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Implicit Family Process Rules Specific to

Eating-Disordered Families

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A thesis submitted to the faculty of
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Master of Science

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ABSTRACT
Implicit Family Process Rules Specific to
Eating-Disordered Families

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Family environment is a significant factor in the development of eating disorders in young-adult females. Clinical experience, research and theories about eating disorders indicate that constrictive implicit process rules within a family are correlated with eating-disordered families. This study identified implicit family process rules that are unique to eating-disordered families and how well these rules predict membership in eating-disordered and non-eating-disordered families. One hundred and two families (51 eating-disordered and 51 comparison families) participated in the study. Mothers, fathers, young-adult female children, and siblings in each family completed the Family Implicit Rules Profile (FIRP). The design included cluster analysis of all 85 rules to determine which implicit rules clustered in eating-disordered families, and discriminant analysis to determine how well the rules from the cluster analysis predicted membership in the groups of eating-disordered vs. control families. Results indicated that two clusters emerged related to eating-disordered families. The first included rules regarding inappropriate protection of parents (ex. "Protect your parent even if they do not deserve it"), not upsetting or inconveniencing parents, the triangulation of a child (eg.. "Listen to a parent when they complain about the other parent"), avoiding pain at any cost, and blaming self for others' anger. Cluster 2 included rules about appearances (eg,. "Do whatever you have to do to look good to others") and rules about keeping family matters private. Discriminant analysis showed that these 15 implicit family rules predicted membership in either the eating-disordered or the non-eating-disordered family groups with 93% accuracy. Implications for family therapy are discussed.

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In the United States, 20 million women and 10 million men suffer from a clinically significant eating disorder in their lifetime. Eating disorders include anorexia nervosa, bulimia nervosa, binge eating disorder or eating disorder not otherwise specified (EDNOS) (National Institute of Health, 2011; Wade, 2011). Eating disorders are serious, potentially life threatening disorders that negatively affect both physical and emotional health. In fact, eating disorders have the highest mortality rate of any mental illness (Arcelus, Mitchell, Wales & Nielsen, 2011; Crow, 2009; Maine, 2005). Crude mortality rates for anorexia nervosa, bulimia nervosa and EDNOS are 4.0%, 3.9% and 5.2% (Crow, 2009). Death of those with eating disorders may result from associated starvation, substance abuse or suicide (Maine, 2005). Despite increased societal awareness of eating disorders, the prevalence of all types of eating disorders continues to increase. This increase is no longer restricted to western civilizations, but instead affects men and women across all nations (Maine, 2005; Wade, 2011).

Eating disorders are treated with individual therapy or with family therapy. Family therapy would include parents, siblings or a spouse. Recently, a growing body of research and treatment has shifted towards family therapy based models. One model in particular, the Maudsley Family-Based Treatment (Treasure, Rhind, Macdonald, & Todd, 2015), includes the parents and siblings of the eating-disordered adolescent or adult in an outpatient therapy process. The idea is, that rather than taking an individual out of the environment they are comfortable in and placing them in a hospital, the patient can stay living at home, surrounded by the people they love and trust while undergoing treatment. This model, as well as other family therapy models, have had great success in treating eating disorders and have led to a more positive effect than individual treatment in categories like increase of body fat percentage, return of menstrual cycle, and a longer maintained remission (Fishman, 2004; Hurst, 2012; Haworth-Hoeppner 2000). In

fact, the American Psychiatric Association (APA) has cited specific models such as Maudsley and has suggested that family treatment is the most effective intervention (Couterier, 2010).

Research (e.g. Berge, et al., 2014; Cao, Miao, & Tong, 2013; Godfrey, Rhodes, & Hunt, 2013; Loth, et al., 2015) has also focused on family dynamics or processes related to eating disorders. Implicit family rules are one of the family dynamics that proves to be related to eating disorders. Implicit rules are not openly discussed, but are created by redundant interaction patterns in the family; they are the unwritten rules that govern family interactions (Neuchterlein,1993; Stoll, 2002). Gillett and colleagues (2009) examined implicit family process rules, and found that the implicit rules in eating-disordered families were different compared to non-eating-disordered families (Gillett, 2009). No research, however, has clarified what specific implicit family rules are linked to eating-disordered families.

The purpose of this study was to identify family implicit process rules that are specific to eating-disordered families. A secondary purpose was to examine how well the implicit process rules specific to eating-disordered families predict membership in the eating-disordered and non-eating-disordered families.

Literature Review
Theoretical Foundation for the Study

General Systems Theory views a family system as the sum of its parts. Thus, each individual influences the family and the family influences each individual. Because of this theory, no individual can be blamed entirely for a problem. Instead, problems emerge from interactions between multiple members of the family system (Broderick, 1993; von Bertalanffy, 1968). Family members behave in redundant patterns and these patterns influence both the beliefs and the behavior of each family member. The redundancy of interaction among family

members leads to implicit family rules unique to each family. These rules are not explicitly discussed, but they govern behavior of family members.

These redundant patterns and the related implicit rules may govern family behaviors such as the expression of emotion, how much personal information family members disclose, sequences of talking, decision making, kindness and compassion, and what kinds of information is shared outside the family. Implicit rules also develop around family eating behaviors and family members' focus on eating, weight and body image. The assumptions underlying this study include the idea that eating-disordered families may develop a set of implicit rules specific and unique to them.

Prevalence of Eating Disorders

Eating disorders are a range of psychological disorders characterized by abnormal or disturbed eating habits, distorted body image and fear of gaining weight. Types of eating disorders include anorexia nervosa (self-starvation and excessive weight loss), bulimia nervosa (cycle of bingeing and self-induced vomiting), binge eating disorder, and eating disorder not otherwise specified (EDNOS) (DSM-5, 2013). Eating disorders affect girls and boys, women and men worldwide and can cause potentially life threatening emotional and physical problems (Arcelus, Mitchell, Wales & Nielsen, 2011). Eating disorders are deadly and may lead to death through starvation, suicide and substance abuse (Crow, 2009).

The lifetime prevalence rates of DSM-IV anorexia nervosa, bulimia nervosa, and binge eating disorder are 0.9%, 1.5%, and 3.5% among women. Eating disorders are generally less common among men with a lifetime prevalence of 0.3%, 0.5% and 2.0%. All three of these eating disorders are significantly comorbid with many other DSM-IV disorders including anxiety, mood, substance abuse and impulse control disorders. Over half of those with anorexia

nervosa and 94.5% of those with bulimia nervosa met the criteria for at least one core DSM-IV disorder. However, no single comorbid disorder stood out as being more present than others in relation to eating disorders. The median onset of age for all eating disorders is between 18-21 years old (Hudson, 2007). Most detected cases of eating disorders range from mild to moderate in severity and the more severe, the higher the chance of detection and treatment (Smink, 2014).

Factors Related to Eating Disorders

A variety of factors contribute to the development of an eating disorder including: genetics, personality traits, family of origin, media, culture, and gender (Gillett, 2009; Haworth-Hoeepner, 2000; Maine, 2005). Research continues to study each of these contributing factors, and each may help in the understanding and treatment of eating disorders.

Some studies (Strobert, Freeman, Lampert, Diamond, & Kaye, 2000; Wade, Bulik, Neale, & Kendler, 2000; Walters & Kendler, 1995) suggest that there may be a genetic predisposition to eating disorders, both anorexia and bulimia. More specifically, medical researchers (Kaye, Bailer, Frank, Wagner, & Henry, 2005) have found that anorexia and bulimia are related disorders and may be related to disturbed function of serotonin (5-HT) pathways in the brain, which regulate mood, impulse control, and regulation of eating.

There also seems to be a pattern of personality traits among those with eating disorders. Carson, Butcher, and Mineka (2000) found that those with eating disorders often display high conformity, usually avoid big changes and risks, do not want to draw attention to themselves, are strongly affected by internal stress, have a focus on perfectionism and often tend to think in "all-or-nothing" patterns.

Haworth-Hoeepner (2000) found that family characteristics such as a critical family environment, coercive parental control, and frequent discussions about weight, contribute to the

development of eating disorders. However, each individual family characteristic does not necessarily link to eating disorders on its own. Instead, it is most often one of a few specific combinations of these characteristics that are connected to the development of an eating disorder (Haworth-Hoeepner, 2000). It is important to note that the family characteristics in this study took place in a culture where thinness is valued (Maine, 2005). Haworth-Hoeppner (2000) explained the significance of this correlation by stating that, "culture does play a role in the production of eating disorders, but that this influence is mediated through groups, like the family, in which the fundamental work of identity is carried on" (p.213).

Media and culture, specifically westernized media and culture, play a vital role in the development of beauty ideals and thinness ideals. Maine (2005) describes a dramatic example of the effect of western beauty ideals on a population. Historically, Fijian culture has valued large female bodies and both celebrated and enjoyed food. In Fiji in 1995, before television was introduced, there was little talk about dieting or weight and eating disorders were essentially non-existent. By 1998, after television was introduced in which western beauty ideals were portrayed, 11% of Fijians used self-induced vomiting, 29% were at risk for eating disorders, 69% had dieted to lose weight, and 74% felt "too fat" (Maine, 2005). This example starkly demonstrates the significant role sociocultural influences play in the development of eating disorders.

Family Factors Related to Eating Disorders

The family meal has been a key component of family-based interventions for anorexia nervosa since structural family therapists developed the idea in the early 1970s (Fishman, 2004). Minuchin first introduced the idea of a lunch session, in which the family comes in for lunch with the anorectic client and they eat together with the therapist. The lunch session provides

clinicians with an opportunity to observe and to directly challenge transactions the family has around eating (Minuchin et al., 1975; Minuchin et al., 1978). The context of this session also provides a broader opportunity to see the family system structurally. Minuchin and colleagues hypothesized and found that often a family dynamic around power and control would manifest in these eating disordered families (Rosman, Minuchin, & Liebman, 1975).

The Maudsley model of family-based treatment (FBT) of eating disorders maintains the importance placed on the family meal; a family meal routinely takes place during the second session of this manualized treatment (Lock & Le Grange, 2013). Maudsley FBT utilizes this session to assess family structure, to evaluate family strengths and weaknesses while eating and to aid parents in successfully refeeding their child. During the first part of this session, the eating-disordered patient eats the food they are comfortable with and the family discusses with the therapist their family eating practices at home. Whenever there is a sign of disordered eating behavior, conversation stops and the parents must then support their child in eating at least one mouthful more than they are willing to eat.

The idea behind this intervention is that in each moment that the family comes together to have the child eat one more bite, they symbolically overcome the eating disorder together. The therapist must directly coach the family and patient with repetitive suggestions and support (Lock & Le Grange, 2013). Usually the eating-disordered patient falls into one of two categories. The patient either fights against the parents and therapist, but eventually eats the extra bites asked of them or does not resist at all which arguably removes the therapeutic aspect of this experience (Godfrey, 2006). These family based interventions emphasize the influence the family has on the eating-disordered daughter.

Implicit Family Process Rules and Eating Disorders

Implicit family process rules are an important family dynamic in several established

family therapy models (Satir, 1991; Minuchin, 1974; Haley, 1991). Family theorists have

conceptualized families as rule governed systems (Jackson, 1965; Blevins, 1993; Constantine,

1986; Ford, 1983) in which rules develop from repetitive interactions or patterns in the

behavioral exchanges of family members. The rules are categorized as implicit to distinguish

them from the clear and intentionally enforced rules like curfews or rules associated with

parental discipline. Implicit rules are, instead, those which family members are often unaware of

until someone, like a therapist, points them out. This lack of awareness that the implicit rules

exist is normal and is true in both functional and dysfunctional families.

Family rules are categorized as either facilitative or constraining. Constraining rules

impede communication, create distance in relationships and stifle familial and personal growth

(Blevins, 1993; Satir, 1988, Ford, 1983). Rules like "share as little information as possible with

other family members" would be considered constraining. Facilitative rules, on the other hand,

are flexible, promote openness, confirm the intrinsic self-worth of each family member,

encourage acceptance and love, serve the entire family, accept differences and foster the

discovery of appropriate, functional behaviors

(Blevins, 1993; Hoopes & Harper, 1992; Satir, 1988). These are rules like, "show physical

affection within the family."

Research (Haworth-Hoeppner, 2000; Nuechterlein, 1993; Stoll, 2004) shows that these

types of rules govern family systems and that family systems play a significant role in

determining the behavior and outlook of individuals within a family, especially adolescents.

Studies (Gillett, et al., 2009; Pfeifer, 2015; Stoll, 2004) have also shown that the presence of

constraining family rules and lack of facilitative family rules result in impeded communication, decreased intrinsic self-worth, decreased self-acceptance and increased need to conform, traits which are often associated with eating disorders. (Carson, Butcher, and Mineka, 2000; Pfeifer, 2015; Gillett 2009, Stoll 2004).

Some research has taken this one step further and has specifically shown that constricting family rules, lack of facilitative family rules and dysfunctional patterns of family interactions are associated with eating disorders (Gillett, 2009; Holtom-Viesel, 2014; Kog & Vandereycken, 1985). Similarly, eating disorders are linked to controlling, interdependent family relationships when paired with parental discordance (Kog & Vandereycken, 1985). In a literature review by Holtom-Viesel (2014) dysfunction among eating-disordered families was measured using The McMaster Family Assessment Device, which measures problem solving, communication, roles, affective responsiveness, affective involvement, behavior control and general functioning. The researchers found that while no consistent pattern of dysfunction existed, eating-disordered families rated as more dysfunctional than non-eating-disordered families. In that same study, the identified patient reported more family dysfunction than their parents did. It was also found that patients with positive perceptions of their family functioning had better treatment outcomes (Holtom-Viesel, 2014).

Gillett, et al. (2009) found that a greater proportion of constraining family rules governed eating-disordered families and that the eating-disordered child reported less facilitative and more constraining rules than their siblings and parents reported. Laliberte, Boland, and Leichner (1999) assessed family climate for eating disorders by surveying both female college students and their mothers, and found that a family focus on appearance and achievement was a powerful predictor of disturbed eating, even more powerful than variables like conflict or emotional

constraint. While it has been clarified that lower family functioning is associated with eating disorders, no research has specified which implicit family rules are specific to eating-disordered families (Gillett, 2009; Holtom Viesel, 2014; Haworth-Hoeppner, 2014). In fact, there is a noticeable lack of research articles published on eating disorders in the last decade in general.

The Current Study

Purpose and research questions. The purpose of this study was to identify clusters, or groupings, of family implicit process rules that are specific to eating-disordered families. The study also examines how well the rules specific to eating-disordered families predicted membership in two known groups, eating-disordered families and non-eating-disordered families. The following research questions were answered:

1) What specific implicit rules are unique to eating-disordered families when compared to non-eating-disordered families?

2) How well do the implicit rules identified in the previous question classify families into eating-disordered and non-eating-disordered groups?

<div align="center">Method</div>

Participants

This study consisted of a clinical sample of 51 eating-disordered participant families and a community comparison sample of 51 non-eating-disordered families (204 family members in eating disordered group and 231 members in comparison group). A participant family consists of a female young-adult between the ages of 13 and 25, her parents with whom she lives with and any siblings who live at home and who are between the ages of 13 and 25 (male or female). The study focused on female young-adults due to the fact that over 90% of all cases of both anorexia nervosa and bulimia nervosa occur in females (Cassell & Gleaves, 2000; DSM-IV-TR, 2000). In addition, the age range of 13 to 25 was chosen based on Cassell and Gleaves' (2000)

identification of the typical age range for a female with anorexia as 12 to 25, and based on

Bellenir (2000) and Kaplan & Saddock's (1996) research identifying the onset of eating

disorders as between 13 and 20 years. The average female with bulimia is in her late adolescence

or is a young adult (Bellenir, 2000), and its onset takes place between the ages of 16 ½ to 18

years of age (Kaplan & Saddock, 1996).

Clinical Sample. The 51 participant families in the clinical sample were considered

eating-disordered due to a female young-adult in the family having been placed in an inpatient

program (n=29) or outpatient therapy (n=22) for an eating disorder. It is important to note that

among these inpatient and outpatient groups, patients were likely to have very different symptom

severity. The eating-disordered participants in this study were females who sought clinical

services from a treatment facility for eating disorders in the Mountain West region, which draws

from the Western and Midwestern United States. This facility was chosen because its' patients

appear to represent the general population of female young-adults with eating disorders in the

Western US and because the center was willing to approach its' female young adult patients and

the families of those patients to participate in this research. Psychiatrists or psychologists

diagnosed the young women in the clinical sample as having anorexia nervosa (AN), bulimia

nervosa (BN) or EDNOS using criteria from the DSM-IV-TR.

Non-clinical Sample. The 51 families in the community, comparison sample were

considered non-eating-disordered because they were not in need of either placing a family

member in an inpatient program, nor were they seeking outpatient therapy for an eating disorder.

This sample consisted of community members and was gathered through a quota sampling

procedure. Additionally, a series of screening questions were used to screen for and eliminate

families that exhibited any eating-disordered tendencies or displayed other addictive behaviors,

such as substance abuse. Gillett, et al. (2009) used this same sample and reported that there were no significant differences between the clinical and community families in terms of income, parental education, and race.

Procedure

The females and their families in the clinical sample were offered a small monetary reward for participating in the research. Eating-disordered patients were offered $10 for a completed questionnaire packet, and the entire family was given $50 when all family members completed the surveys. Parental permission for family involvement was requested by phone or in person. Once permission was granted, the family was faxed or mailed a consent form, Family Implicit Rules Profiles, and demographic questionnaires for both parents and each sibling (both male and female) who live in the home and who are between the ages of 13 and 25. To screen for other addictions, every participant completed the Family Substance Abuse Profile, a 6-item substance abuse screening instrument designed by the researchers. The families were asked to provide information on each questionnaire as it pertained to life just before the young-adult sought services at the treatment facility.

Families in the community, comparison sample were selected using a quota sampling procedure (deVaus, 1995). Students within introductory Family Life and Psychology courses were offered extra credit for recruiting families for the study. The students who chose to participate each nominated at least one family that had a young adult daughter living at home between the ages of 13 and 25 who they believed did not have an eating disorder. Along with their nominations, they provided addresses, phone numbers, and when available, e-mail addresses of the families they recommended. The students first contacted the young adult females and their families by phone to receive verbal consent to participate in the study. The

young adult females and their families were then mailed consent forms, demographic questionnaires, screening instruments, and Family Implicit Rules Profiles for both parents, the female young-adult and any other siblings (male or female) between the ages of 13 and 25 who resided at home. Postage-paid, self-addressed return envelopes for each individual questionnaire were included to facilitate return of the questionnaires and to provide greater confidentiality for each individual participating.

A total of 116 complete comparison sample families returned the Family Rules Profile completed by each family member and the screening instruments that included Children of Alcoholics Screening Test (CAST), SASSI-A2 and SASSI-3, and 6 eating disorder screening questions. Each participant 18 years and younger in the comparison sample was asked to complete the CAST instrument, and the SASSI-A2, and all participants in the comparison sample who were 19 years and older were asked to complete the SASSI-3. All family members in the sample were asked to complete the eating disorder screening questions. Of the 116 families, screening results for 22 families suggested the presence of an eating disorder or substance abuse problem within the family, and they were thus eliminated from the comparison sample. This left 94 eligible families in the comparison sample.

These 94 families were then used as a pool from which to select families who were matched as closely as possible to families in the clinical group. Families were matched by age of young adult/identified patient (IP) and by age of siblings and then by gender of siblings. Subsequently, families were matched by hand for income, race, family structure, religious preference and lastly by general geographic region, in that order. Matching on several variables, of course, meant that an exact match was impossible.

To determine how closely the eating-disordered and non-eating-disordered groups matched, means and standard deviations of the clinical and comparison groups were used to create distribution curves for the two groups by age of the IP. In the case of categorical data, percentage distributions were examined for variables of gender distribution of siblings, income, race, family structure, religious preference, and geographical region. Since the authors were also interested in whether there were differences in family rules between groups based on age, gender, race, religion, income, and geographic region, t-tests and ANOVA's were used to determine whether there were significant differences on Family Implicit Rules Profile scores based on differences in age, gender, race, religion, income, or geographic region. None of these t-tests or ANOVA's yielded significant results. The 51 families from the comparison sample were considered a close enough match to the 51 families from the clinical sample, and these 102 families and their members were used in all statistical analyses.

Measures

Demographic questionnaire. Each individual who participated in the study completed a demographic questionnaire. Questions asked for information regarding age, gender, income, hometown, race, religious preference, position in the family (i.e. mother, father, young-adult, sibling, stepmother, stepfather), and parental marital status. The purpose of this questionnaire was to gather the characteristics of each individual and family in both samples, and to allow for matching of similar characteristics between the clinical and comparison groups.

Family Implicit Rules Profile, FIRP. The Family Implicit Rules Profile or FIRP (Stoll, 2009) used in this study is a 100 item self-report instrument that identifies both facilitative and constraining implicit family rules. The FIRP yields a total score that indicates a level of healthy, facilitative family processes. There are also five subscale scores, two of which consist of

constraining or dysfunctional rules and two of which consist of facilitative or functional rules. Each member of the family including the mother, father, daughter, and any siblings living at home, took the FIRP and their scores were weighed with equal value. Examples of constraining rules, which screen for inappropriate caregiving and constraint of thoughts, feelings and self, include "Protect your mother emotionally even if you have to sacrifice yourself" and "Don't feel or talk about feelings". Examples of facilitative or functional rules, which screen for expressiveness and kindness, are "Share your feelings", "Be affectionate", and "Don't call each other harmful names". The fifth subscale, Monitoring, measures the degree to which family members monitor one another in terms of who they are with, where they are going, when they get in, how they spend money, etc. Examples from this scale include "Let family members know when you'll be home" and "Let family members know where you're going."

In addition to these scales, clinicians who regularly treat eating disorders brainstormed an additional 15 items thought to be related to processes in eating-disordered families. Examples of these rules were, "Your worth is dependent on how much acceptance you get from the opposite sex" and "Being perfect is good." The items on the eating-disordered and two constraining rules subscales were reverse scored and summed with the other scales to get the total score. The total score can range from 100 to 500. Construct validity of these 15 new eating disorder items was evaluated using principle components factor analysis with orthogonal rotation. Factor loadings for these items ranged from .58 to .67. The factor analysis showed that these 15 added items did not constitute a separate factor, but rather factored on the other scales, predominantly on the Constraint of Thoughts, Feelings and Self Subscale.

Three expert judges who were university professors in a doctoral Marriage and Family Therapy Program, were well published in family systems journals, and who had extensive

clinical experience in systemic therapy evaluated each item of the FIRP to assess for content validity according to how much they agreed it was an implicit process rule from a systemic viewpoint and how appropriately the rule was worded. The results led to some items being dropped and some items being reworded. Concurrent validity was evaluated by comparing the total and subscales of the FIRP with the subscale scores of the Self-Report Family Inventory, and the total score of the Internalized Shame Scale (Cook, 2001). All correlations except for the Inappropriate Caretaking subscale were in the expected direction and ranged from .58 to .74 indicating adequate concurrent validity for the FIRP. Construct validity of the FIRP was evaluated using principle components factor analysis with orthogonal rotation, and stable factors were identified that correspond to the subscales with loadings ranging from .41 to .89. Some items were dropped to get the 100 used in this study because their factor loadings were not sufficiently high to keep them in the scale.

Test-retest coefficients were .94 for the total scale and ranged from .75 to .92 on individual subscales. Cronbach's alpha coefficients for FIRP scores in this study ranged from .82 to .94 and split half reliability coefficients from 75 to .95.

Other screening measures. The measures discussed in this section were all used as screening tools to ensure that families in the group were not struggling with alcohol or drug use among one or more of the family members. The Children of Alcoholics Screening Test (CAST) was used to screen families out of the non-clinical who appeared to have difficulties with alcoholism. The CAST contains 30 items that measure the perceptions, feelings, experiences and attitudes of children related to possible parental drinking behavior. It has successfully been shown to identify adolescent and adult children whose parents are alcoholics (Pilat & Jones,

1985). Any subject who answered "Yes" to a question on the CAST was eliminated from the comparison sample of this study.

The Substance Abuse Subtle Screening Inventory 3 (SASSI-3) and the Adolescent Substance Abuse Subtle Screening Inventory-2 (SASSI-A2) are adult and adolescent versions of the inventory designed for the purpose of identifying "individuals who have a high probability of having a diagnosable substance-use disorder…. regardless of whether they are able or willing to acknowledge relevant symptoms" (Lazowski, Miller, Boye & Miller, 1998, p. 115). Participants in both the clinical and non-clinical groups exhibiting traits of substance abuse or dependency according to the scales on the SASSI-3 or in the case of adolescents on the SASSI-A2 were eliminated. Permission to use the SASSI-3 was granted by The SASSI Institute, Bloomington, Indiana.

The Family Substance Abuse Profile (FSAB) is a questionnaire designed by the researchers that contains six questions scored on a four-level Likert-type scale. The questions were adapted from questions found in the CAST instrument and SASSI instruments. It was designed for the purpose of screening out substance abuse problems within both the clinical and non-clinical samples. Those families who members scored above 2 on any of the 6 questions were eliminated from the clinical sample.

Analysis Plan

The first step in the analysis was to calculate descriptive statistics including means, standard deviations, and correlations for the subscales and total score on the Family Implicit Rules Profile, FIRP. Next, cluster analysis was used to determine which family implicit rules are specific to the eating-disordered sample. The goal of cluster analysis is to ascertain which objects within a group are related to one another and different from the objects in other groups (King,

2014), or specific to family implicit rules. The goal was to determine which family implicit rules are highly endorsed by family members in the eating-disordered sample that are not highly endorsed by family members in the non-clinical sample. This resulted in a cluster, or grouping, of rules correlated with eating-disordered families. Following the recommendations of Fraley and Raftery (2002), K-means clustering is used because it allows for partitioning of items into specific clusters. Sarstedt and Mooi (2014) reported that there are no specific guidelines for sample size when using cluster analysis since cluster analysis is not considered an inferential statistic. They indicated that the sample size should be large enough to represent all groups being considered. In this study, two groups (eating disordered and community comparison) were of interest so the total n of 434 was considered sufficient to conduct the analysis.

Lastly, discriminant analysis was used to determine how well the specific implicit rules uncovered in the cluster analysis predict membership in the clinical and non-clinical group. According to Fraley and Raftery (2002), it is not uncommon to use both cluster analysis and discriminant analysis in the same study as cluster analysis reveals variables that are similar (in this case family implicit rules for eating-disordered families) and discriminant analysis serves as a validity check for the variables (implicit rules) by determining how well they predict classification into known groups, in this study clinical and non-clinical.

Results

Descriptive Statistics

Results from cluster analysis. In the current study all 85 items from the Family Implicit Rules Profile were included in cluster analyses (Henry, Tolan, & Gorman-Smith, 2005) in order to examine whether families who had a daughter with an eating disorder could be distinguished empirically from families who did not have a daughter with an eating disorder. Following the recommendations of Steinley and Brusco (2011, 2008b, 2007) hierarchical cluster analysis using

Euclidean distance was initially used and then followed with K-means cluster analysis.

Hierarchical cluster analysis is considered appropriate for smaller samples and is often used as a

prelude to K-means cluster analysis because it allows for examining results for different numbers

of clusters whereas K-means clustering requires that the number of clusters be specified in

advance (Garson, 2014). There was no need to standardize scores since the answers to all 85

items on the Family Implicit Rules Profile were based on the same scale varying from 1 (*Never*)

to 5 (*Most of the Time*). The reporting of the results from the cluster analyses adheres to the

recommendations of Clatworthy and colleagues (2005). The results from the hierarchical cluster

analysis showed that the best solution was one in which there were four clusters, two which

appeared to be related to non-eating-disordered families and two clusters related to eating-

disordered families. A K-means cluster analysis (Steinley, 2006a) was then used, specifying in

advance four clusters, to determine how items from the Family Implicit Rules Profile clustered

for eating-disordered families and for non-eating-disordered families.

The first research question was whether families with a daughter diagnosed as having an

eating disorder have unique family implicit rules compared to non-eating-disordered families. Of

the four clusters specified in the analysis, two were related to implicit family rules that were

more endorsed by non-eating-disordered families so those results are not reported here because

they are not related to the research question about whether eating-disordered families have

unique implicit rules. Table 1 shows the K-mean squares and associated F values for 15 family

implicit rules that occurred in two different clusters and were statistically significant. Cluster 1

contained 11 rules. Four of the implicit rules in cluster 1 (items 56, 57, 59, and 60) were related

to inappropriate protection of parents (*F* ranged from 26.22 to 105.42, all *p*<.001): four were

related to not upsetting or inconveniencing parents (items 64, 65, 66, and 67; *F* ranged from

91.27 to 139.32, all $p<.001$)); one was about triangulation where a child must "listen to a parent when they need to complain about the other parent" ($F = 65.28$. $p<.001$); and the remaining two were about avoiding pain ($F = 54.36$, $p<.001$) and blaming self for other peoples' anger($F = 54.84$, $p<.001$).

Cluster 2 included four rules, two of which were about appearance (item 45—"Make sure you maintain a positive family image at any cost"; $F = 74.03$, $p<.001$, and item 47—" Do whatever you have to do to look good to others"; $F = 79.79$, $p<.001$). The other two items in cluster two were about being disloyal if you talk about the family to others ($F = 47.69$, $p<.001$) and not talking about things that make family members uncomfortable ($F = 108.45$, $p<.001$).

Results from MANOVA Comparing Eating-disordered and Non-eating-disordered Families on 15 Family Implicit Rules

In order to determine how the means for these 15 items from *FIRP* differed between eating-disordered and non-eating-disordered families, a Multivariate Analysis of Variance, MANOVA, was performed with the 15 implicit rules as the dependent variables. The one-way MANOVA revealed a significant multivariate main effect for eating-disordered vs. non-eating-disordered (Wilks' $\lambda =.144$, $F = 304.19$, $p<.001$). Results from univariate tests are shown in Table 2.

On a scale from "Never" (0) to "Always" (5), there were four rules which eating-disordered families endorsed, on average, as occurring "Often" (4) whereas non-eating-disordered families endorsed the same items as "Seldom" (1). These were #3--"Avoid pain at any cost" ($\bar{x} = 3.97$, $SD = 1.16$ $p<.001$,), # 57--"Regardless of whether he deserves it, protect your father" ($\bar{x} = 3.61$, $SD = 1.27$ $p<.001$,), # 59-- "Protect your father emotionally even if you have to sacrifice yourself" ($\bar{x} = 3.61$, $SD = 1.42$, $p<.001$), and #60--"Protect your mother

emotionally even if you have to sacrifice yourself" ($\bar{x} = 3.72$, $SD = 1.35$, $p<.001$). An additional

four implicit rules were endorsed, on average, by eating-disordered families as between

occurring "With some regularity" (3) and "Often" (4), whereas non-eating-disordered families

endorsed them as slightly above "seldom". These were #45—"Make sure you maintain a positive

family image at any cost" ($\bar{x} = 3.47$, $SD = 1.20$ $p<.001$,), #56—"Protect your mother even if she

doesn't deserve it ($\bar{x} = 3.29$, $SD = 1.40$, $p<.001$), #64—"Do not talk to your parents about things

that make them feel uncomfortable" ($\bar{x} = 3.44$, $SD = 1.22$, $p<.001$), and #65—"Don't'

inconvenience a parent" ($\bar{x} = 3.22$, $SD = 1.17$, $p<.001$). Of the remaining implicit rules, eating-

disordered families endorsed them, on average, as occurring slightly below "with some

regularity" (2) whereas non-eating-disordered families endorsed them as "seldom" (1) occurring

($\bar{x}'s$ ranged from 2.77 to 2.98, SD ranged from 1.03 to 1.42, all $p's$ <.001),

Results from Discriminant Analysis

  Discriminant analysis. The second research question was "How well do the family

implicit rules identified from the cluster analyses classify families into eating-disordered and

non-eating-disordered groups. Discriminant analysis is often used in conjunction with cluster

analysis as a type of validation of the cluster analysis (Garson, 2012). Discriminant analysis was

appropriate since it is similar to regression analysis except that the dependent variable is

categorical group membership (Sherry, 2006). In the case of this study, discriminant analysis was

used with the resulting 15 family implicit rules from the cluster analysis to predict membership

in either the eating-disordered or the non-eating-disordered family groups.

  Table 3 shows the standardized canonical discriminant function values, Wilk's Lambda, and

F values from the discriminant analysis for each implicit rule. The significant F values for all 15

implicit rules mean that the model differentiates discriminant scores between the eating-

disordered and non-eating-disordered groups significantly better than chance (F values ranging from 13.14 to 11.69, all p's<.001). The standardized canonical discriminant function coefficients are similar to beta weights in multiple regression with larger values indicating the relative importance in predicting group membership (Sherry, 2006). Wilk's Lambda can vary from 0 to 1 where 1 means all group means are the same and 0 means all group means are different. When Wilk's lambda for a predictor variable is smaller, it contributes more to the classification (Garson, 2012). The standardized canonical discriminant function coefficient of 79.8 and Wilk's Lambda of .48 for implicit rule #59—"Protect your father emotionally even if you have to sacrifice yourself" indicated that this rule contributed the most to prediction of group membership. Item #45, "Make sure you maintain a positive family image at any cost", contributed less to the prediction than the other implicit rules (Standardized canonical discriminant function = 35.3, Wilk's λ =.78, p<.001), but it was still a statistically significant predictor.

Table 4 shows the classification results from the discriminant analysis. The hit rate is the percentage of families that were accurately classified, using the 15 implicit family rules, into their known group. Ninety-two and two-tenths percent of individuals in the eating-disordered families were correctly classified (95 out of 103), and 94.4% of the individuals in non-eating-disordered families were correctly classified (117 out of 124). The overall hit rate was 93.4% meaning that using the 15 implicit rules predicts membership in either eating-disordered or non-eating-disordered families significantly better than chance.

Figure 1 shows the relationship of the two groups based on group centroids. A group centroid is the group mean of canonical variables (Garson, 2012) standardized. The figure shows that the centroid for the eating-disordered group was approximately 2, and the centroid for the

non-eating-disordered group was approximately -4. There is also relatively little overlap between the distributions of the two groups as shown where the tails of the two distributions overlap.

Discussion

Findings indicated that there are 15 implicit family rules that were strongly endorsed in eating-disordered families. These 15 rules encourage children to inappropriately protect and avoid upsetting or inconveniencing their parents, to avoid pain at any cost, to blame themselves for others' anger, and to prove loyalty by avoiding talking about their family to others. The presence of these 15 implicit family rules predicted membership of individuals in eating-disordered as opposed to non-eating-disordered groups with 93.4% accuracy.

It is important to note that factors like genetics, personality traits, media, culture and family of origin have also been linked to eating disorders and may contribute to the development of an eating disorder (Carson, Butcher, and Mineka (2000); Maine, 2005; Strobert, Freeman, Lampert, Diamond, & Kaye, 2000; Wade, Bulik, Neale, & Kendler, 2000). Because this was a cross sectional study, one should not assume that eating disorders prove to be a system-generated problem, meaning that the presence of these rules causes eating disorders. Instead, the correlation may also be explained if eating disorders are part of a problem-generated system, in which the disorder occurred first, and then the family transformed its' implicit rules in response to the presence of the eating disorder.

It is important to note that in this study, therapists specializing in the treatment of eating disorders added certain implicit rules to the FIRP. Some of these rules were clustered with eating-disordered families and are constricting rules concerning maintaining a positive family image and placing value on physical appearance. The findings from this study confirm empirically their observations of these rules in clinical eating-disordered families.

It is crucial to remember that each member of the families in this study recognized the family rules, yet the adolescent daughter was the only family member diagnosed with an eating disorder. This further supports the idea that the existence of these clustered, constrictive family rules is only one piece to the many risk factors associated with eating disorders and that their presence does not guarantee an eating disorder will develop. These findings also support General Systems Theory in that family members' behaviors influence both the belief and behavior of each family member (Broderick, 1993; von Bertalanffy, 1968). All members of the family system, not just the eating-disordered daughter, would have had to endorse these family implicit rules as occurring in their family to produce these results. It would be beneficial for future research to consider longitudinal studies which link the presence of these constrictive family rules in eating-disordered families to the actual development of an eating disorder.

The findings of this study suggest that the implicit family rules that suppress sharing emotions with family members and promote avoiding pain are strongly associated with eating-disordered families. The four rules that were identified as occurring "often" in eating-disordered families and "seldom" in non-eating-disordered families are "Avoid pain at any cost", "Regardless of whether he deserves it, protect your father", "protect your father emotionally even if you have to sacrifice yourself" and "protect your mother emotionally even if you have to sacrifice yourself."

This is not the first empirical study to find an association between family processes and eating disorders (Lock & Le Grange, 2013; Rosman, Minuchin & Liebman, 1975). Other studies have pointed out that dysfunctional patterns in families are associated with eating disorders (Gillett, et al., 2009; Holtom-Viesel, 2014; Laliberte, Boland, and Leichner, 1999). Laliberte, for example, found that variables like the family's concern for weight, shape, and social appearances

and a family's emphasis on achievement correlate with eating-disordered families in comparison to healthy or depressed families (1999). Holtom-Viesel (2014) reviewed 17 research papers, including Gillet's (2009), and found that consistently, eating-disordered families reported worse family functioning, though no specific patterns of dysfunction were found. Gillet (2009) found that eating-disordered families are governed by a greater proportion of constraining family rules than non-eating-disordered families. Wiostky, et al. (2003) also linked eating disorders to family processes by reporting that families with anorexia nervosa reported more rigidity and less cohesiveness as measured by FACES-II.

Similarly, the presence of healthy and facilitative implicit family rules has been associated with a decrease in adolescent psychological symptoms like hostility, interpersonal sensitivity, depression, anxiety and somatization (Feinauer, 2010). Stoll (2004) found that clinical families with an adolescent in therapy for emotional or mental conditions are more heavily influenced by constricting rules and less influenced by facilitative rules in comparison to non-clinical families. These studies further clarify that constrictive family rules are correlated with clinical outcomes like depression, reckless behavior and eating disorders, yet the exact cause remains unclear. It would be helpful for future research to be directed at a strength-based approach to family therapy for eating-disordered families. If we can find what these families know how to do well, clinicians can capitalize on the family's strengths in order to overcome constrictive rules and eating disorder behaviors and produce a more facilitative, connected home environment.

Implications for Family Therapy

The American Psychiatric Association (APA) has suggested that family treatment is the most effective intervention for eating disorders, and the results of this study would greatly

supplement family treatment of eating disorders (Couterier, 2010). This study verifies that unspoken family rules affect not only the eating-disordered daughter, but also every family member. It also provides the list of rules that are likely present in the eating-disordered families that clinicians are treating. Clinicians can utilize these 15 identified implicit family rules to assess which rules are actively present in the eating-disordered families and then intervene to adjust the family rules from constrictive rules that may promote eating disorders to facilitate rules that may combat eating disorders. This could be assessed either by a formal survey of these rules given to each family member, with a similar FIRP method of rating between 1 (Never) to 5 (Most of the time) or through a verbal assessment by the clinician to the entire family.

The identified clustered rules align with existing family dynamics from family therapy models such as the parentification of children (Goldenthal, 1993), an importance placed on looking good on the outside despite feeling bad on the inside which has been shown to lead to internalized shame (Summers, 2010), and rigid boundaries that do not allow sharing uncomfortable or painful emotions (Fishman, 2004; Harper & Hoopes, 1990). Implicit family rules have been a concept in several family therapy models including Satir's conjoint family therapy (Satir, 1991), strategic (Madanes, 1981), and structural family therapies (Minuchin, 1974). The findings of this study confirm that the concept of implicit rules is important when treating eating-disordered families.

The Maudsley model of family-based treatment is one of the family approaches referenced as effective by the American Psychological Association (APA). In this model, the therapist plays an active role in coaching the entire family as to how to help the identified patient overcome her eating disorder. The Maudsley model is an outpatient therapy that hopes to change the family dynamic at home to allow space for healing rather than remove the eating-disordered

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patient from home to heal in an inpatient facility (Lock & Le Grange, 2013). The results of this study would contribute greatly to a model like Maudsley's in identifying specific dynamics and unspoken family rules that should be changed. These rules will give the clinician context as to what implicit family rules are likely present and correlated to the eating disorder and will give the identified patient and family members the vocabulary to address these unspoken rules that they may not have previously recognized.

For example, perhaps a family comes in with an eating-disordered daughter. The family may relay a story in which a few of the siblings had kept something they were struggling with hidden from mom in fear of upsetting her. The clinician would recognize this story as fitting into the unspoken rule that one should "protect your mother emotionally even if you have to sacrifice yourself." Once a rule is recognizable to the clinician, they can make it explicit for the family and see if it resonates with them as existing. At that point, the clinician can begin to intervene with the family who now has an awareness of family dynamics that they may have never before acknowledged or recognized as problematic or constricting.

In a family with these identified rules, a daughter that is suffering emotionally in any way would be encouraged to keep that emotional pain to herself and try to make it stop in any way possible. Emotional pain in adolescent girls, like our eating-disordered population, is common due to significant life phase and hormonal changes as well as high pressure stemming from social interactions, a pressure to fit in, dating, family life, academics, etc (Haggerty, 1994). The rules that occurred often in the eating-disordered families, promote keeping emotional pain to oneself and avoiding confiding in others, especially family members. Without healthy direction, these rules therefore may have influenced a daughter, in times of distress, to instead turn towards

maladaptive coping strategies, like eating disordered behaviors, when they did not know how else to manage the emotional pain.

A teenager who experiences distress, but has been taught not to acknowledge or confide in others about it, may find anorexia, bulimia or EDNOS a relieving distraction. The hyper focus on food and weight loss in anorexia can distract and eventually numb the individual as the body transitions into starvation mode. The adolescent may also find that they receive positive attention from others as they lose weight. The endorphin rush of binging and purging creates a high that similarly distracts from ongoing and seemingly unsolvable emotional distress. This focus or distraction is concrete and clear unlike the seemingly abstract emotional pain her family has told her should be avoided and ignored. This would be another intervention point for clinicians to step in and give the individual healthy coping strategies like a vocabulary to identify negative emotions and express them to others, journaling, mindfulness, and relaxation techniques to replace eating disordered behaviors.

A strategic approach clinicians may use is to make these implicit rules explicit. The clinician should lead open discussions among family members about the existence of these identified family rules, how they have affected the family and why it may be helpful to change them. The therapist should also actively coach parents and children through enactments in which family members must combat the identified constricting family rules while promoting facilitative family rules instead. The therapist should interject as needed when family members may get off track or stuck on their existing, constricting rules.

Many of the identified family rules revolve around the importance of outward appearance. This would be an important topic to coach family members in conversations around what value they place on appearance in comparison to the importance of internal characteristics.

The therapist should help family members find more congruence in outwardly expressing how they feel internally through enactments, discussions and behavioral changes.

Limitations of Study

Data collection in the reported study had limitations including that all eating disorder samples were taken from the same eating disorder treatment center in the Mountain West. The group was not randomly sampled, instead female patients who attended treatment regularly at this facility were asked to participate in this study. This method of sampling limits the data to a geographical location of primarily western United States as well as to families that can afford the inpatient and outpatient care offered by this facility. The control group was matched as closely as possible to the eating-disordered group, meaning that the control group had similar geographic and socioeconomic limitations. The eating-disordered group and consequently the matched control group were also 96% Caucasian.

It is therefore important for future research to examine whether these family implicit rules are found in samples that are more racially, culturally, socioeconomically and geographically diverse. The identified patients in this study were all females, and while eating disorders do statistically affect more females than males, it would be important to research boys and men with eating disorders and their family implicit rules (Cassell & Gleaves, 2000; DSM-IV-TR, 2000). It is also important to note that each family member in this study was given an equal value in the statistical analyses, despite the parents potentially having a stronger influence in the development of unspoken family rules. While these results prove a connection between these two clusters of implicit rules and eating-disordered families, it would be important to research whether or not a change in these family rules from constrictive to facilitative would lead to a more healing environment for the eating-disordered patient and a quicker or longer lasting

recovery. Similarly, research monitoring for the development of eating disorders in families with these identified rules and young children through the children's adolescence would be insightful.

Conclusion

This study provides new insight into how family dynamics are related to an eating disorder and provides clinicians and families with a guide to how they may better change family systems to help prevent the development of eating disorders or provide a healthy and healing environment once an eating disorder is diagnosed in the family. These results also provide a solid base for further research in exploring how the adjustment of these implicit family rules will lead to healthier families and healthier individuals within those families.

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Table 1. K-Means Cluster Analysis Results Showing Two Clusters of Family Implicit Rules for Eating-disordered Families

Cluster 1	Cluster 2	K-Mean Square	F
3.If anyone is angry, it is your fault[1]		36.87	54.84***
7.Avoid pain at any cost[1]		7.64	5.36***
56.Protect your mother even if she doesn't deserve it[2]		51.53	26.72***
57.Regardless of whether he deserves it, protect your father[2]		43.21	26.22***
58.Listen to a parent when they need to complain about the other parent[2]		80.59	65.28***
59.Protect your father emotionally even if you have to sacrifice yourself[2]		95.99	63.14***
60.Protect your mother emotionally even if you have to sacrifice yourself[2]		134.92	105.42***
64.Do not talk to your parents about things that make them uncomfortable[1]		116.01	136.16***
65.Don't inconvenience a parent[2]		82.66	91.27***
66.Never upset your mother by expressing your feelings[2]		129.16	139.34***
67.Never upset your father by expressing your feelings[2]		102.56	108.57***
	37.If you talk to anyone about the family, you are being disloyal[1]	40.75	47.69***
	45.Make sure you maintain a positive family image at any cost[1]	73.9	74.03***
	47.Do whatever you have to do to look good to others[1]	73.12	79.79***
	80.Do not talk about anything that makes family members uncomfortable[1]	91.78	108.45***

***p<.001
[1]From FIRP Constraint of Feelings, Thoughts, Self Subscale
[2]From FIRP Parentification Subscale

Table 2. Means, Standard Deviations, and Univariate ANOVA Results for MANOVA.

Family Implicit Rule	Eating-disordered Mean (SD)	Non-Eating-disordered Mean (SD)	F
3.If anyone is angry, it is your fault	2.82 (1.03)	2.06 (.80)	22.65***
7.Avoid pain at any cost	3.97 (1.16)	2.11 (.94)	11.32***
56.Protect your mother even if she doesn't deserve it	3.29 (1.40)	2.31 (1.12)	12.51***
57.Regardless of whether he deserves it, protect your father	3.61 (1.27)	2.36 (1.03)	25.16***
58.Listen to a parent when they need to complain about the other parent	2.98 (1.42)	1.97 (.87)	16.04***
59.Protect your father emotionally even if you have to sacrifice yourself	3.61 (1.42)	1.99 (.92)	72.60***
60.Protect your mother emotionally even if you have to sacrifice yourself	3.72 (1.35)	2.14 (1.03)	50.11***
64.Do not talk to your parents about things that make them uncomfortable	3.44 (1.22)	1.69 (.96)	34.47***
65.Don't inconvenience a parent	3.22 (1.17)	2.01 (1.03)	14.35***
66.Never upset your mother by expressing your feelings	2.95 (1.26)	2.03 (1.01)	19.74***
67.Never upset your father by expressing your feelings	2.84 (1.24)	2.11 (1.05)	16.78***
37.If you talk to anyone about the family, you are being disloyal[1]	2.96 (1.09)	1.37 (.72)	18.60***
45.Make sure you maintain a positive family image at any cost	3.47 (1.20)	2.31 (1.08)	18.28***
47.Do whatever you have to do to look good to others	2.82 (1.20)	2.0 (.92)	9.16***
80.Do not talk about anything that makes family members uncomfortable	2.77 (1.16)	1.81 (.91)	26.05***

***$p<.001$

Table 3. Results of Discriminant Analysis Using Family Implicit Rules to Predict Membership in Eating-disordered vs. Non-eating-disordered Family Groups

Family Implicit Rule	Standardized Canonical Discriminant Function	Wilk's Lambda	F
59.Protect your father emotionally even if you have to sacrifice yourself	79.8	.48	72.59
60.Protect your mother emotionally even if you have to sacrifice yourself	75.1	.51	37.29***
64.Do not talk to your parents about things that make them uncomfortable	71.7	.52	35.65***
80.Do not talk about anything that makes family members uncomfortable	69.2	.54	32.57***
57.Regardless of whether he deserves it, protect your father	64.8	.56	29.45***
3.If anyone is angry, it is your fault	61.7	.58	25.33***
66.Never upset your mother by expressing your feelings	58.3	.59	23.81***
37.If you talk to anyone about the family, you are being disloyal	55.5	.60	18.96***
67.Never upset your father by expressing your feelings	53.2	.62	17.22***
58.Listen to a parent when they need to complain about the other parent	50.7	.64	16.31***
65.Don't inconvenience a parent	43.9	.65	15.89***
56.Protect your mother even if she doesn't deserve it	40.6	.67	14.36***
7.Avoid pain at any cost	39.4	.68	13.87***
47.Do whatever you have to do to look good to others	37.2	.71	13.14***
45.Make sure you maintain a positive family image at any cost	35.3	.78	111.69***

*p<.001

Table 4. Classification Results from Discriminate Analysis

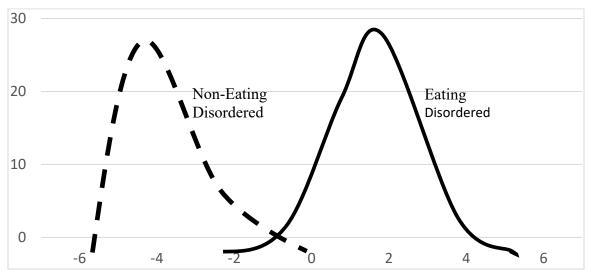| Actual Group	Predicted Eating Disordered	Predicted Non-Eating-disordered
Eating-disordered	95 92.2%	8 7.8%
Non-Eating-disordered	7 6.6%	117 94.4%

Figure 1. Distribution of Eating-disordered and non-Eating-disordered by Group Centroids.