # 2 had a score a 46, which is 15 points lower than the father, 5 points higher than the mother, and 9 points higher than child # 1.

System Maintenance Domain

Organization

The standard individual scores were from 48 to 38, resulting in range of 10 points. The father's score was the highest, and the mother, child #1 and child # 2 all scored this subscale at the value of 38, which is 10 points lower than the fathers.

Control

The standard individual scores were from 70 to 55, resulting in a range of 15 points. The father had the highest score; child # 2 the lowest. The mother and child # 1

both scored this subscale at the value of 59, which is 4 points higher than child # 2 and 11 points lower than the father's score.

Family Incongruence Score

Incongruence score

The family incongruence score was 57. A standard score of 61 or more is classified as a high level of incongruence within the family.

Family IV

Family IV was composed of five members. The youngest child, (age 9) did not qualify for this study because of her age. This was a blended family in which the two oldest children were biological children of the mother, and the youngest child was the biological child of both parents. The father had a high school education and worked in a lumber mill. The mother had an associate degree in nursing and works 12 hour night shifts, 3 nights a week. The family had lived in Jefferson County for 6 years.

Table 13

Family IV: Individual Demographic Variables

Individual	Father	Mother	Child #1	Child #2
Gender	Male	Female	Female	Male
Age	37	36	15	14
Education	Highschool	Associate	--	--
Occupation	Mill Wright	Nurse	--	--
Work Hours	0530-1530	1745-0615	--	--
Years lived in Jefferson County	6	6	6	6

Note: Dashes indicate that the data did not apply.

Table 14

Family IV: Family Demographic Variables

Number of Years Married	12
Number of Children in Family	3
Family Income	Greater Than \$40,000

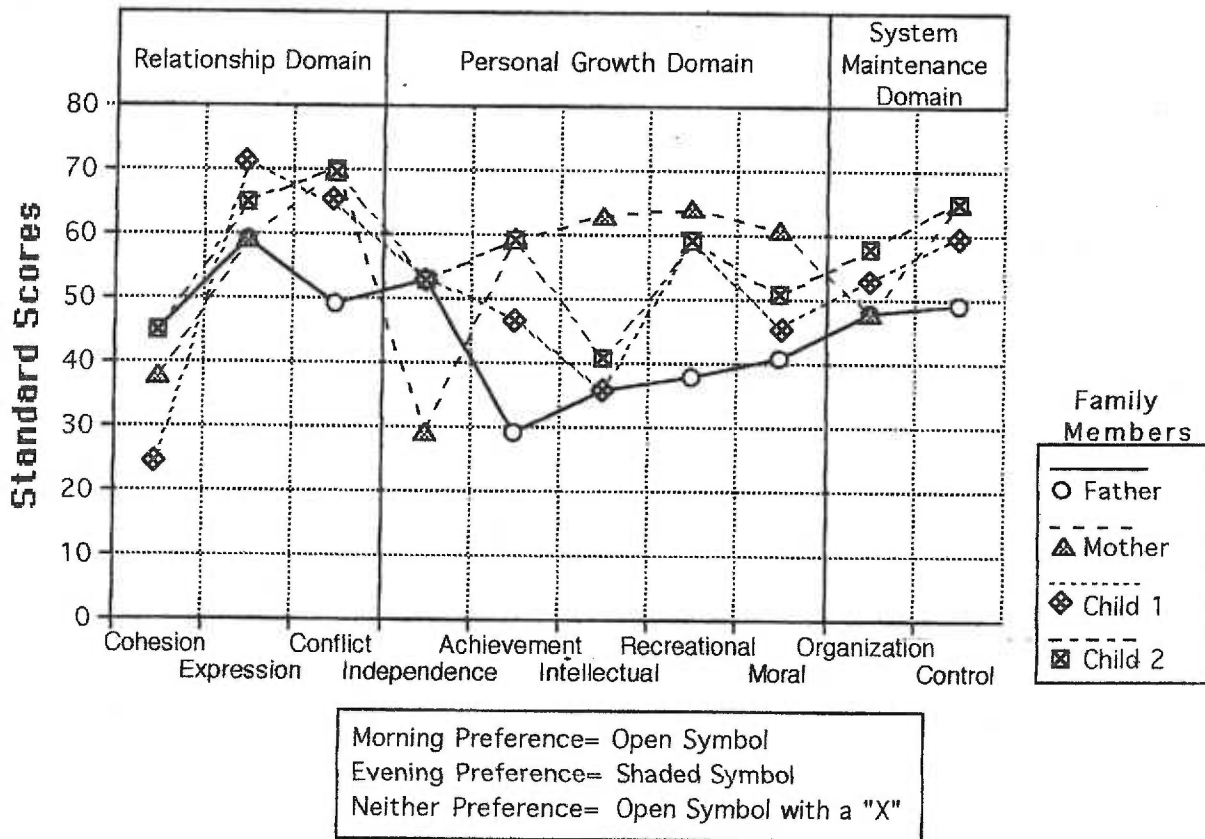
Table 15

Family IV: Individual Chronotypes

	FATHER	MOTHER	CHILD #1	CHILD #2
Morning / Evening Score	65	55	43	45
Morning / Evening Type	Morning	No Preference	No Preference	No Preference

Table 16

Family IV: Family Environment Scale



Family Environment ScaleRelationship DomainCohesion

The standard individual scores were from 45 to 25, resulting in a range of 20 points. The father and child # 2 both scored this subscale at a value of 45. Child #1 had a score of 25. The mother's score was 38, which was 7 points lower than the father and child # 2, and 13 points higher than child # 1.

Expression

The standard individual scores were from 71 to 59, resulting in a range of 22 points. The father and mother both scored this subscale at the high value, 70. Child # 2 had a score of 65 which is 6 points lower than child # 1 and 6 points higher than the parents.

Conflict

The standard individual scores were from 70 to 50 resulting in a range of 20 points. The mother and child # 2 both scored this subscale at the high value of 70. The father's score was 50. Child # 1's score was 65, which is 5 points lower than the mother and child # 2, and 15 points higher than the father.

Personal Growth DomainIndependence

The standard individual scores were from 52 to 29, resulting in a range of 23 points. The father, and both children's scored this subscale at the same value of 52; the mother's score was 29.

Achievement

The standard individual scores were from 60 to 30 resulting in a range of 30 points. The mother and child # 2 both scored this subscale at the high value, 60. Child # 1 had a score of 48 which is 12 points lower than the mother and child # 2, and 18 points higher than the father.

Intellectual-Cultural

The standard individual scores were from 62 to 36, resulting in a range of 26 points. The father and child # 1 both scored this subscale at the value of 36. Child # 2 had a score of 41 which is 21 points lower than the mother, and 5 points higher than the father and child # 1.

Active-Recreational

The standard individual scores were from 63 to 39, resulting in a range of 24 points. Both children scored this subscale at a value of 59, which is 4 points lower than the mother, and 20 points higher than the father.

Moral-Religious

The standard individual scores were from 61 to 41, resulting in a range of 20 points. Child # 1's score of 45 is 16 points lower than the mother, 4 points higher than the father, and 6 points lower than child # 2. Child # 2's score of 51, is 10 points lower than the mother, 10 points higher than the father, and 6 points higher than child # 1.

System Maintenance DomainOrganization

The standard individual scores were from 59 to 49, resulting in a range of 20 points. Child # 2 had the highest score. The parents both scored this subscale at the value of 49. Child # 1's score was 52 which is 7 points lower than child #2, and 3 points greater than the parents.

Control

The standard individual scores were from 65 to 49. The mother and child # 2 both scored this subscale at the high value, 65. The father's score was 49. Child # 1's score was 59; 10 points higher than the father, and 6 points lower than the mother and child # 2.

Family Incongruence Score

Incongruence Score

The family incongruence score was 55. A standard score of 61 or more is classified as a high level of incongruence within the family.

Family V

Family V was composed of four members. A child nine years old, did not qualify to participate in this study because of her age. The father, earned a law degree and was a criminal lawyer. The mother earned a degree in education, but does not work outside the home. The family had lived in Jefferson County for 25 years.

Table 17

Family V: Individual Demographic Variables

Individual	Father	Mother	Child #1
Gender	Male	Female	Male
Age	51	45	14
Education	Law Degree	Bachelors	--
Occupation	Lawyer	Home Maker	--
Work Hours	0830-1730	Varies	--
Years lived in Jefferson County	25	25	14

Note: Dashes indicate that the data did not apply.

Table 18

Family V: Family Demographic Variables

Number of Years Married	17
Number of Children in Family	2
Family Income	Greater Than \$40,000

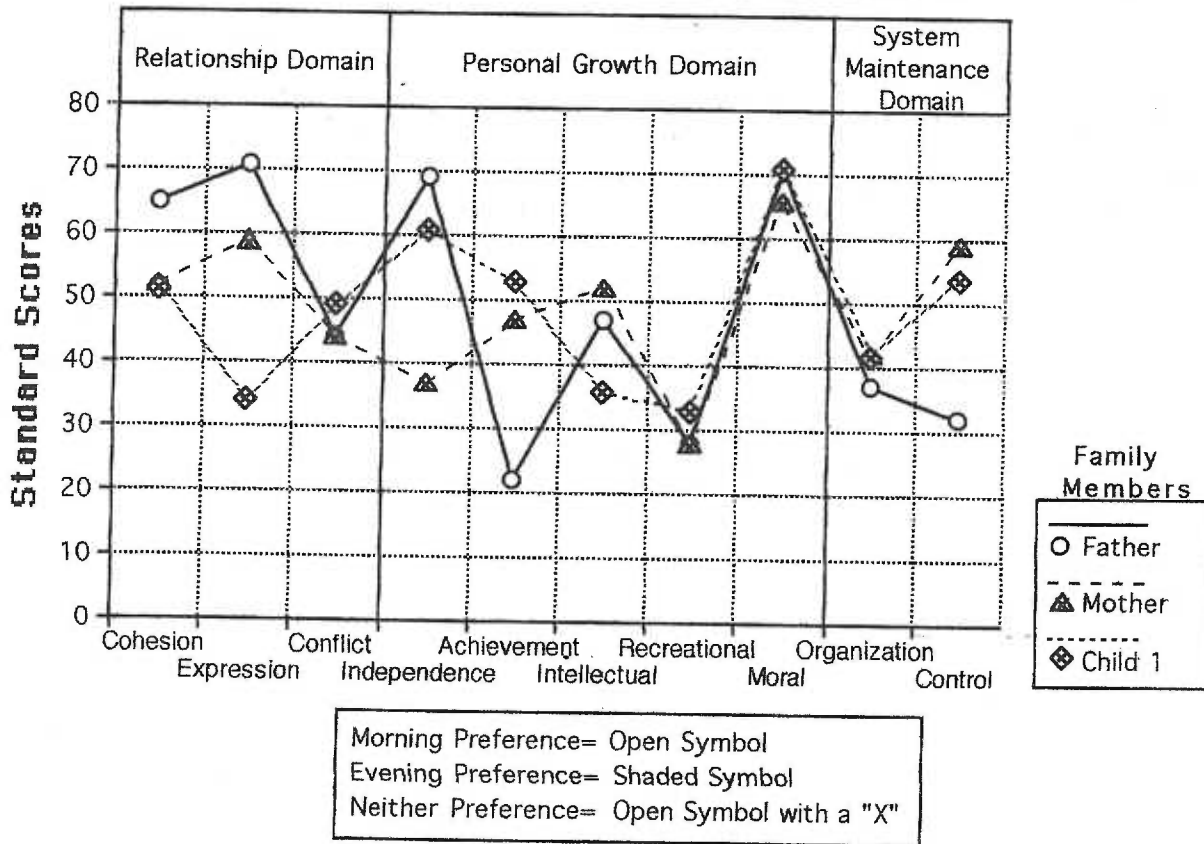
Table 19

Family V: Individual Chronotypes

	FATHER	MOTHER	CHILD #1
Morning / Evening Score	76	46	43
Morning / Evening Type	Morning	No Preference	No Preference

Table 20

Family V: Family Environment Scale



Family Environment ScaleRelationship DomainCohesion

The standard individual scores were from 65 to 51, resulting in a range of 14 points. The father had the highest score, and the mother and child both scored this subscale at the value of 51.

Expression

The standard individual scores were from 70 to 35, resulting in a range of 35 points. The father had the highest score; the child the lowest. The mother's score was 59, which is 11 points lower than the father, and 24 points higher than the child.

Conflict

The standard individual scores were from 50 to 44, resulting in a range of 6 points. The child had the highest score, 50; The parents both scored this subscale at the value of 44.

Personal Growth DomainIndependence

The standard individual scores were from 69 to 38, resulting in a range of 31 points. The father had the highest score; the mother the lowest. The child's score was 60; 9 points lower than the father, and 22 points higher than the mother.

Achievement

The standard individual scores were from 52 to 22, resulting in a range of 30 points. The child had the highest score; the father the lowest. The mother's score was 48; 4 points lower than the child, and 26 points higher than the father.

Intellectual-Cultural

The standard individual scores were from 52 to 36, resulting in a range of 16 points. The mother had the highest score; the child the lowest. The father's score was 48; 4 points lower than the mother, and 12 points higher than the child.

Active-Recreational

The standard individual scores were from 32 to 28, resulting in a range of 4 points. The child had the highest score. Both parents scored this subscale at the low value of 28.

Moral-Religious

The standard individual scores were from 72 to 67, resulting in a range of 5 points. The father and child both scored this subscale at the high value, 72. The mother's score was 67.

System Maintenance DomainOrganization

The standard individual scores were from 41 to 38, resulting in a range of 3 points. The mother and child both scored this subscale at the value, 41. The father's score was 38.

Control

The standard individual scores were from 59 to 32, resulting in a range of 27 points. The mother had the highest score; the father the lowest. The child's score was 54; 5 points lower than the mother's score, and 22 points higher than the father's score.

Family Incongruence ScoreIncongruence score

The family incongruence score was 57. A standard score of 61 or more is classified as a high level of incongruence within the family.

Family VI

Family VI was composed of four members. All family members were present and qualified for this study. Both parents had degrees in education and were school teachers. The family had lived in Jefferson County for 2 years.

Table 21

Family VI: Individual Demographic Variables

Individual	Father	Mother	Child #1	Child #2
Gender	Male	Female	Male	Female
Age	42	38	15	14
Education	Bachelors	Bachelors	--	--
Occupation	Teacher	Teacher	--	--
Work Hours	0800-1600	0800-1600	--	--
Years lived in Jefferson County	2	2	2	2

Note: Dashes indicate that the data did not apply.

Table 22

Family VI: Family Demographic Variables

Number of Years Married	17
Number of Children in Family	2
Family Income	Greater Than \$40,000

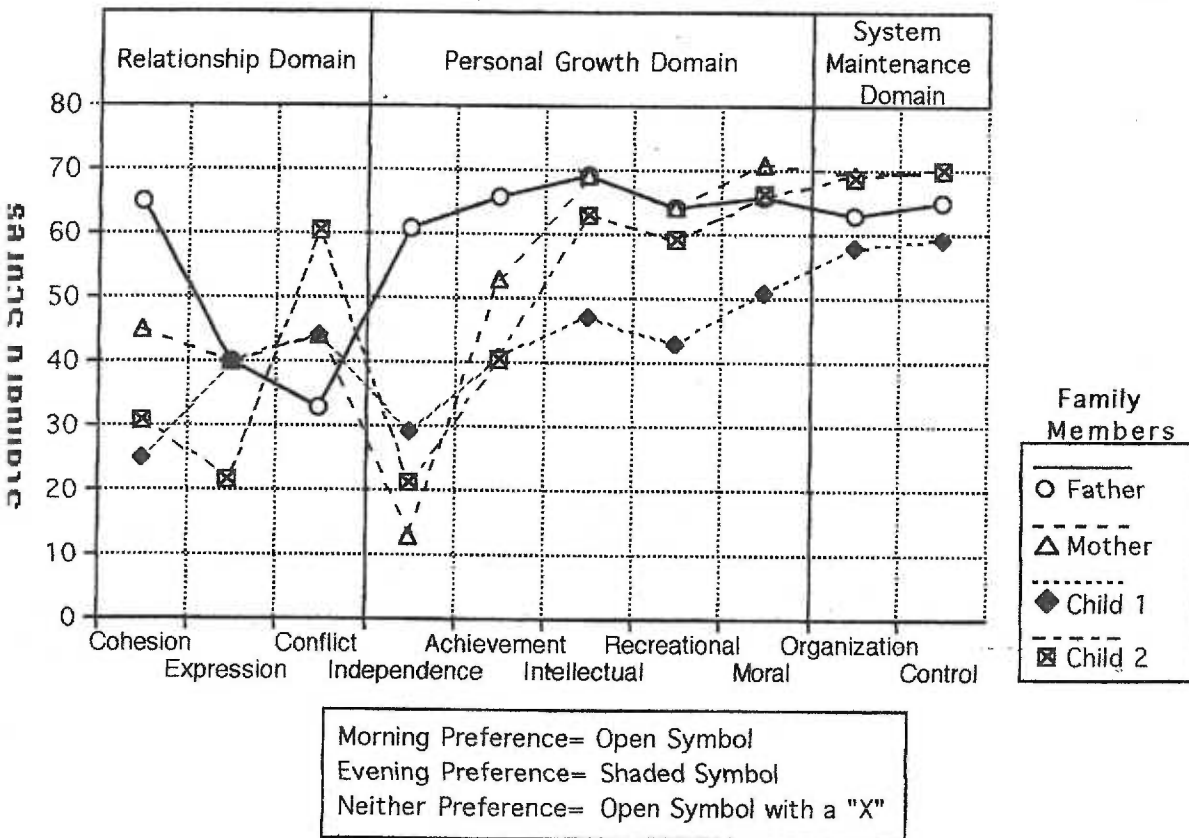
Table 23

Family VI: Individual Chronotypes

	FATHER	MOTHER	CHILD #1	CHILD #2
Morning / Evening Score	80	60	32	44
Morning / Evening Type	Morning	Morning	Evening	No Preference

Table 24

Family VI: Family Environment Scale



Relationship Domain

Cohesion

The standard individual scores were from 66 to 25, resulting in a range of 41 points. The father had the highest score; child # 1 the lowest. The mother's score was 45; 21 points lower than the father, 20 points higher than child # 1, and 14 points higher than child # 2. Child # 2's score was 31; 35 points lower than the father, 14 points lower than the mother, and 6 points higher than child # 1.

Expression

The standard individual scores were from 40 to 22, resulting in a range of 18 points. The parents and child # 1 all scored this subscale at the value of 40. Child # 2's score was 22.

Conflict

The standard individual scores were from 60 to 32, resulting in a range of 28 points. Child # 2 had the highest score; the father the lowest. The mother and child # 1 both scored this subscale at the value, 42. This score is 10 points higher than the father, and 18 points lower than child # 2.

Personal Growth Domain

Independence

The standard individual scores were from 61 to 12, resulting in a range of 49 points. The father had the highest score; the mother the lowest. Child # 1's score 30; 31 points lower than the father, 18 points higher than the mother, and 9 points higher than child # 2. Child # 2's, score was 21; 40 points lower than the father, 9 points lower than child # 1, and 9 points higher than the mother.

Achievement

The standard individual scores were from 66 to 41, resulting in a range of 25 points. The father had the highest score. The children both scored this subscale at the

value of 41. The mother's score was 52, which is 14 points lower than the father, and 11 points higher than the children.

Intellectual-Cultural

The standard individual scores were from 69 to 48, resulting in a range of 21 points. The parents both scored this subscale at the high value, 69. Child # 1 had the lowest score, 48. Child # 2's score was 62; 7 points lower than the parents and 14 points higher than child # 1.

Active-Recreational

The standard individual scores were from 65 to 42, resulting in a range of 23 points. Both parents scored this subscale at the high value, 65. Child # 1 had the lowest score. Child # 2's score was 60; 5 points lower than the parents.

Moral-Religious

The standard individual scores were from 71 to 51, resulting in a range of 20 points. The mother had the highest score; child # 1 the lowest. The father and child # 2 both scored this subscale at the high value, 67. The difference was 4 points lower than the mother, and 16 points higher than child # 2.

System Maintenance Domain

Organization

The standard individual scores were from 69 to 58, resulting in a range of 11 points. The mother and child # 2 both scored this subscale at the value of 69. Child # 1 had the lowest score, and the father's score was 63.

Control

The standard individual scores were from 70 to 59, resulting in a range of 11 points. The mother and child # 2 both scored this subscale at the high value, 70. Child # 2 had the lowest score. The father's score was 65 which is 5 points lower than the mother and child # 2, and 6 points higher than child # 1.

Family Incongruence Score

Incongruence

The family incongruence score is 61. A standard score of 61 or more is classified as a high level of incongruence within the family.

Family VII

Family VII was composed of five members. This was a blended family, where one child, the eldest was the biological child of the mother. The two younger children, (ages 8 and 5) were too young to qualify for this study. The father had a high school education, and worked at a lumber mill. The mother had a high school education, and stayed at home with the younger children as well as baby sat for other families who work outside their homes. The family had lived in Jefferson County for 32 years.

Table 25

Family VII: Individual Demographic Variables

Individual	Father	Mother	Child #1
Gender	Male	Female	Male
Age	32	32	13
Education	Highschool	Highschool	--
Occupation	Mill Work	Babysits	--
Work Hours	0600-1500	0800-1600	--
Years lived in Jefferson County	32	32	13

Note: Dashes indicate that the data did not apply.

Table 26

Family VII: Family Demographic Variables

Number of Years Married	9
Number of Children in Family	3
Family Income	\$30,001 - \$40,000

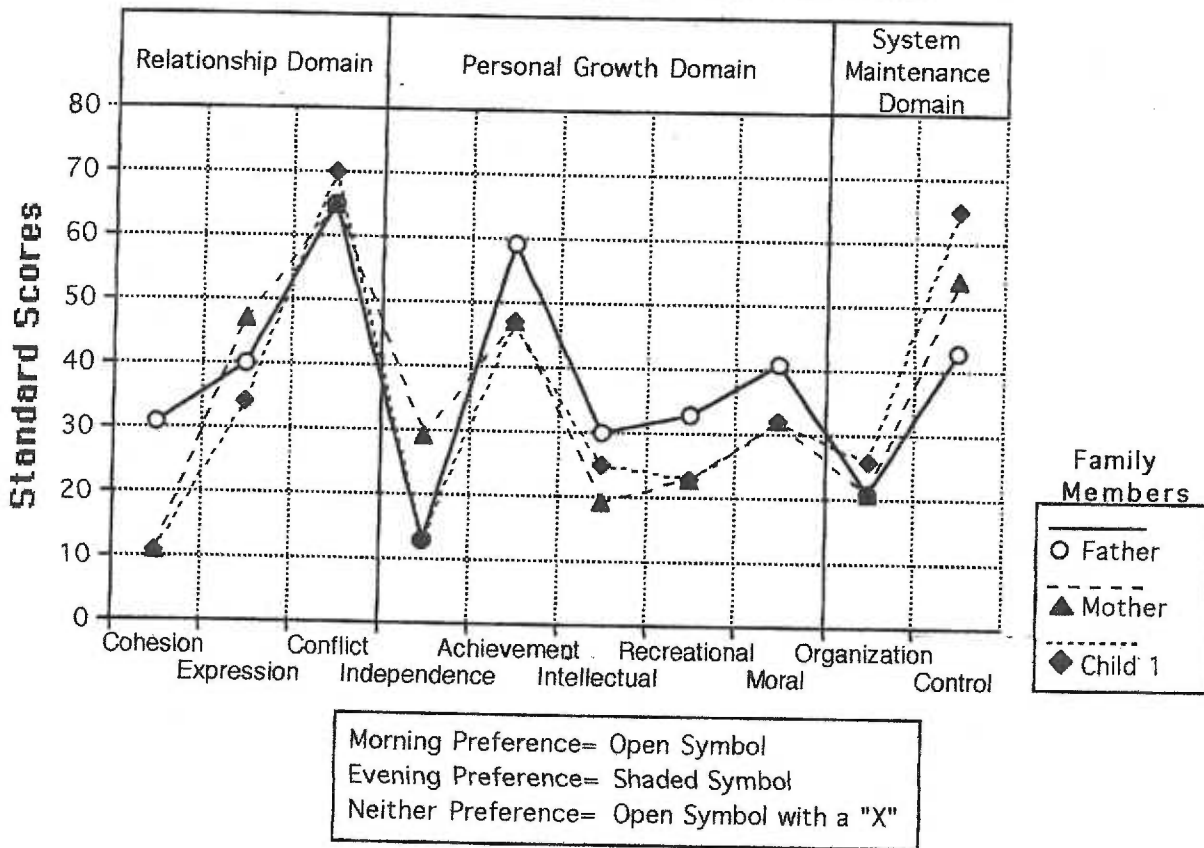
Table 27

Family VII: Family Chronotypes

	FATHER	MOTHER	CHILD #1
Morning / Evening Score	70	41	38
Morning / Evening Type	Morning	Evening	Evening

Table 28

Family VII: Family Environment Scale



Relationship Domain

Cohesion

The standard individual scores were from 31 to 11, resulting in a range of 20 points. The father had the highest score. The mother and child both scored this subscale at the low value, 11.

Expression

The standard individual scores were from 48 to 33, resulting in a range of points. The mother had the highest score; the child the lowest. The father's score was 40; 8 points lower than the mother, and 7 points higher than the child.

Conflict

The standard individual scores were from 70 to 60, resulting in a range of 10 points. The child had the highest score. The parents both scored this subscale at the high value, 60.

Personal Growth Domain

Independence

The standard individual scores were from 29 to 13, resulting in a range of 16 points. The mother had the highest score. The father and son both scored this subscale at the low value, 13.

Achievement

59 to 48, resulting in a range of 11 points. The father had the highest score. The mother and child both scored this subscale at the value, 48.

Intellectual-Cultural

The standard individual scores were from 30 to 19, resulting in a range of 21 points. The father had the highest score; the mother the lowest. The child's score was 25; 5 points lower than the father, and 6 points higher than the mother.

Active-Recreational

The standard individual scores were from 32 to 22, resulting in a range of 10 points. The father had the highest score. The mother and child both scored this subscale at the low value, 22.

Moral-Religious

The standard individual scores were from 41 to 31, resulting in a range of 10 points. The father had the highest score. The mother and child both scored this subscale at the value of 31.

System Maintenance DomainOrganization

The standard individual scores were from 26 to 21, resulting in a range of 5 points. The child had the highest score. The parents both scored this subscale at the low value, 21.

Control

The standard individual scores were from 65 to 42, resulting in a range of 23 points. The father had the highest score; the child the lowest. The mother's score was 54; 11 points lower than the father, and 12 points higher than the child.

Family Incongruence ScoreIncongruence

The family incongruence score is 48. A standard score of 61 or more is classified as a high level of incongruence within the family. A standard score of 30 or less is classified as a low level of incongruence within the family.

Family VIII

Family VIII was composed of five members. This was a blended family, in which the eldest child was the biological child of the father, the middle child, the biological child of the mother, and the youngest child, the biological child of both parents in this study. The two eldest children did not qualify for this study due to their ages (greater than 18 year), and they were not presently living in the home. The father had completed 2 years of college, and operated a small retail business. The mother had completed 2 years of college, and is the bookkeeper for her husband's retail business. The family had lived in Jefferson County for 10 years.

Table 29

Family VIII: Individual Demographic Variables

Individual	Father	Mother	Child #1
Gender	Male	Female	Male
Age	57	50	16
Education	Associate	Associate	--
Occupation	Retail Business	Book Keeper	--
Work Hours	0830-1730	0830-1730	--
Years lived in Jefferson County	10	10	10

Note: Dashes indicate that the data did not apply.

Table 30

Family VIII: Family Demographic Variables

Number of Years Married	22
Number of Children in Family	3
Family Income	Greater than \$40,000

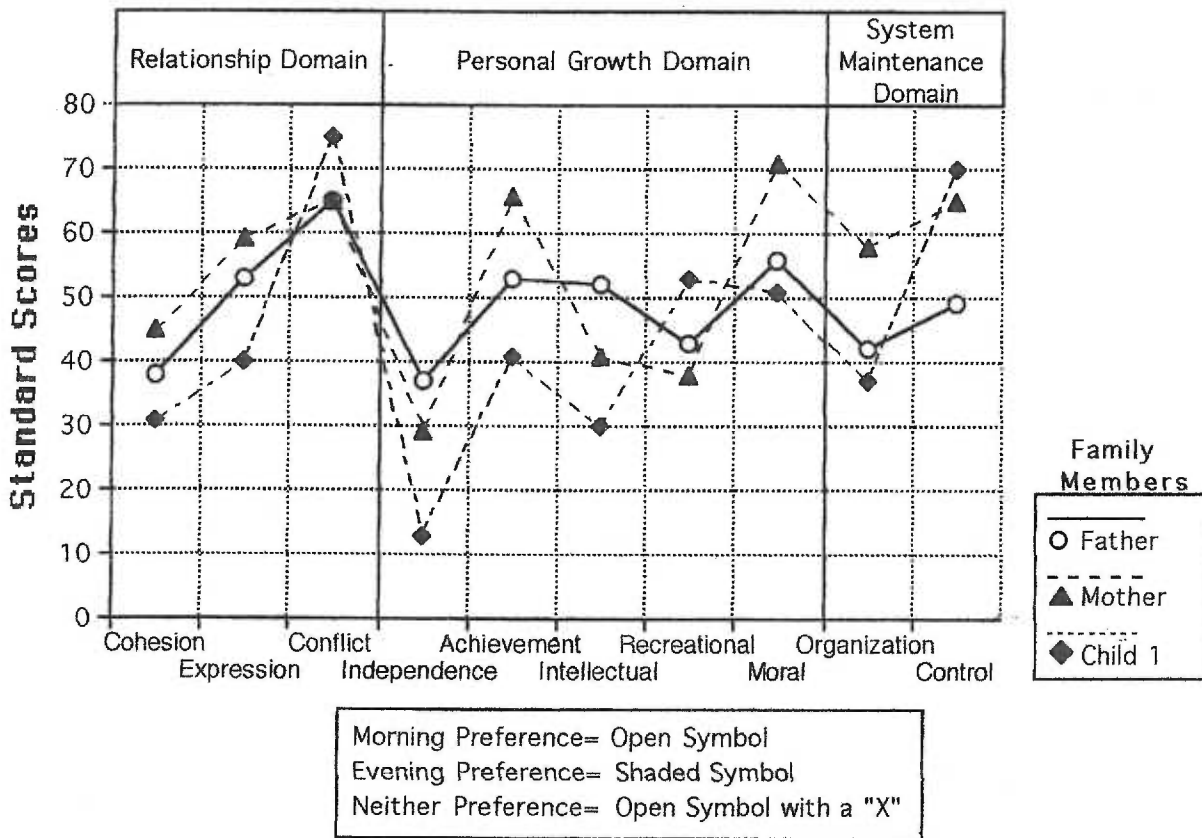
Table 31

Family VIII: Individual Chronotypes

	FATHER	MOTHER	CHILD #1
Morning / Evening Score	72	39	28
Morning / Evening Type	Morning	Evening	Evening

Table 32

Family VIII: Family Environment Scale



Relationship Domain

Cohesion

The standard individual scores were from 45 to 31, resulting in a range of 14 points. The mother had the highest score; the child the lowest. The father's score was 38; 7 points lower than the mother, and 7 points higher than the son.

Expression

The standard individual scores were from 59 to 40, resulting in a range of 19 points. The mother had the highest score; the child the lowest. The father's score was 52; 7 points lower than the mother, and 12 points higher than the child.

Conflict

The standard individual scores were from 75 to 64, resulting in a range of 11 points. The child had the highest score. The parents both scored this subscale at the high value, 64.

Personal Growth Domain

Independence

The standard individual scores were from 38 to 13, resulting in a range of 25 points. The father had the highest score; the child the lowest. The mother's score was 29; 9 points lower than the father, and 16 points higher than the child.

Achievement

The standard individual scores were from 67 to 41, resulting in a range of 25 points. The mother had the highest score; the child the lowest. The father's score was 52; 14 points lower than the mother and 11 points higher than the child.

Intellectual-Cultural

The standard individual scores were from 52 to 31, resulting in a range of 21 points. The father had the highest score; the child the lowest. The mother's score was 41; 11 points lower than the father, and 10 points higher than the child.

Active-Recreational

The standard individual scores were from 52 to 38, resulting in a range of 24 points. The child had the highest score; the mother the lowest. The father's score was 42; 10 points lower than the child, and 4 points higher than the mother.

Moral-Religious

The standard individual scores were from 71 to 51, resulting in the range of 20 points. The mother had the highest score; the child the lowest. The father's score was 56; 15 points lower than the mothers, and 5 points higher than the child.

System Maintenance DomainOrganization

The standard individual scores were from 59 to 37, resulting in a range of 22 points. The mother had the highest score; the child the lowest. The father's score was 41; 18 points lower than the mother, and 4 points higher than the child.

Control

The standard individual scores were from 70 to 49, resulting in a range of 21 points. The child had the highest score; the father the lowest. The mother's score was 65; 5 points lower than the child, and 16 points higher than the father.

Family Incongruence ScoreIncongruence score

The family incongruence score was 66. A standard score of 61 or more is classified as a high level of incongruence within the family.

Family IX

Family IX was composed of five members. This was a blended family with the two eldest children not qualifying for the study due to their age (greater than 18 years) and absence from the home. The two eldest children were the biological children of the father. The youngest child who did qualify for this study was the biological son of both parents. The father had a high school education, and was a truck driver. The mother had a school education and was a sales clerk. The family had lived in Jefferson County all their lives (father 60 years, mother 45 years, child 18 years).

Table 33

Family IX: Individual Demographic Variables

Individual	Father	Mother	Child #1
Gender	Male	Female	Male
Age	60	45	18
Education	Highschool	Highschool	--
Occupation	Truck Driver	Sales Clerk	--
Work Hours	1530-1730	0830-1700	--
Years lived in Jefferson County	60	45	18

Note: Dashes indicate that the data did not apply.

Table 34

Family IX: Family Demographic Variables

Number of Years Married	25
Number of Children in Family	3
Family Income	Greater than \$40,000

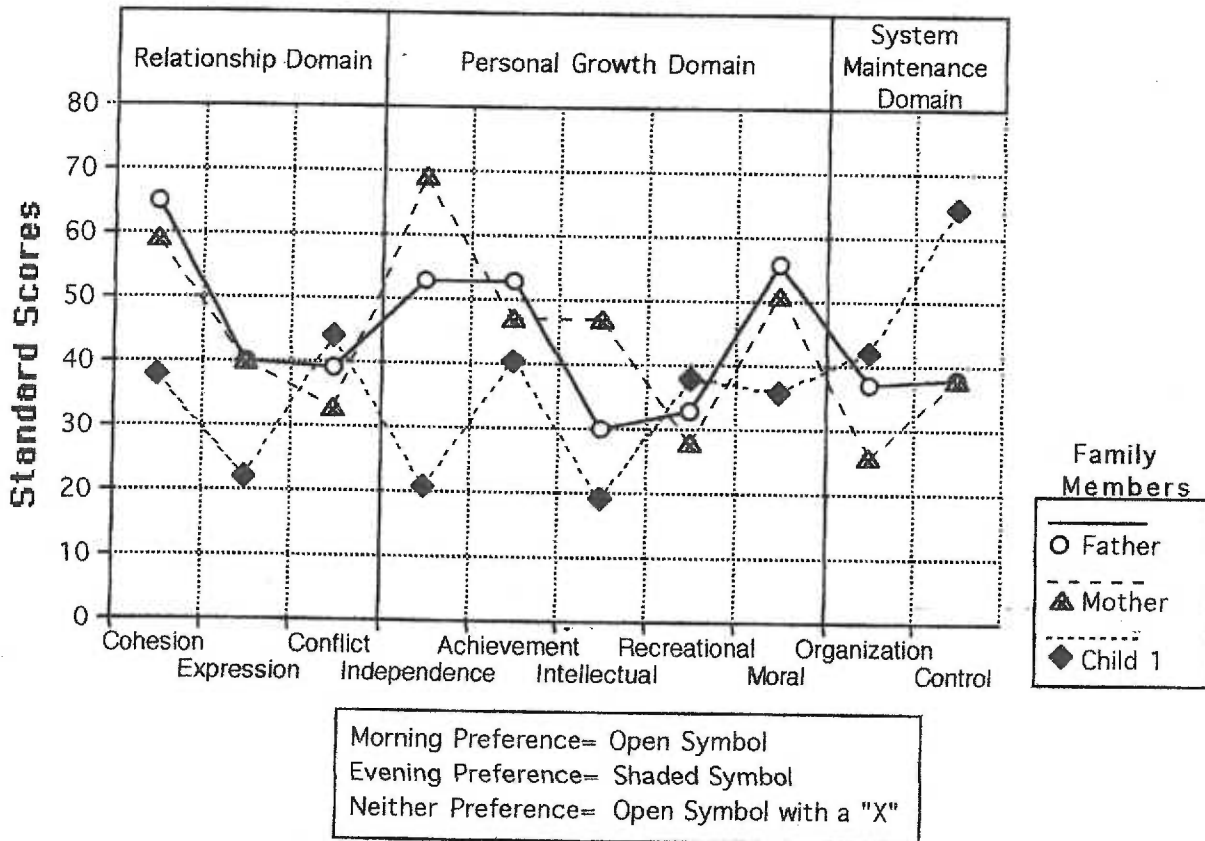
Table 35

Family IX: Individual Chronotypes

	FATHER	MOTHER	CHILD #1
Morning / Evening Score	80	42	27
Morning / Evening Type	Morning	No Preference	Evening

Table 36

Family IX: Family Environment Scale



Relationship Domain

Cohesion

The standard individual scores were from 65 to 38, resulting in a range of 26 points. The father had the highest score; the child the lowest. The mother's score was 59; 6 points lower than the father, and 29 points higher than the child.

Expression

The standard individual scores were from 40 to 22, resulting in a range of 18 points. The parents both scored this subscale at the value, 40. The child had a score of 22.

Conflict

The standard individual scores were from 45 to 32, resulting in a range of 13 points. The child had the highest score; the mother the lowest. The father's score was 40; 5 points lower than the child, and 8 points higher than the mother.

Personal Growth Domain

Independence

The standard individual scores were from 69 to 21, resulting in a range of 48 points. The mother had the highest score; the child the lowest. The father's score was 53; 16 points lower than the mother, and 32 points higher than the child.

Achievement

The standard individual scores were from 53 to 41, resulting in a range of 12 points. The father had the highest score; the child the lowest. The mother's score was 48; 5 points lower than the father, and 7 points higher than the child.

Intellectual-Cultural

The standard individual scores were from 48 to 20, resulting in a range of 28 points. The mother had the highest score; the child the lowest. The father's score was 30; 18 points lower than the mother, and 10 points higher than the child.

Active-Recreational

The standard individual scores were from 38 to 29, resulting in a range of 9 points. The child had the highest score; the mother the lowest. The father's score was 34; 4 points lower than the child, and 5 points higher than the mother.

Moral-Religious

The standard individual scores were from 56 to 37, resulting in a range of 19 points. The father had the highest score; the child the lowest. The mother's score was 51; 5 points lower than the father, and 14 points higher than the child.

System Maintenance DomainOrganization

The standard individual scores were from 42 to 26, resulting in a range of 16 points. The child had the highest score; the mother the lowest. The father's score was 38; 4 points lower than the child, and 12 points higher than the mother.

Control

The standard individual scores were from 65 to 38, resulting in a range of 27 points. The child had the highest score. The parents both scored this subscale at the value,38.

Family Incongruence ScoreIncongruence score

The family incongruence score was 66. A standard score of 61 or more is classified as a high level of incongruence within the family.

Summary

The following table summarizes the nine families in this study. Each family is listed showing individual family member, age in years, gender, chronotype score, and chronotype preference. A mean family score for the subscale of conflict from the Family Environment Scale was calculated as well as the family incongruence score. The focus is the individual chronotype scores and the amount of conflict perceived by the family.

Table 37

Family	Family Member	Age in Years	Gender	HORNE-OSTBERG MORNINGNESS-EVENINGNESS SCALE		FAMILY ENVIRONMENT SCALE	
				Chronotype Score	Chronotype Preference	Conflict Subscale Mean	Family Incongruence Score
Family I	Father	44	M	50	No Preference	49	63
	Mother	45	F	63	Morning		
	Child 1	17	F	44	No Preference		
Family II	Child 2	13	F	45	No Preference	46	61
	Father	55	M	69	Morning		
	Mother	45	F	34	Evening		
Family III	Child 1	17	M	28	Evening	64	57
	Father	50	M	78	Morning		
	Mother	52	F	41	Evening		
Family IV	Child 1	15	F	39	Evening	64	55
	Child 2	14	M	45	No Preference		
	Father	37	M	65	Morning		
Family V	Mother	36	F	55	No Preference	46	57
	Child 1	15	F	43	No Preference		
	Child 2	14	M	45	No Preference		
Family VI	Father	51	M	76	Morning	46	61
	Mother	45	F	46	No Preference		
	Child 1	14	M	43	No Preference		
Family VII	Father	42	M	80	Morning	67	48
	Mother	38	F	60	Morning		
	Child 1	15	M	32	Evening		
Family VIII	Child 2	14	F	44	No Preference	68	66
	Father	32	M	70	Morning		
	Mother	32	F	41	Evening		
Family IX	Child 1	13	M	38	Evening	39	66
	Father	57	M	72	Morning		
	Mother	50	F	39	Evening		
Family X	Child 1	16	M	28	Evening	66	66
	Father	60	M	80	Morning		
	Mother	45	F	42	No Preference		
Family XI	Child 1	18	M	27	Evening	39	66
	Father	60	M	80	Morning		
	Mother	45	F	42	No Preference		

CHAPTER VI
DISCUSSION

The purpose of this study was to investigate family environment and individual chronotype (morningness-eveningness) preferences among the family members. The study explored individual chronotype preferences of family members and if these individual chronotypes influence the family environment. Included in this chapter is a discussion of case studies by family and across families.

A single case study with replication design was used in this study. Data were collected from 9 families of 3 and 4 members each. Seven of the nine families had children who were too young, or too old to participate in this study. Some of those who did not qualify for the study lived in the home, some did not. Thirty one individuals, including 18 adult couples and 13 dependent children ages 13 through 18 participated in this study.

The Horne-Ostberg Morningness-Eveningness Questionnaire was not a reliable instrument to use in this study. It has never been used with children younger than 18 years old. Three children in three different families gave inconsistent responses to several items on the questionnaire.

Case Study by Family

In this section, each family will be discussed individually. Included in this discussion is a summary of how each member of the family scored in relation to the other family members. This summary includes scores from the FES, the Horne-Ostberg Morningness-Eveningness Questionnaire, and how these compared to the literature.

Family I

The adults in this family had a narrow margin of difference in chronotype scores. The father and both children do not have a chronotype preference. The mother preferred morning. With three individuals in the family without a preference for morning or evening, there may be quite a lot of flexibility in this family.

The Horne-Ostberg Morningness-Eveningness Questionnaire has never been tested for reliability with children. The two children had similar chronotype scores, but the youngest child had some inconsistency on her responses. On question 10, she answered her tired time was 3 AM. On question 11, her time for peak performance was 8:00 to 10:00 AM. On question 19, she answered she was definitely an evening type. Horne & Ostberg tested the instrument in 1979 with individuals 18 to 52 years old.

The younger child's scores were more extreme from the parents than the elder child on the Family Environment Scale. The most extreme family functioning scores between the two children were in the subscales of conflict, cultural-intellectual, active-recreational, moral-religious, and organization. The children scored lower than the parents in all domains of the FES except conflict, family organization, and control. Part of this difference may be due to age differences, and the freedoms thus allowed by the parents. These differences may also be due in part to sibling order, as noted by

Frieberg, (1992) who said sibling order influences achievement of independence. The oldest child is generally kept dependent longest. Younger children strive to have more privileges to be like the older siblings at earlier ages.

In this family that had one of the three higher family incongruence scores, (63), 3 of the 4 family members had no preference for morningness or eveningness. Only the mother had a preference, that was for morningness. One wonders if the best time for family activities may be concentrated more in evening hours.

Family II

The couple in this family had opposite chronotype preference with the father preferring morning and mother preferring evening. The child preferred evening with a score close to his mother's. This child misread, or did not understand the questions on the Horne-Ostberg Morningness-Eveningness Questionnaire. His answers to Questions 10, 11, and 19 were not consistent with his responses on the other questionnaire items. Though he did have a total score placing him in a evening category, he would have had a even smaller score in this same category if his responses to questions 10 and 11 would have been consistent with his response to question 19.

The adults scored closely on most subscales of the FES, with the greatest difference in the subscale of independence. The greatest difference in this family can be seen in the child's scores. He perceived very low family cohesion, high family conflict, and low independence. He also perceived the other subscales of the personal growth domain to be much lower than either parent , and control in the family to be much higher. At age 17, the child has developed his own ideas of how his life should be. He is differentiating from his parents, rejecting some of their ideals and family customs and replacing them with his own. The child disagrees more with his mother on the subscales, than with his father. Gilligan, (1982) discussed how boys

disconnect from their mothers at an early age and are rewarded for being autonomous and independent; they are taught to value freedom.

In this family that had one of the higher incongruence scores (61), the adults had opposite chronotype scores and agreed closely on family conflict (within 5 points). The child had the opposite chronotype preference of the father, the same as the mother, and perceived conflict to be higher in the family than his parents. Because there can be marked differences among individuals patterns and preferences for morning or evening, members of a family may be out of phase or in a state of desynchrony with one another (Hoskins, 1981b).

The mother in this family preferred evening and worked morning hours. This mother had the most difficult time answering the morningness-eveningness questions. She said it was very difficult to arise early in the morning. On her days off, she reverted back to her preference for evening, by sleeping until 9 or 10 AM and staying up until midnight and beyond.

Family III

The adults in this family had differences in chronotype scores with the father preferring morning, and the mother preferring evening. The oldest child shares the same chronotype as the mother. The youngest child does not have a preference for morning or evening.

The adults in this family are not in close in harmony, as evidenced by scores on 7 of 9 subscales. This may be attributed in part to their opposite chronotype preferences and their opposite work hours, though the mother only works three days a week. Because of their work hours, they may lead separate lives, three days a week. The mother preferred evening and worked night hours. She reported that this works well for her and she keeps late hours on her days off from work. The mother who shares the same chronotype preference with both children, tended to score closer to

the children than did the father on most subscales. This closeness to the mother may relate in part to time spent with the children. In this type of family, where children are in mid to late teens and are close to a parent, adolescents are also likely to model their parents and to seek parent-approved peers. In contrast, adolescents in families where participation in decision making and self-regulation is limited tend to become more dependent and less self assured (Newman & Newman, 1979).

The children, ages 17 and 15, male and female respectively, agreed closely on all the subscales. The eldest child in this family, perceived very low family cohesion, and perceived expression higher than all the other members, and he perceived the subscales of conflict and independence much higher than the other family members. This child is in late adolescence. At this time in life, people often are trying to move into adulthood by differentiating oneself from parents and family. The younger child scores on all subscales were closer overall to the parents than were the elder child's scores. This may indicate that she has not started "stirring the waters" in expressing herself as an adult.

In situations where the father's chronotype is different from other family members, there may be conflict, misunderstanding and possibly unverified interpretations of other activities such as times of rising or going to bed. The person who rises slowly in the morning and takes a long time to become fully active and responsive, will therefore have a temporally delayed ability to perform. Such a person has an evening orientation and is likely to experience direct conflict with a partner who is characterized by a morning orientation (Hoskins, 1981b). However, the family mean incongruence score was only 57 in the higher portion of 'normal' category. In the single subscale of conflict, the family members agreed that they perceived fairly high conflict with a mean score of 63. Individual scores in the subscale of conflict ranged from 54 to 75. A score of 61 is considered high in this subscale.

Family IV

In this four member family, the father had a preference for morning, and the mother did not have a preference for either morning or evening. There was a lot of difference in the scores on how the adults perceived the subscales of the FES. In this family where the mother does not have a preference for morning or evening but works night hours three days a week, yet has a chronotype score that is very close to preferring morning, one would wonder if there is some confusion in keeping with any chronotype preference. This may account for some distance between the scores on the subscales between the adults.

The children in this family are near the same age and developmental level. Neither child had a preference for morning or evening. Their chronotype scores were within 2 points of each other. There was a similar closeness in scores on the FES between the children. The children were in agreement within 5 to 13 points on all 9 subscales. The younger child scored closer to the mother in most areas than did the elder child. Similarity in children's subscale scores may be attributed to both children just entering adolescence. They have not yet begun to challenge parental ideas and values (Carter & McGoldrick, 1989).

In this family that had one of the lowest family incongruence scores, (55), 3 of the 4 family members had no preference for morningness or eveningness. Only the father had a preference, that was for morningness. One wonders if the best time for family activities may be concentrated more in evening hours.

Family V

The chronotype preference for the adults in this three member family are different, with the father preferring morning, and the mother having no preference for morning or for evening. The couple scored close to each other on all subscales

except those of independence and control. The mother had a much lower perception of independence. Family responsibilities and roles may contribute to this low subscale score. The close scores to her husband, in the other subscales of the FES might be related in part to temporal flexibility of the mother.

The child in this family, like the mother, had no preference for morning or evening. Their chronotype scores were within 3 points of each other. The family environment areas of greatest difference are subscales of expression, in which the child perceived a lower level of expression than both parents, and independence, in which the child perceived more independence than the mother. This child, male age 14, was just entering adolescence and may be closer to his mother than to his father. Montemayor, (1984), pointed out, sons who have mothers at home will be closer and agree more with their mother. The family incongruence score was in the high normal range, at 57.

Family VI

The adults in this family both preferred morning time. Their scores were different by 20 points with the father having the stronger morning preference. The couple's FES scores were very close on all the subscales except for independence. The mother scored lower in perception of independence by almost 50 points. Conflict subscale scores were within 10 points of each other, congruent with Hoskins findings with couples.

The children, though close in age and developmental level, did not agree closely on the subscales except for the achievement subscale. This similarity may mean a similar value or education, the primary "work" of children this age. The children did not have close chronotype scores. The elder preferred evening while the younger did not have a preference. The differences in the childrens scores on the subscales may relate in part to age, as well as to time spent with parents and in family activities.

This hypothesis is supported by Montemayor, (1984), who reported that teenagers spend less time with their parents when the mother works full time. Montemayor also supported that males had longer arguments of greater intensity with their mothers if she worked outside the home. Differences in family environmental subscale scores by the children may also be attributed to the older child's preference for evening time when the remainder of the family preferred or was close to preferring morning time as evidenced by the chronotype scores. The younger child, who did not prefer morning or evening times, was in close agreement with her parents on nearly all the subscales. This may be attributed to the child's developmental state. For younger children, parents and family are still more important than friends (Frieberg, 1992).

Family VII

The adults in this five member family had opposite preferences for morning and evening. The couple's subscale scores were all close on the FES. They both scored high on family conflict, and low in independence. This may be attributed to multiple challenges facing a young family as well as opposite chronotype preferences. The tested child in this family, just entering adolescence, was in close agreement with the parents on all subscales. He had not yet begun to differentiate from his parents and was especially close to his mother on the subscales of cohesion, achievement, active-recreational, and moral-religious. For now, congruent with Montemayer's (1984) hypothesis of a child being close to the parent when the mother is at home rather than working, the child is in close agreement with parental ideals and values. This family agreed closely on the FES subscales to have the lowest family incongruence score of 48. There was family agreement on perception of low family cohesion and high family conflict. The child and his mother also shared the same chronotype preference of evening. On the child's Horne-Ostberg Morningness-Eveningness Questionnaire, he was not consistent in answering some of the

questions. For example, on question 11 and 17, he gave preferring morning answers, but on question 19 marked that he was definitely an evening person.

Family VIII

The adults in this three member family had a wide span between their chronotype scores. The father of the family was strongly morning oriented and the mother of the family was strongly evening oriented. The couple was in close agreement on most of the subscales. They have high conflict and low independence scores. This couple works together in their business, seeing each other all day. This combination is consistent with dyad findings by Hoskins when studying couples and their chronotype preferences. Conflict and independence subscale scores may relate in part to the amount of time the family spends together. They spend many hours each day working to keep the business going.

The child rated the subscale of expression much lower than the parents did, and all personal growth subscales were perceived to be lower except the active-recreational subscale. On this subscale he was much higher than his parents. The strength of his scores helped raised the incongruence score for the family. As a 16 year old he is reaching the age where males question their parents' ideals and way of life (Carter & McGoldrick, 1989). At this time, males are forming their own ideas of how the world should be. It is during middle and late adolescence that the most severe changes occur in the parent-child relationship (Murray & Zentner, 1997). Overall, score patterns on the child's subscales were closer to his father's scores than to his mother's. The father and child had opposite chronotype preferences. Again, the conflict scores were high, and the independence scores low. It may be that the conflict-chronotype relationship reported by Hoskins in couples, may also be present in some parent-child dyads.

Family IX

The adults in this five member family had a difference in chronotype preference. The father preferred morning, but the mother had no preference for morning or for evening. They are in very close agreement on the subscales of the FES. The greatest difference between this couple was in the subscales of independence and cultural-intellectual. The mother scored highest in both of these subscales. The mother may have scored higher in independence because she has more freedom of movement in her job. More importantly for this study, the conflict scores were only in the average range.

At 18, the child in this family was no longer a child, but instead a young adult. In late adolescence, one has differentiated from one's parents and is more likely to be formulating one's own ideas, opinions and interests (Carter & McGoldrick, 1989). Since he still lives in the home and is in school, he may well be experiencing some struggles between himself and his parents. As adolescents strengthen their alliances outside the family, their decreasing participation at home is often experienced by the other family members as a loss. Parents often feel a void as adolescents move toward greater independence because they are no longer needed the same way and the nature of their care taking changes (Carter & McGoldrick, 1989).

This 18 year old did not score near either parent in the subscale. There may be a correlation between his preference for evening, and how he related to his parent. His chronotype score was extremely low, 15 points lower than his mother, and 53 points lower than his father's chronotype score. Though still in the average range, the highest conflict score was from the child in this family. Additionally, the score on the control scale was very high for the child. The differences in chronotypes among family members may contribute to variability on these subscale scores. The family incongruence score, at 66, was the highest among the 9 families studies, and equal to

that calculated for family VII.

Discussion Across Families

In this section, discussion includes similarities of how the families in this study viewed their family environments. For purposes of this study and in keeping with the literature, discussion focused on the mean family incongruence scores and the subscale of conflict. This discussion includes similarities and replications cross families including childrens ages and the family incongruence score, years of marriage and the family incongruence score, family size and perception of conflict, parent and child perception of conflict, and gender differences in perception of family conflict.

Childrens' Age and Family Incongruence Score

The mean incongruence scores for each family tended to depend in part on the age of the tested children in the family. A incongruence score of 61 or more is in the high range. Five families had a child 16 years and older. Four of these five families had a incongruence score greater than 60. One family with a 17 year old child, had a incongruence score of 57. A incongruence score of 61 was calculated for one family in which the children in this study were less than 16 years old.

Years of Marriage and the Family Incongruence Score

Another variable that affected incongruence scores was the number of years the couple was married. The longer they had been married, the greater the incongruence. Five of nine couples tested had been married more than 20 years. Of these five couples, four had incongruence scores greater than 61. The family with the lowest incongruence score had been married the least number of years.

Family Size and perception of Conflict

In a study by Moos and Moos, (1994) in families of larger size (no numbers specified) there was more conflict. In this study, there were four families with four

members and five families with three members. The average conflict score for four member families was 48. The average conflict score for three member families was 42.

Parent and Child Perception of Conflict

In families tested where there were two siblings, they did not always agree on the family perception of conflict. In three of four families with four members tested, the younger child perceived the subscale of conflict higher than did the elder child. In three of the families with four members tested, the mother and elder child perceived the subscale of conflict with the same score. For this same subscale, four out of four fathers perceived the lowest level of conflict for the family. Children overall reported more emphasis on family conflict.

Gender Differences in Family Conflict

In this case study, there were 5 female children and 8 male children. Moos and Moos, (1994) identified no significant gender differences in perceptions of family environment, after administering the FES to a sample of 900 individuals in a unspecified number of families. In a study by Moos and Moos (1994), boys and girls viewed their families very similarly. Male and female children, tended to score high in family conflict. Generally the male children had higher scores in family conflict than did the female children. Eight children were male with a mean conflict subscale score of 63. Five female children had a mean conflict subscale score of 60. Fathers in this study, perceived lower family conflict than did the mothers on the conflict subscale. The fathers mean score for the conflict subscale was 48, and the mothers 52.

When adolescents described overall family functioning, they may refer more to their relationships with their parents than to their parents' relationship with each other. The likelihood that adolescents give more weight to a relationship that involves them directly than to a relationship that does not may, explain some of the differences

between parents' and children's perceptions of their families (Moos and Moos, 1994).

Chronotype Preference

This portion of the discussion is centered around chronotype preference. The discussion of chronotype preference of adults and children in this study, included gender differences of adults and children.

A study by Adams and Cromwell (1978) indicated that differences in chronotype preferences between couples create disharmony in the relationship. Cromwell (1976) and Karacan (1982) studied differences in sleep-wake patterns in relation to the subscale conflict: a desynchrony between partners was related to a greater incidence of behaviors conducive to conflict and poor family functioning. In this case study, 4 of 9 couples had opposite chronotype preferences. In one of nine families, the couple had the same same chronotype preference. Of the four couples with the opposite chronotype preferences, the man preferred morning, and the woman preferred evening. In all four of these families, couples scored higher on the subscale of family conflict than the couple in which both were the same chronotype.

Children's chronotype scores varied in relationship to age, gender and position in the family. However, the children's scores must be interpreted with caution because a number of inconsistencies were found in their responses to the questions. The Horne-Ostberg Morningness-Eveningness Questionnaire has not been tested for reliability with children below the age of 18 years. In this study, three children, in three different families, did not answer the instrument consistently. The three questions that were troublesome for the three children were numbers 10, 11, and 19. For example, the 13 year old child in family I, answered question 10 to indicate her tired time was 3:00 AM, question 11 that her peak performance time was 8:00 to 10:00 AM, and that she was definitely an evening type according to her response on question 19. Of the three children who had inconsistency on the questionnaire, all three responded to

question 19 as preferring evening. The score for one of the three children was tabulated into the 'no preference' category. In all nine families, five of the 8 children whose score indicated no preference, responded to question 19 as definitely being an evening type person.

Adult Gender Differences in Chronotype

In the chronotype analysis, the fathers in 8 of the 9 families preferred morning time over evening time. The mothers in 2 of the 9 families preferred morning time over evening time. In 1 of the 9 families, both parents preferred morning time over evening time. Studies by Cromwell (1976) and Karacan (1982) reported that differences in sleep-awake patterns in partners was related to greater conflict.

In this study, the four couples with opposite chronotypes, scored higher in the subscale of family conflict when compared with the one couple with the same chronotype. Adams and Cromwell (1978) and (Hoskins, 1981b) noted that greater conflict occurred among couples in which one partner is a morning person whose peak in activity and alertness occurs early in the day and the other an evening person whose peak is late in the day.

Children Gender Difference in Chronotype

The children totaled 13 in this study. Six of the 13 children preferred evening time over morning time. Seven of the children had no preference for morning or evening. However, this is questionable because the Horne-Ostberg Morningness-Eveningness Questionnaire is not reliable in measuring chronotype preferences in children. As noted earlier, it has never been tested with children below the age of 18 years. Of the children who did not have a preference for morning or evening, five were females and two male. No children in the study preferred morning time over evening time.

Replications-Family Environment and Chronotype

In this case study with replication some similarities were found between families. Included in this section are similarities in the family conflict subscale and individual chronotype preferences of family members.

Family and Children's Chronotype

In this study, the younger the child, the closer they scored to one or both parents on all the subscales. Gradually family relationships change and the adolescent develops social ties and close relationships outside the family. The family's beliefs, lifestyle, values, and patterns of interaction influence the development of these relationships, as can socioeconomic levels of the parents (Murray & Zentner, 1997).

Family Environment and Adults Preferring the same Chronotype

In this study, there was one family where the adults both had the same chronotype. In this family the adults both preferred morning time. For the subscale of conflict, the father's perception of family conflict was lower than the mother's perception. This couples scores were in the lower part of the average range on the FES.

Family Environment and Adults Preferring the Opposite Chronotype

In this study, 4 of 9 couples had opposite chronotype preferences. In familys' II, III, VII, and VIII the father preferred morning time, and the mother preferred evening time. Past research is supported in that three of the four couples perceived conflict to be in the high level of the FES scale.

Family's with same Chronotype Configurations

Familys' II, VII, and VIII have the exact same chronotype configuration. Among the tested members, the father had a preference for morning; the mother, a preference

for evening; and the only child in the study, a preference for evening. The intra family chronotype scores for these family members were close together. The fathers' scores were from 69, 70 and 72 respectively. The mothers' scores were 34, 39, and 41 respectively. The childrens' scores were 28, 28, and 38 respectively. The children in families' II, and VIII had similarities in ages, 17 and 16 respectively. In family VII, the age was 13 years. In each family the child was a male. Two of the three families with the same chronotype configuration, perceived the subscale of family conflict to be high (greater than 61). The average family conflict score for family II was 46; family VII, 63; and family VIII, 68. Individually, all family members in family VII and family VIII perceived the subscale of conflict to be 60 or greater. In family II, the child marked 65 for his perception of family conflict; the father 33; the mother 39.

Summary

As measured, the FES subscale of family environment was influenced by many factors. These factors included parent and child differences, family size, number of years the couple in the family had been married, gender, and age of children studied. Chronotype preferences by family members, adult chronotype preferences, and childrens chronotype preferences influenced how the family perceived the FES subscale of conflict.

Chapter VII

SUMMARY, LIMITATION, IMPLICATIONS, CONCLUSIONS

This chapter includes a summary of findings, limitations, implications for nursing education, research and practice, and conclusions.

Summary

The purpose of this research study was to investigate family ecology and individual chronotype preferences among the family members. A single case study with replication design was used in this study. Data were collected from 9 families, with testing of 3 to 4 members each. Seven of the nine families had children who were too young, or too old to participate in this study. Thirty-one individuals (18 adult couples and 13 dependent children ages 13- 18) participated in this study.

The Horne-Ostberg Morningness-Eveningness Questionnaire is a way to measure individual family member' preference for morning, evening, or to determine if an individual does not have a time preference. In this study there was not conclusive evidence that an individual's preference for time of day affected how the family environment was perceived. However since the Horne-Ostberg Morningness-Eveningness Questionnaire had never been tested with children, the childrens scores needed to be interpreted with caution. -The Family Environment Scale did give all family members the opportunity to individually express the extent to which the family environment affected them, and how they perceived the family environment as compared to other individuals in the family perceptions of family environment. The family incongruence score gave a view of the entire family's perception if its environment.

Limitations to this study

Limitations of this study included the following. The population from whom data were collected was entirely Caucasian. The family size was limited, with some members living in the household who did not meet the qualifications of the study. Interpersonal relationships among family members were not studied. Determination of any factors in scoring of blended families was not addressed. The majority of the families studied were in the upper socioeconomic level. The sample size was limited with the sample taken entirely in one rural area of Oregon. The Horne-Ostberg Morningness-Eveningness Questionnaire had never been tested with children. There was inconsistent data on the Horne-Ostberg Questionnaire from three children, in three different families.

Implications

Implications for Nursing

The study of chronotype and family environment is rarely found in nursing curricula. By soliciting chronotype information, the nurse may have access to more complete prerequisite data to better accommodate the patient and family in the acute care setting, or home health setting, as well as determine what is the best time of day for various activities such as patient teaching and learning. Study of the environment of the family and how this environment is perceived by family members may aid the nurse in how best to approach families-in accordance with their age, socioeconomic status, and relationships. The nurse who will be practicing in primary, secondary, or tertiary care settings may be better prepared to use the concepts of chronotype and family environment to individualize his/her approach to patient care with families.

Implications for Nursing Research

The study of chronotype and family environment is relatively new to the field of nursing research. Studies have been conducted in each field separately, and not

combined into a single construct. Prior family studies have been conducted linking chronotypes with dyads. This study is just a beginning. It examined a limited number of families from a single geographic region.

The results of this study would not support an exact replication of the study. Careful development or refinement of an instrument to measure childrens' chronotype preference is needed before further explanation of a link between chronotype and family environment can be made.

Methods and design factors must be addressed to move inquiry from the case study design used here. Researchers must be mindful of the timing of studies, when data are collected, as either or both these elements may influence responses from subjects. Individual families have good and not so good days, depending upon the stressors they are encountering. Any individual, and any family, on any day, and at any time may have significant events occur that can alter how they feel about their family environment.

Implications for Nursing Practice

Understanding individual family members' chronotype preference can allow the nurse to be cognizant that there may be a best time to treat and teach family members. Determining that the individual's chronotype preference is in congruence with the time selected for treatment or teaching might facilitate more positive results.

Families go through daily transitions. By soliciting information about the family environment and individual chronotype, the nurse has access to data that may assist in deciding what is the best time of day for various activities such as patient teaching and learning. Patient care can be individualized to not only the best time of day for treatment, but also the nurse can be cognizant of the needs of the family in relation to family members needs within the environment.

Conclusions

As a result of this study, the following conclusions are made by the investigator. It appears this small sample is consistent with the national norm of people who were studied for standardization of the Family Environment Scale. The FES guidelines were standardized using white middle class families, in which the parents typically made more favorable appraisals of their family than their adolescent children. The developmental ages of the children in the study are consistent with studies using FES and with the literature.

There are many variables for each family that were not included in this study. These variables would have included events that occurred within the individual, or family the day of data collection which may have swayed the subject's answers to be more positive or more negative toward the family environment. Another variable that would have affected the results was the time of day that data collection took place. If a subject was a morning person and was asked to respond to the questions in the evening, they may have been tired and would not answer the questions in the same light as they would have during their best time of the day.

Families with the same chronotype configuration viewed their family environments very similarly on the subscale of conflict. Of nine families, three had the same chronotype configuration. Of these three families, two had similar conflict subscale scores; family VII had a mean of 63 and family VIII had a mean of 68.

Families with the same chronotype configuration viewed their family incongruence similarly. Of the nine families, three had the same chronotype configuration. Of these three, two families had similar family incongruence scores; family II had a score of 67, family VIII had a score of 63.

In 6 of 9 families where fathers preferred mornings and one child preferred evenings, these children perceived a higher level of conflict than the fathers. The

average conflict score for these six fathers and six children was above average on the Family Environment Scale. Since the Horne-Ostberg Morningness-Eveningness Questionnaire had never been tested with children, the childrens scores needed to be interpreted with caution.

In this study there is not conclusive evidence that a individual's preference for time of day affected how the family environment was perceived. Though there is not enough evidence to say that the entire family environment is affected by time of day preference, this small sample does demonstrate that there may be a similarity between time of day preference and family perception of conflict.

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Appendix A
Adult Demographic Questionnaire

1. Gender: Male Female
2. Age: _____
3. Number of years married or cohabitating: _____
4. What are your work hours: _____
5. What hours does your adult partner work? _____
6. Number of children in this family: _____
7. Ages of children in this family: _____
8. Family annual income: 0 - 10,000 10,001 - 20,000
 (circle one) 20,001 - 30,000 30,001 - 40,000
40,001 or more
9. Highest level of education completed: High School Trade School or Two-Year
 (circle one) Four-year Degree Graduate Degree
10. Occupation _____
11. Have you lived in Jefferson County all of your life? Yes No
12. If the answer to question 11 was NO, then how long have you lived in Jefferson County? _____ Years _____ Months

Appendix B
Demographic Questionnaire
Scoring Criteria

1. Gender: Male = 0 Female = 1
2. Age: = exact age
3. Number of years Married, or cohabitating: =exact number
4. What are your work hours? =exact hours
5. What hours does your adult partner work? =exact hours
6. Number of children in this family = use exact number
7. Ages of children in this family = use exact ages
8. Family annual Income: (circle one)

0 = 0-10,000	1 = 10,001-20,000
2 = 20,001- 30,000	3 = 30,001-40,000
4 = greater than 40,000	
9. Highest level o education completed: (circle one)

1 = high school	2 = trade school or two years of college
3 = four year degree	4 = graduate degree
10. Occupation: = exact occupation
11. Have you lived in Jefferson County all of your life? 2 = Yes 1 = No
12. I you answered NO in question number 11, how long have you lived in Jefferson County? = exact number of years or months

Appendix C
 Adolescent Demographic Questionnaire

- | | | |
|--|-------------|--------------|
| 1. Gender: | Male | Female |
| 2. Age: | _____ | |
| 3. Have you lived in Jefferson
County all of your life? | Yes | No |
| 4. If the answer to question 3
was <u>NO</u> , then how long have
you lived in Jefferson County? | _____ Years | _____ Months |

Appendix E

The Horne-Ostberg Morningness-Eveningness Questionnaire

Instructions

1. Please read each question very carefully before answering.
2. Answer ALL questions.
3. Answer questions in numerical order.
4. Each question should be answered independently of others. Do NOT go back and check your answers.
5. All questions have a selection of answers. For each question place an X alongside ONE answer only. Some questions have a scale instead of a selection of answers. Place an X at the appropriate point along the scale.
6. Please answer each question as honestly as possible. Both your answers and the results will be kept in strict confidence.
7. Please feel free to make any comments in the section provided below each question.

The Questionnaire

1. Considering only your own "feeling best" rhythm, at what time would you get up if you were entirely free to plan your day?

AM 5 6 7 8 9 10 11 12

2. Considering only your own "feeling best" rhythm, at what time would you go to bed if you were entirely free to plan your evening?

PM 8 9 10 11 12AM 1 2 3

3. If there is a specific time at which you have to get up in the morning, to what extent are you dependent on being woken up by an alarm clock?

Not at all dependent

Slightly dependent

Fairly dependent

Very dependent

4. Assuming adequate environmental conditions, how easy do you get up in the mornings?
- Not at all easy
 - Not very easy
 - Fairly easy
 - Very easy
5. How alert do you feel during the first half hour after having woken in the mornings?
- Not at all alert
 - Slightly alert
 - Fairly alert
 - Very alert
6. How is your appetite during the first half-hour after having woken in the mornings?
- Very poor
 - Fairly poor
 - Fairly good
 - Very good
7. During the first half-hour after having woken in the morning, how tired do you feel?
- Very tired
 - Fairly tired
 - Fairly refreshed
 - Very refreshed

8. When you have no commitments the next day, at what time do you go to bed compared to your usual bedtime?
- Seldom or never later
 - Less than one hour later
 - 1 to 2 hours later
 - More than two hours later
9. You have decided to engage in some physical exercise. A friend suggests that you do this one hour twice a week and the best time for him is between 7:00 - 8:00 AM. Bearing in mind nothing else but your own "feeling best" rhythm how do you think you would perform?
- Would be in good form
 - Would be in reasonable form
 - Would find it difficult
 - Would find it very difficult
10. At what time in the evening do you feel tired and as a result in need of sleep?
- PM 8 9 10 11 12AM 1 2 3
11. You wish to be at your peak performance for a test which you know is going to be mentally exhausting and lasting for two hours. You are entirely free to plan your day and considering only your own "feeling best" rhythm which ONE of the four testing times would you choose?
- 8:00 to 10:00 AM
 - 11:00 to 1:00 PM
 - 3:00 to 5:00 PM
 - 7:00 to 9:00 PM
12. If you went to bed at 11:00 PM at what level of tiredness would you be?
- Not at all tired
 - A little tired
 - Fairly tired
 - Very tired

13. For some reason you have gone to bed several hours later than usual, but there is no need to get up at any particular time the next morning? Which ONE of the following events are you most likely to experience?
- Will wake up at the usual time and will NOT fall to sleep.
 - Will wake up at the usual time and will doze thereafter
 - Will wake up at the usual time but will fall asleep again
 - Will not wake up until later than usual
14. One night you have to remain awake between 4:00 to 6:00 AM in order to carry out a night watch. You have no commitments the next day. Which one of the following alternatives will suit you best?
- Would NOT go to bed until watch was over
 - Would take a nap before and sleep after
 - Would take a good sleep before and nap after
 - Would take ALL sleep before watch
15. You have to do two hours of hard physical work. You are entirely free to plan your day and considering your own "feeling best" rhythm which ONE of the following times would you choose?
- 8:00 to 10:00 AM
 - 11:00 AM to 1:00 PM
 - 3:00 to 5:00 PM
 - 7:00 to 9:00 PM
16. You decided to engage in some physical exercise. A friend suggests that you do this one hour twice a week and the best time for him is between 10:00 to 11:00 PM. Bearing in mind nothing else but your own "feeling best" rhythm how do you think you would perform?
- Would be in good form
 - Would be in reasonable form
 - Would find it difficult
 - Would find it very difficult

17. Suppose that you can choose your own work hours. Assume that you worked a FIVE hour day (including breaks) and that your job was interesting and paid by results. Which FIVE CONSECUTIVE HOURS would you select?

12_1_2_3_4_5_6_7_8_9_10_11_12_1_2_3_4_5_6_7_8_9_10_11_12
Midnight Noon Midnight

18. At what time of the day do you think that you reach your "feeling best" peak?

12_1_2_3_4_5_6_7_8_9_10_11_12_1_2_3_4_5_6_7_8_9_10_11_12
Midnight Noon Midnight

19. One hears about "morning" and "evening" types of people. Which ONE of these types do you consider yourself to be?

- Definitely a "morning" type
- Rather more a "morning" type
- Rather more and "evening" than an "morning" type
- Definitely an "evening" type

Appendix F
 The Horne-Ostberg Morningness-Eveningness Questionnaire
 Scoring Criteria and Instructions

Instructions

1. Please read each question very carefully before answering.
2. Answer ALL questions.
3. Answer questions in numerical order.
4. Each question should be answered independently of others. Do NOT go back and check your answers.
5. All questions have a selection of answers. For each question place an X alongside ONE answer only. Some questions have a scale instead of a selection of answers. Place an X at the appropriate point along the scale.
6. Please answer each question as honestly as possible. Both your answers and the results will be kept in strict confidence.
7. Please feel free to make any comments in the section provided below each question.

The Questionnaire

1. Considering only your own "feeling best" rhythm, at what time would you get up if you were entirely free to plan your day?

AM 5 6 7 8 9 10 11 12
 5 X 4 X 3 X 2 X 1

2. Considering only your own "feeling best" rhythm, at what time would you go to bed if you were entirely free to plan your evening?

PM 8 9 10 11 12AM 1 2 3
 5 X 4 X 3 X 2 X 1

3. If there is a specific time at which you have to get up in the morning, to what extent are you dependent on being woken up by an alarm clock?

- 4 Not at all dependent
- 3 Slightly dependent
- 2 Fairly dependent
- 1 Very dependent

4. Assuming adequate environmental conditions, how easy do you get up in the mornings?
 - 1 Not at all easy
 - 2 Not very easy
 - 3 Fairly easy
 - 4 Very easy

5. How alert do you feel during the first half hour after having woken in the mornings?
 - 1 Not at all alert
 - 2 Slightly alert
 - 3 Fairly alert
 - 4 Very alert

6. How is your appetite during the first half-hour after having woken in the mornings?
 - 1 Very poor
 - 2 Fairly poor
 - 3 Fairly good
 - 4 Very good

7. During the first half-hour after having woken in the morning, how tired do you feel?
 - 1 Very tired
 - 2 Fairly tired
 - 3 Fairly refreshed
 - 4 Very refreshed

8. When you have no commitments the next day, at what time do you go to bed compared to your usual bedtime?
- 4 Seldom or never later
 - 3 Less than one hour later
 - 2 1 to 2 hours later
 - 1 More than two hours later
9. You have decided to engage in some physical exercise. A friend suggests that you do this one hour twice a week and the best time for him is between 7:00 - 8:00 AM. Bearing in mind nothing else but your own "feeling best" rhythm how do you think you would perform?
- 4 Would be in good form
 - 3 Would be in reasonable form
 - 2 Would find it difficult
 - 1 Would find it very difficult
10. At what time in the evening do you feel tired and as a result in need of sleep?
- | | | | | | | | | |
|----|---|---|----|----|------|---|---|---|
| PM | 8 | 9 | 10 | 11 | 12AM | 1 | 2 | 3 |
| | 5 | 4 | 3 | 2 | 1 | | | |
| | X | X | X | X | X | | | |
11. You wish to be at your peak performance for a test which you know is going to be mentally exhausting and lasting for two hours. You are entirely free to plan your day and considering only your own "feeling best" rhythm which ONE of the four testing times would you choose?
- 6 8:00 to 10:00 AM
 - 4 11:00 to 1:00 PM
 - 2 3:00 to 5:00 PM
 - 0 7:00 to 9:00 PM

12. If you went to bed at 11:00 PM at what level of tiredness would you be?
- 0 Not at all tired
 - 2 A little tired
 - 3 Fairly tired
 - 5 Very tired
13. For some reason you have gone to bed several hours later than usual, but there is no need to get up at any particular time the next morning? Which ONE of the following events are you most likely to experience?
- 4 Will wake up at the usual time and will NOT fall to sleep.
 - 3 Will wake up at the usual time and will doze thereafter
 - 2 Will wake up at the usual time but will fall asleep again
 - 1 Will not wake up until later than usual
14. One night you have to remain awake between 4:00 to 6:00 AM in order to carry out a night watch. You have no commitments the next day. Which one of the following alternatives will suit you best?
- 1 Would NOT go to bed until watch was over
 - 2 Would take a nap before and sleep after
 - 3 Would take a good sleep before and nap after
 - 4 Would take ALL sleep before watch
15. You have to do two hours of hard physical work. You are entirely free to plan your day and considering your own "feeling best" rhythm which ONE of the following times would you choose?
- 4 8:00 to 10:00 AM
 - 3 11:00 AM to 1:00 PM
 - 2 3:00 to 5:00 PM
 - 1 7:00 to 9:00 PM

16. You decided to engage in some physical exercise. A friend suggests that you do this one hour twice a week and the best time for him is between 10:00 to 11:00 PM. Bearing in mind nothing else but your own "feeling best" rhythm how do you think you would perform?
- 1 Would be in good form
 - 2 Would be in reasonable form
 - 3 Would find it difficult
 - 4 Would find it very difficult

17. Suppose that you can choose your own work hours. Assume that you worked a FIVE hour day (including breaks) and that your job was interesting and paid by results. Which FIVE CONSECUTIVE HOURS would you select?

12_1_2_3_4_5_6_7_8_9_10_11_12_1_2_3_4_5_6_7_8_9_10_11_12
 Midnight Noon Midnight
 ___1___X___5___X4X___3___X___2X___1___

18. At what time of the day do you think that you reach your "feeling best" peak?

12_1_2_3_4_5_6_7_8_9_10_11_12_1_2_3_4_5_6_7_8_9_10_11_12
 Midnight Noon Midnight
 ___1___X___5___X4X___3___X___2___X___1___

19. One hears about "morning" and "evening" types of people. Which ONE of these types do you consider yourself to be?
- 6 Definitely a "morning" type
 - 4 Rather more a "morning" type
 - 2 Rather more and "evening" than an "morning" type
 - 0 Definitely an "evening" type

Appendix F
 Scoring Instructions for
 Horne-Ostberg Morningness-Eveningness Questionnaire

1. For questions 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, and 19, the appropriate score for each response is displayed beside the answer box.
2. For questions 1, 2, 10, and 18, the cross made along each scale is referred to the appropriate score value range below the scale.
3. For question 17 the most extreme cross on the right hand side is taken as the reference point and the appropriate score value range below this point is taken.
4. For questions 11 and 15: if subject writes in 9-11 AM, score as if it were marked 8-10 AM.
5. For questions 1, 2, and 10:

If mark is between	score as
4 and 5	5
3 and 4	4
2 and 3	2
1 and 2	1

The scores are added together and the sum converted into a five point Morningness-Eveningness scale:

Type	Score
Morning Type	59 - 86
Neither Type	42 - 58
Evening Type	16 - 41

START
HERE

FAMILY ENVIRONMENT SCALE

DIRECTIONS

Look at your test booklet and check the Form printed on it here:

Form R DO NOT E THIS I PAR

Your Name _____ Age _____
Address _____

Sex: M F
(circle)

Please indicate your position in the family (check one):

Mother (wife) _____ Father (husband) _____ Son or Daughter _____

Other _____ (Please specify): _____

Today's Date _____

Now, please read each statement in your booklet and then, in the boxes on the other side of this sheet, mark X (true) if you think the statement is true of your family, and F (false) if the statement is not true of your family.

EXAMPLE ONLY

T	X	1	2
F			X

Use a heavy X, as in the example: Please use a pencil with an eraser, not a pen. Be sure to match each number in the booklet with each one on this sheet.

T	F	1	2	3	4	5	6	7	8	9	10	T	F
T	F	11	12	13	14	15	16	17	18	19	20	T	F
T	F	21	22	23	24	25	26	27	28	29	30	T	F
T	F	31	32	33	34	35	36	37	38	39	40	T	F
T	F	41	42	43	44	45	46	47	48	49	50	T	F
T	F	51	52	53	54	55	56	57	58	59	60	T	F
T	F	61	62	63	64	65	66	67	68	69	70	T	F
T	F	71	72	73	74	75	76	77	78	79	80	T	F
T	F	81	82	83	84	85	86	87	88	89	90	T	F

do not mark below this line

	C	Ex	Con	Ind	AO	ICO	ARO	MRE	Org	Ctd
R/S										
S/S										

1. Family members really help and support one another.
2. Family members often keep their feelings to themselves.
3. We fight a lot in our family.
4. We don't do things on our own very often in our family.
5. We feel it is important to be the best at whatever you do.
6. We often talk about political and social problems.
7. We spend most weekends and evenings at home.
8. Family members attend church, synagogue, or Sunday School fairly often.
9. Activities in our family are pretty carefully planned.
10. Family members are rarely ordered around.
1. We often seem to be killing time at home.
2. We say anything we want to around home.
3. Family members rarely become openly angry.
4. In our family, we are strongly encouraged to be independent.
5. Getting ahead in life is very important in our family.
6. We rarely go to lectures, plays or concerts.
7. Friends often come over for dinner or to visit.
8. We don't say prayers in our family.
9. We are generally very neat and orderly.
20. There are very few rules to follow in our family.
21. We put a lot of energy into what we do at home.
22. It's hard to "blow off steam" at home without upsetting somebody.
23. Family members sometimes get so angry they throw things.
24. We think things out for ourselves in our family.
25. How much money a person makes is not very important to us.
26. Learning about new and different things is very important in our family.
27. Nobody in our family is active in sports, Little League, bowling, etc.
28. We often talk about the religious meaning of Christmas, Passover, or other holidays.
29. It's often hard to find things when you need them in our household.
30. There is one family member who makes most of the decisions.
31. There is a feeling of togetherness in our family.
32. We tell each other about our personal problems.
33. Family members hardly ever lose their tempers.
34. We come and go as we want to in our family.
35. We believe in competition and "may the best man win."
36. We are not that interested in cultural activities.
37. We often go to movies, sports events, camping, etc.
38. We don't believe in heaven or hell.
39. Being on time is very important in our family.
40. There are set ways of doing things at home.
41. We rarely volunteer when something has to be done at home.
42. If we feel like doing something on the spur of the moment we often just pick up and go.
43. Family members often criticize each other.
44. There is very little privacy in our family.
45. We always strive to do things just a little better the next time.
46. We rarely have intellectual discussions.
47. Everyone in our family has a hobby or two.
48. Family members have strict ideas about what is right and wrong.
49. People change their minds often in our family.
50. There is a strong emphasis on following rules in our family.
51. Family members really back each other up.
52. Someone usually gets upset if you complain in our family.
53. Family members sometimes hit each other.
54. Family members almost always rely on themselves when a problem comes up.
55. Family members rarely worry about job promotions, school grades, etc.
56. Someone in our family plays a musical instrument.
57. Family members are not very involved in recreational activities outside work or school.
58. We believe there are some things you just have to take on faith.
59. Family members make sure their rooms are neat.
60. Everyone has an equal say in family decisions.
61. There is very little group spirit in our family.
62. Money and paying bills is openly talked about in our family.
63. If there's a disagreement in our family, we try hard to smooth things over and keep the peace.
64. Family members strongly encourage each other to stand up for their rights.
65. In our family, we don't try that hard to succeed.
66. Family members often go to the library.
67. Family members sometimes attend courses or take lessons for some hobby or interest (outside of school).

FAMILY ENVIRONMENT SCALE FORM

Rudolf H. Moos

Instructions

There are 90 statements in this booklet. They are statements about families. You are to decide which of these statements are true of your family and which are false. Make all your marks on the separate answer sheet. If you think the statement is *True* or mostly *True* of your family, make an X in the box labeled T (true). If you think the statement is *False* or mostly *False* of your family, make an X in the box labeled F (false).

You may feel that some of the statements are true for some family members and false for others. Mark T if the statement is true for most members. Mark F if the statement is false for most members. If the members are evenly divided, decide what is the stronger overall impression and answer accordingly.

Remember, we would like to know what your family seems like to you. So *do not* try to figure out how other members see your family, but *do* give us your general impression of your family for each statement.



Consulting Psychologists Press, Inc.
3803 E. Bayshore Road, Palo Alto, CA 94303

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- Appendix C
68. In our family each person has different ideas about what is right and wrong.
 69. Each person's duties are clearly defined in our family.
 70. We can do whatever we want to in our family.
 71. We really get along well with each other.
 72. We are usually careful about what we say to each other.
 73. Family members often try to one-up or out-do each other.
 74. It's hard to be by yourself without hurting someone's feelings in our household.
 75. "Work before play" is the rule in our family.
 76. Watching T.V. is more important than reading in our family.
 77. Family members go out a lot.
 78. The Bible is a very important book in our home.
 79. Money is not handled very carefully in our family.
 80. Rules are pretty inflexible in our household.
 81. There is plenty of time and attention for everyone in our family.
 82. There are a lot of spontaneous discussions in our family.
 83. In our family, we believe you don't ever get anywhere by raising your voice.
 84. We are not really encouraged to speak up for ourselves in our family.
 85. Family members are often compared with others as to how well they are doing at work or school.
 86. Family members really like music, art and literature.
 87. Our main form of entertainment is watching T.V. or listening to the radio.
 88. Family members believe that if you sin you will be punished.
 89. Dishes are usually done immediately after eating.
 90. You can't get away with much in our family.

Appendix H

Scoring Criteria for Family Environment Scale

The FES items are arranged so that each column of responses on the answer sheet constitutes one subscale. A template provided by Consulting Psychologists Press will be placed over the completed answer sheet. To determine a person's raw score (R/S), count the number of X's showing through the template in each column and enter the total in the R/S box at the bottom.

To convert an individual's subscale R/S into a standard score (S/S), the following table is used: (see Appendix E).

The Family Incongruence Score is calculated in the following way:

1. For each of the 10 subscale scores, calculate the absolute difference between a specific pair of family members.
2. Add these 10 numbers to obtain a measure of incongruence for that pair of family members, that is, the extent to which they disagree about the family environment.
3. Calculate incongruence scores for all other possible pairings of family members.
4. Calculate the mean of these incongruence scores to obtain the Family Incongruence Score.

Appendix I

Form R Raw Score to Standard Score Conversion Table (Normal Family Sample; N = 1,432)

Raw Score	Cohesion	Expressiveness	Conflict	Independence	Achievement Orientation
9.0	65	71	80	69	72
8.5	62	68	78	65	69
8.0	59	65	75	61	66
7.5	55	62	73	57	63
7.0	52	59	70	53	59
6.5	48	56	67	49	56
6.0	45	53	65	45	53
5.5	42	50	62	41	50
5.0	38	47	60	37	47
4.5	35	44	57	33	44
4.0	31	40	54	29	41
3.5	28	37	52	25	38
3.0	25	34	49	21	35
2.5	21	31	46	17	32
2.0	18	28	44	13	29
1.5	14	25	41	9	25
1.0	11	22	39	5	22
0.5	8	19	36	1	19
0.0	4	16	33	-	16

Form R Raw Score to Standard Score Conversion Table (con't.)

Raw Score	Intellectual-Cultural Orientation	Active-Recreational Orientation	Moral-Religious Emphasis	Organization	Control
9.0	69	69	71	69	76
8.5	66	66	68	66	73
8.0	63	64	66	63	70
7.5	61	61	64	61	68
7.0	58	59	61	58	65
6.5	55	56	59	55	62
6.0	52	53	56	53	59
5.5	50	51	54	50	57
5.0	47	48	51	48	54
4.5	44	46	49	45	51
4.0	41	43	46	42	49
3.5	39	41	44	40	46
3.0	36	38	41	37	43
2.5	33	36	39	34	40
2.0	30	33	36	32	38
1.5	28	30	34	29	35
1.0	25	28	32	26	32
0.5	22	25	29	24	30
0.0	19	23	27	21	27

Appendix J

Glossary

Chronotype

Chrono means time; type means preference. The individual characteristics of morningness, and eveningness is a stable fairly enduring quality, that is an inherent intrinsic trait that relates to morningness-eveningness activity in individuals (Westfall, 1992 p. 309).

Family Environment

The interactions and relationships between individuals that form a family. A composite measure of family values and concerns among the individual family members that affect the entire family group. The differences in these relationships will be determined using ten subscales of the Family Environmental Scale

IRB #4339

Appendix K
Oregon Health Sciences University
Consent Form

TITLE: Family Environment and Family Chronotype

PRINCIPAL INVESTIGATOR: Janice Monroe, B.S.N., R.N.

Faculty Research Advisor: Shirley Hanson, Ph.D., R.N.

Contact telephone number: (503) 494-3869

PURPOSE: You are being asked to participate in this research study because you are a member of a family that includes one or two children between the ages of 13 and 18 years of age. The purpose of this study is to determine if the family environment is affected by individual preferences of morningness or eveningness of its members. We believe this study will provide information that will help nurses better understand and care for families.

PROCEDURES: The study will involve a visit in your home that will last about 45 minutes. During the visit you and your family members will be asked to fill out three questionnaires. One asks questions about yourself including your age, gender, and education level. The second asks questions about your family relationships, growth and structure. For example relationships will include the questions "Family members really help and support one another", and "We fight a lot in our family". Family growth will include the questions "We often go to movies, sports events, camping, ect", and "Everyone in our family has a hobby or two." The third type of questions ask about how the family is organized. For example "There are very few rules in our family", and "Everyone has an equal say in family decisions".

RISKS and DISCOMFORTS: Filling out the questionnaires may involve some

inconvenience.

You may find some of the questions make you feel uncomfortable. You may review the questionnaires prior to consenting to participate in this study if you wish.

BENEFITS: You will not personally benefit by participation in this study. However, by serving as subjects you may contribute information which may benefit other families in the future.

CONFIDENTIALITY: Information you provide to the investigator will be kept strictly confidential. Neither your name nor your identity will be used for publication or publicity purposes. Study records will be identified only by a code number. The coded data will be kept indefinitely and may be used in future related research. According to Oregon law, suspected child or elder abuse must be reported to appropriate authorities.

COSTS: There is no cost or compensation to you for participating in the study.

LIABILITY: The Oregon Health Sciences University, as a public institution, is subject to the Oregon Tort Claims Act, and is self-insured for liability claims. If you suffer any injury from this research project, compensation would be available to you only if you establish that the injury occurred through the fault of the University, its officers, or employees. If you have further questions, please call the Medical Services Director at (504) 494-8014

PARTICIPATION: Janice Monroe and Dr. Shirley Hanson have offered to answer any questions that you might have about the study. If you have any questions about your rights as a research subject, you may contact the Oregon Health Sciences University Institutional Review Board at (503) 494-7887.

Your participation in this research study is voluntary. You may refuse to participate, or you may withdraw from this study at any time without affecting your

relationship with Oregon Health Sciences University. You will received a copy of this consent form. Your signature below indicates that you have read the foregoing and agree to participate.

Subject

Date

Parent/Guardian of minor Subject



**OREGON
HEALTH SCIENCES UNIVERSITY**

3181 S.W. Sam Jackson Park Road, Portland, OR 97201-3098
Mail Code L106, (503) 494-7887 Fax (503) 494-7787

Institutional Review Board/Committee on Human Research

DATE: January 8, 1997

TO: Janice Monroe, BSN, RN SN-FAM
c/o Shirley Hanson, PhD

FROM: The Committee on Human Research
MacHall Rm. 2160, Ext. 7887

SUBJECT: IRB#: 4339

TITLE: Family Environment and Family Chronotype

This confirms receipt of the revised consent form(s), and/or answers to questions, assurances, etc., for the above-referenced study.

It satisfies the requirements of the Committee on Human Research. The protocol and proposal to use human subjects are herewith approved. The IRB# and the date of this memo must be placed in the top right corner of the first page of the consent form. This is the approval date of this revised consent form.

Investigators must provide subjects with a copy of the consent form, keep a copy of the signed consent form with the research records, and place a signed copy in the patient's hospital/clinic medical record (if applicable).

Approval by the Committee on Human Research does not, in and of itself, constitute approval for implementation of this project. Other levels of review and approval may be required, and the project should not be started until all required approvals have been obtained. Also, studies funded by external sources must be covered by an agreement signed by the sponsor and an authorized official of the University. The Principal Investigator is not authorized to sign.

If this project involves the use of an Investigational New Drug, a copy of the protocol must be forwarded to the Pharmacy and Therapeutics Committee (Pharmacy Services - Investigational Drugs, OP-16A).

Thank you for your cooperation.

**Examination Certification/
Research Approval
Form 110003**

1. Student Janice K. Monroe

2. Degree Master of Science Doctor of Philosophy

3. Title of Study

Family Environment and Individual Chronotypes

4. **This is to certify that the student has been examined by the undersigned over the material contained in the Research Proposal which has been submitted in partial fulfillment of the requirements of the degree indicated in #2 above.**

[Redacted Signature]
Research Advisor (signature)

[Redacted Name]
(printed name)

[Redacted Signature]
Committee Member (signature)

[Redacted Name]
(printed name)

Committee Member (signature)

(printed name)

Committee Member (signature)

(printed name)

6. **The final copy of this study has been approved and is ready for binding.**

[Redacted Signature] 5/20/97
Research Advisor Date

If MRP, complete and submit form with final copies of MRP for the signature of the Associate Dean for Graduate Studies. If dissertation, complete and submit form to Office of Graduate Studies when final copies submitted for Dean's signature.

Research Advisor Agreement
Form 110001

1. Student Janice K. Monroe

2. Degree Master of Science

Doctor of Philosophy

3. Specialty Family Nursing

4. I have consented to serve as the Research Advisor for this student.

Shirley M.H. Hanson

Advisor's Signature

1/11/96

Date

5. Committee members (print names; signatures not necessary)

Unabeth Westfall

Complete and submit form to Office of Graduate Studies, SN-ADM, prior to registering for research credit.