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# Family Resemblance: A Study of Linguistic Conformity within Family Systems

Rebecca L. Garnett
*University of Massachusetts Boston*

# FAMILY RESEMBLANCE: A STUDY OF LINGUISTIC CONFORMITY WITHIN FAMILY SYSTEMS

A Thesis Presented

by

REBECCA LEE GARNETT

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Approved as to style and content by:

[redacted]

John R. Murray, Ed.D., Chairperson of Committee
Critical and Creative Thinking Program

[redacted]

Carol Smith, Ph.D., Member of Committee
Department of Psychology

[redacted]

Renos K. Papadopoulos, Ph.D., Member of Committee
Brunel University and the Tavistock Clinic, London

[redacted]

Patricia S. Davidson, Director
Critical and Creative Thinking Program

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ABSTRACT

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WITHIN FAMILY SYSTEMS

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REBECCA LEE GARNETT, B.Mus., UNIVERSITY OF MISSOURI

M.A., UNIVERSITY OF MASSACHUSETTS
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Directed by: Professor John R. Murray

This thesis reports the results of an empirical study designed to test two hypotheses from the early psychiatric work of C.G. Jung: first, the existence of a "family disposition" toward the word association test (WAT), and second, the theory that there is interference between the "thinking" and the "feeling" functions in an individual's cognitive processing. The experiment involved 52 normal subjects from 15 families, ranging in age from 12 to 65. Subjects were tested using an association instrument adapted from the WAT developed by Jung (Jung, 1973). Response commonality was examined along several dimensions: identical verbal response, identical category response, and identical reaction type. Subjects were found to have 20% verbal commonality and 34-38% categorial commonality within family units. Comparison of relatives' responses to those of non-related individuals, using a Spearman rank order correlation test on classified responses, yielded an average correlation figure of .29 for related and .25 for unrelated pairs of individuals; this difference seemed too small to support the hypothesis, but no formal test of significance was performed. Sample size proved too small to test the significance of response pattern redundancy within families. In the second part of the experiment, 38 subjects completed the deductive logic section of the Ross Test of

Higher Cognitive Processes, and their error rate was compared with their rate of predicative responses on the WAT. A Pearson Product Moment Correlation was .57, indicating a moderately strong correlation between preference for predication, a characteristic of the "feeling" function, and difficulty with deductive logic, a process of the "thinking" function. A theoretical chapter traces the evolution of Jung's cognitive theories from his early word association experiments (Jung, 1973) to the development of his functional system of psychological typology (Jung, 1971). 37 tables, 12 figures.

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To the memory of

Sabina Spielrein, M.D.

dîa gynaikôn

Although the word is shared,

people live as though thinking were a private possession.

--Heraclitus

# I N T R O D U C T I O N

## OF ASSOCIATIVE, PREDICATIVE, AND DEDUCTIVE LOGIC

In 1883, Sir Francis Galton, a cousin of Charles Darwin and one of the founders of modern word association theory, published the first edition of a book containing family portraits created through a technique he had invented, composite photography. By superimposing the image of one individual on that of another, he was able to create the portrait of a "family face," an image in which the similarities of form and structure among individuals were reinforced through repetition, and the differences distinguishing each individual from the others smoothed away. The resultant likeness, though representing no one in particular, did represent the "family resemblance," the prototypical face in which all the individual members had a share.[1]

A generation later, Dr. C.G. Jung uncovered a curious phenomenon while giving the word association test to a group of normal subjects at the psychiatric clinic of the University of Zurich. Among the first thirty-eight people he tested were eight women who were connected by family ties, two groups of mothers with two daughters, and a mother-daughter pair. In each of these three groups, there was a remarkable similarity among reactions to the stimulus words of the test, not only in terms of the actual response words uttered, but in terms of the type of response, the reaction style, adopted by each of the women. It was as though each family group shared a specific attitude, a manner of approaching the words of the test, and the concepts they represented, that showed an underlying unity of thought and of orientation toward the world.

Was it mere coincidence? Clearly, Jung didn't think so, and he was quick to organize an experiment on family associations which was carried out by one of his students at the Burgholzli Clinic, Dr. Emma Furst. The results, published by Dr. Furst in 1907 and subsequently reported by Jung in his 1909 lectures at Clark University, seemed to point to the existence of a family reaction-type, a distinct style of associative thinking pervading the responses of family members.[2] Individual patterns of relationship between stimulus and response, when graphed and superimposed on one another, yielded the same sort of prototypical form as Galton had produced with his composite photographic images.

A passionate interest in image and symbol formation diverted Jung's attention from any further exploration of the linguistic phenomenon he and Furst had observed in families, and the focus of analytical psychology, as he was to define it over the next decade, turned to the deep autonomous processes which all individuals share--the functions of the collective unconscious. Association theory itself followed much the same path, shifting its emphasis from the introspective exploration of individuals' thoughts and reminiscences, which had characterized the work of Galton, Wundt, and the Zurich researchers, to the generalized, mass approach of Kent and Rosanoff, Woodrow and Lowell, Thorndike, Palermo, Russell and Jenkins, in experiments designed to yield the most common, most average, most typical associations across vast populations of adults and schoolchildren, responses that can be statistically predicted on the basis of frequency tables, word pairs that seem so natural in their occurrence as to be somehow embedded in the language of everyday usage.

In both of these approaches--the Jungian and the statistical--what has dropped out of the equation is the intermediating system between the individual and the collective. It is through the family that the collective structure of meaning in society--its language--is introduced to each of us; it is by means of family interaction that category, opinion, bias, prejudice, and inhibition slip in and permeate the logic of everyday discourse, molding our attitudes to conformity with those of the group with which we live. And it is out of the matrix of that interaction that we emerge into the collective as full participants in its linguistic order, holding in common many of its meanings, but bearing with us as well the unseen tokens of a private understanding shared only with those who taught us the use of words.

Cognitive psychology and systems theory have recently turned their attention to the role of the family in language acquisition and conceptual development, and the influence of family communication style in the etiology of functional thought disorders, including the syndrome diagnosed as schizophrenia. Jung himself had undertaken his original association experiment in order to establish a normative baseline against which the reactions of psychotic speech could be compared. As a working psychiatrist on the staff of one of the most progressive mental hospitals of its day, his primary concern was to be able to shed some light on the hopelessly obscure utterances of his inpatients. But what emerged from his results had powerful implications for the development of a theory of cognition embracing both pathological and "normal" thought processes, a theory that leads, by way of the linguistic patterns in a household, from simple associative reaction to the full panoply of attributes and characteristics comprising personality.

In a conception that long antedates the current view of "multiple intelligences," or "multiple frames of reference," Jung described the qualities of a number of different cognitive styles which he had observed in tests of verbal association, each of which represented a different way of perceiving, processing, and relating to the data of material reality. When set on a continuum, these styles could be seen to progress systematically from the logical to the pathological; when compared among themselves, they showed antithetical and complementary features that allowed them to be organized in terms of opposing cognitive functions--thinking and feeling, sensation and intuition, as they came to be called in his 1921 monograph, Psychological Types.

Ever since Freud proposed the existence of two modes of cognition, primary and secondary process thinking, the dichotomy between syncretic and analytical thought, between the associative and the rational, has come to be taken for granted, and yet little attention has been paid to the conditions by which "thinking" comes to be differentiated as the prefered mode of cognition in advanced societies. An implicit assumption that rational thought is a universal phenomenon pervades the educational system. Piaget suggests that logic is the culminating stage of a child's natural cognitive development; some psycholinguistic and cognitive theorists would go even further, and locate the discriminative function of thought in some sort of inborn structure of the mind, coexistent with innate "hardwiring" for language and information processing.

If it were possible to rely on innate disposition--natural function, hardware, the universal architecture of cognition--to reach its predestined potential in the process of rational thought, there

would be little market for the courses in "critical thinking" that have become popular on the contemporary American educational scene. But the fact is that for many individuals, the ability to think critically is a painful, artificial, hard-won acquisition in the struggle against natural disposition and the forces of the environment; it is achieved at tremendous personal risk in a battle waged with received wisdom, public opinion, family mores, religious authority, peer pressure and the line of least resistance. For some, the fight may hardly be worth the trouble, if it means the loss of comfort, the relinquishment of safe conformity, alienation from friends and family. Rational thinking is work, and there is very little to make it attractive, too little to offset the danger it entails.

Among the leading factors inhibiting the development of critical thought is dispositional bias, which figures in the discussion of such theorists of thinking as Jonathan Baron. It is an argument, again, foreshadowed in the work of Jung, who in 1921 proposed the idea that a cognitive habit based on the feeling function could not accommodate the operation of the thinking function. The two processes were mutually opposed, in his conception; yet both were "rational" processes, and both operated systematically to reach conclusions--thinking by a rigorous, linear, sequential discrimination among facts, and feeling by means of evaluative judgment, the sole criterion of which was to accept or reject any given proposition.

The process of evaluative judgment, the hallmark of the feeling function, was first observed by Jung in the associative behavior of subjects who tended to respond to stimulus-words with predicates, rather than with synonyms, superordinates, contrasts, or other linguistic

forms. The predicative relationship, in itself, carries qualification; it is that which describes, which indicates the surface characteristics of a substance, and the way in which an action is performed. Predicates value, and evaluate, their arguments; they form the basic syntagmatic unit of thought, the simplest statements of fact, and, according to at least one cognitive theorist, Soviet psychologist Lev Vygotsky, provide the essential structure of the purely egocentric, "inner" speech of silent thought.[3]

A person whose associative thought runs in predicative channels is likely to construe the world in relationships based on value, on objective comparison and qualification, or on subjective judgment and opinion. Such a habit of thought might be less amenable to instruction in the rigors of critical reasoning than, for example, a style which grasps the substantive, hierarchical relationships among things, a style which reflects the orderly syntax of Western ontology and the logic implicit in the structure of Indo-European grammar. This latter approach turns on analysis, discrimination, dissection, separation, the creation of an array of substances through division and subdivision which are then to be assembled in categorical conceptualizations; such is the essence of rational thought. The other, the predicative style, analyses as well, but into one of two categories: this specific thing, which by predication becomes that much more specific, and everything else. Thinking builds structure through abstraction; predication concretizes the single instance; thinking ascends to the immaterial realm of concepts, predication remains with the object in all its grounded sensory manifestations; thinking classifies, predication labels--and may impose, along with the label, a set of attitudes and

values that work underground, as it were, to subvert the move toward dispassionate, rational discourse.

By some coincidence--or was it?--the majority of those identified as "predicate reaction types" by Jung in his first experiment were the members of his family groups, women of his educated sample. Fürst, who reported her test results from nine Zurich families of the uneducated class, found the predicate reaction-type pervasive among adult members of both sexes in eight of them. These findings would seem to suggest that predication, as a reaction style, transcends the categories of gender, age and education, and when present at all in a family unit, tends to dominate the responses of its members.

It was to examine that suggestion that the present study was undertaken. Do family members resemble each other in terms of their associative reaction style? Is predication a dominant force in the linguistic patterns of those family groups where it occurs? Is there a demonstrable level of conformity, or congruity, in linguistic patterns produced by family members in response to a given set of words? That much could be determined from a replication of the original word association experiment among family groups. But what about the deeper implications of the nature of predicative thought itself? Is there any evidence to suggest that a cognitive process which manifests itself in predication--the basic unit of "feeling" cognition--would have difficulty when asked to switch to the "thinking" skill required in formal logic? To answer that question, a comparison was made between individuals' reaction styles and their answers on a standardized test of deductive reasoning.

Like Jung and his coauthor Franz Riklin, and like Emma Furst, I was primarily concerned in this research to establish an initial set of norms against which more dysfunctional responses might be compared. My involvement with the subject of family associations, an outgrowth of three semesters' work with the material of Jung's article "The Associations of Normal Subjects," takes its real impetus from a deep personal concern for the kind of dynamics that can lead to pathological conformity among family members, conformity of language, of behavior, and of thought.[4] My ultimate interest, like Jung's, is therapeutic, not intellectual; I intend to take this work further, into the realm where the processes of identification, unconscious role-play, and empathic enmeshment operate beneath the level of language to annihilate the individual personality. In such a nightmarish system, an over-close conformity in verbal response might be the sign of deeper contamination of one being by another, indeed perhaps the only sign, a silent cry for help from a troubled soul whose hope of detection lies in the family resemblance, the linguistic camouflage by which his entrapment is meant to be concealed.

This work is dedicated to the memory of Soviet psychiatrist Sabina Spielrein, whose devotion to word association research began in her teens, when she was asked by Carl Jung to assist him in his experiments at the hospital where he was treating her for schizophrenia. Later a member of Freud's Vienna circle, a collaborator of Saussure's student Charles Bally, and the analyst of Jean Piaget, this extraordinary woman returned to the Soviet Union in 1923, bringing Jungian and Freudian ideas into an intellectual milieu that included Vygotsky and a very

young Alexander Luria.[5] Her spirit and inspiration have been an ever-present force in the conception and development of this project.

There are many among the living who have given me encouragement in this work as well, and they have my most heartfelt thanks. Among those whose help was of special significance is Ann Bikales, of the C.G. Jung Institute of Boston, who at the moment when I strayed across the threshold of analytical psychology set me the task of completing a master's degree; I hope that what I have done over the last two years fulfills the adventure in the spirit of her mandate. Thanks also are due to Jacqueline Schectman, LICSW, IAAP, whose year-long program in Child Therapy Studies at the Boston Jung Institute served as my practicum in the Graduate Program in Critical and Creative Thinking at the University of Massachusetts at Boston, and set the stage upon which I was destined to meet my mentor in a moment of despair when I believed I was the only one in all the world who really cared about Jung's early word association work.

My friends and former colleagues, who served as subjects of my experiment and were so caught by the excitement of word association--the same extraordinary excitement which fired the staff of the Burgholzli Hospital for nearly a decade and made it one of the most desirable sites for aspiring young psychiatrists from all over the world--that they wanted to go out and test the families of their own friends and acquaintances, you too have my thanks. You know who you are; I hope you understand that to thank you all by name would compromise the privacy in which I promised to hold your participation. This work is yours as well.

# C H A P T E R  I

## THE STRUCTURE OF ASSOCIATIVE COGNITION

C.G. Jung made his reputation in the international psychiatric community at the age of thirty-one with the publication of his experimental research into the psychology and psychopathology of word association. His observation of the processes of cognition focused on patterns of associative response, the relationship between stimulus and response that revealed conceptual and episodic information stored in his subjects' memories. These patterns, or complexes of associations, gave him insight not only into the past of those with whom he worked, but also into the underlying system of their thought, the structural organization of meaning and of mind.

Jung's work on the systemic dimension of associative cognition went beyond an interest in individual process, however. At the same time as he developed his theory of complexes, he was also engaged in an exploration of external systems, and the effect of dynamic interaction on the verbal behavior of group members. The associations of family members, studied under his supervision at the Burgholzli Clinic, led him to an appreciation of the decisive role of the family in shaping an individual's preferred information-processing style. Furthermore, the reaction patterns he observed among members of families provided important evidence for the development of his theory of the collective unconscious, a theory in which the structural dimension of language plays a critical, but little recognized, part.[1]

The present chapter, and the one which follows, are intended to provide a brief overview of a structuralist approach to the

processes of verbal association, and to language as a structure for both associative and conceptual thought. It is in context of this theoretical framework that Jung's ideas can be brought within the paradigm of modern cognitive science.

## Association: Structure and Process

The ability of the human mind to make spontaneous meaning-based associations between words has been recognized at least since the time of Plato and Aristotle, but does not seem to have been studied empirically until Galton, Wundt and Ebbinghaus began their investigations in the last two decades of the nineteenth century.[2] The basic elements of a coherent structuralist approach to association came not from the experimental laboratory, however, but from the world of clinical psychotherapy, in the cognitive model advanced by Sigmund Freud in his revolutionary study of thought, The Interpretation of Dreams.

In the final chapter of this work, Freud detailed his conception of the mind as a vast network of interconnected associative pathways, responding to the displacement of energy set off by the stimulus of a subliminal "directing idea." A quantity of excitation, which he called "cathectic energy," flows like an electrical charge through the network of associations, activating those selected by the directing idea. If the energy reaches sufficient intensity, the thought can spark across the threshold of consciousness; on the other hand, if it fails to "attract the attention of consciousness," the thought "diffuses its energy through all the association paths emanating from it, and throws the entire chain of thoughts into a state of excitation, which continues for a while, and then subsides" (Freud, 1950, p. 446).

Under certain conditions, Freud suggests, the energy of a thought may be sufficient

> to pass from one idea to another, so that individual ideas are formed which are endowed with great intensity. Through the repeated occurrence of this process, the intensity of an entire train of thought may ultimately be concentrated in a single conceptual unit (1950, p. 447).[3]

The nodal connections of the associative network are formed not only around ideas, but also around the data of sensory perception, discrete impressions which become permanently bound to one another in memory through the operation of the classical laws of association, simultaneity, contiguity, or similarity. In an earlier work, one of the case histories included in Studies on Hysteria (1895), Freud had described these associative concentrations as "complexes of ideas," and had suggested that they exert their effect on an individual's thought and behavior through the "compulsion to associate" (Breuer and Freud, 1955, p. 69 n. 1).

Freud's concept of a densely networked associative system, responding to and diffusing the energy of thought, was studied in the mid-twentieth century by a number of clinical and experimental psychologists, among them David Rapaport, who cast the idea into a self-consciously structuralist form. According to his colleague Fred Schwartz, Rapaport called the connections described by Freud "'associative relationship structures,' by which he meant that just as words may be conceptualized as structures, so the relationships between words may be conceptualized as structures, i.e. quasi-permanent organizations of experience" (Schwartz and Rouse, 1961, p. 1). The subliminal influence of Freud's "purposive idea" on the constellation of thoughts through which it passes on its way to consciousness was

renamed "associative priming," or "preactivation," and its effect on free association and on paired associate recall was demonstrated in a variety of empirical tests carried out by Rapaport, Gill, Schafer, Rouse and Schwartz (Schwartz and Rouse, 1961).

These studies identified two distinct phases in the response process, an "analytic" phase, during which the stimulus word activates a variety of associations related by sound, contiguity, meaning, conceptual similarity, or "secondary" or indirect, association," a connection made outside the central associative network with another network interlinked by one or more overlapping meanings; and a "synthetic" phase, marked by the selection of one association and its referral to consciousness. Recovery of the associate word in the synthetic phase was found to be affected by the subject's verbal fluency and motivation, as well as such strategic factors as his sense of what is appropriate or acceptable in the social context, and his desire to minimize personal discomfort in the process of recall.

Many of these experiments used the stimulus-response pairs established in the Kent-Rosanoff experiment of 1910, which had established a set of normative response frequencies in a sample of 1,000 normal American adults. Howard Pollio (1966) linked the phenomenon of associative frequency to the idea of a hierarchical organization among words, with a rank ordering provided by the relative probability of a word's appearance as a response to a given stimulus. Those words which occur most frequently in the language were shown to form larger hierarchies than low-frequency words, due to the greater variety of context in which they are found in colloquial expression.

Affective considerations--the pleasantness or unpleasantness of a word's connotation--were also found to affect hierarchy size.

A closer examination of associative hierarchies undertaken by James Deese (1962) revealed that the hierarchy of a single word is organized around smaller units which he called "clusters," stable groups of words which tend to evoke each other as associates. The associative "meaning" of any stimulus word is to be found in the distribution of responses to it, and the content of the entire constellation of clusters surrounding a stimulus defines the dimensions of the "associative concept" it entails. Mapping the semantic interrelationships within and between clusters gives an indication of the terrain of what Pollio (1966) calls "semantic space," an overall "verbal-cognitive structure" within which the associative process operates.

Deese's work (1962, 1965) demonstrated that clustering is not merely a consequence of the frequency of words within the language, or of semantic and conceptual relationships established by common consent. An individual's attitudes and values are also a powerful factor in the organization of verbal clusters, and Deese suggests that a simple test of word association can function as an effective and reliable tool for the exposure of this personal dimension of cognitive processing.

Psycholinguistic theory of the 1960's contributed to the structural approach a yet more rigorous analysis of the relations which underlie associative connections. The manifest phenomenon of the word became secondary; the operant unit of thought in this model is the proposition, a structure which encodes in non-verbal form the quality of a relationship between items, actions, or concepts. The information

propositional form; likewise, the retrieval of information from a proposition, or propositional node, requires a process of reconstitution, according to the operation of a set of transformational rules, in order to return the thought to verbal form.

Classical information-processing theory as described by Howard (1983) and Stillings (1987) conceives of memory as a powerful network comprised of a myriad of such propositional nodes, the basic units of the "architecture of cognition." The informational essence of each proposition is a predicate, an abstraction of the relationship obtaining between the elements, or arguments, connected within the node. Networks of propositions are created as predicates pertaining to a single argument link it with others in an outwardly expanding system of interrelationship. The complexity and richness of the networks that form over time can be revealed in the patterns of response evoked on a test of verbal association.

Like the Freudian model at the beginning of the century, a number of cognitive theories developed since in the late 1960's by Quillian, Anderson, and others (Howard, 1983) describe associative thought in terms of a process of spreading activation, or diffusion of attentive energy, along the pathways of a propositional network, making connections between a bit of input information, the stimulus, and the finite number of possible responses to it. Because the links in a propositional chain become strengthened through repeated activation, the argument with the strongest link to the stimulus word is most likely to channel the activation, and receive a sufficiently high "charge" to send it into consciousness as the selected response.[4] The entire process of activation and retrieval can, in fact, function as an indicator of "associative relevancy" (Anderson, 1983).

The information encoded within a proposition is arranged in a hierarchical fashion, allowing for the establishment of stable categories into which the components of declarative knowledge can be classified. Arguments are conceived as subsets, or subordinates, of the class of elements represented by the predicate, according to the information processing theory developed by John Anderson (1976, 1983) under the name "Adaptive Control of Thought," or ACT. Relation-argument structures function not only to represent verbal knowledge, or information presented in verbal form; an event or episode is also subject to the same sort of analysis as is an item of declarative or semantic information. Any incident or activity can be dissolved into predicates in such a way as to preserve information about the relationships among actors and objects, as well as information as to time, place, condition, quality, and attitude.[5]

Predication, then, proves adequate for the abstraction and representation of complex semantic, conceptual, and episodic information. The networking of predicates creates a unified field containing the totality of an individual's knowledge about the world, and, through the process of spreading activation, serves to make that knowledge accessible to consciousness at the stimulus of a single word.

## The Family and the Development of Categories and Attitudes

Theorists of language have long recognized that interaction with adults is essential for normal linguistic development in children. The language a child hears from his parents not only determines the verbal patterns in which he makes his own attempts at expression, but also serves to transmit a set of values, affects and attitudes appropriate to the parents' social class and educational level (Deese, 1970).

Studies of vocabulary acquisition in children have traced the development of successive classification systems, which are transformed and restructured under the impact of increasing experience and additional information. The words that name things are first encountered in a specific context, and they function as designations of a field of connotative associations, with links to particular concrete objects rather than to other words (Pollio, 1966). The act of naming is itself an act of association, with two distinct dimensions: connections are made between the sound of the word and the physical entity to which it refers, and also between the entity and the environment in which it is encountered. A child's internal categories are built around these syncretic units of information, which must be broken down and reformulated as the child begins to separate what is constant in a word's meaning from what is subject to change.

Roger Brown (1958a, 1958b) found that the naming practices of adults are designed to anticipate the functional structure of the child's perspective. Words which are thought to have utility in the child's world are chosen as the names given to the child to learn; often, these terms convey some intermediate degree of specificity, being neither the most concrete term possible for the item named, nor the term for an inclusive conceptual category. Children evidently do form abstract classes with the items of their experience, but they tend to refer to their abstractions with the only words they have to use, those terms which an adult would find applicable to some individual member of the intended class.[6]

As the utility of this limited system of nomenclature is outgrown, the child is introduced to the appropriate terms for the inclusive

concept, or the more finely-discriminated example, and gradually gains proficiency in going up and down the hierarchy of subordinations and superordinations which these terms represent. Jeremy Anglin (1977) has seen this readjustment of nomenclature as an integral step in the child's conceptual development.

Anglin remarks that the acquisition of a name for a thing comes comparatively late in a child's experience. Prior to the attachment of the arbitrary verbal label to the object, the child has developed, from personal observation, an operant "concept" of the object, a concept which carries such practical bits of information as how the object behaves, what it does, what purpose it serves, and how one ought to behave with respect to it. These imminently concrete relationships and attributes are subsumed directly into the child's definition of the word, once it has been introduced by an adult, and collectively serve the child as the "meaning" of that word. What a child "means" by a word thus may be a very different matter from the significance the adult attributes to it, although the same word may be used by both to make an identical objective reference.

Children's definitions, then, tend to be expressed in terms of non-essential attributes, descriptive or behavioral qualifications and value judgments, all of which are formal predications with strong links to sensory experience or to parental instruction. The categories which collect these predications cut horizontally across the vertical structure of ontological classes, the categorical hierarchy of being into which individuals are sorted as the child's understanding of the world shifts from an associative to a conceptual base. An item with one established place in a conceptual hierarchy can, at the same time,

enjoy membership in a vast number of predicative categories, by virtue of attributes it shares in common with other, conceptually unrelated, items.

Frank Keil's work in the development of children's ontological knowledge (1979) indicates that predicates come to be used in a much more restricted manner as the child's conceptual organization begins to reflect the categorical differentiations of adult ontology. Meaning, in the lexical sense, becomes detached from context and begins to involve the logical distinctions between things which are more characteristic of an adult perspective.[7] Likewise, Anglin (1977) also considers the ability to abstract predicative attributes as crucial to the process of concept attainment.

Abstraction is, in essence, the discovery of some common quality pervading a number of differentiated items. Brown (1958b) suggests that this ability, which characterizes adult cognition, is qualitatively different from the generalizing approach taken by the child, who applies an attribute perceived in a single item to objects which have not previously been differentiated. Generalization, then, occurs as a result of two distinct and in some respects antithetical processes, conceptual abstraction, and failure to discriminate. To the extent that words tend to function in the child's language as category terms, any predicative attributions the child hears made by adults are susceptible of inappropriate generalization, and may lead, especially if they are introduced in emotionally-loaded contexts, to the development of prejudicial attitudes which are as difficult to adjust as are immature conceptual formulations.

Like Brown, Anglin (1977) also suggests that attitudes and values can be transmitted within the family as a part of the language acquisition process. The selection of terms, and the context in which they are taught, implies a set of beliefs about appropriate action, affect and orientation that go far beyond the strictly lexical, or conceptual, meaning of the given words. What Anglin calls "behavioral equivalence" is one of the earliest categories established by parents for their children, grouping together objects toward which the child should behave in a similar manner. The injunctions contained in these early naming practices invest the child's linguistic habits with parental attitudes, a process which presumably extends through his later development of abstract concepts and a semantic structure which is increasingly independent of concrete experience.

## Predicate, Paradigm, and Associative Development

The theorists of children's language acquisition have generally worked with instruments other than the word association test, and in studies where association tests were administered, the purpose has been to examine the comparative developmental level of the child's linguistic structure, and not the relationship of the child's language to that of his parents. The developmental approach does, however, point out some systematic features which distinguish children's associations from those of mature adults; in particular, the role of the predicative response assumes significance as an indicator of linguistic maturation.

The earliest verbal language of children consists of words embedded in syntactical context. Individual words attain the significance of sentences, or perhaps more accurately, commands, and conversely, entire phrases are apprehended as single indivisible words. Until the unitary structure of these verbal packages has been broken down, any one word from the phrase will evoke the rest of it in a word association exercise (Entwisle, 1966).

A sentence-constructing operation predominates in a child's associative process, until such time as he has attained an understanding of formal grammatical relations. A child's response will "complete" the stimulus word, by attaching a verb to a given noun, or a noun to an adjective. From the standpoint of associative relationships, both responses qualify as predications, but Doris Entwisle, who studied the associations of more than a thousand American schoolchildren in the early 1960's, preferred to call them "syntagmatic responses."

Once the child has developed a coherent sense of the grammatical organization of language, associative responses begin to be drawn from the same form class as the stimulus word, nouns being given in response to nouns, and adjectives to other adjectives. This shift to "paradigmatic responses" is completed by the age ten or twelve, and is then maintained until at college age, there is, among some individuals, a return to the earlier pattern of syntagmatic association.[8] Such a systematic modification in the associative pattern, from predicative to paradigmatic responses, can be seen as a reflection of the child's appreciation of the functional structure of language, derived from formalized instruction in the acquisition of literacy.

Nouns predominate in the vocabulary of young children, although as Brown (1958b) suggests, this fact does not necessarily mean that children think more concretely than do adults, but simply that the terminology they are given to use by adults is more concrete than that the adult might prefer. There is at least one qualitative difference between the nouns produced by children and adults, however: adult associations tend to create categorical hierarchies of subordinate, coordinate and superordinate terms, while children's nominal responses tend to express contiguity or coexistence; children produce far fewer coordinating responses than do adults, and almost no abstract conceptual terms.

The most common paradigmatic responses of children tend to be made in the form of antonyms or contrasts. Antonyms have been found in responses of children as young as four years old, far younger than the age at which the paradigmatic shift begins, and the tendency to respond with opposites increases until the age of fourth grade. Entwisle (1966) found girls more likely to respond with opposites than boys, and attributed this phenomenon to a heightened reactivity on the part of girls toward what they perceived as the "pressure" of the testing situation. For both genders, response commonality, the production of a word with a high level of statistical frequency in the language, increased with age, a measure both of increasing familiarity with lexical meanings of words and a higher degree of socialization.

The acoustical properties of a stimulus word seem to dominate the associations of very young children, an indication that the semantic content of the word is not yet adequately comprehended. On the other hand, sound-based responses virtually disappear from the associations of more linguistically mature subjects.

Entwisle found an orderly pattern of development in children's associations, shaped by the factors of function and context within which words are encountered and exchanged. As the child's linguistic ability matures, a stimulus word characteristically elicits first a noun, then a syntactic reaction of some kind, next a paradigmatic response, and finally a secondary, or "late syntactic" response, representative of the elaborate and flexible predication which distinguishes an adult's verbal expression.

Socioeconomic factors were found to play a significant role in the development of a child's associative system. In Entwisle's study, children of high socioeconomic status exhibited more response commonality, at an earlier age, than children of more depressed family backgrounds. Regular exposure to adult verbal interaction, associated with higher-status families, accelerated a child's acquisition of mature vocabulary and syntactic fluency; conversely, isolation and lack of opportunity for meaningful interaction with adults was seen as a factor inhibiting a child's development of linguistic skill.

Deese (1970) went further in his analysis of the cultural influences on language acquisition patterns. Citing the research of Bernstein (1961) in Great Britain, he suggests that for members of the higher social class, language functions as an instrument for description and for analysis; formal speech, for individuals of this class, is highly structured, and the activity of speech tends to be treated as an intellectual game, offering opportunities for advanced semantic and conceptual formulations. Among the lower classes, however, language serves only the purposes of description, and as a consequence, it is more difficult to propose analytic arguments within

the limitations of its style. Furthermore, Deese suggests that different attitudes toward the expression of affect among members of differing social classes may also have an impact on the patterns of linguistic development in children, and on the related process of their cognitive development as well.

The studies mentioned in this chapter have focused on aspects of language and information processing which are assumed to be universal in scope, part of the structure of the cognitive system common to all individuals. The chapter which follows will treat the work of a number of theorists, contemporaries of Freud and Jung, for whom language itself was the supraordinate structure, operating with its own set of constraints on the development of individual thought and expression.

# C H A P T E R  I I

## LANGUAGE AS THE STRUCTURE OF PERSPECTIVE

The current cognitivist focus on the relational structures of thought is a perspective that was shared by a number of researchers in the structure and psychology of language whose work began in the first decades of the twentieth century. Of these pioneers in the science of language and cognition, two, Lev Semyonovich Vygotsky and Alexander Romanovich Luria, are well known and highly respected within cognitive and developmental circles. Two others, Ferdinand de Saussure and Benjamin Lee Whorf, are perhaps better known in the fields of semiotics, linguistics, and anthropology, yet their ideas contribute substantially to an understanding of the external context within which the psychological process of associative thought takes place.

All four of these students of cognitive processes shared a belief in the influence of language on thought, and the primacy of its social or collective dimension in shaping an individual's expression and his world-view. But to Saussure, in particular, can be credited the original insights into language as a system that gave rise to the structuralist method of analysis, and an intellectual revolution to which cognitive science is one among many heirs.

The first portion of this chapter will offer a summary of some of the thoughts of these four men on language in its relation to associative cognition. Part two will discuss the mediating role of the family, as described by systems theorists Gregory Bateson and R.D. Laing, in creating the individual's linguistic practices, and transmitting collective values and attitudes.

## Language and Associative Cognition

In 1907, the year after the publication of C.G. Jung's first volume of Diagnostic Association Studies, his compatriot, Ferdinand de Saussure, professor of linguistics at the University of Geneva, began a course of lectures which revolutionized the academic approach to language. Rejecting the historical and comparative traditions of linguistics, with their focus on the evolutionary development of words in isolation from each other, Saussure offered instead a vision of language as an integrated system of relations existing complete at any moment in time, and represented by conceptually-invested sound patterns, which he called "signs." In his view, the study of relations by means of signs might well transcend the boundaries of linguistic science, and apply to any realm of human existence which was structured in terms of formal interactions; out of this perspective emerged the science of semiology, and the analytic movement known as structuralism.

Language as a system of relations. The sign is itself the expression of a relationship between sound and concept. In Saussure's conception, it is an arbitrary union; there is no natural or inevitable connection between a word and the object it signifies. Nor is the word a mere name, set within a formalized nomenclature. The essential function of a word is not the indication of a specific object, but rather the set of relations in which that object is located, its existential and determinate context.

Language, for Saussure, is the comprehensive structure which gives order to the expression of these relative relationships. Language is both a repository of linguistic signs, meaningful sound patterns which are the synthetic creations of social convention, and a system of

classification, arising from the mind's innate capacity for association and coordination. The dynamic interplay between the individual and the societal dimensions is what gives rise to language as a structural system.

In a passage which predates by more than half a century one of the tenets of cognitive linguistic theory, Saussure remarks:

> A language, as a collective phenomenon, takes the form of a totality of imprints in everyone's brain, rather like a dictionary of which each individual has an identical copy. Thus it is something which is in each individual, but is none the less common to all (Saussure, 1972, p. 19).

This lexicon of structural relations gives formal coherence to the individual's associative process. Because it is a social construct, it differs in its particulars from one linguistic community to another, but what does not vary is the structure itself, and the operation of a systematic cognitive process based ultimately on the perception of difference.

"The mechanism of a language," Saussure says, "turns entirely on identities and differences" (1972, p. 107), on an analysis of the psychological contrasts between sounds. There are no concrete, independent, positive entities in language, but only contrasts, sets of values defined in relation to one another. Word and concept, signal and signification, are completely context-dependent. The content of a word, or of the concept to which it refers, "is determined in the final analysis not by what it contains, but what exists outside it" (1972, p. 114). Meaning exists by virtue of the relations between signs, and the contrast between each sign and all others which are contained in the same system. "In the language itself," Saussure says, "there are only differences" (1972, p. 118).

This system of oppositions and contrasts inevitably constrains the communication of thought into certain channels. "Any difference in ideas distinguished by the mind will seek expression in different linguistic signals," Saussure suggests; "whereas two ideas the mind no longer differentiates will tend to find expression in the same signal" (1972, p. 119). Language is formally organized in such a way as to permit a systematic and regular process of comparison and substitution among its constitutent signals, and the function of discrimination underlies and facilitates the process of communication between individuals. Outside the bounds of social discourse, however, it is not difference, but identity, which dominates an individual's linguistic organization. The perception of identity, or of similarity among the elements of language, allows for the creation of complexes of associations, the structures in which language is stored in memory.

Language as a social instrument, as a means of communication, is linear, sequential, constructive, "syntagmatic." As a network of associative complexes, on the other hand, it is simultaneous, unlimited, "paradigmatic." In syntagmatic configurations, Saussure says, "any unit acquires its value simply in opposition to what precedes, or what follows, or both" (1972, p. 121); but within associative clusters, each element takes its place on the basis of the commonality it shares with other units in the mnemonic group. The inclusion of a set of relations in an associative series may be based on similarity at the conceptual level, or it may reflect similarities of form or of sound between two linguistic elements. "Any word," Saussure remarks, "can evoke in the mind whatever is capable of being associated with it in some way or other" (1972, p. 124); likewise, any

word can stand at the center of its own complex of associations, surrounded by an indefinite number of other words, linked with it in an indeterminate order.[1]

Thus, Saussure says,

> the whole set of phonetic and conceptual differences which constitute a language are. . .the product of two kinds of comparison, associative and syntagmatic. Groups of both kinds are in large measure established by the language. This set of of habitual relations is what constitutes linguistic structure and determines how the language functions (1972, p. 126).

Syntagma and association are mutually interdependent. The relations which are defined in the linear context of discourse become codified in paradigmatic complexes; and when the purposes of communication call for the construction of a syntagm, the associative groups provide a choice of terms. As this dynamic process unfolds, the concept, or its sign,

> evokes not just one form but a whole latent system, through which the oppositions involved in the constitution of that sign are made available. . .In this process, which involves eliminating mentally everything which does not lead to the desired differentiation at the point required, associative groupings and syntagmatic types are both involved (1972, p. 129).

Both syntagmatic and associative processes ultimately depend on the same cognitive function, the perception of the relations obtaining between the units of each order, and a classification system based on the discrimination among those relations, their respective values. The use each individual makes of these relative values Saussure called "speech;" the system itself, the codification of values assigned collectively by society, was called the "linguistic structure." Habitual speech practice by individuals over time supplies the content of the code, but once the system has been fixed, it imposes its conventional forms and structures on the expression of each individual

who shares the language. Although it may appear, Saussure says, that there is considerable choice in the selection of a word in relation to the concept it represents, "the signal is imposed rather than freely chosen. . .What can be chosen is already determined in advance" (1972, p. 71).

Furthermore, in Saussure's theory, language is a closed system. Definition and explanation take place within its confines, referring the unknown element to terms already known; "to explain a word is to relate it to other words: for there are no necessary relations between sound and meaning" (1972, p. 188). Words become enriched through contact with other words, but attain their precise values only by contrast with similar terms. "No word has a value that can be identified independently of what else there is in its vicinity," Saussure says. "There are languages, for example, in which it is impossible to say the equivalent of 'to sit in the sun'" (1972, p. 114).

But even within that inflexible system of evaluative relations, the shared tradition of a given linguistic community, a deeply radical relativism is still possible. In speaking of the shift in perspective which had allowed him to break with the whole of linguistic science before him, Saussure remarks that a given field may be seen to present

> quite different things, depending on the viewpoint adopted. . .The object is not given in advance of the viewpoint: far from it. Rather, one might say that it is the viewpoint adopted which creates the object (1972, p. 8).

The conceptual reframing of linguistics accomplished by Saussure at the beginning of the century has been described by psychologist Paul

Kugler (1982) as a "paradigm shift" comparable to the change in focus from substance to structures in contemporary physics. But it remained for another linguistic scholar, Benjamin Lee Whorf, to work out the implications of Saussure's ideas on the delimiting function of the structures of language.

## Linguistic Structure and the Boundaries of Cognition

Saussure's conception of language as a system of patterned relationships is the launching-point for the radical and still highly controversial reformulation of linguistic theory proposed in the 1930's by American language scholar Benjamin Lee Whorf. In a statement which embodied Saussure's philosophy, Whorf asserted his position in his essay, "A Linguistic Consideration of Thinking in Primitive Communities:" "Sense or meaning does not result from words or morphemes, but from patterned relations between words and morphemes ... Any scientific grammar is necessarily a deep analysis into relations" (Whorf, 1956, p. 67-68). Out of his study of relational systems, Whorf developed, in concert with his mentor Edward Sapir, the hypothesis of "linguistic relativity," and the belief that an understanding of linguistic structure is fundamental to any comprehensive theory of human cognition.

Whorf's painstaking research into the patterns of expression in aboriginal languages of the Western hemisphere convinced him that the familiar occidental categories of reality--space, time, and matter, form and substance, being and becoming--which are assumed by Westerners to be universal in nature are, in fact, artificial constructs rooted in Indo-European language, reflective of the structures of that language,

and, far from universally accepted, are held only in the communities that hold that linguistic system in common. Other, non-Western societies have developed radically different views of the universe, no less valid than the one to which our language predisposes us, and equally reflective of the relational system encoded in their particular linguistic tradition.

The philosophical abstractions and psychological realities of any culture, Whorf believed, are implicit in the syntax of that culture's language, which not only serves to organize expression, but actually imposes its own order on human perception and thought. Perspective is nothing more or less than a derivative of language, a consequence of the linguistic classification of the data of sensory experience; and thinking itself, the formulation of ideas, is inextricably linked to the system of relationships which is codified in the structure of a particular language.

The process of cognition, according to this theory, is a search for meaning within the limits of external constraints, a search confined to the relational patterns fixed within a given language system. Words convey no meaning in isolation; the content, the reference of an individual word, is insufficient in itself to carry meaning. Rather, it is the "rapport" between words, the "factors of linkage between words and morphemes, which make the categories and patterns in which linguistic meaning dwells" (1956, p. 66). The process of thought, what Whorf calls "silent thinking," is no less dependent on this matrix of patterned connections than is the overt speech by which the formulations of individual thought can be expressed to others. It is rapport, systematic relationship, which coordinates

words into the semantic units with which thinking operates, and by this means serves to constitute what Whorf considers to be the real essence of thought.

The form that an individual's thought can take, Whorf says, is

> controlled by inexorable laws of pattern of which he is unconscious. These patterns are the unperceived intricate systematizations of his own language. . .every language is a vast pattern-system, different from others, in which are culturally ordained the forms and categories by which the personality not only communicates, but also analyses nature, notices or neglects types of relationship and phenomena, channels his reasoning, and builds the house of his consciousness (1956, p. 252).

Rational thinking, as we know it, is in Whorf's view a purely ethnocentric phenomenon, the outcome of a relation between formal expression and linguistic patterning discovered in classical Greece and India. The propositional logic of predication and deduction which resulted from this ancient insight is not a universally shared cognitive process, but rather a specialized type of syntax, an operation within grammatical structures latent in the language, what Whorf calls "the background linguistic system" (1956, p. 212).

But even less formal modes of thinking, the apparently unstructured associative connection of concepts and ideas, are no less influenced by the patterns available to the thinker, patterns of which he is entirely unaware. Just as the formal relationship of logical propositions forces to certain inevitable conclusions, so the underlying structural system of a language leads to the formulation of ideas which may be taken as universally valid and necessary by the participants in the linguistic order, but which may be completely invalid in another. Strict objectivity, in this model, is impossible:

perspective is never absent from the equation of thought. And like Saussure, Whorf believed that the individual "is constrained to certain modes of interpretation even while he thinks himself most free" (1956, p. 213).

The automatic and involuntary patterns of language, in Whorf's view, are a result of collective consensus within a society, and serve as the means by which a coherent world-view is represented. "Fashions of speaking" crystallize in idiomatic form a society's habitual modes of analysing and classifying the data of experience; these patterns, in turn, contain and transmit the system of thought which has developed within the confines of linguistic structure.

Furthermore, language patterns, Whorf believed, not only channel thought into specific forms, but also enforce "resistances to widely divergent points of view" (1956, p. 247). Concepts from one system which cannot be easily formulated in other language systems will meet with intellectual rejection. This language-based relativity operates for Whorf not only at the structural level, between language systems, but also within language systems, between groups and individuals who share the same overall structure but operate with different habits of speaking. In some of his work, Whorf found that language patterns may conduce to specific behavioral patterns, as well as habits of thinking, both in the collective context of society as a whole, and perhaps more importantly, within the sphere of individual action.

"An accepted pattern of using words," Whorf wrote in an essay on "The Relation of Habitual Thought and Behavior to Language," "is often prior to certain lines of thinking and forms of behavior" (1956, p. 134). Automatized connections between concepts and the phenomena out

of which they are constructed seem to condition or influence an individual's reactions. Often, Whorf says, the "cue to a certain line of behavior is. . .given by the analogies of the linguistic formula in which the situation is spoken of" (1956, p. 137); in other words, the terms which are used by people to speak about things are connected with interpretations of situations in which those objects appear, and, in Whorf's view, carry implications as to the standard of behavior to be adopted with respect to the things so named. Linguistic patterns thus materialize in the form of behavioral patterns. Inappropriate terminology used with respect to a hazardous situation, for example, can lead to careless behavior which may cause an accident; pejoritive or prejudicial labels applied to individuals may become self-fulfilling prophecies. "Our behavior," Whorf asserted, "can be seen to be coordinated in many ways to the linguistically conditioned microcosm . . .people act about situations in ways which are like the ways they talk about them" (1956, p. 148).

Language, then, is for Whorf the means by which we create our own versions of reality, and in turn, react to our creations, both as individuals and as members of a collective linguistic union. So interconnected are the phenomena of language, thought and behavior that some cognitive and behavioral disorders can be directly traced to the linguistic patterns in which an individual's thought has become entrapped.[2] But even those whose thinking is not apparently abnormal still operate within the bounds of systematic patterning, and have a great deal to gain through an expansion of their awareness of the underlying structure of relation by which language influences thought. Although apparently a strict determinist, Whorf, like Saussure, allowed

for the possibility of perspectival change: something as simple as a change in the habits of our language, he suggests, "can transform our appreciation of the Cosmos" (1956, p. 263).

The principle of linguistic relativity, as embodied in the work of Whorf's mentor, Edward Sapir, in combination with the methodological approach of Saussure's structural analysis of language, entered into the intellectual framework of cognitive science through the work of Soviet psychologist Lev Vygotsky, for whom language is preeminently the instrument for the organization of thought and action.[3] Vygotsky's developmental work on the stages in which associative cognition is transformed into abstract or conceptual thinking, although the subject of an ongoing intellectual critique, provides one framework for the understanding of qualitative differences between the processes of predicative and deductive thought.

## The Logic of Complex and Concept

For Vygotsky, language is ultimately social. As a system of semantic elements, language provides the means through which private experience can be generalized, made sufficiently abstract, to be communicated to and comprehended by others. Its communicative and expressive function operates long before it assumes its role as organizer of internal thought. The process of language learning takes place in a social context, and thought itself develops out of the externally directed habits of childhood speech.

The earliest language of the child, Vygotsky says, is

> essentially social. At first it is global and multi-functional; later its functions become differentiated. At a certain age the social speech of the child is

> quite sharply divided into egocentric speech and communicative speech. . .Egocentric speech emerges when the child transfers social, collaborative forms of behavior to the sphere of inner-personal psychic functions (1986, p. 35).

Egocentric speech, Vygotsky found, plays an important transitional role in the development of thought from overt social expression to inner cognitive process. Far from indicating a detachment from real activity, as Piaget and other students of psychoanalytic theory had previously asserted, egocentric speech is actually an integral component of social behavior. This kind of speech, Vygotsky observed, "becomes gradually intellectualized and starts serving as a mediator in purposive activity and in planning complex actions" (1986, p. 39).

At an early stage of development, Vygotsky says, the child uses words as though they were properties of the things they designate; "for a long period of time the child is unaware of the symbolic role of language and uses words as simple attributes of things" (1986, p. 93). As it develops in the direction of internalization, the child's verbalization retains this essentially predicative quality, and his thought becomes structured in complexes of associations which coalesce around connections made between objects by way of their perceived attributes.

Vygotsky distinguishes five separate stages in the development of thought, from the level of vague and purely subjective association to that of true concept formation, according to his definition. The cognitive process at work in all these stages he calls "thinking in complexes." In a complex, he says, "individual objects are united in the child's mind not only by his subjective impressions by also by bonds actually existing between these objects" (1986, p. 112). The

process of thinking in complexes is both objective and coherent, but differs qualitatively from conceptual thought in that the bonds uniting elements in a complex are "concrete and factual, rather than abstract and logical" (1986, p. 113).[4] It is as if, Vygotsky suggests, the child organizes the discrete elements and objects of the universe into "family groups," the individual members of which belong together in point of actual fact, and not by virtue of logical classification.

The earliest complexes to constellate in a child's thinking are, in Vygotsky's term, the "associative type." Associative complexes are based on any kind of objective connection perceived among objects at hand, not simply shared qualities, but the accidental attributes of contiguity or spatial coexistence as well. At this stage of cognitive development, a word "ceases to be the 'proper name' of an individual object; it becomes the family name of a group of objects related to one another in many kinds of ways" (1986, p. 114).

This level is superseded by one in which associative complexes are formed on the principle of contrast, among objects which differ and complement one another. This sort of arrangement is the "collection complex. . .a grouping of objects on the basis of their participation in the same practical operation--of their functional cooperation" (1986, p. 115). It reflects the child's practical experience with objects in the world, a learned awareness of the fact that unlike objects are often taken together to form a complementary set of things.

These basic complexes, the associative and the collective, differ from the succeeding types, called the "chain complex" and the "diffuse complex," in that in the latter, there is no evident principle of consistency in the manner of complex formation. The chain complex, in

particular, Vygotsky says, "has no nucleus" (1986, p. 117); no single trait can be abstracted from all its members, but each element is connected to others through differing attributes or qualities. Two items may have nothing in common with each other, but join in the structure of a chain by sharing one trait in common with some intermediating third element. Diffuse complexes are even less apparently coherent, but are internally organized around some sort of indefinite inner generalization, personal and idiosyncratic to a high degree.

The most highly-evolved type of complex thinking is called by Vygotsky "the pseudoconcept" (1986, p. 119) by virtue of its apparent similarity to the mature cognitive process of concept formation. At this level, complex and concept are functionally equivalent, but represent distinctly different mental operations. The resemblance between them is enhanced by a superficial similarity in the language used to express them.

The material in which the child forms his thoughts, his words, are taken from the language of adults, as Vygotsky points out.

> complexes corresponding to word meanings are not spontaneously developed by the child: The lines along which a complex develops are predetermined by the meaning a given word already has in the language of adults. . . The linguistic milieu, with its stable, permanent word meanings, charts the way that the child's generalizations will take. But, constrained as it is, the child's thinking proceeds along this preordained path in the manner characteristic of the child's own stage of intellectual development (1986, p. 120).

The adult, through verbal interaction with the child, can demonstrate the process of conceptual thinking, Vygotsky says, but

> cannot pass on to the child his mode of thinking. He merely supplies the ready-made meanings of the words, around which the child builds complexes. Such complexes are nothing but pseudoconcepts. They are similar to concepts in their appearance, but differ substantially in their essence (1986, p. 120).

Vygotsky believed that conceptual thinking would not develop spontaneously out of the associative processes underlying the formation of complexes. As an earlier researcher, Narziss Ach, had demonstrated, the mere existence of associations, "however numerous and strong, between verbal symbols and objects is not in itself sufficient for concept formation" (1986, p. 99). Although a pseudoconcept may contain all the necessary elements from which a concept might be fashioned, what is required is a mental operation which transcends the concrete and perceptual links which unite the disparate members of a complex. Conceptualization is thus conceived as the product of abstraction.

The essential function of a complex, Vygotsky says, is

> to establish bonds and relations. Complex thinking begins the unification of scattered impressions; by organizing discrete elements of experience into groups, it creates a basis for later generalizations.
>
> But the advanced concept presupposes more than unification. To form such a concept it is also necessary to abstract, to single out elements, and to view the abstracted elements apart from the totality of the concrete experience in which they are embedded. In genuine concept formation, it is equally important to unite and to separate: Synthesis and analysis presuppose each other as inhalation presupposes exhalation (1986, p. 135-136).

The inherent difference between complex and conceptual thinking in the Vygotskyan schema can be traced to the differing functions of the word in each operation. At the stage which precedes the awareness of abstract relations, Vygotsky says, the structure of meaning is

word, the child (or adult in the preconceptual stage of cognitive development) is incapable of a semantic or lexical analysis, and instead offers lists of qualitative or functional attributes. Once an individual has made the transition from generalization to abstraction, and has developed the ability to analyse and coordinate concepts within a coherent and hierarchical system of thought, the shift may be reflected only in his social speech. His inner speech, the transform of early egocentric verbalization, still retains its original structure as predication.

Inner speech is almost entirely predicative, Vygotsky suggests, because "the situation, the subject of thought, is always known to the thinker" (1986, p. 182). Written speech and oral communication generally requires the full specification of subject and object in order to be intelligible, but there are, Vygotsky says, two cases in which predication can be encountered in external speech: as the answer to a question, or when the subject of the sentence is understood by all concerned.

The kind of condensation or abbreviation of thought represented by predicative speech becomes possible as a means of communication when "the thoughts of two people coincide" (1986, p. 236). As Lev Tolstoy had found in his developmental research, communication by abbreviated speech is the rule, rather than the exception, among people who live in close psychological contact. Thus, Vygotsky suggests, the predications of inner speech become externalized among individuals who participate in a shared frame of reference, with mutual agreement as to perception and perspective.

For Vygotsky, as for Saussure and Whorf, specifically verbal thought must be distinguished from other, non-verbal forms of thinking, and is subject to the inner rules of language. "Verbal thought," he asserts, "is not an innate, natural form of behavior, but is determined by a historical-cultural process and has specific properties and laws that cannot be found in the natural forms of thought and speech" (1986, p. 94); that is, in the purely associative and predicative modes of thought characteristic of elementary consciousness. Abstractions are impossible without words, Vygotsky says; and although current critiques of his work center around the adequacy of his definition of "concept," his position is one which identifies conceptual thought with verbal processes.

Associative and conceptual thinking thus remain for Vygotsky two distinct, although interconnected, processes, the one based on generalized perceptions, the other on the abstraction of relations, and the systematic creation of structure. Thought is that process of connection by which such structured relations are established and developed through the mediating influence of words. "Thought," Vygotsky says, "is not merely expressed in words; it comes into existence through them" (1986, p. 218).

## Associative and Categorical Relations

Vygotsky's younger colleague and friend, cognitive psychologist Alexander Romanovich Luria, further elaborated his ideas on the mutual interdependence of thought and language, and the qualitative difference between association and concept formation. In Luria's conception,

association is in itself already a form of abstraction, a transcendence of purely sensory perception which is a necessary precondition for the construction of abstract concepts. But beyond the conceptual stage of cognitive development, which is characterized by an awareness of what Luria calls "categorical" relations, is rational thought itself, the processes of logic, the ability to draw conclusions on the basis of premises. For Luria, associative and rational cognition are the two methods by which human intellegence can broaden and deepen its field beyond the immediate experience of sensory perception, and both modes of thought process the data of perception through the medium of language.

The essence of language, Luria says, is that which "enables us to abstract, codify, and generalize signs and objects" (1982, p. 28). Language designates things or actions, properties or relations, and hence conveys and processes objective information." The active selection of a word does not simply indicate the object named; it "analyzes it and introduces it into a certain system of associations and relationships" (1982, p. 29). This, in fact, is the function of words: "words organize things into systems. That is to say, words codify our experience" (1982, p. 31), and allow for communication of that experience with others.

The relations and properties signified by a word, over and above its objective or nominal reference, compose what Luria, along with other contemporary psycholinguistic researchers, calls its "semantic field," a complex of connotations, derived from personal experience, which surrounds every word and structures its connections with other words. It is this semantic field which is activated through the

process of association, providing a choice among rich and meaningful alternatives for the purposes of expression. On the other hand, however, each word also has its "categorical" significance, its place in a structured hierarchy of abstracted properties, with its formal relations restricted to other elements sharing the same category. The latter mode of organization, the result of an analytical operation, contributes the objective "meaning" of any given word; the synthetic process, working within the semantic material of individual experience, creates what Luria calls the "sense" of the word.

Like Vygotsky, Luria found that "meaning" is subject to change; the objective reference of a word may remain constant, but its place in the conceptual hierarchy, the comprehension of its categorical relations, is repeatedly redefined in the course of cognitive maturation. Conceptual development has profound consequences, as both Soviet researchers found: "as word meaning changes," Luria asserted, "psychological processes also change" (1982, p. 50).[5]

The semantic field, or associative complex, is in its most basic form a network of predications--actions, attributes and affects which are linked to the experience of concrete situations. At later stages of development, Luria suggests, "the structure of word meaning takes on an entirely different character.

> The word enters into a system of hierarchically connected and mutually subordinated categories. It acquires, as linguists say, a paradigmatic character. The word's meaning is situated in a hierarchical system of abstract oppositions . . .At the stage of concrete concepts, the key role is played by situational, object-actuated bonds; whereas at the stage of abstract concepts, the key role is played by the verbal and logical hierarchically constructed bonds (1982, p. 52-53).

With this change, the experiential and affective dimensions of the word, its associative connotations, are left behind, and its expressive potential comes to conform to the objective meaning shared in society. The psychological shift in the analysis of relations is from concrete to abstract, from predication to paradigm, from description and differentiation to coordination and classification according to a strict system of verbal-logical definitions.

In a perspective that they shared with Whorf and Saussure, and in the intellectual tradition of dialectical materialism, both Vygotsky and Luria saw this structural shift in the way language is used as related to socioeconomic factors, as historically and culturally determined, rather than as the result of natural cognitive development. Luria's engaging memoir, The Making of Mind (1979), describes a series of experiments he conducted in Soviet Central Asia to explore the processes of linguistic coding, classification and abstraction, and logical problem-solving among members of a non-literate society, subsisting in relatively primitive conditions of life.

His results in this endeavor led him to the conclusion that people of such traditional backgrounds "classify objects according to their inclusion in a concrete situation" (1982, p. 62). Their own forms of conceptualization, as evidenced in Luria's Cartesian tests, proved to be very different from those of urban, formally educated individuals, and in their radical inclusivity were not entirely unlike Vygotsky's "complexes." In terms of abstract reasoning, Luria's aboriginal subjects were completely unfamiliar with the kind of abstraction characteristic of those who have been educated in the methods of formal logical thinking. The unwillingness of his subjects to move beyond the

immediate sensory dimension of personal experience, their focus on the practical interrelationships between things, made categorial discrimination difficult and deductive reasoning a virtual impossibility for them. Within the context of their daily lives, the abstract universals and particulars of syllogistic logic bore no intelligible relationship to each other, and led to no necessary or inevitable conclusion.

From this experience, Luria identified rational thinking as a process deriving from formal education, but not so much from instruction in reasoning as such, as from the systematic approach to words which is involved in the teaching of literacy. The preconditions for rational thought, he believed, must include a fundamental change in the functional role of language. Words must become separated from their "sympractical" and "synsemantic" contexts and cease to express associative relations before they can become tools for the orderly classification and analysis of objective reality. It is only when this cognitive shift has taken place, under the influence of education, that formal methods of thinking become possible. Logic is a consequence of language, but of language viewed as the structure of categorical relations. It can emerge, Luria says, "only during those stages of cultural development when activity realized through the help of language becomes an independent process" (1982, p. 203), divorced from the concrete and perceptual process of associative cognition.

For Luria, as for Vygotsky, the context in which this transformation was most likely to occur was the structured environment of socialized education. But many habits of thought which are acquired and reinforced through family interaction may prove impervious to the

structuring processes of a systematic conceptual perspective. The remainder of this chapter will be devoted to the ideas of two metacognitive theorists, anthropologist Gregory Bateson and psychiatrist R.D. Laing, on the influence of family communication patterns on the thought of the individual.

## Cognitive Functioning and Language Patterns in the Family

Gregory Bateson has been cited by psychologist Howard Gardner as one of the leading participants in the group that created cybernetic theory, the immediate intellectual precursor of the "cognitive revolution" (Gardner, 1985). His work on information processing in social systems, including cross-cultural research on families in developed and traditional societies, presents an analysis of language and its relation learning which has far-reaching implications for the mental functioning and behavior of those involved in the communication patterns of the group.

For Bateson, all learning takes place within a specific context, a "frame" by which information about the message to be learned, a metacommunication, is presented to the learner. The presence of dual or multiple levels of information is rarely noticed, but contributes to learning by providing a background against which the overt message is to be understood, along with a set of rules and instructions for the appropriate interpretation of the message. The frame functions include the message in an particular category of information, and to exclude all other, irrelevant information.

"People will respond most energetically," Bateson suggests, "when the context is structured to appeal to their habitual patterns of reaction" (1972, p. 104). These patterns are themselves developed and habituated in the earliest of social settings, the family. Values, attitudes, and ideals are implicit in the metalinguistic frame in which language is learned, in the way a word is used, the affective tone it carries, the system of relationships into which it is introduced, the interaction which it facilitates. All these dimensions are elements of the code which imparts meaning to the word in the systemic context in which it is meant to function, transforming it from arbitrary sign to communicative signal.

Meaning, in Bateson's conception, is a "synonym of pattern, redundancy, information, and 'restraint'" (1972, p. 130). Language is a system for the generation of pattern, and the act of communication is, in its essence, "the creation of redundancy, meaning, pattern, predictability, information, and/or the reduction of the random by 'restraint'" (1972, p. 131-132). Pattern introduces the appearance of order into the chaos of perceptual data, and allows for the discrimination of differences on the basis of which structures of meaning can be developed, predictions made, and information transferred among individuals.

In much the same way that Saussure conceived of language as a system of differences, Bateson, in one of several essays on the "double bind" theory of communication, defines information as "a difference which makes a difference" (1972, p. 272). Difference, in this view, results from a modulation of communication, an adjustment or qualification made in relation to other elements within the frame, or

in relation to the frame itself, the context. Data is selected to become "information" on the basis of the perceiver's relative point of view; thus difference may not be a criterion of the selection process, but rather a result of it.

Individuals within systems function together in such a way as to reduce the negative impact of difference, Bateson says, through "a sharing of premises regarding the meaning and appropriateness of messages and other acts in the context of the relationship" (1972, p. 233). In other words, they evolve common meanings and a collective approach to the processing of information.

In any group, so long as the information contained in both the message and the frame is logically consistent, cognitive operations can function in a normal manner. However, as Bateson found, when there is chronic incongruence or contradiction between the two levels of communication, information processing can be seriously impaired. Mixed messages of the kind which result in paradox, what Bateson called the "double bind communication," can cause the recipient to begin to doubt the validity of his own perceptions, to distrust the information contained in any context, and to react inappropriately to messages with consistent contexts. These behavior patterns, and the linguistic patterns which accompany them, were found by Bateson to be habitual in families in which one or more members suffer from functional thought disorders, including schizophrenia.

The influence of family communication patterns stems from the fact that individuals rarely examine the abstractions which underlie their cognitive habits and their modes of linguistic interaction with one another. Yet premises and assumptions which have become automatic and

can therefore remain unspoken contribute substantially to the context in which verbal messages are formulated and interpreted. Unless they are critically examined, these patterns are reinforced and perpetuated without alteration. But any transferable change in understanding, what Bateson calls "second order learning," or learning to learn, requires just such a critical examination, a recognition of patterns as they signify both meaning and relationship.

A family system characterized by resistance to this metacognitive level of analysis will, by its very nature, impede the process of second order learning. As Bateson points out, it is the function of any system to be "self-corrective against disturbance" (1972, p. 435), a function which is accomplished by a reactive reframing of disturbing information. By this means, homeostasis is maintained, the status quo is preserved, development is prevented, and the necessity for change restricted to an absolute minimum.

Out of its habitual communication patterns, a family system develops internal organization and a stable relational structure which seems logical within its own context. Likewise, the patterns of thought arising from within a communication system become so standardized as to appear rational to the participants in the system. It is only when these patterns are placed in another context that difficulties may become apparent, difficulties which manifest themselves through the evidence of language and of reasoning.

Bateson's theories developed directly out of his experience with dysfunctional families, as did those of R.D. Laing, a psychoanalyst and psychiatrist at the Tavistock and Langham Clinics in London. But both approaches emphasize the role of communication in regulating cognitive

operations, and the sets of relations which define the structure of the system, in ways that are applicable to the unimpaired family as well.

For Laing, the "family" is "an introjected set of relations" (1972, p. 6), patterns of reaction and interaction among individual participants in the system which become internalized over time and are subsequently reenacted in other contexts outside the original system. "When such an internal template of space-time relations-in-sequence is externalized," Laing says, "it appears to function both as a schema governing ways external events are hoped, feared, seen to happen, and, by inducing action and reaction, as self-fulfilling fantasy and prophecy" (1972, p. 11). The total set of interactions, according to Laing, has an unrecognized dramatic structure involving multiple generations, and the description of the set in any given moment depends entirely on the perspective of the participant, the character and role he has assumed in the context of the family "story."

Like Bateson, Laing believes that communication patterns can induce patterns of behavior and of thought. One of the most powerful mechanisms of induction, in his view, is the language of predication. The attribution by parents of qualities, especially negative qualities, to their children, or the pronouncement of evaluative judgments, can carry such force as to shape the child's entire perspective. Parental definitions of the child's behavior, whether objectively true or not, can become true over time as the child internalizes both the predicate and the context, the circumstances, in which it was delivered. Furthermore, in the context of a mixed message, Laing suggests that it is the predicative portion of the communication which takes precedence over any other, discrepant information (1972, p. 79-80).

Induction, for Laing, is a process of "mapping" one individual's set of expectations and values onto another in such a way as to cause the other to embody those attributions and behave accordingly (1972, p. 117). Unlike the process of education, which might serve the same apparent end, induction undermines the child's development; it is linked with unexamined attitudes and habitual patterns of interaction, and occurs because of unspoken prohibitions against examining the structure and context of those patterns.

Some families operate, Laing says, as a "transpersonal system of collusion" (1972, p. 99) in which members agree to maintain the stability of the system by ignoring the existence of its operating procedures, its "rules and metarules." Such rules, Laing says, "govern all aspects of experience,

> what we are to experience, and what not to experience, the operations we must and must not carry out, in order to arrive at a permitted picture of ourselves and others in the world. . .If what we are instructed to achieve cannot be achieved by the how we are instructed to achieve it, we are in difficulty. (1972, p. 107).

A major factor in this difficulty, perhaps the determining one, is to be found in the linguistic patterns in the family household, and in particular, the psychological force of predicative speech.

The theorists mentioned in this chapter, with the exception of Saussure, worked out their intellectual systems with explicit reference to the psychoanalytic doctrines of Freud and his followers, including C.G. Jung. In the chapter which follows, the development of Jung's ideas on cognition will be traced from his early empirical work in word association, to his theoretical formulation of a functional approach to cognitive processing.

# CHAPTER III

## C.G. JUNG'S EARLY THEORY OF COGNITION

The professional career of Carl Gustav Jung--and the historical course of twentieth-century psychology--took a decisive turn in the moment when he discovered that his painstaking experimental work at Zurich's famed Burgholzli Clinic gave empirical support to the radical, shocking, and academically unacceptable theories of Sigmund Freud. The structural model of mind which had been outlined by the Viennese neurologist in his monumental 1900 publication, The Interpretation of Dreams, explained in one comprehensive representation a whole system of cognitive functions and processes known only too well to the young Swiss psychiatrist from the fragmentary evidence of his patients' word associations. Despite the hazard to his own reputation as a scientist, Jung chose to cast his empirical data on the side of Freud's speculations, and in 1906 took the first step toward establishing a relationship with Freud that would forever alter the world's understanding of human cognition.

In the seven years of their professional collaboration and personal friendship, Jung offered Freud what he could not have achieved on his own: not simply the validation of his theories, but access to medical and intellectual circles outside Vienna as well. The Burgholzli Clinic drew interns and researchers from all parts of Europe, from Russia and from America, and in its experimental research facilities, a generation of psychiatrists learned Freud's psychoanalytic theory through the practice of the word association experiment. As part of that theory, they studied the structure of the

psyche detailed in the final chapter of The Interpretation of Dreams, a complex information-processing system that has been seen by some recent theorists (Peterfreund, 1971; Erdelyi, 1985) as a forerunner of the computer-based "multi-store" model of modern cognitive psychology.

But Freud's mechanical metaphor for the mind--the "compound instrument," as he termed it--with its two modes of operation, primary and secondary process thinking, was in some respects too static and too homogeneous a model for Jung to adopt as his own. While keeping Freud's idea of two essential thought processes, which he called "directed" and "non-directed" thinking, Jung eventually rejected the structural approach to cognition for one which conceived of the mind in terms of the fluid interplay of four dynamic functions, centered around a nucleus of associated ideas which holds the essence of each individual's personal self-consciousness. Where Freud had posited a single, comprehensive, unified apparatus of human thought, a structure and function common to everyone, Jung sought to explain the diversity of human individuality with a theory of psychological types, describing his own approach to the mind in terms which sound strikingly similar to those of cognitive psychology's "levels of processing" model.[1]

The present chapter will present a brief summary of the early cognitive theory of C.G. Jung as it emerged from the data of his association experiments. The first section will discuss the reaction-types described by Jung and his colleague, Franz Riklin, in their 1904 article, "The Associations of Normal Subjects." The second section will follow the theory of reaction-types in its subsequent development toward the concept of four cognitive functions, and in particular the opposing pair of rational functions, thinking and

feeling. The final section will be devoted to Jung's discussion of types and functions as they develop in context of the family.

## Linguistic Orientation and Reaction-Types

Jung and Riklin began their experimental program with the idea that an individual's responses on a word association test might fall into patterns that could be identified and described as distinctive reaction-types. The criterion upon which such a differentiation might be made was the preference the individual showed for specific kinds of associative responses, particular semantic or logical relationships which the respondent chose to set forth in his reactions to the stimulus-words.

In order to test their hypothesis, Jung and Riklin gathered more than 12,000 associations from thirty-eight normal adults, men and women of varying ages, educational levels and linguistic abilities. Subjects were tested in conditions of undisturbed attention and in the presence of a variety of distractions, including auditory and motor tasks, visualizations, and conditions of physical and emotional fatigue. Each subject's responses were then classified according to a four-part system, adapted by the Burgholzli researchers from an earlier schema developed by Gustav Aschaffenburg and Emil Kraepelin for use in their empirical investigations of association. The system discriminates among some thirty-seven types of associative response to a given stimulus word, and is structured in such a way as to permit an analysis of the relative strength of the logical or linguistic connection inhering in the relationship between stimulus and response.

At the top of the hierarchy are the so-called "internal associations," those relationships which reflect objective conceptual bonds between words. Associations which fall into this sector are those in which stimulus and response are united by reference to some coordinating common concept, or those which orient each other through subordination or superordination. Definitions and declarations of cause are located in this initial group, as are all forms of predication, including the syntactic (the subject-verb or verb-object relationship) and the attributive (adjectival predication of quality, quantity, attitude, or relation, and disposition as to place, time, means and purpose). These meaning-based or meaning-extending associations are assumed to be the product of reflective thought, the result of an analysis which has penetrated to the depth at which, in the language of levels of processing theory, the conceptual material of stimulus and response has been encoded in all its relational, referential, thematic and functional complexity (Perfetti, 1979).

More superficial, and less complex, are the responses which fall into the second category of "external associations." These are the responses conditioned by the operation of the classical laws of association, the laws of contiguity, frequency and similarity, as well as the automated responses of synonym and antonym, and the form changes, word completions, and compound constructions that show that the subject has made no effort to address the semantic content--the meaning--of the stimulus word. This is the realm of slogans, interjections, proverbs, quotations and empty phrases, of "speech formulas" (Lakoff, 1982), of verbal interaction which can occur without the expenditure of attention, without an attempt at comprehension, without regard for concept, idea, or meaning.

More marginal still are the responses of the third major category, that of "sound reactions." These are verbal productions which have lost their claim to be called associations in the true referential sense of the word; they are responses at the most superficial level of cognitive analysis, reactions to the acoustic, phonemic and phonological dimensions of the stimulus-word. The most debased responses of all are classified in the final, residual category. Here are grouped the repetitions of the stimulus word and the failures to respond, as well as those indirect associations which are made in response not to the stimulus-word, but rather to some other, unarticulated inner concept, the sense of which may be a complete mystery even to the respondent.

Given this scale on which to position the verbal-logical relationships formed by their subjects' responses, Jung and Riklin noticed that their data did, in fact, organize itself around a number of distinct reaction patterns, or types, which could be identified in part from an analysis of the relational category preferred by the subject for the majority of his responses. Some individuals, the experimenters found, had a predominant tendency to answer the stimulus with a word indicative of some common concept, a clear, coherent, objective association which bore witness to an organized and logical approach to the lexical and semantic information of the stimulus word. Others, no less clear and objective, responded to the purely linguistic dimensions of the stimulus, its grammatical mutability, its involvement in the popular phrases of everyday speech, its tendency to merge with other words into compounds in which each element loses its intrinsic meaning.

In these two types of reaction, nothing in particular was revealed about the subjective state of the respondent, his emotional response or his personal orientation to the stimulus concept. A certain amount of factual data might emerge from the response words themselves; members of certain professions, for example, might give themselves away with words that had become habitual through the common language of their careers. But in contrast to these individuals, who shared what Jung and Riklin called an "objective attitude," were respondents who indulged in open self-disclosure with their associations, respondents whose orientation was identified by Jung and Riklin as an "egocentric attitude." Among these respondents, two major types emerged, those whose responses clustered in associative complexes which hinted at specific personal experiences of a more or less emotional nature, and those who reacted with the evaluative pronouncements of predication.

These four basic reaction-types[2] represented four distinct approaches to the information carried in the stimulus-word, and, by extension, Jung believed, to the reality represented by the stimulus, a reality which would appear in a radically different guise to a objective-semantic reaction type than to a complex or a predicate type. An individual's interpretation of, and reaction to, the external stimuli of his environment could perhaps be understood through an analysis of these response preference patterns, which were themselves evidence of the background and education he had experienced, the kind of language he had heard, and affects expressed or concealed by means of that language.

Far from mere linguistic phenomena, then, these associative reaction-styles were signals of a set of attitudes about the nature of

reality, and were accompanied by characteristics commonly held to be components of personality. The degree of a subject's self-control, the intensity of his emotional engagement, the quality of attention he was able to maintain, his tendency to place the sound of a word into an intellectualized conceptual hierarchy or into the vivid imagery of predication, his preference for paradigm or syntagm, for analytic or synthetic formulations, for similarity or for difference, were all evidence of underlying cognitive processes which varied among individuals even as their reaction-styles, their choice of associate responses, varied from one to another.[3]

The calm neutrality of the two objective types, for example, was evident in their conceptual approach to the word, their abstraction, the absence both of affect and of personal involvement with the matter of the stimulus-word.[4] Among the egocentric types, a great number of predicates in an individual's response pattern was found to accompany a solid subjective stance, a high degree of concentration, a freedom of emotional expression, and a remarkable trait not shared by members of other reaction-types, the ability to generate internal imagery as a non-verbal associative response to the stimulus-word. A high proportion of superficial reactions among an individual's responses, finally, the sort of words that have become embedded and automatized in the language of common discourse, was found to occur in conjunction with a high degree of distractibility and the tendency to self-revealing reminiscence, which might either be given free expression, or else, if too painful, suppressed.

The program of research into normal associations at the Burgholzli Clinic was designed to provide a baseline against which the utterances

of mentally ill individuals could be compared. Rather than finding any clear-cut differentiation between the associations of normal and disturbed individuals, however, Jung and his colleague found only a difference of degree. The verbal patterns of their subjects proceeded on a continuum from the tight and structurally stable conceptual bonds of coordinate, subordinate and superordinate relationships, through varying intensities of predication, to the more superficial and automatic reactions of synonym, antonym and casual phrase, to apparently incoherent responses and failures stemming from some private inner experience which the subject either refused to reveal or was actually unable to explain to the experimenters. At this end of the spectrum, Jung and Riklin observed, the responses of perfectly average individuals began to coincide with the kind of linguistic behavior that might be observed in clinical cases of hysteria, manic disorders, or more pathological kinds of cognitive dysfunction.

In pathological states, the same two orientations or attitudes which distinguished the responses of normal individuals could be also be seen, differentiated again in terms of relative degree: the outwardly-directed organizing tendency of the objective type, and the inwardly-focused evaluative tendency of the egocentric type. These two attitudes were the first of the cognitive phenomena to be drawn by Jung from the material of his word association experiments to serve as the foundation for his emerging theory of psychological types.

## Toward a Functional Typology of Cognition

Much of the verbal behavior Jung and his colleague observed in their word association research was not, in fact, the evidence of deep-lying psychological processes or of complex, conceptually-based thought. Rather, the responses they collected might better be described as "linguistic reactions," which the researchers held to "represent the psychological connection only in a remote and imperfect way" (1973, p. 10). Language itself, and not the intention of the respondent, provided the motive force for many of the reactions. The individual's inner association "cannot become the object of another's consciousness without being transformed into the familiar symbolism of language," according to Jung and his colleague (1973, p. 11). This transformation will be shaped by the individual's fluency in the language, but also by the frequency that certain associative pairs and common phrases have established for themselves in the patterns of ordinary social discourse.

The linguistic roots of cognitive processing. The primacy of language-based associations asserted itself most strongly when a subject's attention was artificially diminished. Jung and his coauthor explained the phenomena they observed in the distraction portion of their their experiment in dynamic terms:

> . . .one could say that the "associative energy" (Ranschburg) was to such an extent diverted to another area that only a portion of it is still available for the reaction. Thus a correspondingly poor or easy (that is, strongly canalized) association is given, because the stimulation of ready and accustomed cerebral mechanisms requires a smaller amount of energy than the canalization of relatively new and unaccustomed connections (1973, p. 43).

When distracted, fatigued, or emotionally disturbed, then, a subject responds with the easiest reactions to produce, those which have become mechanical through practice, habit, or repetition. Such habitual connections between words would naturally include not simply those formulas an individual has rehearsed on his own, but also those high-frequency verbal patterns, "stereotyped word-connections" (1973, p. 184) which are shared throughout a linguistic or social group by virtue of a common form of speech. In this way, Jung and Riklin suggest, "ideas already automatized and condensed in language assist the subject in his effort to comprehend the meaning of the stimulus word and to work it over" (1973, p. 138) with the most economical expenditure of effort.

When concentration of attention on the idea of the stimulus-word is possible, on the other hand, "these purely linguistic connections are suppressed" (1973, p. 138), and the subject is free to select the appropriate level of analysis at which to formulate a meaningful association, one which conveys the sense of the associated idea. Attention, then, aids the development of the stimulus idea by controlling and directing the process of association, and by keeping the meaningless verbal patterns of the language, always present in memory, excluded from the focus of consciousness.

The processes of language reflect the dynamics of thought at a deeper, more structural level as well, as Jung wrote in his 1913 article, "A Contribution to the Study of Psychological Types." There, he compared the two orientations of consciousness that he had seen in his reaction-types, the outward- or inward-looking attitudes which he now called extraversion and introversion, with the dynamics of

transitive and intransitive verbs in language. According to contemporary linguistic scholar Franz Finck, Jung said,

> . . .there are two main types of linguistic structure. The one is represented in general by the transitive verbs: I see him, I kill him, etc. The other is represented by the intransitive verbs: He appears before me, he dies at my feet. The first type clearly shows a centrifugal movement of libido going out from the subject; the second, a centripetal movement of libido coming in from the object. The latter, introverting type of structure is found particularly among the primitive languages of the Eskimos (1971, p. 507-508).

Thus, a linguistic analysis of function serves as an analogy for the differences in attitude which distinguish two types of individuals, the introvert and the extravert, whose differing verbal behavior Jung had already observed on the word association test. But language is far more than a repository of automatic verbal patterns and an indicator of the direction in which an individual's consciousness prefers to turn. Language is the medium in which the process of cognition actually takes place.

Directed and non-directed thinking. In the work which represents the tumultuous process of his own mid-life self-analysis,[3] Jung began an examination of cognitive processing which would lead him to a theoretical and personal break with his mentor Freud. Yet his point of departure in that work, Symbols and Transformations of the Libido, is a discussion of thinking which seems to owe much to ideas Freud had expressed in The Interpretation of Dreams.

Under the heading, "The Primary and Secondary Processes," Freud had elaborated an operational theory for his mechanical model of the psyche based on the process of association between words and ideas.

The material of memories, dreams, and conscious thought is acted upon by two essentially different cognitive processes, Freud suggests, the one driving toward a reduction of tension through a discharge of energy, and the other attempting to minimize the accumulation of tension by maintaining the entire system in a state of rest. The dynamics of the first operation he called the "primary process"; its function was manifest in the images of dream and fantasy, in the sound-based associations characteristic of depressed attention, in impulses, emotions and desires. By contrast, the "secondary process," the equilibriating and controlling operation, was that dynamic which allowed for the exploratory cognitive work of "experimental thought" (1950, p. 452), using pleasure and pain as signals to adjust its course as it progressed through the associative network of memory.

Primary process thinking, Freud suggests, seeks an "identity of perception," a sensation-based experience providing the gratification of a wish for physical pleasure. The secondary process, on the other hand, finds its goal in a more rarefied form of pleasure, an "identity of thought" (1950, p. 453). "Thought must concern itself with the connecting-paths between ideas without allowing itself to be misled by their intensities;" that is, by the enticement of sensual gratification they may represent. Nor, Freud says, can thinking allow itself to be detoured by the obstacles of pain:

> the tendency of the thinking process must always be to free itself more and more from exclusive regulation by the pain-principle, and to restrict the development of affect through the work of thought to the very minimum which remains effective as a signal. This refinement in functioning is to be achieved. . .with the help of consciousness (1950, p. 454).

The ability to follow a train of thought with purposive and directed attention, avoiding the attractions of pleasure and the prohibitions of pain, is one which appears comparatively late in an individual's development. The apparatus for the primary process is functional at birth, but the operations of secondary thinking develop only gradually, Freud says, "inhibiting and overlaying the primary, whilst gaining complete control over them perhaps only in the prime of life" (1950, p. 455). Both modes of cognition are perfectly normal, and both coexist in the mental systems of perfectly normal individuals, although in mature adults the primary process tends to reveal itself only in the form of dreams and in the symptoms of diverted attention--parapraxes, slips of the tongue, temporary lapses of memory.

The means by which the secondary process, what might be thought of as "normal," or rational, thinking, gains its ascendancy over the supposedly "incorrect" or "defective thinking" (1950, p. 456) of the primary process, Freud asserts, is repression. This was the very operation which Jung had observed in his experimental work as well, and he had attributed to it a similar function, that of excluding inferior associations, verbal-motor patterns and sound responses, from the focus of consciousness.

When Jung moved on from the study of verbal behavior to a consideration of the mythological and symbolic structure which underlies the production of psychotic fantasies, he began his work, translated under the title The Psychology of the Unconscious (1916), with a discussion of two kinds of thought, "directed" and "non-directed" thinking, which seem related to the primary and

secondary processes described by Freud, but refined by explicit reference to the linguistic matrix out of which "directed thinking" develops.[6]

The process of conscious thought, Jung says, works itself out in the form of words. Language, and verbal concepts, are the material in which thought is cast; even the most private forms of thought, if subjected to an attentive analysis, would reveal themselves in the guise of internal speech. This thinking in words, or "logical" thinking, is preeminently designed for communication with others. It is adapted to the shared reality of society, and through that adaptation fosters an outward-looking attitude toward the world. "As long as we think directedly," Jung says, "we think for others and speak to others" (1916, p. 14), using a system of sounds that over the course of centuries have come to carry commonly accepted conceptual or semantic meanings.

The development of a regularized system of meaning has depended historically on the separation of sounds from the concrete, sensual and affective realities they originally signified, and a shift to the signification of relations and comparisons which alone permit the operation of abstract thought. But while containing, and transmitting, these standard patterns of information, language also permits the development and exercise of private reference, and thus serves as a double-edged instrument, with functions in both the personal and the social realm.

Jung agreed with the English philosopher Baldwin, whom he quotes extensively, that language systematically delimits thought. Furthermore, it also serves to condition the faculty of judgment, as

each individual, through trial and error, learns to adjust and conform his own immature and ideosyncratic understanding of words to the conventional meanings fixed within the language. Social confirmation is a sign of the appropriateness of an individual's usage, not only of words themselves, but of concepts elaborated from those words as well.

Thinking by means of internal speech, or "directed thinking," Jung writes, "is the manifest instrument of culture," a comparatively recent development in historical terms. Education in the methods of directed thinking gradually forced the human cognitive process out of its inward, subjective orientation to the objective realm of social interaction;[7] this radical reorientation of mind has allowed for the advances in science and technology on which modern society as we know it has been built.

But this acquisition of the benefits of logical processing is not made without cost. Directed thinking, Jung suggests, requires the expenditure of energy, and thus cannot be sustained for extended periods of time. And in the interim, when fatigue or inattention supervene, an alternative cognitive process is allowed to emerge, one which works with images, feelings, and desires, a thought process described by psychologist William James as "merely associative" thinking, and called by Jung "non-directed" or "fantasy thinking."

Thus Jung, like Freud, builds a cognitive model on the distinction between two contrasting modes of thought: one controlled, attentive, objective, governed by the logical principles of abstraction, the product of maturity or of rigorous education; the other archaic, undisciplined, spontaneous, egocentric, and anti-social. "The first," Jung says,

> working for communication with speech elements, is troublesome and exhausting; the latter, on the contrary, goes on without trouble, working spontaneously, so to speak, with reminiscences. The first creates innovations, adaptations, imitates reality and seeks to act upon it. The latter, on the contrary, turns away from reality, sets free subjective wishes, and is, in regard to adaptation, wholly unproductive (1916, p. 22).

A representation of the world formed under the influence of one type of thought would be quite different from the impression left by the operation of the other, Jung suggests, and it is the role of directed thought to correct and modify the productions of associative or fantasy thinking.[8] The essential distinction between the two modes of thought, can be traced to the fact that non-directed thought corresponds to the attitude of introversion, a focus on the processes of inner, subjective experience, while directed, or logical, thought, occupies itself with the objective interests of extraversion.

By the time of his next major publication, Psychological Types, however, Jung had come to realize that the attitudes of introversion and extraversion could be adopted with equal ease by thinkers of both directed and non-directed modes. Furthermore, he had come to realize that the process of rational thinking was itself comprised of two different functions, one of which is distinguished by a number of qualities reminiscent of the subjective, judgmental approach of the "predicate type" subjects of his early word association experiments. The cognitive process underlying their preferred style of association Jung named the "feeling function," and described its logic as the opposite of that used in the other mode of rational cognition, which he chose to call the "thinking function."

## Thinking and Feeling

The essential difference between analytical and associative thought, between discrimination and evaluation, between deduction and predication, intellect and sentiment, logic and judgment, is for Jung a problem of "psychological types," and in his 1921 monograph of that name, he traces the history of typological differences through aesthetics, literature, psychopathology and philosophy from the nineteenth century back to its roots in classical and medieval thought. The question at stake in the unresolved scholastic argument over nominalism and realism, and the conflict in ancient philosophy between the doctrines of inherence and predication, Jung says,

> is the typical opposition between the abstract standpoint, where the decisive value lies in the mental process itself, and the personal thinking and feeling which, consciously or unconsciously, underlie orientation by the objects of sense (1971, p. 36).

The first process characteristically draws from a multiplicity of appearances an idea which orders and contains diversity; the second process attempts to reduce the insubstantial idea to something concrete and particular. The first is objective and impersonal, the second subjective, personal and reductive; the first is a development of the function of thinking, the second is related to the operation of the feeling function.

Both thinking and feeling are said by Jung to be "rational" cognitive functions; they are modes of information processing, in contrast to the "irrational" functions of sensation and intuition, which govern the processes of perception. All four functions, he says, are available to every individual, and ideally operate in

harmonious equilibrium. But in practice, they are developed at different rates and employed by an individual in differing degrees. A function which is preferred becomes habitual. Chronic reliance on one of the four allows it to determine "type," the characteristic mode in which an individual interprets and responds to his environment.

The two rational functions of thinking and feeling, Jung suggests, are both the products of reflection, and both are designed to assist in the adaptation of the individual to objective values (1971, p. 458). Thinking, in this scheme, includes the active process he had earlier described as "directed thought," as well as the passive experience he had designated "fantasy thinking." What the two operations share in common is a process of bringing "the contents of ideation into conceptual connection with one another," a coordination of ideas under a common concept (1971, p. 481). Where the arrangement of concepts is made in accordance with objective laws of logic, consciously applied, the process is a fully rational one; but even when the arrangement occurs unintentionally, in what might be called an irrational manner, the act of ordering with reference to a concept still distinguishes the result as a product of the thinking function.[9]

Feeling, on the other hand, has only one criterion by which it introduces order: the value of an object, on the basis of which it is either to be accepted or rejected.[10] Feeling "is an entirely subjective process," Jung says,

> which may be in every respect independent of external stimuli, though it allies itself with every sensation. . . .feeling is a kind of judgment, differing from intellectual judgment in that its aim is not to establish conceptual relations but to set up a subjective criterion of acceptance or rejection (1971, p. 434).

Simple feeling, Jung says, is concrete, closely allied with sensation in its task of evaluation. But as a rational function, feeling is also capable of abstraction.

> In the same way that thinking organizes the contents of consciousness under concepts, feeling arranges them according to their value. The more concrete it is, the more subjective and personal is the value conferred upon them; but the more abstract it is, the more universal and objective the value will be (1971, p. 435).

Like thinking, feeling is rational in that "values in general are assigned according to the laws of reason, just as concepts in general are formed according to these laws" (1971, p. 435). It must be distinguished from affect in that it is a principle of discrimination, a criterion of judgment, and not in itself a state of emotional disturbance. But the feeling function can lead to an arousal of the emotions, if the intensity with which evaluation is performed reaches a sufficiently high degree.

Because the criteria of thinking and feeling are, in essence, antithetical to one another, the functions are considered opposites. The normal adaptation of an individual requires the choice of one mode over the other; the preferred mode is then developed at the expense of the other. Feeling, Jung says, "can never act as the second function alongside thinking, because it is by its very nature too strongly opposed to thinking. Thinking, if it is to be real thinking and true to its own principle, must rigorously exclude feeling" (1971, p. 406). As cognitive functions, they are equal, but mutually exclusive.

The characteristics associated with the feeling function--its evaluative tendency, its reliance on the sensory dimensions of consciousness, and above all its strong subjectivity--are all

attributes which Jung had first noticed in the word associations of his predicate-type subjects.[11] Although he does not explicitly make the connection in his discussion of the types, the pattern seems compelling, as does the conclusion which follows: that as exemplars of the feeling type, individuals with high levels of predication would, almost by definition, have difficulty with the use of their thinking function. And to the extent that thinking is a process of conceptual coordination, those who show a preference for the coordination of words with reference to concepts should, by contrast, demonstrate a well-differentiated thinking function. However, by the time he had completed his work on functions and types, Jung had long since abandoned the experimental method which might have given empirical support to his theory, which rests instead on clinical observations from his practice as a psychoanalyst.

Thus far, the discussion has centered around several specific aspects of Jung's approach to individual psychology, on cognitive processes which can be subjected to analysis as isolated phenomena in persons equally isolated from one another. What remains to be examined is his work in the area of functional systems, his observations on the psycholinguistic dynamics of the family.

## The Family Constellation

Jung warned the students of his early experimental research that the results of an individual's word association test should not be taken as indicative of an "intellectual" type. The coordinates, definitions, or predications which dominate a subject's reaction pattern are not, he emphasized, the products of "intellectual peculiarities, but depend entirely on emotional attitudes." The

better educated subjects

> usually show trivial, well-canalized verbal associations, whereas the uneducated make more valuable, often more meaningful, associations. This behavior would, from an intellectual point of view, be paradoxical (1973, p. 458).

The clear conceptualizations and orderly verbal arrangements which appear in the responses of less educated people, Jung suggests, are not so much the result of an evolved thought process as of emotional involvement, an interest in the task, which contributes to an intensity of attention by means of which the deeper conceptual associations may be accessed. The attention of educated subjects is not so well concentrated; their emotions are not engaged by the task, and as a result the associations they produce arise from the more superficial and automated level of semantic and linguistic analysis.

Attention, Jung suggests, is in itself an emotional phenomenon (1973, p. 525),[12] and a critical one, in that the quality and depth of cognitive processing is directly dependent upon it. But other, more obvious, signs of emotion are to be found in the responses of the predicate or the complex type individual, which become even more striking when the individual's associations are set in context of the responses of his family. Certain reaction-types--in particular the predicate type--tended to redundancy within family groups, with consequences that Jung believed could be detrimental to the development of the children within the family.

The question of reaction patterns within families had arisen in the earliest stages of Jung and Riklin's investigation of associative behavior in normal subjects. Their original experimental sample of thirty-eight individuals had contained eight subjects who shared a

family connection: two sets of sisters with their respective mothers, and a mother and daughter pair. All members of each family group, when tested, proved to belong to the same reaction-type, and furthermore, the differences between and among their individual reaction patterns seemed to occur in a regular and predictible way.

These preliminary observations seemed to the researchers to justify the hypothesis of a "familial disposition" (1973, p. 60) as a way of explaining the phenomenon, but in order to explore the deeper dimensions of this linguistic similarity among members of the same family, a second experiment was designed and carried out under Jung's supervision by one of his students at the Burgholzli, Dr. Emma Furst. Association tests were performed with members of twenty-four families of varying levels of education and social status, and the results were published in 1909, in the second volume of Diagnostic Association Studies. In the same year, Jung presented the material in a lecture, "The Family Constellation," at Clark University in Worcester, Massachusetts.[13]

As had been predicted, members of families were found to show striking similarities in their associations, not simply in terms of the words with which they responded, but also in terms of their response patterns, the way the responses fell into the categories of the logico-linguistic classification system. In the absence of what we might consider standard statistical tests for the quantification of the observed phenomena, Jung invented a simple numerical formula by which individual responses could be compared with each other, and was able to demonstrate that the reaction patterns of relatives show greater similarity to each other than do the patterns of unrelated persons. Interfamilial agreement was correlated with the relationship

of the individuals compared: children's associations were closer in type to the mother's responses than to the father's; mothers were closer to their daughters than to their sons, and married women seemed more affected by the reaction type of their spouse than that of their family of origin.

The linguistic conformity of some respondents in the sample was uncanny. Speaking at Worcester of one mother-daughter pair, Jung says:

> One might indeed think that in this experiment, where the door is thrown wide open to so-called chance, individuality would become a factor of the utmost importance. . .But, as we have seen, the opposite is the case. The daughter shares her mother's way of thinking, not only in her ideas but also in her form of expression; so much so that she even uses the same words (1973, p. 469).

The kind of thought captured in an associative response, Jung says, is "not inconsequent. . .nor free, but strongly determined within the boundaries of the environment.

> If, therefore, even the most superficial and apparently most fleeting mental images are entirely due to the constellation of the environment, what must we not expect for the more important mental activities, for emotions, wishes, hopes, and intentions? (1973, p. 469)

The emotional attitude of the parent, as conveyed in a habitual reaction type, can so contaminate the familial environment that the child adopts that attitude as his own, complete with its linguistic forms of expression. This is particularly the case, Jung says, with the reaction-types that are most charged with emotional content, those highest in the evaluative terms of predication.

The wife and daughter of a chronic alcoholic, tested in the experiment, were examples of this form of psycholinguistic

identification.[14] It may be understandable, Jung says, for the wife to express her disillusionment with her life through the predication of intense value judgments, but

> it is quite unnatural for the daughter to appear as an extreme evaluating predicate type. She responds to the stimuli of the environment precisely as her mother does. But whereas, in the mother, the type is to some extent a natural consequence of her unhappy situation, this simply does not apply to the daughter. The daughter merely imitates her mother; she follows her mother's pattern (1973, p. 473).

This imitation is neither conscious nor intentional; rather, it is the sign of an unconscious and highly dangerous process of empathetic identification, a result of the child's inability to protect herself from being permeated by the intense emotional environment in which she lives. The phenomenon by which emotions are transmitted among living beings is biological in origin and was designed to protect the individual and the group; the expression of feelings serves survival by evoking similar feelings in others. But the engagement of this primitive response in more developed surroundings can have devastating consequences. Close contact with the emotional force of an evaluating predicate type leaves the bystander feeling "infected," overwhelmed, "carried away." And, as the associative evidence suggests, the impact of this assault on the empathetic system can even transform a young girl into the likeness of a dissatisfied and bitter matron, doomed, perhaps, to repeat her mother's unhappy destiny (1973, p. 473).[15]

This example of the transmission of attitude from mother to

> It is not pious precepts nor the repetition of pedagogic truths that have a moulding influence on the character of a developing child; what most influences him are the unconscious personal affective states of his parents and teachers. Hidden conflicts. . .secret worries, repressed wishes, all these produce in the child an emotional state, with clearly recognizable signs, that slowly but surely, though unconsciously, seeps into his mind, leading to the same attitudes and hence the same reactions to the environment.

Among those recognizable signs are the verbal reactions that appear on a test of word associations, but other behavioral manifestations may serve as signs as well.

> Fathers and mothers deeply impress their children's minds with the stamp of their personalities; the more sensitive and impressionable the child, the deeper the impression. Everything is unconsciously reflected, even those things that have never been mentioned at all. A child imitates gestures and, just as the parents' gestures are the expressions of their emotional states, so in turn the gesture gradually produces an emotional state in the child, as he makes the gesture his own. His adaptation to the world is the same as his parents' (1973, p. 474).

Word and gesture then, not only convey information about attitude and affective state, but can actually induce them in the child. Reactions to the environment, habituated through practice and reinforced by the milieu, perpetuate themselves across generations, leading to the development of what Jung had earlier called "the family disposition." An understanding of these processes by educators was essential, he believed, in order for them to discharge their responsibility to the developing child, in liberating him from the debilitating influence of the home environment, while helping him retain whatever might be of value in it. At the very least, they ought not to contribute to the child's difficulties by permeating the school atmosphere with their own unresolved emotional issues.

The discovery of agreement in reaction-type among family members, for Jung, was not simply an intellectual curiosity. It had profound implications for the cognitive development of children, and an equally profound significance for the healthy functioning of the family as a group. The mere fact of linguistic conformity was only the surface manifestation of a deeper current, one which powered the family system and underlay the dynamics of its members' interactions with one another.

In a contemporaneous work, "The Significance of the Father in the Destiny of the Individual" (1961), Jung further developed his themes of environmental contagion, the influence of evaluative predication on the emotional states of others, and the psychological dangers of identification, and amplified his theories with case material from his therapeutic practice. Although in terms of conclusions it does not add to the impression he had left in his speech on "The Family Constellation," it indicates the centrality of these ideas to the cognitive theory he had evolved from his observations of verbal associative behavior. And although it is cast in Freudian terms, the work stands as an important link in Jung's own post-Freudian theoretical development. In future years, he was to return to the same material, and, just as he had found evidence to support Freud's views in his days as a young psychiatrist, he would look at the data again and find the foundation of his own mature theory of the psyche, the theory of archetypes and the collective unconscious.

Although the word association work done at the Burgholzli Clinic at the turn of the century cannot be considered "statistical" in the

modern sense of the term--the experimenters worked only in terms of mean and modal figures, standard deviations and the correlational formula devised by Jung, and had no way of determining such matters as validity, reliability or significance--nevertheless, the descriptions of logical and linguistic patterns reported in the studies of family associations were made in such positive terms as to imply a high level of statistical significance. It was the purpose of the present study, reported in the chapter which follows, to replicate the Burgholzli work on family associations with a more modern statistical analysis, and to examine two claims of Jung's early cognitive theory: the existence of a family reaction-type, and the interference between the processes of thinking and feeling.

# C H A P T E R  I V

## THE EMPIRICAL STUDY

The processes of thinking and feeling, of predication and coordination, of associative and analytical cognition that had so fascinated C.G. Jung lend themselves to study through empirical means, no less so than did his sense that the family environment plays a critical role--perhaps the decisive one--in the development of an individual's cognitive style. In 1903, even before his first study of associative behavior was in print, Jung and his student, Emma Furst, were engaged in the analysis of responses from twenty-four families, the members of which showed remarkable agreement in terms of reaction-type. Once the fact of conformity among families had been suggested, however, no further work seems to have been done in this area, and as late as 1935, when Jung delivered a series of lectures on his psychological theories at the Tavistock Clinic in London (Jung, 1968), the material on family association he presented was derived from the early experimental work of Dr. Furst.

Although in an earlier presentation at Clark University he had described her study as of "merely theoretical importance" (1973, p. 466)--that is, without intrinsic therapeutic or psychoanalytic value--the insight it gave into the underlying structural similarity in cognition within family groups can hardly be dismissed so lightly. A metacognitive examination of one's reactions to the environment--and in essence, most reactions are purely associative in nature--cannot avoid comparison with the reactions of one's parents, siblings and other close relatives. Such a reflection can bring to light the

detrimental effects of automatic patterns learned in childhood, and lead an individual to the assumption of responsibility for the content of his own reactions.

The present chapter reports an experiment that was designed to explore two aspects of Jung's early theory of cognition: first, that a "family disposition" shapes the associative styles of individual members into conformity with one another; and second, that the cognitive qualities of the feeling function interfere with the operation of logical thought. A simple word association test, coupled with a test of deductive reasoning, provided the tools for the exploration. Fifty-two members of fifteen different families then agreed to grant this special glimpse into the logical and linguistic patterns that exist within their households.

## Conditions of the Experiment

Hypotheses. This work was begun with four basic hypotheses:

1. That as Furst had demonstrated, there is a statistically significant level of redundancy in patterns of associative response among family members;

2. That the predicate reaction-type is dominant in any family in which it occurs in at least one of the parents;

3. That mothers and daughters will show a higher degree of linguistic conformity than other family members;

4. That a high proportion of predicate responses on a test of word association will correlate negatively with a standard measure of deductive logic, one of the major critical thinking skills.

In addition, the experiment was designed to provide parameters within which the response agreement of normal families might be contained. Although Jung, Riklin and Furst were interested in aspects of individual psychology and reported their data to reflect the behavior of individuals and individual families, the present analysis will focus only on trends within the aggregate.

Selection of subjects. Unlike an experiment that seeks to examine the characteristics of a number of free and unassociated individuals, a study of families is made much more complex by the fact that consent must be given by all members of the group in order for that group to be considered as a coherent system. The unavailability, unwillingness, or incapacity of one or two members to participate can leave the experimenter with an interesting, but incomplete, picture of processes operating within the group as a whole, and unfortunately this was the case in all but two of the families in the sample. To this complication should be added the circumstances of divorce and death of a parent, which obtained in four of the sample families; in these cases the extent of associative resemblance of the children to the absent parent can never be subject to investigation.

However, these limitations reflect the realities of everyday life, and their influence on the sample discussed here is a consequence of the experimenter's decision not to design a clinically ideal sample, with artificial constraints placed on the compositional or numerical definition of "family," but rather to follow the more pragmatic practice of Jung and Riklin in selecting the individuals to study. Like the thirty-eight men and women who were chosen to serve as

subjects in the original Burgholzli experiment on associations of normal individuals, the core participants in this study were all affiliated with the institution where the experiment took place: they were either professional colleagues of the experimenter or fellow students in the graduate program. Random chance thus did not play a part in the initial selection of the families, but the inclusion of a family's data did depend, in the final analysis, on the unpredictable agreement of a majority of its members to participate as subjects in the experiment.

Four of the families who were asked to serve did not do so: of these, one refused at the outset; another withdrew after the testing was already well underway; and two, who had agreed in principle, found it impossible to make themselves available during the time frame in which the experiment was conducted. On the other hand, one family came forward voluntarily to participate, after the father heard from someone in his office that the study was being done.[1] With this one exception, however, all families were personally invited by the experimenter through one of their members, usually a parent; and consent of other family members was obtained either by the experimenter personally or by a member of the family who had already been tested, and who could therefore allay the concerns of relatives who might otherwise hesitate to participate if asked by a stranger. No subject was compensated for participation.

Characteristics of the sample. A total of fifty-two individuals are included in the sample, representing fifteen different families. Six might be described as traditional nuclear families; two are

multi-generational extended families, two are extended families involving in-laws, and in addition there are two separate dyads, a father and son, and a pair of sisters. The most extensive family unit in the sample comprised nine individuals: two parents, six children and a grandchild whose father is the parents' oldest son, and who frequents the homes of all his older relatives, including the grandparents. Two of the families consist of two parents and four children, and in one of these groups, the husband of the youngest daughter and two children of the oldest daughter also agreed to participate.

The composition of the sample in its final form is detailed in Table 1. The unit of analysis is the dyad, a structural relationship obtaining between any two members of the family. Abbreviations which will be used in subsequent tables to refer to dyadic relationships are also given in Table 1.

For the sake of simplicity, a family is defined as a nuclear group comprised of at least one parent and at least two children; thus, the smallest family in the sample will consist of at least three dyads. These nuclear groups will be considered as separate units, regardless of any relational affiliation which may exist with members of other nuclear groups.[2] In other words, the extended family relationships of aunts, uncles, grandparents, cousins and in-laws which are present in the sample as a whole will not be subjected to analysis for levels of linguistic conformity. Given this working definition of "family," then, the sample contains nine families (Families 1 through 7, 9, and 11), and two groups which might better be conceived as sets of dyads (Families 8 and 10), as well as four

TABLE 1

Composition of Sample Families

| | |
|---|---|
| **Family 1: 6 members, 15 dyads** | |
| Father-Mother (f-m) | 1 |
| Mother-Daughter (m-d) | 2 |
| Mother-Son (m-s) | 2 |
| Father-Daughter (f-d) | 2 |
| Father-Son (f-s) | 2 |
| Sister-Sister (s-s) | 1 |
| Brother-Brother (b-b) | 1 |
| Brother-Sister(b-s) | 4 |
| **Family 2: 4 members, 6 dyads** | |
| Father-Mother | 1 |
| Mother-Daughter | 1 |
| Mother-Son | 1 |
| Father-Daughter | 1 |
| Father-Son | 1 |
| Brother-Sister | 1 |
| **Family 3: 4 members, 6 dyads** | |
| Father-Mother | 1 |
| Mother-Son | 2 |
| Father-Son | 2 |
| Brother-Brother | 1 |
| **Family 4: 9 members, 29 dyads** | |
| Father-Mother | 1 |
| Mother-Daughter | 3 |
| Father-Daughter | 3 |
| Mother-Son | 3 |
| Father-Son | 3 |
| Sister-Sister | 3 |
| Brother-Brother | 3 |
| Brother-Sister | 9 |
| Father-Grandson (gs) | 1 |
| **Family 5: 3 members, 3 dyads** | |
| Mother-Companion (m-pc) | 1 |
| Mother-Son | 1 |
| Companion-Son (pc-s) | 1 |
| **Family 6: 3 members, 3 dyads** | |
| Father-Mother | 1 |
| Mother-Daughter | 1 |
| Father-Daughter | 1 |
| **Family 7: 6 members, 15 dyads** | |
| Father-Mother | 1 |
| Mother-Daughter | 4 |
| Father-Daughter | 4 |
| Sister-Sister | 6 |
| **Family 8: 3 members, 2 dyads** | |
| Mother-Daughter | 1 |
| Mother-Daughter-in-Law(dl) | 1 |
| **Family 9: 3 members, 3 dyads** | |
| Mother-Daughter | 1 |
| Mother-Son | 1 |
| Brother-Sister | 1 |
| **Family 10: 4 members, 6 dyads** | |
| Mother-Daughter | 1 |
| Daughter-Husband (d-h) | 1 |
| Husband-Sister (h-s) | 1 |
| Mother-Son in Law (sl) | 1 |
| Mother-Husband's Sister(hs) | 1 |
| Daughter-Husband's Sister | 1 |
| **Family 11: 4 members, 6 dyads** | |
| Father-Mother | 1 |
| Mother-Son | 2 |
| Father-Son | 2 |
| Brother-Brother | 1 |
| **Dyad 12 (Family 7)** | |
| Husband-Wife (h-w) | 1 |
| **Dyad 13 (Family 4)** | |
| Father-Son | 1 |
| **Dyad 14** | |
| Father-Son | 1 |
| **Dyad 15** | |
| Sister-Sister | 1 |
| **TOTAL DYADS IN SAMPLE** | **98** |

separate dyads of related individuals (Families 12, 13, 14, and 15). Data from these dyadic groups are not included in all portions of the analysis which follows.

The native language of all subjects is English. With that single characteristic in common, the families represent a broad range of ethnic, cultural and socio-economic backgrounds. One family is black, and deeply involved in the life of its religious community. One family is Jewish, six are Irish-Catholic, and in one family, the parents retain a strong fundamentalist Protestant affiliation which has been abandoned by the children. In two of the families, expressed unorthodox spiritual beliefs prevail, and in two, there was no mention made of cultural, religious or spiritual ideation.

In terms of socioeconomic distribution, no direct data was taken on range of family income, but inferences can be drawn from the educational level and occupation of family members. Sixteen of the adult participants are employed or self-employed in professional or administrative capaticies; eleven can be classed as blue-collar workers, a category which includes supervisory positions for which a college education is not required. Five are primarily homemakers; thirteen are full-time students, including nine who are currently in grade school or high school; and six reported themselves as retired, but with the exception of only one, a businessman, did not specify the positions which they held during their working careers.

All families can be assumed to fall into a moderate to lower-middle income range; none were exceptionally prosperous, and while some might conceivably identify themselves as members of the "working poor," none were below the official poverty level. All but

two of the families live in a major metropolitan center; one family lives in a small town in a rural area, and one in a moderate-sized community at some distance from any large city.

In terms of education, twenty of the thirty-one adults in the sample held at least the baccalaureate degree. Another eleven, of whom four are currently full-time college students, had attended between one and three years of college, and twelve had only a high school diploma.

The sample was slightly weighted toward women, with twenty-eight female participants, as against twenty-four males. Subjects ranged in age from 12 to 76 years of age; twenty-two of the subjects, or 42%, fell in the mid-range age bracket of 20 to 39; ten were below the age of 19; eight were between the ages of 40 and 59, and twelve were over the age of 60.

Although care was taken as much as possible to select only families which were not exceptional in terms of emotional difficulties or disturbances within the home, information volunteered after the test by individual subjects revealed the fact that in at least four of the families, conditions in the past had been such as to warrant some degree of professional or psychiatric intervention with at least one of the members. To what extent such intervention may have been necessary in other families whose members were not quite so forthcoming will, of course, never be known. It is worth mentioning, however, for several reasons: first, as a reminder of how truly commonplace psychological dysfunction can be, even within a seemingly "normal" population; second, because echoes of disturbance still resonate in the responses of a number of the subjects of the test

reported here; and third, because past experience with psychological assessment practices had made some of the subjects unhappily familiar with the specific process of the word association test.

Since the purpose of this experiment was an analysis of linguistic phenomena and their relation to formal-logical processes, and not an examination of individual or group pathology, however, it was decided that no data would be excluded from the sample solely on the basis of the subject's reported or self-confessed psychological history. Where data has had to be excluded from some portion of the analysis (and in one case this proved to be necessary), it is only because the subject deliberately refused to comply with the instructions given at the outset of the test. Where this exclusion occurs, it will be noted.

Test administration. The experiment was conducted in two parts. First, the subject was asked to give verbal associations to a list of one hundred ordinary words, read by the test administrator one at a time. Prior to the beginning of the test, the subject was read, or was given to read, a set of instructions which asked that he or she simply say the first word that came to mind, as quickly as possible, after the stimulus word had been heard and comprehended. At the conclusion of the word association task, the subject was given ten minutes to complete eighteen questions from the deductive logic section of the Ross Test of Higher Cognitive Processes. These instruments are reproduced as Appendices 1 and 2.

Time constraints, as well as logistical considerations, dictated the creation of a research team to assist with the administration of

the tests. Twenty-one of the fifty-two subjects were tested directly by the experimenter. The rest of the data was collected by nine colleagues, each of whom had first been tested and then given a set of simple guidelines to govern their behavior as test administrators. Each of these nine assistants then obtained data from at least one other member of his or her immediate family, and two of them, who became entranced by the game-like quality of the process, went on to test eight relatives apiece, including parents and siblings as well as nieces, nephews and in-laws.

In all but six cases, the test was administered with subject and tester face to face in the same room. In those six cases, where the relatives were away at school or permanently living in another city, the word association test was administered by telephone, and the Ross Test was either mailed or was not given at all. Ten of the subjects were tested in their workplace (or the workplace of the parent, in the case of one minor child); the remainder were tested either in their own homes or in the "family" home, the residence of those members around whom the extended family centers. Although every effort was made to insure that each subject had the same degree of privacy with the tester, in one family it proved necessary to test two members in the presence of the mother, who had already given her responses.

The majority of the testing for each group was carried out at the same place, on the same day, and took place either during a holiday, when the family had already planned to be gathered together, or in the early evening of a workday, after dinner. Two of the subjects had just awakened from a nap at the time the test was administered, and this condition may have had an effect on both the content of their

responses and their reaction-times.[3] In three families, the testing of individual members extended over a period longer than a week, and this was due both to logistical difficulties as well as to uncertainty as to whether or not the prospective subjects would agree to participate.

Part of the condition of the experiment was that individual subjects not be made aware of responses that other family members, previously tested, had given to the stimulus-words. Where groups were tested in the home, great care was taken to see to it that the subject and the tester were physically isolated from other family members who were waiting to be tested. Even in cases where the time period of the experiment was prolonged over several days or weeks, it is most unlikely that the subjects who were last to be tested had been made aware of the responses previously given by their relatives.

In these conditions, a total of 5,200 word associations was collected, together with thirty-eight completed copies of the Ross Test of deductive reasoning.

## The Word Association Experiment

The instrument and classification system. The word list used in the experiment was closely modelled on the A.A. Brill translation of the list reported by Jung in his 1909 article, "The Association Method" (1973). As an instrument, that list had itself been modified in practice over the course of time from the list initially devised for use in the experiments at the Burgholzli Hospital; in particular, many

of the highly-charged affect-laden terms in the original list had been dropped in favor of milder words signifying a similar concept, or neutral terms evocative of no particular affective response. The present list (see Appendix 1) differs from the Brill version of Jung's list in twelve items. Of these alterations, seven are different translations of the original term, and five are substitutions from an earlier version of the list for stimulus words that were thought to be redundant or inappropriate for a test involving children.[4]

It would be ideal to be able to classify the stimulus-words as to grammatical form, with fixed percentages of nouns, verbs, and adjectives, and in fact, this sort of computation could be done with the formal signs which appear in the written list. In practice, however, as the written signs are transformed first into acoustic patterns by the speaker and then into mental concepts by the hearer, they undergo permutations which take them far from their original, clear-cut morphological identity. There are at least thirteen words on the stimulus-list that lend themselves to ambiguities in interpretation, due to the homonymous form they assume when functioning in different grammatical roles. Is "fall," for example, an unequivocal verb in the German original, necessarily a verb in English? Might it not also be a noun, or could it perhaps even be an adjective, as in "fall foliage"? Can "marry" not legitimately be heard as "Mary," or "dear" as "deer," leading to unexpected, but perfectly direct, associative responses?

To a great degree, such ambiguity as to nouns and verbs was absent from Jung's German list; the formal structure of German verbal infinitives instantly distinguishes them as verbs, an identification

which must be accomplished in English by the addition of the separate prefix "to," as in "to pay," "to ask," "to swim." The Brill translation of Jung's list faithfully reproduces the cumbersome two-word verbal infinitive for the 24 stimulus-words which were single-word verbs in the German original. The present list did not formally indicate any differentiation between verbs and other grammatical forms, leaving the interpretation, and consequently a wider field of choice for a potential associative response, entirely up to the subject. Several subjects were uncomfortable with this degree of freedom, and wanted to know "which one" of the homonyms the experimenter meant; the answer was that it was whichever one the subject thought it was. The lexicon of responses, which appears in the appendix, clearly shows the degree to which subjects differed in their interpretation of the given stimuli.

Classification of response words. The source of numerical data on which the following analysis is based is the time-consuming, perplexing and at times intensely frustrating process of response word classification, a "difficult and unrewarding task" indeed, in the words of Jung and Riklin (1973, p. 9). The entire analytic structure of comparisons and conclusions, of coherence, of contrast, of commonality and of difference must stand or fall on the foundation laid, piece by painstaking piece, in the relationship identified between each single stimulus-word and its elicited associate. The perils inherent in this process are not to be minimized. Just as a word like "fall" is not by nature a noun, an adjective or a verb, but is boxed into its semantic function by the verbal environment which surrounds it at any given time, so too a superficially self-evident

verb-noun pair like "pay-money" or "ride-rollercoaster" may on deeper examination prove to be an implied pair of synonyms, on the one hand (the pay one receives is in the form of money), or a specification of an implied substantive, on the other (rollercoaster as one particular instance of "a ride").

It might be thought that the subjects who gave the responses ought to be able to help to clarify their associative relationship to the stimulus word, and in some few cases, particularly in response-pairs which reproduce current advertising slogans or other culturally-embedded proper nouns (names of television shows, rock groups or popular publications), post-test questioning of the subject proved to be helpful. For the most part, however, the subjects either could not remember what they had actually thought while producing the response in question, or in trying to remember began to confuse themselves with other possible alternatives to the explanation that first came to mind. After provoking a few such embarrassing situations, the experimenter chose to stop asking for subjective explanations, and to rely on intuition and the inner logic of the subject's overall response-pattern to help classify any questionable responses.

In general, responses have been classified according to the schema presented by Jung and Riklin in their 1904 article, "The Associations of Normal Subjects," which is described in detail in the preceding chapter. The organizing principle of this hierarchical system is the degree of logical relatedness obtaining between the stimulus and response words. A summary of the analytical categories is presented in Table 2, on the following two pages. Column 1 gives the categories of the most detailed analysis performed by Jung and

Table 2
Response Classification Systems

| Jung-Riklin System | Simplified J-R System | Furst's System |
|---|---|---|
| **I. Internal Associations** | | |
| A. Grouping | | |
| 1. Coordination | 1. Coordination | 1. Coordination |
| a. By common general concept (0111) | | |
| b. By similarity (0112) | | |
| c. By internal relationship (0113) | | |
| d. By external relationship (0114) | | |
| e. By example (0115) | | |
| 2. Subordination | | |
| a. Actual subordination (0121) | | 2. Sub- and Supra-ordination |
| b. Specification (0122) | | |
| 3. Superordination (0130) | | |
| 4. Contrast (0140) | | 3. Contrasts |
| 5. Groupings of Doubtful Quality (0150) | | |
| B. Predicative relationship | 2. Predicate | |
| 1. Noun and adjective | | |
| a. Internal predicate | | |
| i. objective judgment (0211) | | |
| ii.value judgment (0212) | | 4. Value predicates |
| b. External predicate (0213) | | 5. Other predicates |
| 2. Noun and Verb | | |
| a. Subject relationship (0221) | | 6. Relationship of subject and object |
| b. Object relationship (0222) | | |
| 3. Determination of place, time, means and purpose (0230) | | 7. Designation of time, place, means, etc. |
| 4. Definition or explanation (0250) | | 8. Definition |
| C. Causal relationship (0300) | 3. Causal | |

| | | |
|---|---|---|
| **II. External Associations** | | |
| A. Coexistence (0400) | 4. Coexistence | 9. Coexistence |
| B. Identity (0500) | 5. Identity | 10. Identity |
| C. Linguistic-motor forms | 6. Linguistic-motor | 11. Linguistic-motor |
| 1. Canalized verbal associations | | |
| a. Simple contrasts (0611) | | |
| b. Current phrases (0612) | | |
| 2. Proverbs and quotations (0620) | | |
| 3. Compound words and word-changes (0630) | | 12. Word formation |
| 4. Anticipatory reactions (0640) | | |
| 5. Interjections (0650) | | |
| **III. Sound Reactions** | | |
| A. Word-completion (0700) | 7. Word-completion | 13. Word-completion |
| B. Sound (0800) | 8. Sound | 14. Sound |
| C. Rhyme (0900) | 9. Rhyme | |
| **IV. Miscellaneous** | | 15. Remainder |
| A. Indirect associations | 10. Indirect | |
| 1. Connection by common intermediate concept (1010) | | |
| 2. Centrifugal sound-shift (1020) | | |
| 3. Centripetal sound-shift (1030) | | |
| 4. Shift through word-completion or linguistic-motor form (1040) | | |
| 5. Shift through several intermediate links (1050) | | |
| B. Meaningless reactions (1100) | 11. Meaningless | |
| C. Failures (1200) | 12. Failures | |
| D. Repetitions of the stimulus word (1300) | 13. Repetition/stimulus | |

Riklin; the numbers in parentheses are the code numbers assigned to each category for purposes of the computer analysis performed in the present study. Column 2 gives the summary categories of Jung and Riklin's work with normal individuals, and column 3 shows the slightly different arrangement of summary categories used by Furst in her analysis of data from families. The analysis which follows will make reference to all three levels of complexity in terms of response classification.

The basic numerical data of the analysis derives from a classification across the full range of relational categories. Each category was assigned a unique four-digit code number on a scale proceeding from 0111, representing the tight conceptual bonds of coordinate responses, through intermediate numbers indicating the increasing marginality of linguistic responses, to the high numbers of residual responses and failures. Mean and modal figures for individuals and families can be understood with reference to this coding scale. A low modal response figure, for instance a 230 or 350, would indicate a predominance of conceptual or meaning-based associations in an individual's responses; the higher the figure, the more superficial the overall pattern it represents.

Prior to beginning a presentation of the data, however, a word remains to be said about some of the aspects of the classification system which diminish its capacity to function as an objective instrument. The identification of response category has in general followed the examples given by Jung and Riklin in their article "The Associations of Normal Subjects." In practice, it is difficult, if not in fact impossible, to identify the shades of meaning which might

distinguish an intended synonym from a coordinate response, and yet the difference is one which distinguishes two major relational classes, internal and external associations. Contrasts, or antonyms, likewise might be classed either as ordinates (internal) or as linguistic-motor reactions (external), depending on principles of judgment on which Jung and Riklin are not entirely clear. The choice of one category over another has implications for the weighting of an individual's entire response-profile, and consequently for any comparisons which might be drawn between individuals or among groups. In consideration of the inconsistencies which seem to have been built into the classification system, several principles of analysis have been adopted in this study which are intended to minimize the need for subjective judgment and provide for a reliable level of consistency in classification.[5]

The effect of these principles has been to shift the entire classification system in the apparent direction of the linguistic, less conceptually coherent, more automatized reaction types, with the result that individuals who habitually respond in synonyms and antonyms, for example, have a much higher numerical coefficient assigned to their response profile than they might have if any of those associations had been were classified as ordinates of some kind. This fact must be bourne in mind if the present data is compared with the results obtained by Jung, Riklin and Furst at the turn of the century.

Response commonality. The results from the fifty-two individuals in the sample were analysed and compared in a number of procedures which examined different dimensions of response commonality. The first set of procedures dealt with the actual word responses given by each individual, and the categories assigned to each response. In this phase of the work, comparisons among family members were made in such a way as to establish parameters within which relatives' associations are similar to each other; these similarities were then compared against levels of similarity which exist in the entire population of unrelated individuals. The second phase of the analysis examined the patterns which emerged when the data was sorted by category and grouped according to the schemas of Furst and of Jung. Here, coefficients of difference were established for each of the interfamilial dyads, and dyads were ranked within each family in order of their manifest agreement. Third, modal response types were determined for each family member, and a contingency test was performed to see if the patterns obtaining between parents and children was statistically significant.

In noticing that within a family, a father and son, for example, associate "like" one another, the observer might be making reference to any one of three dimensions in which associative similarity can be demonstrated. First, there is the surface level of the actual response words themselves: do father and son give an identical verbal response to the same stimulus word? But the words themselves fall into categories which begin to erode the differences perceived at this superficial level; father and son may reply with different words, but both words may be antonyms to the stimulus, and thus represent a

common response at the categorial level of analysis (for the full range of categories used in this analysis, see Table 2, column 1). Finally, a father and son may each respond with a great overall number of antonyms, but not necessarily to the same stimulus-words; a similar total percentage of shared response categories may exist, but the similarity can only emerge when individual response categories begin to be grouped into the more comprehensive summary categories shown in the second and third columns of Table 2.

In the present section, the first two levels of potential commonality between and among family members will be examined, those levels which reflect the actual verbal responses made to each of the one hundred stimulus words of the test, in the actual order in which they were given, and the most specific category into which the responses can be classified. The results summarized here are intended to be descriptive only; no standard statistical procedures or tests of significance were performed at this stage of the analysis.

Verbal commonality. The tendency of family members to produce the same verbal response to the same stimulus-word is most startling when the response words are unique to that family within the sample, or unusual in some other regard. The fact that all members of a given family respond with "sister" to the stimulus-word "brother," for example, loses its significance if this specific response has a high frequency in the sample as a whole. The associate-pair "journey-adventure," on the other hand, given only by three male members of Family 4, out of the entire population of fifty-two respondents, is a more viable indicator of associative commonality within that particular family.

Most of the common responses elicited in this experiment are, in fact, merely a reflection of conventional associative frequencies found in the population at large. However, the fact that linguistic convention underlies the shared responses of family members does not diminish the level of conformity as such within that family. As a matter of interest, the frequency of all responses elicited in the sample is given in the lexicon as Appendix 3.

Percentages of identical verbal responses given by family members are given in Table 3. Only those families with at least three related members are shown. The top figure in each column represents the number of instances in which all members of the family gave the same response to the same stimulus word; for example, in Family 4, with nine members, 4% of the stimulus words evoked an identical response from all members. In Family 1, there were no words which evoked the same response from all six members; on the other hand, in Family 7, also with six members, five stimulus words evoked the same response from all members.

Table 3

Percentage of Identical Responses to Stimulus Words

| Family | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 11 |
|---|---|---|---|---|---|---|---|---|---|
| | n=6 | n=4 | n=4 | n=9 | n=3 | n=3 | n=6 | n=3 | n=4 |
| | | | | | | | | | |
| 9 members, same response | | | | 4 | | | | | |
| 8 members, same response | | | | 4 | | | | | |
| 7 members, same response | | | | 5 | | | | | |
| 6 members, same response | 0 | | | 4 | | | 5 | | |
| 5 members, same response | 0 | | | 8 | | | 7 | | |
| 4 members, same response | 2 | 6 | 2 | 16 | | | 12 | | 5 |
| 3 members, same response | 18 | 19 | 15 | 25 | 10 | 13 | 19 | 5 | 14 |
| 2 members, same response | 45 | 37 | 43 | 83 | 29 | 23 | 73 | 35 | 35 |
| At least 2 with same response | 59 | 58 | 58 | 93 | 39 | 36 | 89 | 40 | 53 |

Succeeding rows in each column show the percentage of stimulus words to which an identical verbal response was given by any combination of members, with reference to the total number in the family. For example, in Family 2, with four members, three gave identical responses 19% of the time, but they were not necessarily the same three individuals in every case.

Because the families are composed of differing numbers of members, it is not possible to make many direct comparisons from one family to another. However, it seems as though larger families have a greater chance of common responses occurring in at least two of the members (last line of Table 3) because of the greater number of dyads existing within them.

The consideration of any two responses to each stimulus word leads to an examination of responses given by specific individuals in comparison with other members of their families; these figures are given in Table 4, on the following page. Each member of a family is compared with any and all other members for identical verbal responses. In Family 1, for example, 38% of the father's verbal responses were matched by at least one other member of his family, while only 11% of the mother's responses were shared by any other member. Again, higher percentages seem to be associated with greater numbers of individuals in the family, with commonalities in the 50-60% range appearing in Families 4 and 7, but only 27-32% in families of three members. The lowest commonality figures in the sample belong to the mother and first daughter of Family 1, and, as will be seen, the response patterns of these two individuals will so depress the aggregate averages as to require their exclusion from some of the calculations which follow.

Table 4

Percentage of Responses Shared by Individuals with Any Other Member of the Family

| Family | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 11 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| father | 38 | 41 | 38 | 45 | 28 | 29 | 59 | | 29 |
| mother | 11 | 36 | 43 | 63 | 28 | 28 | 58 | 28 | 40 |
| 1st child | 11 | 37 | 37 | 47 | 32 | 28 | 52 | 29 | 34 |
| 2nd child | 27 | 41 | 41 | 54 | | | 48 | 27 | 29 |
| 3rd child | 38 | | | 60 | | | 55 | | |
| 4th child | 26 | | | 51 | | | 43 | | |
| 5th child | | | | 63 | | | | | |
| 6th child | | | | 39 | | | | | |
| grandchild | | | | 47 | | | | | |

Although not every family can be analysed into comparable dyads, some overall averages can be established for the degree to which family members share common verbal responses with each other. The figures in Table 5 represent the percentage of instances in which the identified family member gave a verbal response which was identical to the response of any other member of the family.

Table 5

Average Percentage of Responses Shared by Individuals with Any Other Members of the Family

| | |
|---|---|
| Father: | 38.4 |
| Mother: | 37.2 |
| 1st Child: | 33.3 |
| 2nd Child: | 36.6 |

These figures suggest that in the average family of three or more members, any individual might be expected to produce the same association as any other member between 33-38% of the time.

Once this general level of verbal commonality has been established, it remains to compare responses from specific pairs of

individuals, to determine the commonality which exists between members of structural intrafamilial dyads. Results from this analysis are presented in Table 6, on the following page. Families of three or more members are given on the left half of the chart; families of dyads are on the right.

Here, commonality ranges from 1 to 31%, with about half of the dyads (39 out of 77) producing identical responses between 20 and 30% of the time. Family groups, conceived as the aggregate of their constituent dyads, show commonality averages of between 7.2 and 26.0%, with a mean of 19.3%, and the average verbal commonality of all intrafamilial dyads is 17.9%. The two highest figures, 29 and 31%, belong to mother-daughter dyads, the mother and second oldest daughter from Family 7, and the mother and third oldest daughter from Family 4, respectively. The next highest figure, 28%, is shared by two other dyads from Family 7, the mother-father pair, and the pair consisting of father and second daughter. Again, the lowest figures in all but one of the dyadic categories are to be found in the responses of Family 1.

The summary given in Table 7 represents averages for the major intrafamilial dyads in the sample. These figures indicate the instances in which both members of the identified pair produced identical verbal responses to the same stimulus word. It seems that parental dyads, and mother-elder child dyads, give identical response more often than other pairs of relatives, but the differences are so slight as to carry no significance. What emerges clearly from these figures, however, is that any given pair of family members might be expected to produce identical responses to any stimulus word just under 20% of the time.

Table 6

Percentage of Identical Responses Given by Members of Familial Dyads

| FAMILY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 11 | | 8 | 10 | 10 | 10 | 12 | 13 | 14 | 15 | Averages |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | |
| DYAD | | | | | | | | | | | | | | | | | | | |
| Father-Mother | 4 | 18 | 26 | 23 | 17 | 21 | 28 | | 19 | | | | | 18 | 17 | | | | 19.10 |
| Father-1st Child | 6 | 23 | 10 | 20 | 21 | 21 | 26 | | 16 | | | | | | | 23 | 25 | | 19.10 |
| Father-2nd Child | 9 | 24 | 18 | 17 | | | 28 | | 14 | | | | | | | | | | 18.30 |
| Father-3rd Child | 23 | | | 18 | | | 23 | | | | | | | | | | | | 21.30 |
| Father-4th Child | 11 | | | 23 | | | 22 | | | | | | | | | | | | 18.60 |
| Mother-1st Child | 4 | 18 | 24 | 23 | 21 | 18 | 24 | 17 | 26 | | 13 | 18 | | | | | | | 18.70 |
| Mother-2nd Child | 4 | 25 | 14 | 22 | | | 20 | 16 | 18 | | | | | | | | | | 17.00 |
| Mother-3rd Child | 4 | | | 31 | | | 29 | | | | | | | | | | | | 21.30 |
| Mother-4th Child | 2 | | | 20 | | | 17 | | | | | | | | | | | | 13.00 |
| 1st Child-2nd Child | 3 | 20 | 12 | 17 | | | 22 | 17 | 14 | | | | 27 | | | | | 26 | 17.50 |
| 1st Child-3rd Child | 4 | | | 25 | | | 22 | | | | | | | | | | | | 17.00 |
| 1st Child-4th Child | 1 | | | 20 | | | 22 | | | | | | | | | | | | 14.30 |
| 2nd Child-3rd Child | 13 | | | 24 | | | 21 | | | | | | | | | | | | 19.30 |
| 2nd Child-4th Child | 9 | | | 24 | | | 14 | | | | | | | | | | | | 15.60 |
| 3rd Child-4th Child | 11 | | | 20 | | | 27 | | | | | | | | | | | | 19.30 |
| | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| AVERAGES | 7.2 | 21.3 | 17.3 | 21.8 | 19.6 | 20 | 23 | 16.7 | 17.8 | | 13 | 18 | 27 | 18 | 17 | 23 | | | |

Table 7

Average Percentage of Verbal Response Commonality in Members of Familial Dyads

| | |
|---|---|
| Father-Mother: | 19.5 |
| Father-1st Child: | 17.9 |
| Father-2nd Child: | 18.3 |
| Mother-1st Child: | 19.4 |
| Mother-2nd Child: | 17.0 |

Categorial commonality. When the focus of analysis is shifted to the next level of abstraction, that of responses among family members which share a category designation in common, the figures show a marked increase in commonality. At the categorial level of analysis, verbal responses which differ in content may represent the same "type" of response. For example, the stimulus-response pairs "bird-fly" and "bird-sing" although apparently different, are both "predicate" responses to the stimulus, actions or states which can be predicated of the term "bird," and thus are classified as belonging to the same category of response. Again, the full range of categories into which responses have been classified is given in Table 2, above.

As Table 8, on the next page, indicates, for families of six or more members, 99-100% of all stimulus-words will evoke responses from at least two family members which can be classified in the same category, using the thirteen-part Jung-Riklin system shown in Table 2. In families of four, between 87 and 100% of stimulus words evoke a response of identical category from two or more members of the group, and families of three show about a 70% categorial commonality rate between responses of any two members.

Families of six or more share between 40-50% responses among half their members; families of four have a slightly higher rate of commonality among half their members, between 56 and 66%. The highest

Table 8

Percentage of Categorial Responses in Common

| Family | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 11 |
|---|---|---|---|---|---|---|---|---|---|
| | n=6 | n=4 | n=4 | n=9 | n=3 | n=3 | n=6 | n=3 | n=4 |
| | | | | | | | | | |
| 9 members, same category | | | | 6 | | | | | |
| 8 members, same category | | | | 7 | | | | | |
| 7 members, same category | | | | 11 | | | | | |
| 6 members, same category | 1 | | | 13 | | | 8 | | |
| 5 members, same category | 6 | | | 19 | | | 15 | | |
| 4 members, same category | 13 | 13 | 6 | 28 | | | 28 | | 15 |
| 3 members, same category | 46 | 29 | 31 | 50 | 22 | 25 | 40 | 21 | 26 |
| 2 members, same category | 77 | 66 | 56 | 79 | 51 | 46 | 74 | 52 | 62 |
| At least 2, same category | 99 | 92 | 87 | 100 | 73 | 71 | 100 | 73 | 90 |

rate of unanimity is found in Family 6, where 25% of the stimulus-words evoked responses in the same category from all members of the family. Family 1, which had no verbal responses shared by more than four of its six members and only two identical responses shared by four members (see Table 3, above), shows 13% commonality among four members when the verbal associations are converted into their appropriate relational classifications.

Overall, the rate at which a similar category response is produced seems to be about twice the rate which occurs when only the actual response word itself is taken into account. This result has not been subjected to any test of statistical significance, however, and until such time as a more detailed analysis is performed, it can only be presented as descriptive of a trend existing within the present sample.

When at least three responses are shared among members of a group which comprises four or more individuals, it is possible to analyse the percentages of commonality into constituent groupings representing

intrafamilial alliances or sub-systems. Of the 46 instances of common category response among three members of Family 1, for example, the father was party to 29 of them; seven of them involved the father and the two sons, and another eight involved father, mother, and older son. Of the thirteen instances in which four responses were shared in common, the father and older son were among the respondents in eleven of them; the older son was involved in all thirteen; seven of the instances included father, both sons, and the younger daughter.

While space does not permit a detailed analysis of all the commonalities which are include three or more members, suffice it to say here that the results seem to indicate the existence of demonstrable internal fissures within family groups, interior groupings among members which may indicate stable coalitions or subgroups among members. Only a sensitive post-test interviewing process would reveal the extent to which these verbal alliances are replicated in other areas of the family's interaction, and clearly, such investigation falls outside the realm of the present study. As a matter of interest, however, the data on interior groupings within family units is presented in Appendix 5.

When the percentage of shared category responses of each family member is compared with similar data on the verbal responses, all figures are elevated to a striking degree, more than doubled in most instances (see Table 9, on the following page). Most surprising of all are the figures for the mother and older daughter of Family 1, who shared only eleven verbal responses with any other members of their family (see Table 4, above). When the words they produced are converted into their appropriate relational categories, the daughter

Table 9

Categorial Responses Shared Among Family Members

| Family | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 11 |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| father | 73 | 68 | 67 | 85 | 58 | 58 | 90 | | 65 |
| mother | 57 | 69 | 60 | 90 | 54 | 53 | 82 | 55 | 68 |
| 1st child | 40 | 59 | 52 | 80 | 55 | 55 | 87 | 57 | 67 |
| 2nd child | 60 | 70 | 49 | 89 | | | 82 | 55 | 62 |
| 3rd child | 84 | | | 88 | | | 85 | | |
| 4th child | 67 | | | 85 | | | 79 | | |
| 5th child | | | | 91 | | | | | |
| 6th child | | | | 83 | | | | | |
| grandchild | | | | 92 | | | | | |

is shown to share 40% of her responses with others, and the mother a stunning 57%, a five-fold increase over her verbal commonality rate. Thus, although her actual words may have been ideosyncratic or unique, the way in which she approached the stimulus word--her choice of a relational category with which to respond--clearly was not. It is at this level of abstraction that deeper levels of agreement among family members can begin to become apparent, structural similarities which are obscured by the surface differences among individuals' verbal responses. The response words themselves differ, but the relations between stimulus and response may prove to be the same.

About 8% of the subjects share at least 90% of their categorial reactions with another member of the family, as can be seen in Table 9; the mother, second son and grandson of Family 4 and the father of Family 7 show this high degree of intersection with others. Another eleven persons--roughly one quarter of the sample--responded with words whose categories were matched by between 80 and 90% of their relatives'

responses. Even the lowest degree of commonality was a respectable 40%, and all individuals with the exception of this one (the older daughter of Family 1) shared categories in at least 50% of their responses.

Average figures for shared categorial responses of family members are presented below; these figures represent the percentage of instances in which the designated family member responds in categories which are matched by any other member of the family. As can be seen from a comparison with figures given above in Table 5, category commonality can be expected to occur at about twice the rate of the average level of commonality which exists when only the actual words themselves are examined. Again, because no commonly accepted statistical procedures were performed on these figures, they must be understood as merely descriptive.

Table 10

Average Percentage of Category Commonality for Family Members

| | |
|---|---|
| Father: | 70.5 |
| Mother: | 65.3 |
| 1st Child: | 61.6 |
| 2nd Child: | 66.7 |

As before, it seems as though the fathers share a somewhat higher percentage of responses with others in the family than do mothers or children, and that the younger child tends to a slightly higher degree of category commonality overall than the older child or the mother.

When categorial choice is examined across the structural dyads of which each family is composed (see Table 11, on the following page), an overall average family commonality rate of 38.37% emerges from the entire sample of related individuals. Commonality within dyads ranges

Table 11

Percentage of Categorial Commonality Among Family Dyads

| FAMILY | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 9 | 11 | | 8 | 10 | 10 | 10 | 12 | 13 | 14 | 15 | Averages |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | |
| DYAD | | | | | | | | | | | | | | | | | | | |
| Father-Mother | 19 | 37 | 37 | 46 | 37 | 40 | 48 | | 42 | | | | | 41 | 36 | | | | 38.30 |
| Father-1st Child | 15 | 36 | 29 | 44 | 42 | 42 | 44 | | 39 | | | | | | | 43 | 46 | | 38.00 |
| Father-2nd Child | 23 | 44 | 37 | 34 | | | 54 | | 34 | | | | | | | | | | 37.70 |
| Father-3rd Child | 50 | | | 43 | | | 42 | | | | | | | | | | | | 45.00 |
| Father-4th Child | 36 | | | 37 | | | 40 | | | | | | | | | | | | 37.70 |
| Mother-1st Child | 18 | 36 | 35 | 43 | 38 | 30 | 43 | 40 | 43 | | 30 | 38 | | | | | | | 35.80 |
| Mother-2nd Child | 21 | 44 | 25 | 35 | | | 40 | 38 | 35 | | | | | | | | | | 34.00 |
| Mother-3rd Child | 27 | | | 44 | | | 40 | | | | | | | | | | | | 37.00 |
| Mother-4th Child | 18 | | | 36 | | | 39 | | | | | | | | | | | | 31.00 |
| 1st Child-2nd Child | 15 | 33 | 24 | 28 | | | 40 | 39 | 37 | | | | 49 | | | | | 40 | 33.90 |
| 1st Child-3rd Child | 22 | | | 42 | | | 43 | | | | | | | | | | | | 35.70 |
| 1st Child-4th Child | 11 | | | 38 | | | 37 | | | | | | | | | | | | 28.70 |
| 2nd Child-3rd Child | 31 | | | 44 | | | 44 | | | | | | | | | | | | 39.70 |
| 2nd Child-4th Child | 27 | | | 49 | | | 30 | | | | | | | | | | | | 35.30 |
| 3rd Child-4th Child | 33 | | | 20 | | | 43 | | | | | | | | | | | | 38.30 |
| | | | | 39 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| AVERAGES | 24.4 | 38.3 | 31.2 | 40.1 | 39 | 37.3 | 41.8 | 30 | 38.3 | | 30 | 38 | 49 | 41 | 36 | 43 | 46 | 40 | |

from a low of 11% (Family 1, older daughter-younger son) to a high of 59% (Family 4, third son-grandson). Four of the dyads show a commonality of 50% or above; three of them involve pairs of males (Family 1, father-1st son; Family 4, 1st son-3rd son and 3rd son-grandson), and the fourth is a father-daughter pair (Family 7, father-2nd daughter). Thirty-six percent of the dyads in the sample share responses at a level of between 40 and 50%; of these dyads, two-thirds are members of Families 4 and 7, which are not only among the most numerous of the families, but also the most closely knit in terms of shared responses. Even the least closely related dyad of Family 7 still has a commonality rate of 30%, as compared with 11% for the comparable pair in Family 1, and 24% for the least similar pair in Family 3.

Average figures of categorial commonality in the most frequently occurring intrafamilial dyads are given in Table 12, below. As with the figures for individual respondents, the commonality of pairs when examined at the categorial level is about twice that obtaining when the words alone are subjected to comparison.

Table 12

Average Percentage of Categorial Commonality Within Familial Dyads

| | |
|---|---|
| Father-Mother | 38.3 |
| Father-1st Child | 36.4 |
| Father-2nd Child | 37.7 |
| Mother-1st Child | 36.2 |
| Mother-2nd Child | 34.0 |

Only those families consisting of three or more members have been figured into these averages. And as before, the father's similarity to both first and second children is slightly higher than that of the

mother. It is also worth mentioning that the father-son dyads which occur as isolated units in this sample would raise the overall average for fathers and children by several percentage points, for reasons which cannot be clarified in the absence of considerably more data.

The cohesion of a family's responses can be best expressed in terms of the actual percentages of common reactions, but the tightness of the range in which the commonalities are contained is also a measure of similarity descriptive of the family as a whole. Because it refers to the distance between the most and least similar members of the family, the figure for each family's range is rather less dependent on the factor of number of family members than is a numeric measure of shared responses among members, which tends to increase with increasing family size. The most expansive range of category commonality is 39, the difference between the 11% commonality of the 1st daughter-2nd son dyad and the 50% commonality of the father-1st son dyad of Family 1. It is rivalled in scope only by the 31 point range of Family 4, the distance separating the 1st daughter-1st son dyad (28% commonality) from the 59% high point of 3rd son-grandson. The tightest ranges are those of Families 5 and 9; the levels of commonality for all dyads in these families fall within 5 and 2 points of each other, respectively, and thus their levels of commonality with each other are to all intents identical. Dyad commonality in Families 2, 3, 6 and 11 occurs within a range of between 9 and 12 points, still fairly tightly compressed when compared with the wide expanse across which the dyads of Family 1 are distributed.

Table 13, on the following page, presents a comprehensive view of the categorial commonality shared among all related dyads in the

## Table 13
## Categorial Commonality Within Families

| | Family 1 | | Family 2 | | Family 3 | | Family 4 | | Family 5 | | Family 6 | | Family 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | f-1s | 44 | f-s | 37 | f-m | 59 | 3s-gs | 42 | pc-s | 42 | f-d | 54 | f-2d |
| 36 | f-2s | 44 | m-s | 37 | f-2s | 58 | 1s-3s | 38 | m-s | 40 | f-m | 48 | f-1d |
| 33 | 1s-2s | 37 | f-m | 35 | m-1s | 49 | 1s-3d | 37 | m-pc | 30 | m-2d | 44 | f-m |
| 31 | 2d-1s | 36 | f-1d | 29 | f-1s | 48 | f-gs | | | | | 44 | f-1d |
| 27 | m-1s | 36 | m-1d | 25 | m-2s | 46 | f-m | | | | | 43 | 2d-3d |
| 27 | 2d-2s | 33 | d-s | 24 | 1s-2s | 46 | m-3s | | | | | 43 | m-1d |
| 23 | f-2d | | | | | 46 | m-gs | | | | | 43 | 1d-3d |
| 22 | 1d-1s | | | | | 44 | f-1d | | | | | 42 | 3d-4d |
| 21 | m-2d | | | | | 44 | m-2d | | | | | 40 | f-3d |
| 19 | f-m | | | | | 44 | 1s-2d | | | | | 40 | f-4d |
| 18 | m-1d | | | | | 43 | f-2d | | | | | 40 | m-2d |
| 18 | m-2s | | | | | 43 | m-1d | | | | | 40 | m-3d |
| 15 | f-1d | | | | | 43 | 1s-gs | | | | | 39 | 1d-2d |
| 15 | 1d-2d | | | | | 42 | 1d-2d | | | | | 37 | m-4d |
| 11 | 1d-2s | | | | | 40 | m-4s | | | | | 58 | 1d-4d |
| | | | | | | 39 | f-3s | | | | | 30 | 2d-4h |
| | | | | | | 39 | 2d-3d | | | | | | |
| | | | | | | 38 | 1d-3d | | | | | | |
| | | | | | | 38 | 3d-3s | | | | | | |
| | | | | | | 38 | 4s-gs | | | | | | |
| | | | | | | 37 | f-3d | | | | | | |
| | | | | | | 37 | f-4s | | | | | | |
| | | | | | | 36 | m-3d | | | | | | |
| | | | | | | 36 | 2d-4s | | | | | | |
| | Family 8 | | Family 9 | | Family 10 | 35 | m-1s | | Family 11 | | Dyad 12 | | Averages |
| | | | | | | 35 | 1d-3s | | | | | | |
| 41 | m-dl | 40 | m-d | 49 | dh-s | 35 | 1d-4s | 43 | m-2s | 36 | h-w | 37 | mean |
| 30 | m-d | 39 | d-s | 39 | m-d | 35 | 1s-4s | 42 | f-m | | | 59 | max |
| | | 38 | m-s | 38 | m-dh | 35 | 3s-4s | 39 | f-2s | | | 11 | min |
| | | | | | | 34 | f-1s | 37 | 2s-4s | | Dyad 13 | 48 | range |
| | | | | | | 34 | 2d-gs | 35 | m-4s | | | 8.67 | st.dev. |
| | | | | | | 33 | 2d-3d | 34 | f-4s | 43 | f-s | | |
| | | | | | | 32 | 2d-gs | | | | | | |
| | | | | | | 32 | 3d-4s | | | | Dyad 14 | | |
| | | | | | | 31 | 1d-gs | | | | | | |
| | | | | | | 28 | 1d-1s | | | 36 | f-s | | |

sample, arranged in descending order of each family group. The extent to which each dyad differs from the average of the sample can be seen from the figures for mean and standard deviation given at the end of the table.

Response predictability: correlation tests. The analysis of data presented thus far has been primarily descriptive in nature, based on procedures which required nothing more complex than the visual comparison of similar words written on a page, or the mechanical tallying of similar category codes once words had been converted into numbers. Any significant inferences as to patterns of verbal association among family members, however, should be based on some sort of recognized statistical procedure, one which might be able to distinguish differences--if indeed any exist--between associative response patterns of individuals as family members, and patterns which exist in the population at large.

In this phase of the investigation, two series of correlations were performed on the data of each individual's responses, first, in order to determine levels of agreement within the family group, and second, in order to compare each individual with all unrelated individuals in the sample. In the process of comparing figures for related and unrelated groups, it was expected that any trends distinguishing family members from all others would become evident.

Table 14, on the following page, presents the correlation coefficients obtained for each related dyad in the sample. The procedure of correlation is intended to determine the level at which it is possible to predict one individual's responses, given the data of

Table 14: Correlation Coefficients of Responses of Familial Dyads

| | Family 1 | | Family 2 | | Family 3 | | Family 4 | | Family 5 | | Family 6 | | Family 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -0.13 | f-m | 0.37 | f-m | 0.08 | f-m | 0.26 | f-m | 0.35 | m-pc | 0.38 | f-m | 0.33 | f-m |
| 0.02 | f-1d | 0.34 | f-d | 0.11 | f-1s | 0.27 | f-1d | 0.36 | m-s | 0.41 | f-d | 0.24 | f-1d |
| 0.25 | f-2d | 0.42 | f-s | 0.09 | f-2s | 0.37 | f-1s | 0.45 | pc-s | 0.22 | m-d | 0.31 | f-2d |
| 0.39 | f-1s | 0.40 | m-d | 0.24 | m-1s | 0.27 | f-2d | | | | | 0.32 | f-3d |
| 0.44 | f-2s | 0.29 | m-s | 0.18 | m-2s | 0.42 | f-3d | | | | | 0.26 | f-4d |
| 0.11 | m-1d | 0.12 | d-s | 0.20 | 1s-2s | 0.20 | f-3s | | | | | 0.14 | m-1d |
| -0.11 | m-2d | | | | | 0.32 | f-4s | | | | | 0.21 | m-2d |
| 0.11 | m-1s | | | | | 0.33 | m-1d | | | | | 0.21 | m-3d |
| -0.08 | m-2s | | | | | 0.41 | m-1s | | | | | 0.30 | m-4d |
| -0.05 | 1d-2d | | | | | 0.27 | m-2d | | | | | 0.18 | 1d-2d |
| 0.14 | 1d-1s | | | | | 0.13 | m-3d | | | | | 0.39 | 1d-3d |
| -0.06 | 1d-2s | | | | | 0.37 | m-3s | | | | | 0.31 | 1d-4d |
| 0.18 | 2d-1s | | | | | 0.21 | m-4s | | | | | 0.35 | 2d-3d |
| 0.19 | 2d-2s | | | | | 0.39 | 1d-1s | | | | | 0.28 | 2d-4d |
| 0.28 | 1s-2s | | | | | 0.23 | 1d-2s | | | | | 0.34 | 3d-4d |
| | | | | | | 0.29 | 1d-3d | | | | | | |
| | | | | | | 0.50 | 1d-3s | | | | | | |
| | | | | | | 0.22 | 1d-4s | | | | | | |
| | | | | | | 0.28 | 1s-2d | | | | | | |
| | | | | | | 0.42 | 1s-3d | | | | | | |
| | | | | | | 0.48 | 1s-3s | | | | | | |
| | | | | | | 0.20 | 1s-4s | | | | | | |
| | | | | | | 0.16 | 2d-3d | | | | | | |
| | | | | | | 0.12 | 2d-3s | | | | | | |
| | Family 8 | | Family 9 | | Family 10 | 0.04 | 2d-4s | | Family 11 | | Dyad 12 | | Dyad 14 |
| | | | | | | 0.42 | 3d-3s | | | | | | |
| 0.18 | m-d | 0.29 | m-d | 0.27 | m-d | 0.18 | 3d-4s | 0.32 | f-m | 0.13 | h-w | 0.29 | f-s |
| 0.19 | m-dl | 0.24 | m-s | 0.24 | m-dh | 0.26 | 3s-4s | 0.11 | f-2s | | | | |
| 0.14 | d-dl | 0.00 | d-s | 0.23 | m-dhs | | | 0.16 | f-4s | | | | |
| | | | | 0.27 | d-h | | | 0.25 | m-2s | | Dyad 13 | | Dyad 15 |
| | | | | 0.15 | d-hs | | | 0.23 | m-4s | | | | |
| | | | | 0.30 | h-s | | | 0.05 | 2s-4s | 0.34 | f-s | | n/a |

another. Higher figures, then, would indicate closer levels of conformity between correlated pairs. The material of the analysis is the category code assigned to the verbal reaction given by each respondent to each stimulus word, in the actual order in which they were presented in the test. Responses were classified according to the most detailed category system used by Jung and Riklin, given in Table 2, above.

Some correlations are quite low; the children of Family 9 have a 0 correlation to each other, but each shares a correlation greater than .23 with the mother. The mother and first daughter of Family 1 produced responses so divergent as to correlate negatively with other members of their family. On the other hand, a substantial number of the intrafamilial dyads in Families 2, 4 and 7 gave responses which correlate at .30 and above. Among the highest correlations in the sample are those of the father and second son of Family 1 (0.44), the elder daughter and third son of Family 4 (0.50), the first and third sons of Family 4, (0.48), and the parental companion and son of Family 5 (0.45).

After this basic set of correlations had been obtained, a series of Spearman rank order correlations were performed on all related dyads in the sample. This procedure operated with the same category codes as were subjected to the preceding analysis, but sorted them in ascending numerical order. All coordinate responses (0111-0115) were listed first, then subordinations (0121-0122), superordinations (0130), and so on through the range of thirty-seven possible relational categories (see Table 2), and the numerically ordered data for each subject was then correlated with the data for each other member of the family.

Spearman rank order correlations for related dyads are given in Table 15, on the following page. The strength of these correlations is in general somewhat higher than that shown by means of the correlation coefficient. Dyads are ranked within each family in descending order of response agreement.

The highest rank order coefficient obtained between related pairs of individuals was 0.54, occurring in two instances in Family 4, between the oldest daughter and the second youngest son, and the (grand)father and grandson. No other dyad in the sample produced a coefficient of above 0.50, and the highest overall family average was only .3967, the mean of Family 5's three dyadic figures. As might be expected, Family 1 produced the lowest coefficients and the lowest family average, although the figures for the father and his two sons (0.42, 0.38) continue to approximate, or even exceed, the average levels of conformity shown by pairs of relatives in other family groups.

Most members of Families 4 and 7 continue to show a moderately high degree of correlation, in the 0.30-0.40 range. In Family 6, the father's closeness to the daughter contrasts markedly with the mother's distance from her (0.38 as against 0.19); perhaps not surprisingly, this is a family in which mother and daughter have had considerable difficulty in understanding one another. Likewise, in Family 3, a sizeable difference separates the correlation of father-older son from that of mother-older son; indeed, in this family the father's correlations overall are noticeably below the average, comparable only to the figures for Family 1's father and daughters, and the dyad of father-1st son in Family 11, another historically difficult relationship.

Table 15: Spearman Rank Order Correlations of Responses of Familial Dyads

| | Family 1 | | Family 2 | | Family 3 | | Family 4 | | Family 5 | | Family 6 | | Family 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.42 | f-1s | 0.43 | f-d | 0.29 | m-1s | 0.54 | 1c-5c | 0.44 | pc-s | 0.43 | f-m | 0.45 | f-m |
| 0.38 | f-2s | 0.43 | m-d | 0.22 | m-2s | 0.54 | f-gs | 0.38 | m-pc | 0.38 | f-2d | 0.44 | m-4d |
| 0.27 | 1s-2s | 0.40 | f-s | 0.21 | f-2s | 0.49 | f-4c | 0.37 | m-s | 0.19 | m-2d | 0.42 | 2d-3d |
| 0.19 | 2d-1s | 0.39 | f-m | 0.18 | f-1s | 0.47 | m-1c | | | | | 0.41 | 3d-4d |
| 0.19 | 2d-2s | 0.29 | m-s | 0.18 | 1s-2s | 0.47 | 2c-5c | | | | | 0.39 | f-3d |
| 0.18 | f-2d | 0.09 | d-s | 0.16 | f-m | 0.46 | 4c-5c | | | | | 0.33 | f-2d |
| -0.14 | f-m | | | | | 0.44 | 5c-gs | | | | | 0.33 | 1d-3d |
| 0.13 | m-1d | | | | | 0.42 | 2c-4c | | | | | 0.31 | f-1d |
| 0.11 | m-1s | | | | | 0.39 | f-2c | | | | | 0.29 | m-3d |
| -0.10 | m-2d | | | | | 0.39 | 1c-4c | | | | | 0.29 | 1d-4d |
| 0.09 | 1d-1s | | | | | 0.39 | m-gs | | | | | 0.29 | 2d-4d |
| -0.09 | 1d-2d | | | | | 0.39 | 1c-gs | | | | | 0.25 | m-2d |
| -0.08 | 1d-2s | | | | | 0.38 | 1c-2c | | | | | 0.24 | f-4d |
| 0.03 | m-2s | | | | | 0.37 | f-m | | | | | 0.19 | m-1d |
| 0.00 | f-1d | | | | | 0.37 | f-6c | | | | | 0.14 | 1d-2d |
| | | | | | | 0.36 | m-5c | | | | | | |
| | | | | | | 0.36 | 4c-gs | | | | | | |
| | | | | | | 0.34 | 6c-gs | | | | | | |
| | | | | | | 0.33 | f-1c | | | | | | |
| | | | | | | 0.32 | m-2c | | | | | | |
| | | | | | | 0.32 | m-3c | | | | | | |
| | | | | | | 0.31 | 5c-6c | | | | | | |
| | | | | | | 0.30 | f-5c | | | | | | |
| | | | | | | 0.30 | 1c-6c | | | | | | |
| | Family 8 | | Family 9 | | Family 10 | 0.29 | 2c-3c | | Family 11 | | Dyad 12 | | Dyad 14 |
| | | | | | | 0.27 | m-6c | | | | | | |
| 0.26 | m-d | 0.31 | m-d | 0.40 | m-d | 0.26 | 2c-gs | 0.36 | f-m | 0.22 | h-w | 0.36 | f-s |
| 0.25 | m-dl | 0.29 | m-s | 0.40 | dh-s | 0.25 | f-3c | 0.27 | m-2s | | | | |
| 0.16 | d-dl | 0.07 | d-s | 0.38 | m-dh | 0.22 | 2c-6c | 0.26 | f-4s | | | | |
| | | | | 0.37 | m-dhs | 0.21 | 1c-3c | 0.22 | m-4s | | Dyad 13 | | Dyad 15 |
| | | | | 0.25 | d-hs | 0.20 | m-4c | 0.14 | f-2s | | | | |
| | | | | 0.21 | d-h | 0.20 | 4c-6c | 0.11 | 2s-4s | 0.26 | f-s | | n/a |
| | | | | | | 0.19 | 3c-4c | | | | | | |
| | | | | | | 0.11 | 3c-6c | | | | | | |
| | | | | | | 0.09 | 3c-5c | | | | | | |
| | | | | | | 0.08 | 3c-gs | | | | | | |

Table 16 shows average figures for the rank correlations of all dyads within each family, and averages for the major structural dyads occuring in the sample as a whole. Parental dyads have an average coeficient of 0.2886, which is slightly higher than the overall sample average (0.2753) and higher than the averages for mothers and daughters (0.27) or mothers and sons (0.25). When the negative correlations occuring in Family 1 are excluded, the sample average rises to .2923, and the average parental rank order correlation across the sample rises to 0.36, a figure which is higher than that of any other interfamilial dyad and one which may suggest that the associative patterns of married couples develop in similarity over time. Of the couples tested, the lowest figure (0.16) belonged to the youngest set of parents; correlations in the 0.36-0.45 range, by contrast, were produced by parents who had been married for thirty years or more.

Table 16

Average Rank Correlations of Families and Relational Dyads

| Family | Correlation | Dyad | Correlation |
|---|---|---|---|
| 1 | .1053 | M-F | .2886 |
| 2 | .3383 | M-D | .2700 |
| 3 | .2067 | M-S | .2500 |
| 4 | .3383 | M-Child | .2600 |
| 5 | .3967 | F-D | .3000 |
| 6 | .3333 | F-S | .3100 |
| 7 | .3180 | F-Child | .3000 |
| 8 | .2233 | Sisters | .2580 |
| 9 | .2233 | Brothers | .2600 |
| 10 | .3350 | Siblings | .2450 |
| 11 | .2267 | | |
| Average of Family Rank Order Correlations | | | .2753 |
| AVERAGE (excluding negative correlations) | | | .2923 |

After the figure for parental dyads, the highest average correlation belongs to father-son pairs, at 0.31, followed by the mean coefficient for fathers and daughters (0.30). The average father-

child correlation, in fact, is four points higher than the mother-child figure, although when the figures for Family 1 are excluded, the means for mother-child and father-child dyads come to within 1.5 points of one another (0.3022 and 0.3168 respectively). Same-gender siblings correlate at a slightly higher rate than do brother-sister pairs (0.258 for sister dyads, 0.26 for brother dyads, and 0.228 for mixed-gender groupings), but the coefficients for siblings are, in general, somewhat lower than figures for parental dyads or for pairs of parents and children.

In order to ascertain whether or not there is any significance in the fact of family membership in these correlations, a series of 1,106 rank correlations was performed on all pairs of unrelated individuals in the sample.[6] The father of Family 1, having been situated within the correlational matrix of his family, was now compared with all other individuals, irrespective of their gender or position in the family, and the same was done for the mother, the daughters, and so on. If an effect of family were to emerge at this level, it was to be expected that intrafamilial correlation figures would be higher than those obtained from across the population at large.

The differences, however, proved to be so slight as to be almost negligible. The overall "family" figure of .2923, obtained by averaging all the positively correlated dyads in the sample of related individuals, was only four points higher than the average of all unrelated pairs of individuals in the sample, .2583. Although no formal tests were performed to analyse this small difference, it seemed worthwhile to examine the data informally to see at what level of the factor of "family" might contribute to a higher correlation.

Figures for rank correlations between related and unrelated pairs are summarized in Table 17.

Table 17

Rank Correlations for Related and Unrelated Dyads

| Level | Related | % of total | Unrelated | % of total |
|---|---|---|---|---|
| 0.50-0.59 | 2 | 2.08 | 25 | 2.24 |
| 0.40-0.49 | 18 | 18.75 | 138 | 12.38 |
| above 0.40 | 20 | 20.83 | 163 | 14.63 |
| 0.30-0.39 | 26 | 27.08 | 291 | 26.12 |

As can be seen, the 0.40 level seems to be the critical one, at which differences between related and unrelated pairs are most apparent. Of the related pairs, 20.83% correlate at the level of 0.40 or above, as compared with only 14.63% of the unrelated pairs, a difference which is about one and one-half times greater for relatives than for individuals in the population at large.

Below 0.39, as above 0.50, the differences seem to level off, with essentially the same rates of correlation occurring among related individuals as might be found in the population at large. Differences at the 0.40 level are such, however, as to suggest that there may be a slight, but effective strength of correlation among family members which will distinguish family groups from all others in a population of normal individuals. The figures are not so high as to suggest that family members can be reliably differentiated from within a population solely on the basis of their rank correlations, but seem to suggest that family relation may be one of the factors contributing to the similarity between two individuals' verbal associations. However, further analysis with a larger sample would be needed to determine the statistical significance of the small variances shown in the present sample.

Another factor contributing to similarity between individuals is reaction-type, the specific pattern which emerges when a set of associative responses is grouped according to the frequency of each category of response produced. The analysis of modal response type, and the patterns of response types which occur within family groups, will be the subject of discussion in the section which follows.

Reaction-type: the individual and the family. The early word association research at the Burgholzli Clinic divided subjects into six reaction-types, based on an examination of a number of factors, including the kind of response which was given most often by the subject. Individuals who reacted to the stimulus-words with primarily ordinate responses--coordinates, subordinates or superordinates or conceptually-based groupings of a more general sort--seemed to form a class which differed markedly in attitude, level of attention, and educational and cultural background from the group of individuals who habitually responded with predications, or with the facile responses of the linguistic-motor category.

C.G. Jung's interest in the issue of family influence on reaction-type arose as result of his observation that all eight of the relatives who were among the thirty-eight subjects of his experiment with normal individuals shared the same reaction type. Before Jung and his coauthor, Franz Riklin, had the results of their experiment in print, another psychiatrist, Emma Furst, had begun an experimental study of reaction-types within families. Her results, obtained from more than one hundred subjects of twenty-four families, seemed to support Jung's hypothesis that one single reaction-type tends to dominate within a

given family. The data she gathered on mothers and daughters, of whom there were eight pairs in her reported sample of nine families, were the same as those of Jung and Riklin: in every instance, mother and daughter shared the same reaction type. Furthermore, her data seems to suggest that predication is the dominant response in households of lower-class or less well educated subjects.

Leaving aside the issue of educational level, which from Jung's data appears not to have been a significant factor in an individual's preference for predicates, the emergence of predication as the one dominant reaction-type within a family, and the phenomenon of agreement between mothers and daughters in modal reaction-type, are both fascinating as objects of study. The present experiment was designed in part to replicate the work of Furst, and in the pages which follow, the analysis of agreement within family groups will employ her principles of classification and computation, as well as those used by Jung and Riklin in their determination of individual reaction-type.

Modal response-types: the Jung-Riklin categories. The statistics which best describe the overall pattern of an individual's responses are the basic measures of central tendency, the mean, median and mode derived from each subject's reaction data. Figures for each individual in the sample are given in Table 18, on the following page.

The numbers in this table are derived from the code assigned to each of the relational categories of the response classification system used by Jung and Riklin in their analysis of data, as shown in Table 2, above. As mentioned earlier, the lower numbers, from 111-300, describe stimulus-response pairs which are tightly bonded in a close conceptual network; numbers in the 400-650 range refer to the looser semantic

Table 18
Mean, Median and Modal Figures for Family Members

| Family 1 | Father | Mother | 1st D | 2nd D | 1st S | 2nd s |
|---|---|---|---|---|---|---|
| mean | 393 | 531 | 674 | 542 | 413 | 376 |
| median | 500 | 612 | 800 | 500 | 500 | 230 |
| mode | 500 | 213 | 800 | 213/630 | 500 | 500 |

| Family 2 | Father | Mother | Daughter | Son |
|---|---|---|---|---|
| mean | 416 | 383 | 406 | 378 |
| median | 500 | 300 | 300 | 300 |
| mode | 611 | 500/611 | 111 | 611 |

| Family 3 | Father | Mother | 1st S | 2nd S |
|---|---|---|---|---|
| mean | 370 | 439 | 443 | 437 |
| median | 230 | 400 | 300 | 300 |
| mode | 213 | 111 | 111 | 1200 |

| Family 4 | Father | Mother | 1st D | 1st S | 2nd D | 3rd D | 3rd S | 4th S | Grandson |
|---|---|---|---|---|---|---|---|---|---|
| mean | 414 | 371 | 328 | 434 | 392 | 392 | 375 | 425 | 423 |
| median | 500 | 350 | 230 | 611 | 400 | 300 | 350 | 300 | 400 |
| mode | 500 | 111 | 500 | 611 | 500 | 111/611 | 111/611 | 611 | 111 |

| Family 5 | Mother | Companion | Son |
|---|---|---|---|
| mean | 410 | 328 | 355 |
| median | 400 | 230 | 230 |
| mode | 630 | 500 | 611 |

| Family 6 | Father | Mother | Daughter |
|---|---|---|---|
| mean | 403 | 379 | 470 |
| median | 315 | 400 | 500 |
| mode | 111 | 500 | 611 |

| Family 7 | Father | Mother | 1st D | 2nd D | 3rd D | 4th D | Husband |
|---|---|---|---|---|---|---|---|
| mean | 368 | 380 | 323 | 406 | 373 | 355 | 423 |
| median | 350 | 300 | 230 | 500 | 230 | 222 | 500 |
| mode | 500 | 500 | 500 | 500 | 111/500 | 611 | 500 |

| Family 8 | Mother | Daughter | D-in-Law |
|---|---|---|---|
| mean | 316 | 360 | 374 |
| median | 221 | 230 | 230 |
| mode | 213 | 111 | 611 |

| Family 9 | Mother | Daughter | Son |
|---|---|---|---|
| mean | 323 | 359 | 404 |
| median | 250 | 230 | 230 |
| mode | 500 | 213 | 213/611 |

| Family 10 | Mother | Daughter | Husband | Sister |
|---|---|---|---|---|
| mean | 377 | 368 | 391 | 378 |
| median | 230 | 222 | 300 | 300 |
| mode | 111 | 213 | 213/611 | 611 |

| Family 11 | Father | Mother | 2st S | 4th S |
|---|---|---|---|---|
| mean | 412 | 414 | 415 | 395 |
| median | 400 | 500 | 500 | 350 |
| mode | 611 | 500 | 611/630 | 500 |

coherence of associations based on contiguity, similarity and linguistic automation; and numbers higher than 700 indicate reactions based on the superficial similarity of sound, as well as the marginal phenomena of indirect responses, repetitions and failures.

Given this arrangement of the numerical scale, a mean response figure of 328, for example, the figure for the oldest daughter of Family 4, would indicate a preponderance of ordinate or predicative reactions; an average of 470, that of the daughter of Family 6, reveals the presence of rather more linguistic or residual-type reactions. The highest mean figure in the sample is 674, the average of the older daughter of Family 1, who has already been mentioned a number of times for her deviation from the sample norms. Her reactions were, by conscious design, almost entirely made up of sound-based pairings, with no attention given to the conceptual or lexical dimensions of the stimulus-word.

The median response figure, likewise, gives an indication of the point at which the individual's reactions, sorted in numeric order from lowest to highest numbers, divides in half. A low median figure, such as that of Family 4's oldest daughter, reinforces the impression given by her mean that her overall response pattern is heaviest in terms of predicates and ordinate associations. A median of 500 or above is in general a good indicator that the individual prefers the linguistic superficiality of synonyms and antonyms, which cannot be considered "associations" in the true sense of the term as used by Jung and Riklin, in that they do not extend beyond the given of the stimulus-word. Median figures for most of the subjects are somewhat lower than the figures for the average.

The final measure of central tendency, the mode, begins to describe the individual's response pattern in terms of frequency, the statistical parameter on which the determination of reaction-type can begin to be made. Modal figures presented here refer to the specific category which occurs most often among an individual's responses. Some of the major relational categories, such as the class of predicates, are subdivided in such a way as to make comparisons among frequencies at this microlevel of analysis somewhat problematic. An individual who has more responses in the category of identity (500), for example, than in any single one of the seven categories of predicates (211-230), may appear deceptively strong in external associations; but when all forms of predication are taken together in a single category, the same subject may be revealed as a modal predicate type.

In nine of the 52 subjects, the mode and the median response are identical, and in eight of these cases, the preferred response is either 500 (identity) or 611 (contrast). In another five subjects, the mode and median fall into the same general relational category, as representing differing degrees of predication. Eight of the respondants were bimodal, and of these, six showed preference for antonyms in combination with some other relational category.

The distribution of response frequencies for members of each family is given in Table 19, on the following page, in the arrangement used by Jung and Riklin in their published case studies of the associative behavior of normal subjects. Family averages are shown in Table 20. The modal reaction-type of the individual takes its name from the category containing the highest single percentage of responses.[7] Where two high-frequency categories differ from one

# Table 19
## Individual Response Figures, Jung-Riklin Categories

| Subject | 1-f | 1-m | 1-1d | 1-2d | 1-1s | 1-2s | | 2-f | 2-m | 2-1d | 2-s | | 3-f | 3-m | 3-1s | 3-2s | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Groupings | 25 | 9 | 4 | 12 | 21 | 20 | | 27 | 23 | 23 | 19 | | 20 | 26 | 27 | 20 | |
| Predicates | 12 | 29 | 9 | 23 | 18 | 32 | | 12 | 23 | 26 | 29 | | 33 | 14 | 15 | 27 | |
| Causal Relations | 1 | 0 | 0 | 3 | 1 | 2 | | 4 | 4 | 3 | 3 | | 6 | 5 | 9 | 12 | |
| Coexistence | 8 | 3 | 4 | 5 | 6 | 13 | | 5 | 6 | 5 | 8 | | 5 | 7 | 1 | 5 | |
| Identity | 29 | 1 | 4 | 8 | 20 | 18 | | 5 | 17 | 9 | 10 | | 11 | 8 | 3 | 9 | |
| Linguistic-Motor | 24 | 32 | 25 | 21 | 31 | 7 | | 44 | 22 | 24 | 28 | | 19 | 28 | 32 | 12 | |
| Completion | 0 | 10 | 2 | 1 | 0 | 0 | | 0 | 1 | 0 | 0 | | 0 | 0 | 0 | 0 | |
| Sound | 0 | 0 | 36 | 5 | 0 | 0 | | 1 | 0 | 1 | 0 | | 0 | 0 | 1 | 0 | |
| Rhyme | 0 | 1 | 4 | 1 | 0 | 1 | | 0 | 0 | 1 | 0 | | 0 | 0 | 0 | 0 | |
| Indirect Association | 1 | 9 | 10 | 16 | 3 | 4 | | 2 | 4 | 8 | 3 | | 6 | 12 | 7 | 2 | |
| Meaningless | 0 | 3 | 0 | 4 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | 3 | 0 | |
| Failure | 0 | 3 | 0 | 1 | 0 | 1 | | 0 | 0 | 0 | 0 | | 0 | 0 | 2 | 13 | |
| Repetition | 0 | 0 | 0 | 0 | 0 | 2 | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | |

| | 4-f | 4-m | 4-1d | 4-1s | 4-2d | 4-3d | 4-3s | 4-4s | 4-gs | | 5-m | 5-pc | 5-s | | 6-f | 6-m | 6-2d |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Groupings | 27 | 33 | 27 | 25 | 21 | 29 | 26 | 23 | 43 | | 21 | 27 | 16 | | 21 | 27 | 22 |
| Predicates | 10 | 13 | 29 | 14 | 21 | 15 | 13 | 24 | 1 | | 26 | 29 | 38 | | 29 | 16 | 12 |
| Causal Relations | 4 | 4 | 2 | 1 | 4 | 7 | 1 | 4 | 2 | | 1 | 2 | 3 | | 0 | 5 | 3 |
| Coexistence | 6 | 8 | 3 | 3 | 6 | 7 | 3 | 5 | 6 | | 7 | 3 | 7 | | 6 | 4 | 8 |
| Identity | 28 | 17 | 28 | 5 | 18 | 12 | 7 | 8 | 9 | | 8 | 28 | 14 | | 10 | 21 | 9 |
| Linguistic-Motor | 19 | 20 | 10 | 48 | 28 | 23 | 38 | 25 | 28 | | 30 | 10 | 20 | | 27 | 25 | 36 |
| Completion | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 |
| Sound | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | | 0 | 0 | 0 | | 0 | 0 | 0 |
| Rhyme | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | | 1 | 0 | 0 | | 0 | 0 | 0 |
| Indirect Association | 4 | 4 | 1 | 3 | 2 | 7 | 1 | 8 | 3 | | 6 | 1 | 2 | | 6 | 0 | 9 |
| Meaningless | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 1 |
| Failure | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 7 | | 0 | 0 | 0 | | 1 | 2 | 0 |
| Repetition | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 |

| | 7-f | 7-m | 7-1d | 7-2d | 7-3d | 7-4d | 7-4dh | | | 8-m | 8-d | 8-dl | | | 9-m | 9-d | 9-s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Groupings | 25 | 18 | 24 | 20 | 27 | 26 | 14 | | | 20 | 26 | 21 | | | 24 | 21 | 21 |
| Predicates | 22 | 29 | 31 | 17 | 25 | 31 | 29 | | | 43 | 25 | 31 | | | 31 | 32 | 32 |
| Causal Relations | 2 | 7 | 6 | 3 | 2 | 3 | 1 | | | 8 | 3 | 3 | | | 6 | 4 | 0 |
| Coexistence | 5 | 8 | 7 | 5 | 3 | 5 | 3 | | | 4 | 7 | 6 | | | 7 | 7 | 2 |
| Identity | 22 | 18 | 17 | 25 | 15 | 4 | 20 | | | 6 | 14 | 9 | | | 17 | 10 | 8 |
| Linguistic-Motor | 22 | 14 | 15 | 29 | 23 | 27 | 28 | | | 17 | 22 | 26 | | | 15 | 22 | 29 |
| Completion | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| Sound | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 1 | 0 |
| Rhyme | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 1 | 0 |
| Indirect Association | 2 | 5 | 0 | 1 | 5 | 4 | 4 | | | 1 | 3 | 4 | | | 0 | 2 | 8 |
| Meaningless | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |
| Failure | 0 | 1 | 0 | 0 | 0 | 0 | 1 | | | 1 | 0 | 0 | | | 0 | 0 | 0 |
| Repetition | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 |

| | 10-m | 10-d | 10-dh | 10-dhs | | 11-f | 11-m | 11-2s | 11-4s | | 14-f | 14-s | | 15-1s | 15-2s | | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Groupings | 24 | 14 | 14 | 17 | | 23 | 31 | 24 | 25 | | 23 | 21 | | 25 | 29 | | 22.61 |
| Predicates | 31 | 40 | 35 | 31 | | 23 | 5 | 17 | 22 | | 20 | 32 | | 20 | 17 | | 23.39 |
| Causal Relations | 3 | 10 | 6 | 5 | | 2 | 2 | 0 | 3 | | 2 | 1 | | 7 | 4 | | 3.50 |
| Coexistence | 4 | 2 | 4 | 5 | | 5 | 6 | 5 | 4 | | 7 | 7 | | 8 | 9 | | 5.52 |
| Identity | 10 | 11 | 9 | 13 | | 13 | 26 | 11 | 15 | | 13 | 9 | | 8 | 18 | | 13.24 |
| Linguistic-Motor | 20 | 15 | 27 | 26 | | 27 | 25 | 41 | 25 | | 24 | 28 | | 27 | 19 | | 24.61 |
| Completion | 0 | 0 | 0 | 0 | | 0 | 0 | 1 | 0 | | 0 | 0 | | 0 | 0 | | 0.30 |
| Sound | 0 | 1 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0.87 |
| Rhyme | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 1 | 1 | | 0 | 0 | | 0.26 |
| Indirect Association | 8 | 7 | 4 | 3 | | 4 | 4 | 0 | 6 | | 9 | 1 | | 5 | 4 | | 4.41 |
| Meaningless | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0.20 |
| Failure | 0 | 0 | 1 | 0 | | 3 | 1 | 1 | 0 | | 1 | 0 | | 0 | 0 | | 0.83 |
| Repetition | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0.04 |

TABLE 20
Family Averages: Jung-Riklin Categories

| Category | Family 1 | Family 2 | Family 3 | Family 4 | Family 5 | Family 6 | Family 7 |
|---|---|---|---|---|---|---|---|
| Grouping | 15.17 | 23.00 | 23.25 | 26.38 | 21.33 | 23.33 | 23.33 |
| Predicate | 20.50 | 22.50 | 22.25 | 17.38 | 31.00 | 19.00 | 25.83 |
| Causal | 1.17 | 3.50 | 8.00 | 3.37 | 2.00 | 2.67 | 3.83 |
| Coexistence | 6.50 | 6.00 | 4.50 | 5.13 | 5.67 | 6.00 | 5.50 |
| Identity | 13.33 | 10.30 | 7.75 | 15.38 | 16.67 | 13.33 | 16.83 |
| Linguistic | 23.33 | 29.50 | 22.75 | 26.38 | 20.00 | 29.33 | 21.67 |
| Completion | 2.17 | 0.25 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 |
| Sound | 6.83 | 0.50 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rhyme | 1.17 | 0.25 | 0.00 | 0.25 | 0.33 | 0.00 | 0.00 |
| Indirect | 7.17 | 4.25 | 6.75 | 3.75 | 3.00 | 5.00 | 2.83 |
| Meaningless | 1.17 | 0.00 | 0.75 | 0.00 | 0.00 | 0.33 | 0.00 |
| Failure | 0.83 | 0.00 | 3.75 | 0.63 | 0.00 | 1.00 | 0.17 |
| Repetition | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Category | Family 8 | Family 9 | Family 10 | Family 11 | Women | Men | Total |
|---|---|---|---|---|---|---|---|
| Grouping | 23.00 | 22.00 | 19.00 | 25.75 | 22.14 | 22.92 | 22.61 |
| Predicate | 34.00 | 31.67 | 35.50 | 16.75 | 23.71 | 22.54 | 23.39 |
| Causal | 5.50 | 3.33 | 6.50 | 1.75 | 3.96 | 2.92 | 3.50 |
| Coexistence | 5.50 | 5.33 | 3.00 | 5.00 | 5.68 | 5.38 | 5.52 |
| Identity | 10.00 | 11.67 | 10.50 | 16.25 | 13.00 | 12.75 | 13.24 |
| Linguistic | 19.50 | 22.00 | 17.50 | 29.50 | 23.25 | 27.21 | 24.61 |
| Completion | 0.00 | 0.00 | 0.00 | 0.25 | 0.50 | 0.08 | 0.30 |
| Sound | 0.00 | 0.33 | 0.50 | 0.00 | 1.57 | 0.13 | 0.87 |
| Rhyme | 0.00 | 0.33 | 0.00 | 0.00 | 0.36 | 0.17 | 0.26 |
| Indirect | 2.00 | 3.33 | 7.50 | 3.50 | 5.14 | 3.88 | 4.41 |
| Meaningless | 0.00 | 0.00 | 0.00 | 0.00 | 0.29 | 0.13 | 0.20 |
| Failure | 0.50 | 0.00 | 0.00 | 1.25 | 0.32 | 1.50 | 0.83 |
| Repetition | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.04 |

another by only a few percentage points, the individual is identified as a mixed type.

The present sample of 52 individuals divides as follows:

Table 21

Reaction-Types of Individual Subjects

| | | |
|---|---|---|
| Ordinate Types | 7 | 13.4% |
| Predicate Types | 16 | 30.8% |
| Linguistic-Motor Types | 11 | 21.1% |
| Mixed Reaction Types | 17 | 32.7% |
| Other (Sound) | 1 | 2.0% |

The sample is dominated by predicate and mixed reaction types, which each account for about a third of all respondents. Moreover, among the sixteen subjects counted here as mixed types, eleven, or 69%, have predication as one of their two preferred modes of reaction. When these subjects are combined with those showing a true preference for predicates--and indeed, in terms of overall proportion of predicates there may be no difference between members of the two groups--the composition of the sample can be summarized as follows:

Table 22

Individual Reaction-Types
(combined predicate and mixed-predicate types)

| | | |
|---|---|---|
| Ordinate Types | 7 | 13.5% |
| Predicate/Mixed Predicate | 27 | 52.0% |
| Linguistic-Motor Types | 11 | 23.0% |
| Mixed and Other Types | 7 | 11.5% |

In this analysis, half the members in the entire sample are seen as having predication as their distinctive reaction-style. Since the appearance, and redundancy, of the predicate reaction-type in a family will be a point of departure for much of the subsequent discussion, it might be useful to look more closely at the single category of

predication, in order to fix a statistical definition of the predicate type which will serve as a consistent measure throughout the remainder of this work.

The true predicate types described by Jung and Riklin seemed to have a response profile that included at least 30% predicative responses.[8] The highest predicate rate in their sample was 61%, held by a woman who was the mother of two other predicate-types, women with 49 and 32% predicates among their responses.

The highest percentage of predicates in the present sample was 43%, belonging to a woman whose daughter was a mixed-predicate type with 25% predicates. By comparison, her daughter-in-law, at 31% predication, might be considered a true predicate type. The second highest figure, 40%, also belonged to a woman surrounded by other true predicate types: her mother (31%), her husband (35%), and her sister-in-law (31%).

Table 23, on the next page, gives a breakdown of predication rate within family units. Each family member is classified according to his or her dominant response category, and in the case of bimodal types, an indication is given as to whether or not predication is one of the two dominating categories.

Altogether, fourteen individuals have predicate rates of more than 30%; all of them might be considered true predicate-types, and seven, or half of them, occur in two families (Families 9, including mother, daughter and son, and Family 10, including mother, daughter, daughter's husband, and husband's sister). Two appear among the three members of Family 8 (mother and daughter-in-law), and two more among the six members of Family 7 (the oldest and youngest daughters).

Table 23

Modal Response Types and Predication Rates for Family Members

| Family | Role | Reaction Type | Predicates |
|---|---|---|---|
| 1 | father | Linguistic | 12 |
| | mother | Mixed Predicate | 29 |
| | 1st daughter | Sound | 9 |
| | 2nd daughter | Mixed Predicate | 23 |
| | 1st son | Linguistic | 18 |
| | 2nd son | Predicate | 32 |
| 2 | father | Linguistic | 12 |
| | mother | Mixed Predicate | 23 |
| | daughter | Mixed Predicate | 26 |
| | son | Mixed Predicate | 29 |
| 3 | father | Predicate | 33 |
| | mother | Mixed | 14 |
| | 1st son | Linguistic | 15 |
| | 2nd son | Predicate | 27 |
| 4 | father | Mixed | 10 |
| | mother | Ordinate | 13 |
| | 1st daughter | Mixed Predicate | 29 |
| | 1st son | Linguistic | 14 |
| | 2nd daughter | Linguistic | 21 |
| | 3rd daughter | Ordinate | 15 |
| | 3rd son | Linguistic | 13 |
| | 4th son | Mixed Predicate | 24 |
| | grandson | Ordinate | 1 |
| 5 | mother | Linguistic | 26 |
| | son | Predicate | 38 |
| 6 | father | Mixed Predicate | 29 |
| | mother | Ordinate | 16 |
| | daughter | Linguistic | 12 |
| 7 | father | Ordinate | 22 |
| | mother | Predicate | 29 |
| | 1st daughter | Predicate | 31 |
| | 2nd daughter | Linguistic | 17 |
| | 3rd daughter | Mixed Predicate | 25 |
| | 4th daughter | Predicate | 31 |
| | son-in-law | Mixed Predicate | 29 |
| 8 | mother | Predicate | 43 |
| | daughter | Mixed Predicate | 25 |
| | dtr-in-law | Predicate | 31 |
| 9 | daughter | Predicate | 32 |
| | son | Predicate | 32 |
| 10 | mother | Predicate | 31 |
| | daughter | Predicate | 40 |
| | son-in-law | Predicate | 35 |
| | " sister | Predicate | 31 |
| 11 | father | Linguistic | 23 |
| | mother | Ordinate | 5 |
| | 2nd son | Linguistic | 17 |
| | 4th son | Mixed | 22 |
| 14 | father | Mixed | 20 |
| | son | Predicate | 32 |
| 15 | 1st sister | Mixed | 20 |
| | 2nd sister | Ordinate | 17 |

(All figures are percentages.)

Another six individuals might be included in the group as borderline predicate types, with 29% predication. All are classified as mixed predicate types, and in all but one, predication is the stronger of the two dominant responses. Their identification as predicate types gives the profile summarized in Table 24.

Table 24

Predicate Types in Families (P=.29)

| Family | Members | P Types | Roles |
|---|---|---|---|
| 1 | 6 | 2 | mother, 2nd son |
| 2 | 4 | 1 | son |
| 3 | 4 | 1 | father |
| 4 | 9 | 1 | 1st daughter |
| 5 | 3 | 2 | companion, son |
| 6 | 3 | 1 | father |
| 7 | 7 | 4 | mother, 1&4 D and SL |
| 8 | 3 | 2 | mother, DL |
| 9 | 3 | 3 | all members |
| 10 | 4 | 4 | all members |
| 11 | 4 | 0 | none |

In one of the family groups, no one had at least 29% predicates among their responses; in two other groups, all of the members qualify as predicate types, and already with predication fixed at the rate of 29%, three of the remaining nine groups have a majority of members who can be classified as predicate-types. Given Jung's results with predicate types, none of whom were men, it is interesting that this sample contains two families in which the fathers tested as predicate types, and were the only members of the family to do so.

When figures are added for those individuals classified as mixed predicate types, in whose reactions predicate responses outweigh the the second preferred category, the following pattern emerges:

Table 25

Predicate Types in Families (P=.23)

| Family | Members | P Types | Roles |
|---|---|---|---|
| 1 | 6 | 3 | mother, 2nd D, 2nd S |
| 2 | 4 | 3 | mother, daughter, son |
| 3 | 4 | 2 | father, 2nd son |
| 4 | 9 | 2 | 1st daughter, 4th son |
| 5 | 3 | 3 | all members |
| 6 | 3 | 1 | father |
| 7 | 7 | 5 | M, 1D, 3D, 4D, SL |
| 8 | 3 | 3 | all members |
| 9 | 3 | 3 | all members |
| 10 | 4 | 4 | all members |
| 11 | 4 | 0 | none |

With these parameters, in nine of the thirteen groups at least half the members tested can be identified as predicate types. Four of the groups (Families 5, 8, 9 and 10) are composed entirely of individuals with predicate rates of 23% or higher. In Family 7, only the father and the second daughter fall below the criterial level of predication; likewise in Family 2, only the father deviates from the preference for predicates shown by the rest of the family. And still at this level, the group that previously appeared without predicate-type members remains without predication in its family profile.

It is interesting to note that in those families where predication does not dominate among members, no other single reaction type dominates to the extent that predication does in other families, although the linguistic-motor type, the second most common response, does tend to appear most regularly as the alternative modal type in a family. It appears twice, for example, in Family 1, in the father and older son; and twice in Family 11, again in the dyad of father and older son. Three of the siblings in Family 4 share the linguistic-motor type, making it the actual dominant mode within this group, along with the ordinate type, also shared by three members of the family.

In Family 6, all three members represent different types; in Family 4, mother and older son are also of different types, and both differ from the predicate pair of father and younger son.

The question of predication and its influence within a family group will arise twice more in this study, first, in context of the contingency tests performed on data from the sample, and second, in the discussion of predication and its relationship to deductive reasoning. At this point, however, it is appropriate to turn to a consideration of agreement as measured by the calculations used by Furst in her study of family associations, the analysis on which Jung's own understanding of familial conformity was based.

Familial agreement: Furst's categories and the coefficient of difference. By the time that Furst began the process of classifying the responses she had obtained from one hundred members of twenty-four separate families, the Burgholzli researchers had recognized some of the inadequacies of their classification system, and as a result, the arrangement in which she presents her data is markedly different from that in which Jung and Riklin had made their determinations of modal frequencies. Specifically, the later classification system combines the four categories of marginal responses under one single heading, condenses the two categories of sound and rhyme into one, differentiates word-completions from the aggregate of linguistic-motor responses, and specifies three varieties of ordination in place of the single "grouping" category of Jung-Riklin system. The most important modification, however, is the expansion of Jung and Riklin's single category of predication into five separate categories: value predication, internal and external (descriptive) predicates, subject-

object relations, predication of place, time, means and purpose, and definitional predication. In all, the schema used by Furst has fifteen categories, with a distribution which allows for a much finer differentiation within major relational classes than was possible given the arrangement of the earlier system.

In Tables 26 and 27, the response profiles for individuals and families are presented in terms of the revised categorial hierarchy used by Furst. The modal center of gravity for most individuals shifts somewhat in this arrangement, as can be seen. It is rare, for example, for any one of the five predicate categories to carry an individual's modal reaction, yet it does happen, in the mother of Family 1, for example, whose 19% so-called "other predicates" serve as a good indication that her borderline identification as a predicate type is most likely the correct one, despite her numerically higher percentage of linguistic-motor responses. The only other instances of this predominance of a single type of predication among the range of possible reactions, in fact, occur in the case of three unmistakeable predicate-types, the mother of Family 8, and the husband and wife of Family 10. In the rest of the sample, however, the distribution of predicates over five subcategories allows for the emergence of other modal points, and highlights in particular the occurrence of synonyms and antonyms (identities and contrasts) in individuals' reaction patterns.

The virtue of this finely-tuned system is not so much its usefulness in determining a reaction-type--that function is more adequately served by the Jung-Riklin arrangement--as the precision of comparison it allows between the response patterns of individuals.

# Table 26
## Individual Response Figures, First Categories

| Subject | 1-f | 1-m | 1-1d | 1-2d | 1-1s | 1-2s | 2-f | 2-m | 2-1d | 2-s | 3-f | 3-m | 3-1s | 3-2s | 4-f | 4-m | 4-1d | 4-1s | 4-2d | 4-3d | 4-3s | 4-4s | 4-gs | 5-m | 5-pc | 5-s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| coordination | 21 | 4 | 4 | 10 | 20 | 8 | 22 | 15 | 16 | 18 | 12 | 24 | 30 | 15 | 12 | 22 | 12 | 17 | 15 | 20 | 25 | 13 | 30 | 14 | 12 | 7 |
| sub/supraordination | 4 | 5 | 0 | 5 | 2 | 13 | 9 | 12 | 10 | 4 | 14 | 7 | 6 | 17 | 19 | 15 | 17 | 9 | 10 | 16 | 12 | 14 | 15 | 8 | 17 | 12 |
| contrast | 15 | 2 | 3 | 6 | 14 | 4 | 31 | 17 | 9 | 19 | 10 | 15 | 15 | 8 | 15 | 16 | 7 | 23 | 8 | 13 | 24 | 20 | 25 | 12 | 7 | 16 |
| value predicate | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 5 | 2 | 4 | 0 | 1 | 2 | 2 | 1 | 0 | 2 | 1 | 0 | 6 | 1 | 0 | 1 | 0 | 2 | 1 |
| other predicate | 3 | 19 | 4 | 12 | 6 | 11 | 3 | 5 | 10 | 13 | 13 | 4 | 6 | 10 | 1 | 3 | 10 | 9 | 10 | 3 | 6 | 10 | 0 | 12 | 10 | 10 |
| subject/object | 7 | 9 | 4 | 8 | 8 | 12 | 6 | 9 | 12 | 8 | 13 | 3 | 4 | 5 | 4 | 6 | 9 | 4 | 8 | 3 | 4 | 9 | 0 | 10 | 9 | 15 |
| place/time | 1 | 1 | 1 | 2 | 2 | 8 | 2 | 4 | 2 | 4 | 7 | 6 | 3 | 10 | 3 | 3 | 8 | 0 | 3 | 3 | 2 | 5 | 0 | 4 | 8 | 12 |
| definition/causal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| coexistence | 8 | 3 | 4 | 5 | 6 | 13 | 5 | 6 | 5 | 8 | 5 | 7 | 1 | 5 | 6 | 8 | 3 | 3 | 6 | 7 | 3 | 5 | 6 | 7 | 3 | 7 |
| identity | 29 | 1 | 4 | 8 | 20 | 18 | 5 | 17 | 9 | 10 | 11 | 8 | 3 | 9 | 28 | 17 | 28 | 5 | 18 | 12 | 7 | 8 | 9 | 8 | 28 | 14 |
| linguistic-motor | 5 | 17 | 3 | 3 | 8 | 2 | 5 | 2 | 3 | 5 | 4 | 6 | 6 | 0 | 2 | 1 | 2 | 12 | 7 | 1 | 3 | 0 | 2 | 18 | 3 | 4 |
| word formation | 5 | 13 | 18 | 12 | 8 | 1 | 8 | 3 | 12 | 4 | 5 | 7 | 11 | 4 | 2 | 3 | 1 | 13 | 13 | 9 | 11 | 5 | 1 | 0 | 0 | 0 |
| word completion | 0 | 10 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| sound | 0 | 1 | 40 | 6 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| residual | 2 | 15 | 13 | 22 | 5 | 8 | 2 | 4 | 8 | 3 | 6 | 12 | 12 | 15 | 6 | 4 | 1 | 3 | 2 | 7 | 1 | 11 | 10 | 6 | 1 | 2 |

| Subject | 6-f | 6-m | 6-2d | 7-f | 7-m | 7-1d | 7-2d | 7-3d | 7-4d | 7-4dh | 8-m | 8-d | 8-dl | 9-m | 9-d | 9-s | 10-m | 10-d | 10-dl | 10-dhs | 11-m | 11-f | 11-2 | 11-4s |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| coordination | 14 | 17 | 19 | 13 | 12 | 13 | 13 | 17 | 17 | 5 | 16 | 21 | 13 | 13 | 16 | 7 | 15 | 6 | 9 | 12 | 16 | 21 | 11 | 15 |
| sub/supraordination | 7 | 16 | 6 | 14 | 13 | 17 | 10 | 12 | 12 | 10 | 12 | 8 | 11 | 17 | 9 | 14 | 9 | 8 | 15 | 5 | 9 | 12 | 13 | 13 |
| contrast | 13 | 19 | 19 | 16 | 10 | 7 | 8 | 12 | 22 | 8 | 9 | 10 | 14 | 7 | 10 | 15 | 13 | 9 | 18 | 21 | 20 | 16 | 16 | 8 |
| value predicate | 9 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 7 | 3 | 2 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 3 | 1 | 0 | 0 |
| other predicate | 6 | 5 | 4 | 7 | 4 | 11 | 7 | 12 | 12 | 19 | 21 | 10 | 8 | 11 | 14 | 15 | 14 | 20 | 19 | 14 | 6 | 1 | 10 | 10 |
| subject/object | 10 | 5 | 3 | 7 | 12 | 9 | 7 | 9 | 15 | 9 | 9 | 6 | 14 | 9 | 9 | 10 | 6 | 14 | 10 | 4 | 5 | 2 | 5 | 7 |
| place/time | 4 | 5 | 5 | 7 | 9 | 10 | 3 | 4 | 4 | 1 | 6 | 6 | 7 | 10 | 8 | 5 | 10 | 3 | 4 | 10 | 9 | 1 | 2 | 5 |
| definition/causal | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 10 | 6 | 5 | 0 | 0 | 0 | 0 |
| coexistence | 6 | 4 | 8 | 5 | 8 | 7 | 5 | 3 | 5 | 3 | 4 | 7 | 6 | 7 | 7 | 2 | 4 | 2 | 4 | 5 | 5 | 6 | 5 | 4 |
| identity | 10 | 21 | 9 | 22 | 18 | 17 | 25 | 15 | 4 | 20 | 6 | 14 | 9 | 17 | 10 | 8 | 10 | 11 | 9 | 13 | 13 | 26 | 11 | 15 |
| linguistic-motor | 12 | 1 | 8 | 4 | 3 | 4 | 9 | 4 | 2 | 4 | 3 | 4 | 6 | 4 | 2 | 7 | 0 | 1 | 1 | 1 | 2 | 4 | 9 | 4 |
| word formation | 2 | 5 | 9 | 2 | 1 | 4 | 12 | 7 | 3 | 16 | 5 | 8 | 6 | 4 | 10 | 7 | 7 | 5 | 8 | 4 | 5 | 5 | 16 | 13 |
| word completion | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| sound | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| residual | 7 | 2 | 10 | 2 | 6 | 0 | 1 | 5 | 4 | 5 | 2 | 3 | 4 | 0 | 2 | 8 | 8 | 7 | 5 | 3 | 7 | 5 | 1 | 6 |

TABLE 27
Family Averages: Furst Categories

| Category | Family 1 | Family 2 | Family 3 | Family 4 | Family 5 | Family 6 | Family 7 |
|---|---|---|---|---|---|---|---|
| Coordinate | 11.17 | 17.80 | 20.30 | 17.00 | 11.00 | 16.67 | 14.17 |
| Sub/supraord. | 4.83 | 8.75 | 11.00 | 14.00 | 12.30 | 3.67 | 13.00 |
| Contrast | 7.33 | 19.00 | 12.00 | 15.75 | 11.70 | 17.00 | 12.50 |
| Value predicate | 0.33 | 3.00 | 1.25 | 1.38 | 1.00 | 3.33 | 0.50 |
| Other predicate | 9.17 | 7.75 | 8.25 | 6.50 | 10.70 | 5.00 | 8.83 |
| Subject/object | 8.00 | 8.75 | 6.25 | 5.88 | 11.30 | 6.00 | 9.83 |
| Place/time | 2.50 | 3.00 | 6.50 | 3.38 | 8.00 | 4.67 | 6.17 |
| Definition | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.50 |
| Coexistence | 6.50 | 6.00 | 4.50 | 5.13 | 5.67 | 6.00 | 5.50 |
| Identity | 13.33 | 10.30 | 7.75 | 15.38 | 16.70 | 13.33 | 16.83 |
| Linguistic | 6.33 | 3.75 | 4.00 | 3.50 | 8.33 | 7.00 | 4.33 |
| Formation | 9.50 | 6.75 | 6.75 | 7.13 | 0.00 | 5.33 | 4.83 |
| Completion | 2.17 | 0.25 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 |
| Sound | 8.00 | 0.75 | 0.25 | 0.25 | 0.33 | 0.00 | 0.00 |
| Residual | 10.83 | 4.25 | 11.30 | 4.38 | 3.00 | 6.33 | 3.00 |

| Category | Family 8 | Family 9 | Family 10 | Family 11 | Women | Men | Total |
|---|---|---|---|---|---|---|---|
| Coordinate | 18.50 | 12.00 | 10.50 | 15.75 | 14.97 | 15.63 | 15.15 |
| Sub/supraord. | 10.00 | 13.33 | 8.50 | 11.75 | 10.41 | 10.75 | 10.87 |
| Contrast | 9.50 | 10.67 | 11.00 | 15.00 | 12.07 | 16.00 | 13.67 |
| Value predicate | 5.00 | 1.00 | 2.00 | 1.00 | 1.69 | 1.33 | 1.52 |
| Other predicate | 15.50 | 13.33 | 17.00 | 6.75 | 9.52 | 8.42 | 9.13 |
| Subject/object | 7.50 | 0.33 | 10.00 | 4.75 | 8.00 | 7.21 | 7.78 |
| Place/time | 6.00 | 7.67 | 6.50 | 4.25 | 5.24 | 4.38 | 4.80 |
| Definition | 0.00 | 0.33 | 6.50 | 0.00 | 0.72 | 0.33 | 0.56 |
| Coexistence | 5.50 | 5.33 | 3.00 | 5.00 | 5.69 | 5.46 | 5.52 |
| Identity | 10.00 | 11.67 | 10.50 | 16.25 | 12.69 | 13.46 | 13.24 |
| Linguistic | 3.50 | 4.33 | 0.50 | 4.75 | 4.17 | 4.42 | 4.26 |
| Formation | 6.50 | 7.00 | 6.00 | 9.75 | 6.76 | 6.67 | 6.67 |
| Completion | 0.00 | 0.00 | 0.00 | 0.25 | 0.48 | 0.08 | 0.30 |
| Sound | 0.00 | 0.67 | 0.50 | 0.00 | 1.86 | 0.29 | 1.13 |
| Residual | 2.50 | 0.33 | 7.50 | 4.75 | 5.76 | 5.58 | 5.63 |

Comparison can, of course, be done using the thirteen-part scale, but since a number of its categories are aggregates, any resultant analysis would certainly be less accurate, and less precise, than one which operates at the level of the constituent categories.

In order to quantify the similarity, or agreement, obtaining between any pair of classified reactions, Jung devised for his student a simple formula yielding a coefficient of difference (D). The calculation is a sum of the differences between two individuals' classified responses in each of the relational categories (the smaller percentage of coordinates, subordinates, value predicates and so on subtracted from the larger percentage), divided by the total number of categories, fifteen. The resultant figure describes the degree to which one response pattern conforms to another. Two response profiles which are identical to one another would have a "D" value of 0; the maximum D value possible, assuming that that two individuals responded in such a way that none of their categories coincided, would be 200/15, or 13.3. A D of 2.0, then, would signify an average of only two points difference between individuals' responses in each of the fifteen categories, and indicates a fairly close agreement in the patterns of the individuals' reactions.

Table 28, on the following page, presents D figures for the members of all families in the present sample. The dyads are arranged in order from highest degree of conformity to lowest. Statistical parameters for each family are given in Table 29.

## Table 28
## Coefficients of Difference for Familial Dyads

| | Family 1 | | Family 2 | | Family 3 | | Family 4 | | Family 5 | | Family 6 | | Family 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.00 | f-1s | 2.53 | m-s | 2.00 | m-1s | 2.13 | m-3d | 3.33 | pc-s | 3.20 | f-d | 2.27 | f-m |
| 4.27 | m-2d | 3.33 | m-1d | 2.67 | f-2s | 2.27 | 1s-3s | 3.73 | m-s | 3.40 | m-d | 2.27 | f-1d |
| 4.93 | 2d-1s | 3.33 | 1d-s | 3.60 | m-2s | 2.53 | f-m | 4.67 | m-pc | 4.33 | f-m | 2.27 | m-1d |
| 4.93 | 2d-2s | 3.47 | f-s | 3.73 | f-m | 2.67 | f-1d | | | | | 2.27 | 3d-4d |
| 4.93 | 1s-2s | 4.00 | f-m | 4.67 | 1s-2s | 3.07 | 3s-gs | | | | | 2.40 | f-2d |
| 5.33 | 1d-2d | 4.00 | f-1d | 5.33 | f-1s | 3.20 | f-3d | | | | | 2.40 | 1d-3d |
| 5.60 | f-2s | | | | | 3.33 | m-3s | | | | | 2.53 | f-3d |
| 6.13 | f-2d | | | | | 3.33 | m-4s | | | | | 2.80 | 3d-sl |
| 6.53 | m-1d | | | | | 3.33 | m-gs | | | | | 2.93 | 2d-3d |
| 6.93 | m-1s | | | | | 3.33 | 1d-2d | | | | | 2.93 | 2d-sl |
| 6.93 | m-2s | | | | | 3.33 | 1s-2d | | | | | 3.00 | m-3d |
| 8.00 | 1d-1s | | | | | 3.33 | 3d-3s | | | | | 3.07 | 1d-2d |
| 8.47 | f-m | | | | | 3.47 | m-2d | | | | | 3.47 | f-4d |
| 8.47 | 1d-2s | | | | | 3.47 | 3d-4s | | | | | 3.73 | m-2d |
| 8.93 | f-1d | | | | | 3.60 | 3d-gs | | | | | 3.87 | 1d-sl |
| | | | | | | 3.60 | 3s-4s | | | | | 4.00 | m-4d |
| | | | | | | 3.80 | 2d-3d | | | | | 4.00 | 1d-4d |
| | | | | | | 3.80 | 2d-4s | | | | | 4.13 | f-sl |
| | | | | | | 3.87 | 1s-4s | | | | | 4.40 | m-sl |
| | | | | | | 3.87 | 4s-gs | | | | | 4.93 | 2d-4d |
| | | | | | | 4.00 | f-4s | | | | | | |
| | | | | | | 4.00 | 1d-4s | | | | | | |
| | | | | | | 4.00 | 2d-3s | | | | | | |
| | | | | | | 4.13 | m-1d | | | | | | |
| | Family 8 | | Family 9 | | Family 10 | 4.27 | f-2d | | Family 11 | | Dyad 12 | | Averages |
| | | | | | | 4.40 | f-gs | | | | | | |
| 2.53 | d-dl | 2.53 | m-d | 2.00 | d-h | 4.40 | 1s-3d | 2.40 | 2s-4s | 5.20 | h-w | 3.90 | mean |
| 2.93 | m-d | 3.20 | d-s | 2.00 | m-hs | 4.80 | m-1s | 2.93 | f-4s | | | 8.93 | max |
| 2.93 | m-dl | 3.73 | m-s | 2.27 | m-sl | 4.80 | 1d-3d | 3.20 | f-m | | | 2.00 | min |
| | | | | 2.27 | h-hs | 4.87 | 1s-gs | 3.60 | f-2s | | Dyad 14 | 6.93 | range |
| | | | | 2.53 | m-d | 5.07 | f-3s | 3.73 | m-4s | | | 1.46 | st.dev. |
| | | | | 3.33 | d-hs | 5.60 | 1d-3s | 4.00 | m-2s | 2.53 | f-s | | |
| | | | | | | 5.73 | f-1s | | | | | | |
| | | | | | | 6.13 | 1d-1s | | | | | | |
| | | | | | | 6.27 | 2d-gs | | | | | | |
| | | | | | | 6.53 | 1d-gs | | | | | | |

Table 29

Statistical Parameters of Familial Coefficients of Difference

| Family | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| mean | 6.1 | 3.5 | 3.7 | 4.0 | 3.9 | 3.7 | 3.3 | 2.8 | 3.1 | 2.4 | 3.3 |
| max | 8.9 | 4.0 | 5.3 | 6.5 | 4.7 | 4.3 | 5.2 | 2.9 | 3.7 | 3.3 | 4.0 |
| min | 2.0 | 2.5 | 2.0 | 3.3 | 2.1 | 3.2 | 2.3 | 2.5 | 2.5 | 2.7 | 2.4 |
| range | 6.9 | 1.5 | 3.3 | 3.2 | 2.6 | 1.1 | 2.9 | 0.4 | 1.2 | 0.6 | 1.6 |

As was shown with previous measures of family agreement, some of the families tested are very tight indeed: Family 10, with its collection of four predicate-type individuals, has five of its six dyads in the 2.0-2.5 range of difference, and its most distant dyad is still as close in conformity as is the closest dyad of Family 5. Nine of the eleven families have at least one dyad that falls within the 2.0-2.5 range; Family 4 has three, two of which involve the mother, and Family 7 has a substantial seven out of fifteen. In nearly half the dyads of Family 7, the reaction patterns of the members have less than 2.5 points of difference between them; two thirds of the father's relationships and half the relationships of the oldest daughter are included in this closest of categories. Even Family 1, with its extravagant range, has one of the closest dyads in the entire sample: the father and older son agree at a difference of only 2.0, more than twice as close as the next dyad in the household, the mother and younger daughter (4.3), and nearly three times as close as the father's next relationship, that with his younger son (5.6).

In total, 21 dyads in the sample, or 19.4%, show conformity at a level closer than 2.5. Six involve mothers and their children, four involve fathers and their children, and five involve siblings; interestingly, the only sibling dyads at this level of agreement are pairs of the same gender. Three married couples, two of them parents

of families, are included in the most closely conforming group, as are three pairs of inlaws, all from Family 10. The largest single group is comprised of mother-daughter dyads, who make up some 26.7% of the entire set of individuals with the highest level of agreement.

Another 30 pairs, or 27.7% of the sample, fall into the next category of agreement, that defined by D at 2.6-3.5, making for a level of conformity at 3.5 or closer for nearly half the dyads in the sample. This group now includes all members of Families 8 and 10, 62% of the relationships in Family 7, nearly 40% of the pairs in Family 4, four out of six dyads in Family 2, the daughter's relationship with both parents in Family 6, the daughter's relationship with her mother and her brother in Family 9, and the father's relationship with his wife and his younger son in Family 11.

Half the parental dyads in the sample are included at the 3.5 level of difference, as are nine of the fourteen mother-daughter dyads, or about 65%. The remainder of the mother-daughter pairs are to be found in the vicinity, within the 3.7-4.2 range, with the exception of the sound-producing daughter of Family 1, who relates to her mother at a D-figure of 6.5. Her relation to her father, at 8.9, is the most distant of all dyads under comparison in the entire sample.

One indication of the reliability of the D coefficient as a measure of associative similarity might be found in a comparison of its figures with measures based on other procedures, such as the Spearman rank correlation. When the rank order of dyads within a family, as determined by the closeness of the D coefficient, is compared with the rank order derived from a comparison of Spearman correlations, in five of the eleven families the same dyad is listed first; that is to say,

the degree of associative conformity between the designated pair was considered to be the strongest in the family in both analyses.

When the dyads ranked as the three closest by Spearman and Furst calculations are compared, seven of the families show at least one pair in the top three common to both analyses, and in one group (Family 3), the same three pairs comprise the top ranked dyads in both arrangements. Four of the closest five pairs in Family 1 are the same on both lists, but in Family 4, only one of the top five dyads is identified in each group. In Family 7, the situation is better, with three dyads appearing in the closest six in both Furst and Spearman rankings. The pairs showing least agreement in both lists are different in every family, with the exception of Family 1, where father and first daughter maintain their distance at the bottom of both ranked lists.

In terms of general trends, the figures presented in Table 30, on the following page, are indicative of levels of associative conformity that might be expected in a normal sample of family members. Figures in the first column are those obtained from the subjects of the present study; those in the second column are averages calculated by Furst from the sample she tested at the turn of the century.

The closest relationship in both samples is that between mothers and daughters. Fathers' associative patterns in the present sample are slightly more distant with both daughters and sons, but both relationships are closer than that between mothers and sons. Same-gender siblings have close agreement, and in terms of conformity fall midway between the mother-daughter and father-daughter figures. Brother-sister pairs, on the other hand, are the least close of all

Table 30

Average Coefficient of Difference

| Dyad | Current | Furst |
|---|---|---|
| Father-Mother | 4.04 | 4.70 |
| Mother-Daughter | 3.45 | 3.00 |
| Mother-Son | 4.05 | 4.70 |
| Father-Daughter | 3.91 | 4.90 |
| Father-Son | 3.98 | 3.10 |
| Brothers | 3.60 | 4.70 |
| Sisters | 3.68 | 5.10 |
| Brother-Sister | 4.57 | 4.40 |
| Mother-Child | 3.75 | 3.50 |
| Father-Child | 3.94 | 4.20 |
| Related Males | 3.80 | 4.10 |
| Related Females | 3.56 | 3.80 |

figures. Married couples' D-coefficients are higher than the averages for all related pairs of men and of women, and furthermore are higher than the differences associated with parents and their children.

It is interesting to note that the mothers and daughters in Furst's sample, who also showed the highest level of associative conformity, were considerably closer to one another than members of the present sample. The same is true of the group of fathers and sons, who were on average nearly one full point closer in Furst's sample than in the population of this study. On the other hand, the mother-son and father-daughter pairs tested in the early 1900's are discernably more distant from one another than the comparable dyads in the current sample. These variations may reflect social practices which today allow for more consistent interaction between parents and their opposite-sex children; in fact, the fathers in the Furst sample are rather more distant from their children than are the current fathers, and considerably more distant than the mothers among their own contemporaries.

Siblings, as well, seem to have been more distant at the turn of the century, with sisters showing less agreement than brothers, a pattern which still obtains in the present sample, but to a much attenuated degree. The difference, however, is probably not significant. Parents, too, in the earlier study were more distant from each other than those of the present day. Interestingly, the pattern of closeness between mother-father dyads and mother-son dyads, although expressed in different numbers, is proportionally the same for dyads in both samples. From the figures given for related pairs of men and women, it seems as though family members of the present sample associate at a somewhat higher level of conformity than did those subjects who participated in the Furst study. An overall average figure for related individuals is 3.68 for the current population, as against 3.95 for related members of the earlier sample.

It is in the context of these figures that the instances of close conformity, at the level of 2.5 and below, ought to be examined. The D coefficient is intended to serve as a general measure of the degree to which one individual's associative pattern conforms to that of another, but since it is an average, it cannot give an indication of the specific relational categories in which two individual's reponses are most alike. This kind of information is perhaps best shown by composite graphing of the category figures for the individuals whose associative profile is being analysed. At the tightest level of agreement, 2.0-2.5, some very striking patterns emerge.

In the twelve graphs which follow, the perpendicular axis represents percentages of responses given in each cagetory. The fifteen relational categories of the Furst schema are plotted along the horizontal axis. The category titles are given in Table 2, above.

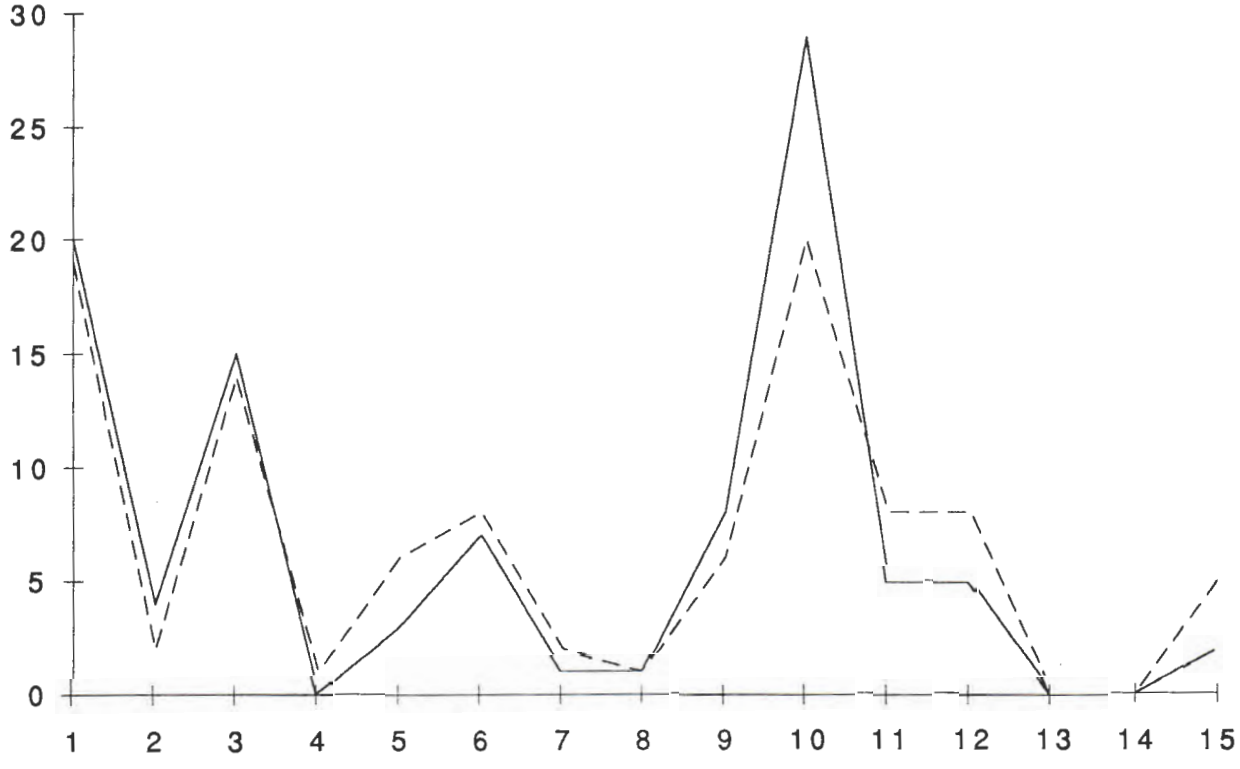


Figure 1. Comparison of response profiles of father and oldest son of Family 1 (father graphed with solid line). Coefficient of difference: 2.0.

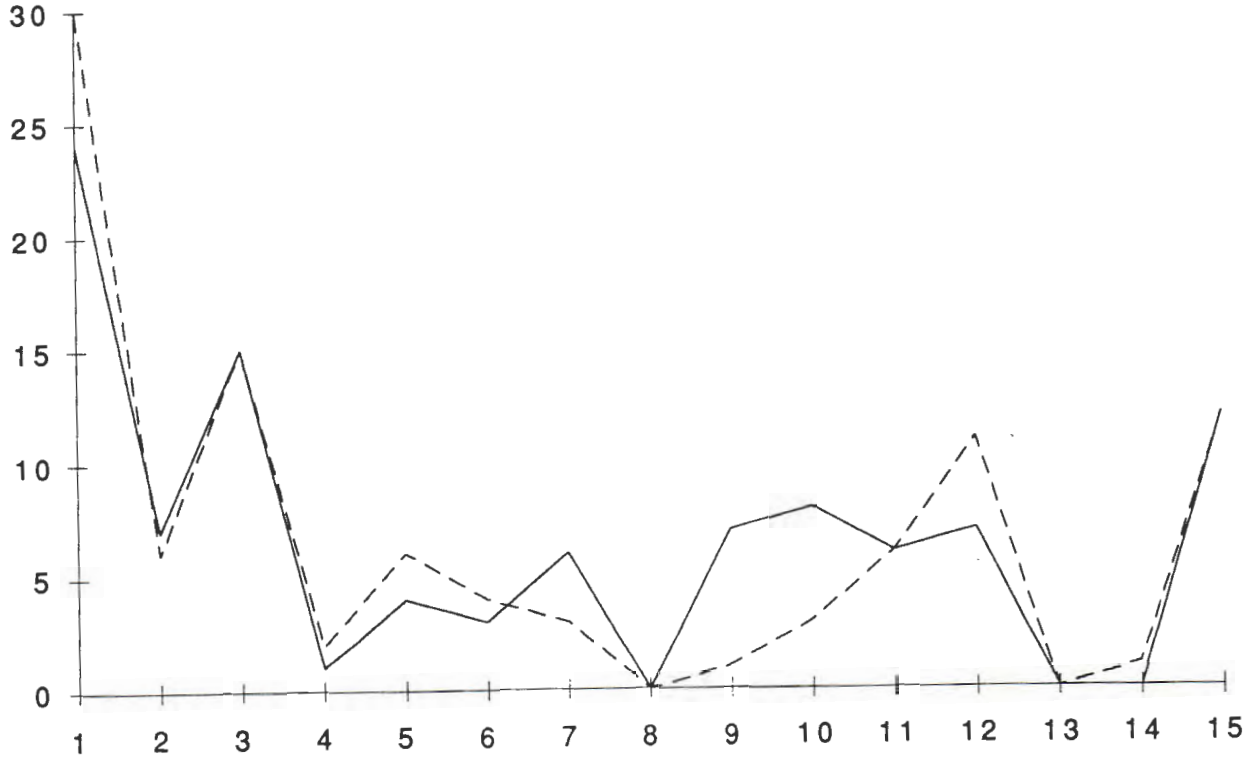


Figure 2. Comparison of response profiles of mother and older son of Family 3 (mother graphed with solid line). Coefficient of difference: 2.0.

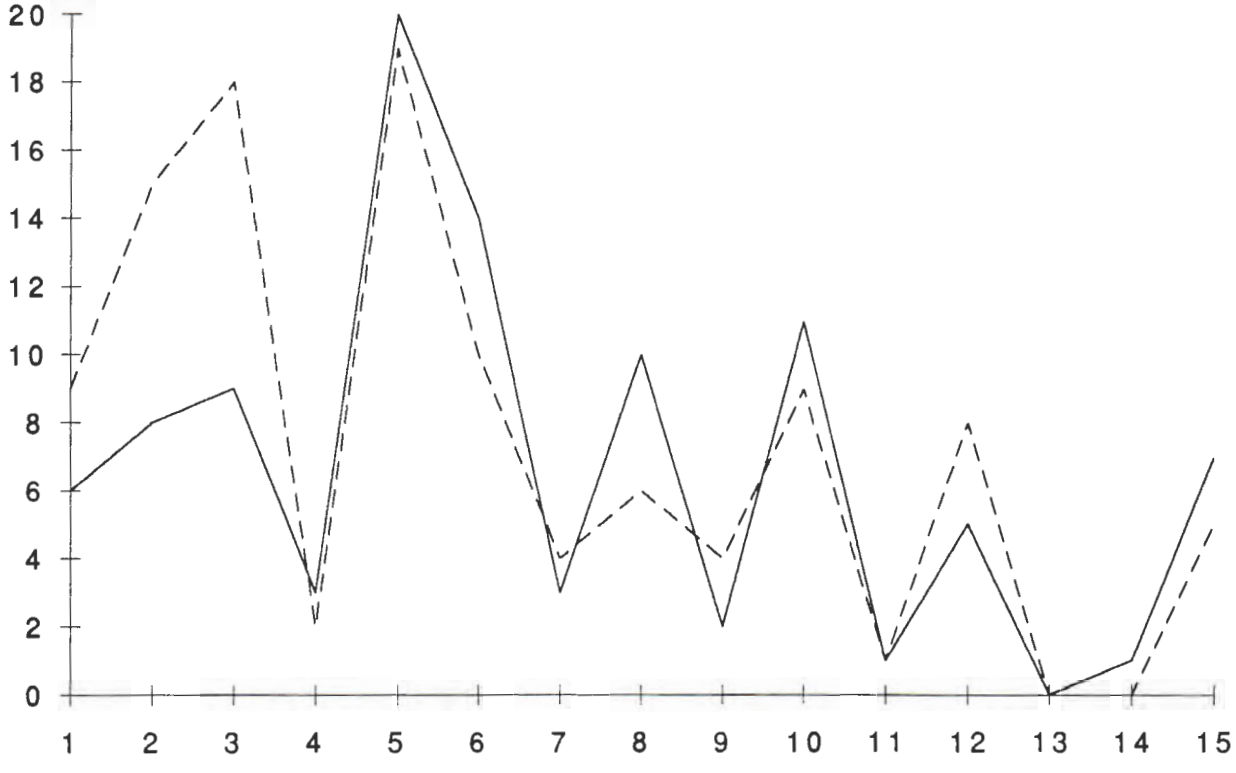


Figure 3. Comparison of response profiles of husband and wife of Family 10 (wife graphed with solid line). Coefficient of difference: 2.0.

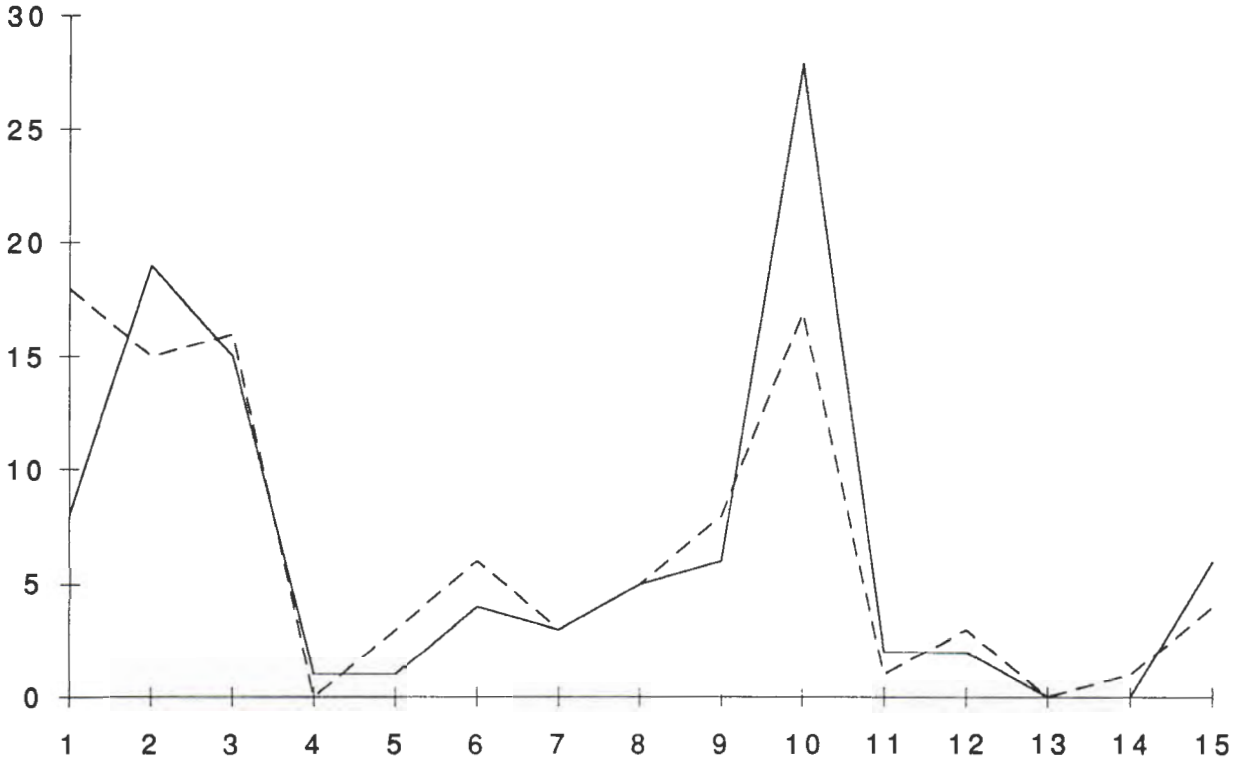


Figure 4. Comparison of response profiles of father and mother of Family 4 (father graphed with solid line). Coefficient of difference: 2.5.

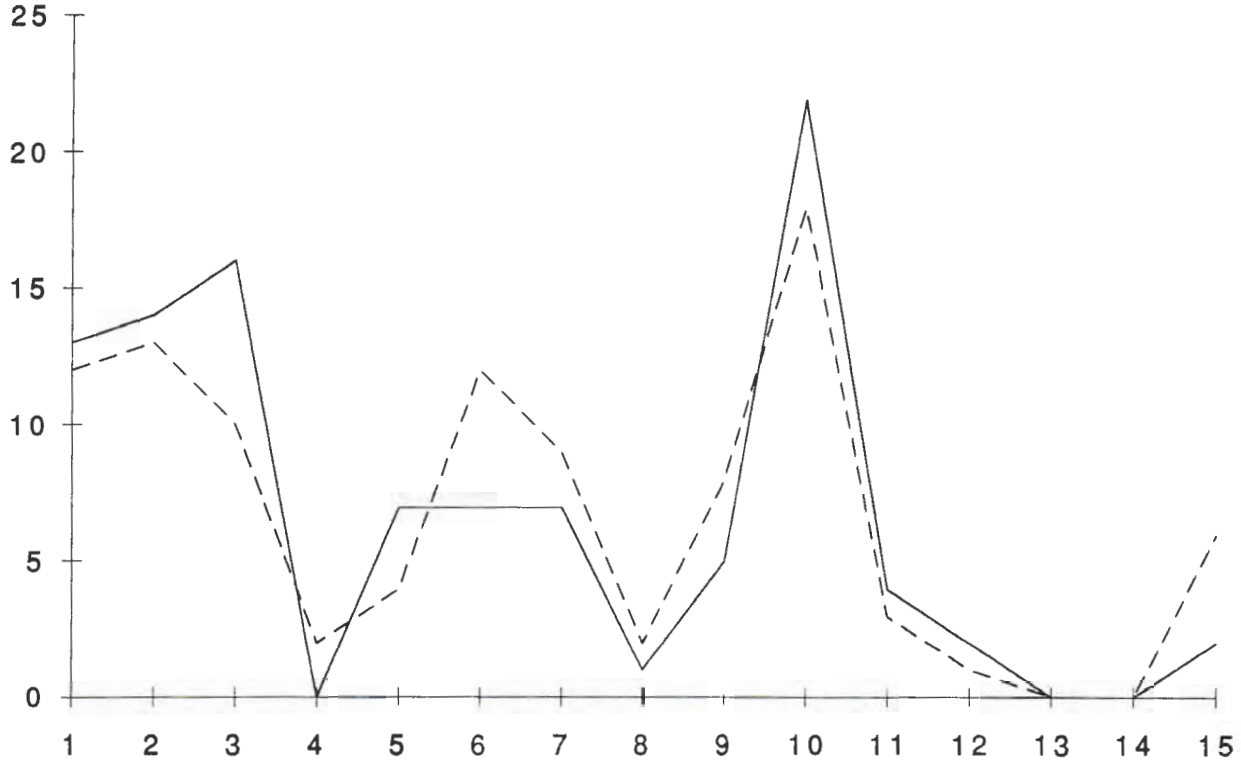


Figure 5. Comparison of response profiles of father and mother of Family 7 (father graphed with solid line). Coefficient of difference: 2.27.

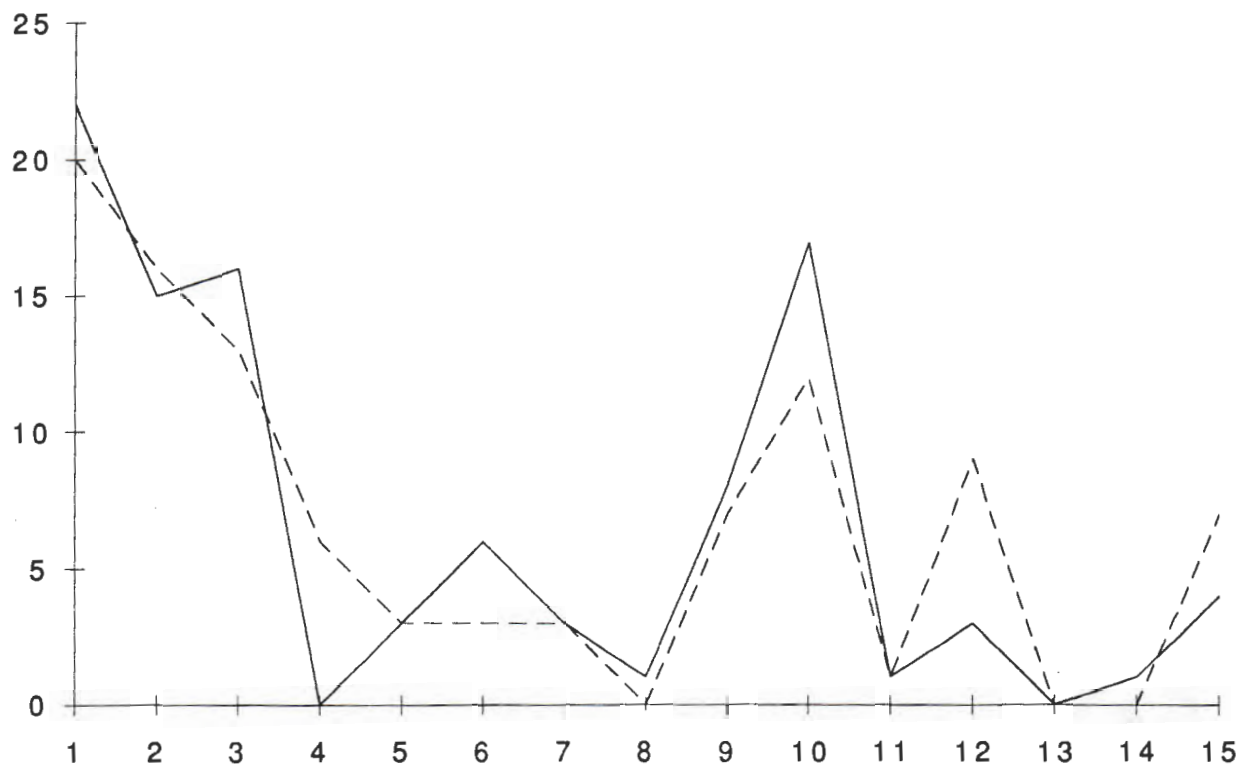


Figure 6. Comparison of response profiles of mother and third daughter of Family 4 (mother graphed with solid line). Coefficient of difference: 2.13.

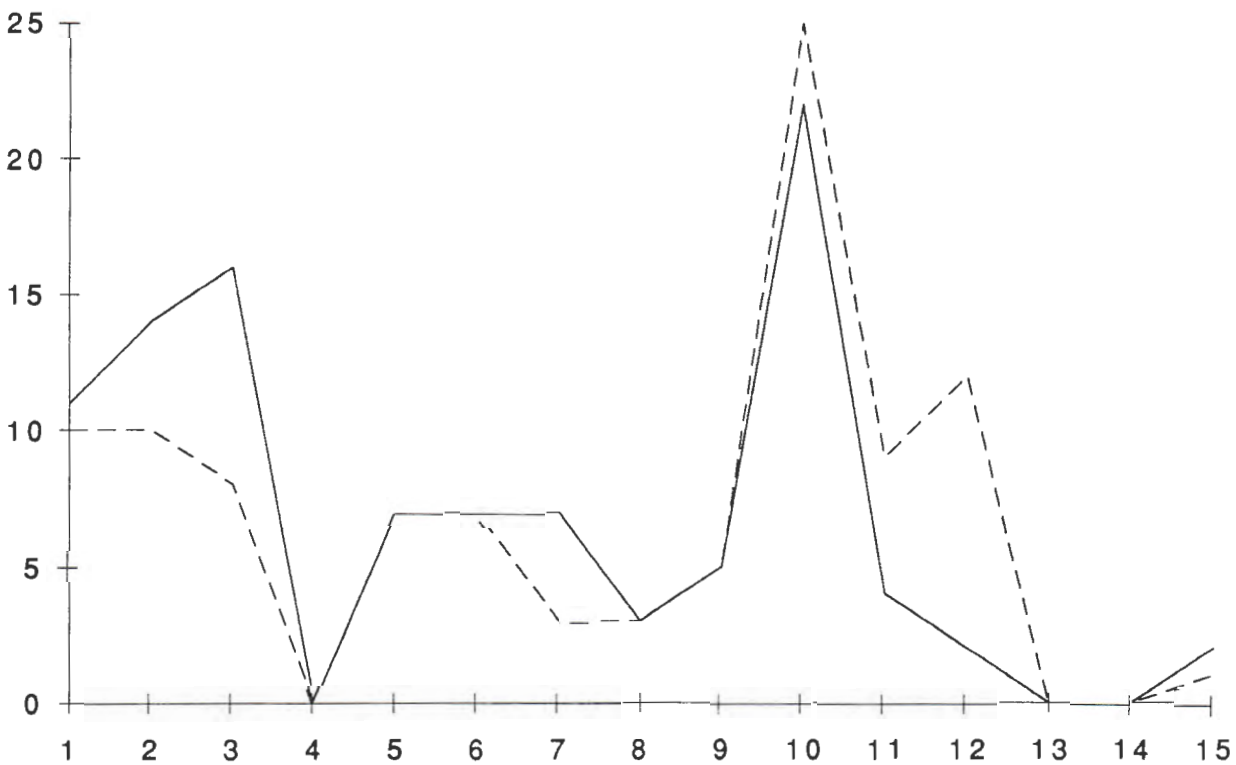


Figure 7. Comparison of response profiles of father and oldest daughter of Family 7 (father graphed with solid line). Coefficient of difference: 2.27.

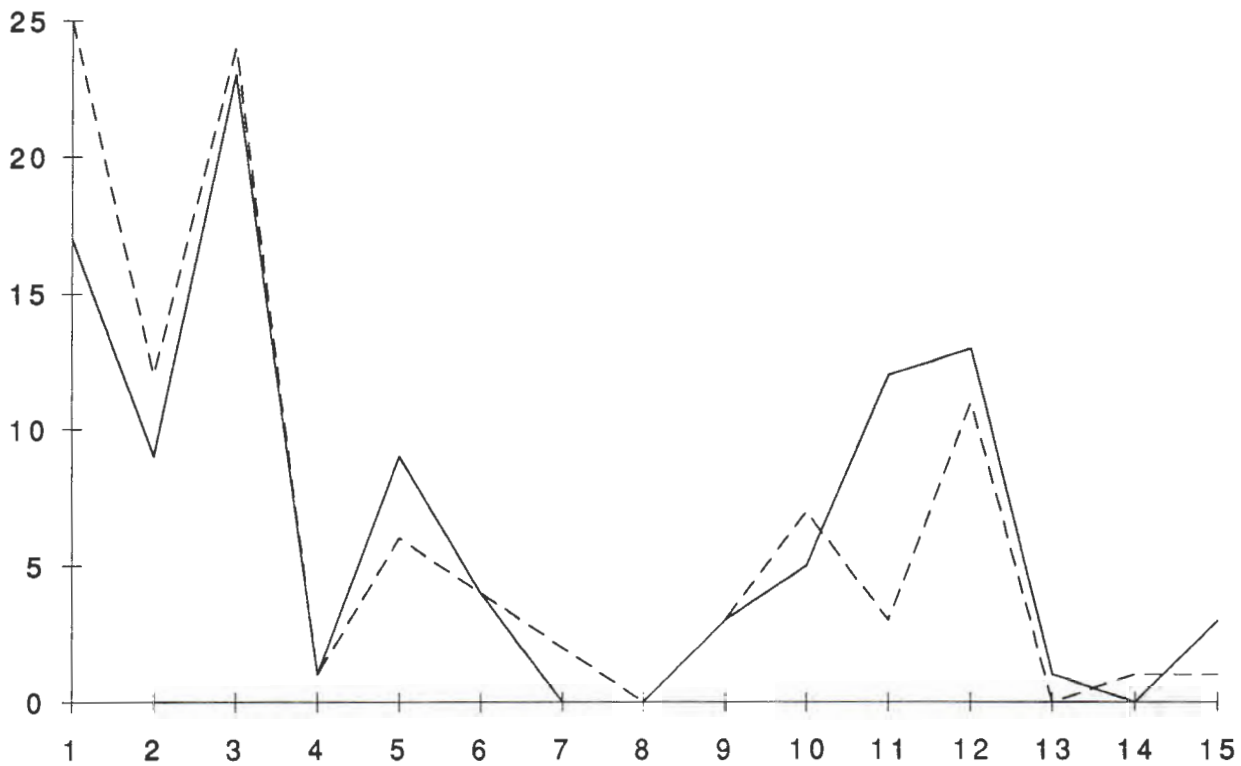


Figure 8. Comparison of response profiles of first and third sons of Family 4 (older son graphed with solid line). Coefficient of difference: 2.27.

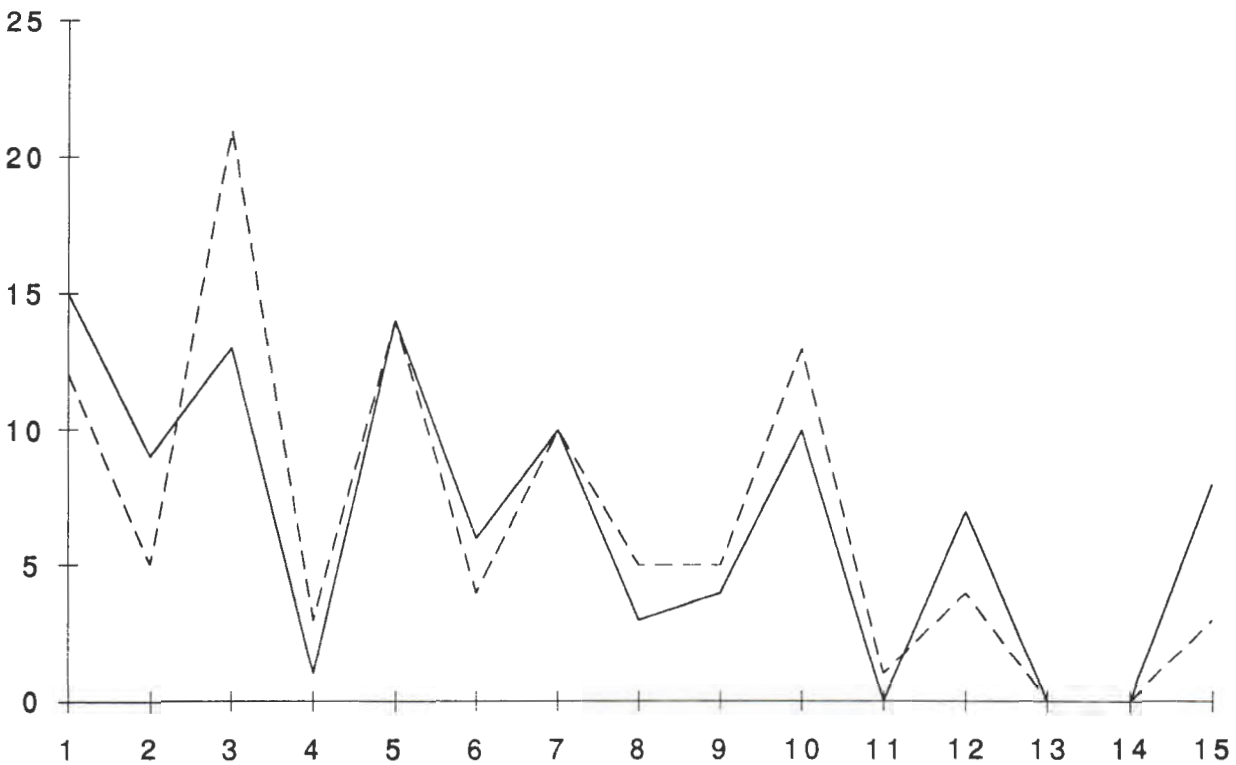


Figure 9. Comparison of response profiles of mother of Family 10 and her daughter's husband's sister (mother graphed with solid line). Coefficient of difference: 2.0.

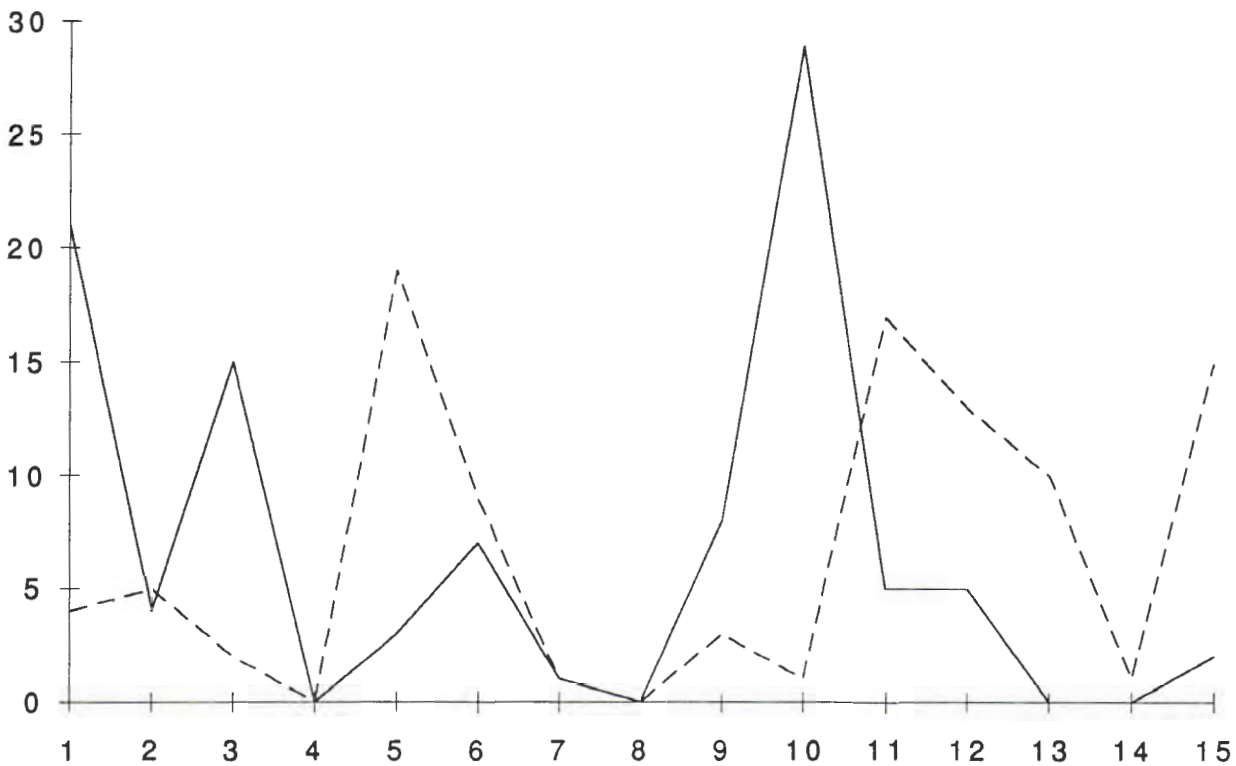


Figure 10. Comparison of response profiles of father and mother of Family 1 (father graphed with solid line). Coefficient of difference: 8.4.

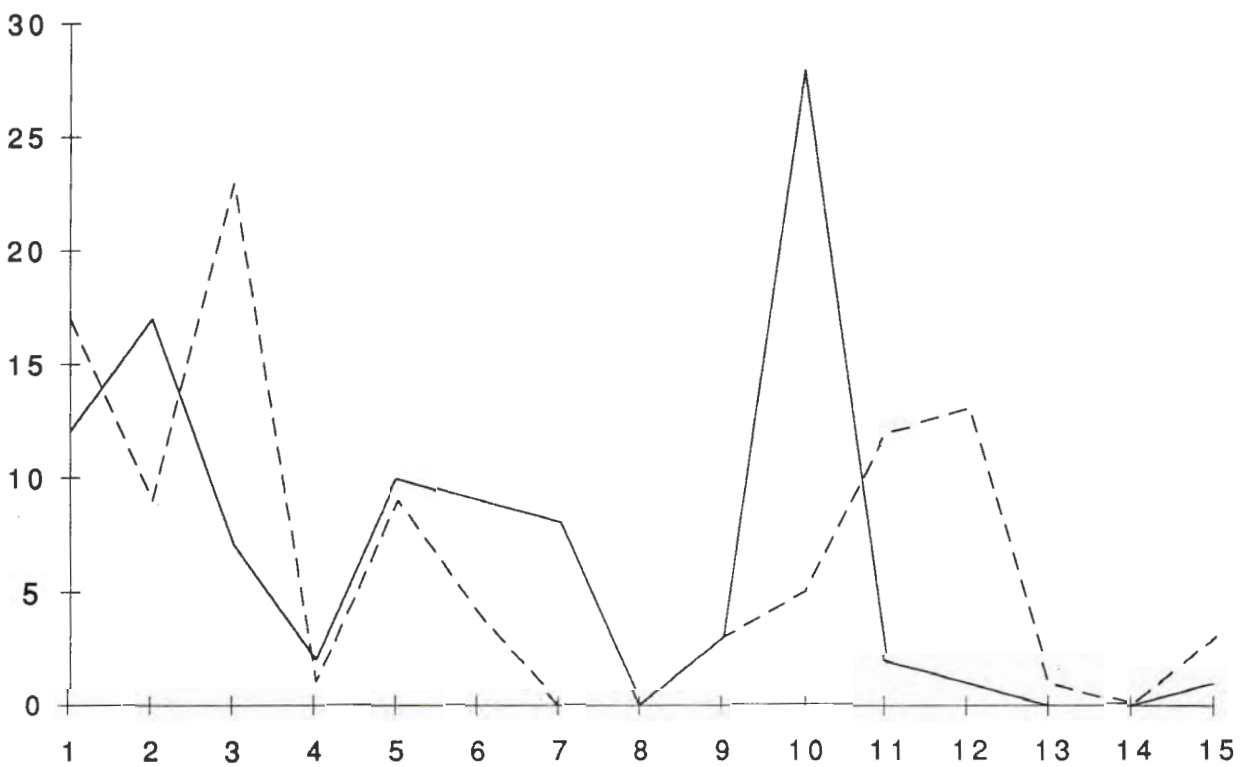


Figure 11. Comparison of response profiles of oldest daughter and oldest son of Family 4 (daughter graphed with solid line). Coefficient of difference: 6.13.

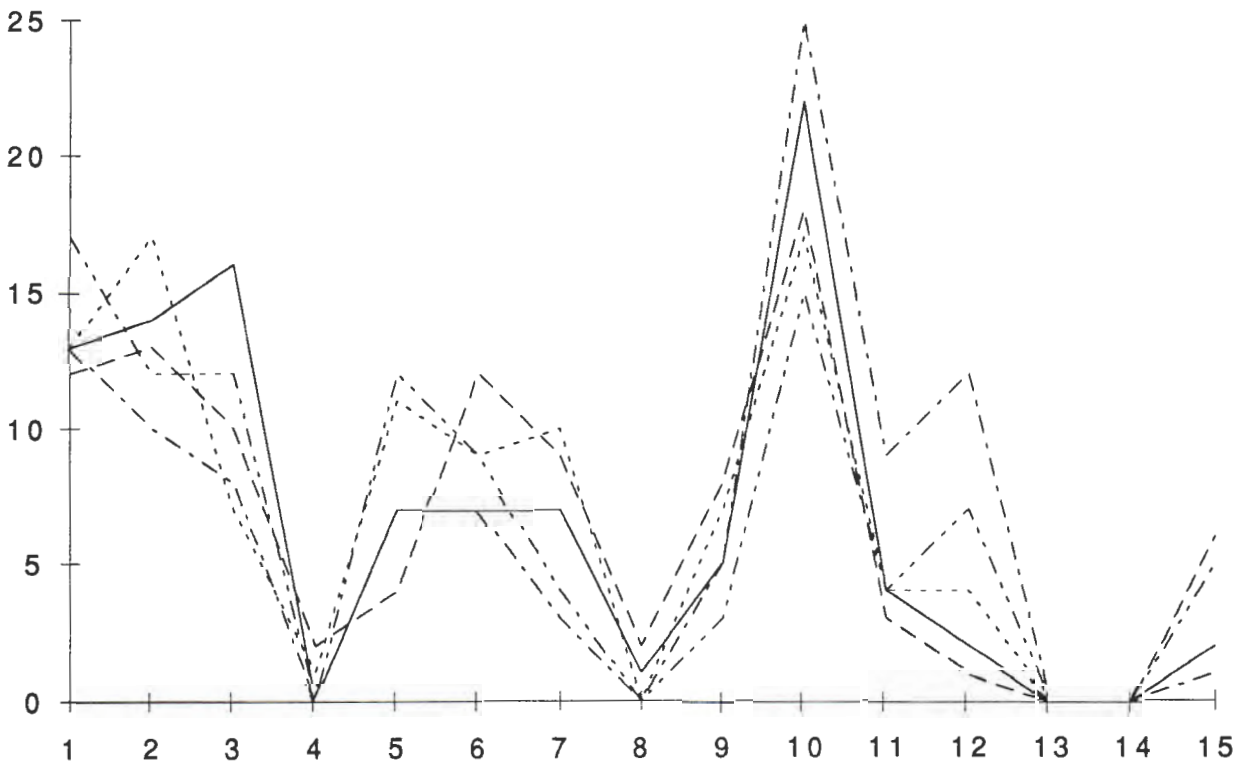


Figure 12. Comparison of response profiles of parents and three oldest daughters of Family 7. Coefficient of difference for individual dyads ranges from 2.27 to 3.73.

Figure 1 shows the associative conformity of a father and his son, the closest dyad from Family 1. Figure 2 is a composite profile of a mother and son from Family 3. Figures 3, 4 and 5 give a picture of the conformity of the closest married couples in the sample, the husband and wife of Family 10, and the parents of Families 4 and 7. The closest mother-daughter dyad in the sample, the mother and third daughter of Family 4, is shown in Figure 6; the father-daughter pair with the closest conformity, the father and oldest daughter of Family 7, is compared in Figure 7. Figure 8 shows a pair of brothers with close agreement, from Family 4.

Most remarkable of all, perhaps, is Figure 9, which shows two in-laws, the mother of Family 10 and the sister of her daughter's husband. The profiles of these two unrelated predicate-types are in virtual point-by-point correspondence. Except for the frequency of contrasts, which the younger woman produced half again as often as the older one, the patterns of the two women coincide in near-perfect conformity.

For the sake of comparison, Figures 10 and 11 show the composite profiles of family members whose coefficient of difference is not carried within the 2.0 - 2.5 range of close agreement. The quality of the "difference" becomes immediately apparent in these two graphs, of related individuals whose modal response falls into entirely different categories. Figure 10 shows the husband and wife of Family 1, with the husband stronger in linguistic-motor responses and the wife in predication; Figure 11 is a brother-sister pair from Family 4, with the same clash of reaction types, between linguistic-motor and predicative responses. This sort of diversity among response profiles can only

heighten an observer's appreciation of the symmetry obtaining between profiles of the more closely conforming individuals.

Finally, Figure 12 is composite response-profile for five of the six related individuals tested in Family 7. The parents and three oldest daughters of the family show extraordinary similarity in reaction-type; the only dissention in the family came from the youngest daughter, who responded with antonyms in marked contrast to her relatives' preference for synonyms.

The example of the mother and her son-in-law's sister serves as a powerful reminder that the dimension of associative conformity measured in terms of the D-coefficient is closely connected with the analysis of reaction-type. Any two unrelated individuals who share a common modal response pattern might conceivably generate composite graphs with the same exquisite resemblance as that shown by the two predicate-type inlaws of Family 10. As the analysis of Spearman rank correlations for related and unrelated individuals demonstrated, agreement in response patterns is not uncommon in the general population, although within certain parameters family members might be expected to show a somewhat higher degree of similarity more regularly, or more often, than members of the population at large.

Furst's analysis included the computation of more than 8,000 D-coefficients for unrelated dyads in her sample, and she found evidence to suggest that relatives show closer conformity in their associative response patterns than do unrelated individuals. The average of related women in her sample was 3.8, that of related men 4.1, as against figures of 6.0 and 5.9 for unrelated men and women. Although time constraints did not permit a similar analysis of the eleven

hundred unrelated pairs in the present sample, future work is needed in this area to ascertain the effect of family relationship on reaction patterns. It is to be hoped that analysis of the data on reaction types might yield a more telling result than that of the Spearman rank order correlations reported above, which showed only a very slight effect of family when the categorized responses of entire sample were subjected to analysis.

The extent to which the same reaction-type tends to redundancy within a family becomes the point on which the difference between related and unrelated pairs of individuals comes to rest, and in order to explore this dimension of familial agreement, a series of chi-square (contingency) tests were performed on selected members of the sample, in order to determine the significance attendant upon the multiple occurrence of the same reaction-type among members of the same household.

Reaction-type within the family unit: redundancy and contingency. Jung's first observations about associative patterns within families derived from the accidental involvement in his sample of mothers and daughters from three families, all of whom shared the same reaction type. One group, a mother and two daughters, was composed of solid linguistic-motor types; the other two groups, a mother with two daughters and a mother-daughter pair, reacted to the stimulus-words in a way that identified them as predicate reaction-types.

The redundancy of a single type among these relatives led Jung and his coauthor to hypothesize the existence of a "familial disposition," which shaped the responses of the daughters in the families and which

could be traced in the children's reactions with reference to their birth order. The older the child, the more like the parent her reactions were observed to be, and there was a tendency for the associative center of gravity to shift in the direction of more superficial reactions as the experiment proceeded from from mother to younger daughter.

It was this phenomenon of progressive "blunting" that Jung wished to pursue with material collected from members of other families. Furst, who devoted a part of her analysis to this problem, found that as a general principle it was the case only with children over the age of sixteen,[9] and only occurred with children and their mothers. In comparison to fathers, most children showed less superficiality in their responses, and most wives gave more internal associations than did their husbands.

But the issue which engaged her more directly was the phenomenon of predication within families. Her sample was composed of at least 54% true predicate types, and of those persons she classified as mixed reaction types, half had predication as one of their most strongly preferred modes. Her analysis thus began with material from a sample containing 72% predicate types, with women--mothers, daughters and sisters--represented at a ratio of 17:10 in comparison with men.

The nine families she selected to report were dominated by predication: 22 of the 37 individuals were pure predicate types, and another four were mixed predicate types, yielding a 70% proportion of the total family membership. These figures are considerably higher than those of the present sample, as can be seen from the following comparison. Mixed-predicate types are included as predicate types in

both columns. In each column, the figure identifies numbers of predicate types out of the total number of family members tested.

Table 31

Predicate Reaction Types within Families

| Family | Furst | Current |
|---|---|---|
| 1 | 2/3 | 2/6 |
| 2 | 3/6 | 3/4 |
| 3 | 3/3 | 2/4 |
| 4 | 3/3 | 2/9 |
| 5 | 3/4 | 3/3 |
| 6 | 6/7 | 1/3 |
| 7 | 2/4 | 5/7 |
| 8 | 5/5 | 3/3 |
| 9 | 0/2 | 3/3 |
| 10 | n/a | 4/4 |
| 11 | n/a | 0/4 |
| Total: | 26/37 (70%) | 29/50 (58%) |

In three of the Furst families and four of the families in the present sample, all tested members proved to be predicate types. In one family of each set, 75% of the members were predicate types; in two families of each group, half were predicate types. In both families of seven members, the majority were predicate types, and in both samples, there was one family in which no predicate types were to be found. The primary source of difference between the two samples resides with Family 4 of the present study, seven of whose nine members preferred non-predicative categories for their associative responses.

Both Jung and Furst seemed to accept, as fact, what observation bore out in both their samples: that families tend to produce members whose associative behavior is similar. In the specific case of the predicate type, Furst speculated that it was linked to a subjective or egocentric attitude which in both women and men tends to increase with greater age.[10] The relatively high predication rate of young

children is a somewhat different matter, and although it is not discussed by Furst, her understanding of the phenomena is implied in her statement that associations of children below the age of sixteen are predominantly inner associations, a class composed almost entirely of either ordinate or predicative responses.

Aside from these descriptive observations, however, neither Furst nor Jung were able to examine the phenomenon of intrafamilial predication, or the redundancy of reaction-type, from the standpoint of its statistical significance in the modern sense. Intuition would suggest that the appearance of so many predicate-types in the same household is, in fact, a matter of significance, one that calls for a closer look at the relationships of those who share the predicate reaction type. There is a great discrepancy between the samples in terms of the familial relations represented; for the purpose of the analysis which follows, therefore, comparisons will be made only in terms of comparable family roles, and the primary focus will be on the one intrafamilial relationship which is stable in both groups--the parent-child dyad.

The chi-square test of contingency. The chi-square test is one of the methods available to modern statisticians to determine the degree of significance which can be attributed to an observed phenomenon, the degree to which the phenomenon differs from results which might be obtained by chance. In order to be valid, it requires larger numbers of subjects than were available in the present sample, such that there is a minimum of five subjects in the smallest cell of the contingency table. Even the addition of Furst's subjects to the numbers of the present sample would not reach the requisite minimum number for a valid

chi-square analysis to be performed. Nevertheless, a number of such tests were undertaken, in both the 3 x 3 and 2 x 2 format, in order to see if any trends might emerge from the data which would indicate the need for further research. The results presented in this section must be seen, therefore, as descriptive, and no statistical significance can be attached to them at this time.

The first analyses were done using data from the thirteen mother-child dyads occurring in Furst's sample. In the 3 x 3 format, all predicate mothers were found to have either predicate children (seven instances) or children with mixed-predicate reaction-types (two instances). Mixed type mothers accounted for one predicate child, two mixed reaction-types, and one of the rare non-predicating members of the sample. There were no mothers of a non-predicate type. Although the distribution of these frequencies seems weighted toward the occurrence of predicate type children in the household of predicating mothers, the numbers are too small to indicate any level of significance.

When subjects classified as mixed predicate types were combined with the true predicate types in a 2 x 2 format, twelve out of thirteen children fell into the same analytic cell, that of mothers and children sharing reaction type. However, with this arrangement the $X^2$ result was 0, a figure which would lead one to the counterintuitive conclusion that the observed phenomenon was one which could have been produced by chance.

Part of the difficulty in working with this data is the low number of dyads available for analysis. In the sample of the present study, there were 49 parent-child pairs and 26 mother-child dyads, twice the

number of mother-child dyads in the Furst sample.[11] When chi-square tests were performed on them, the results proved to be somewhat more reasonable, but still fell below the criterial level of statistical significance.

For the purposes of the first two tests reported here, the predicate type was defined at a predication rate of 30% and above, and mixed predication was fixed between 23 and 29%. Children of the eleven families were compared with either mother or father, depending on which of the two demonstrated the criterial levels of predication. Unlike the Furst group, no household in the present sample had two predicate-type parents among the members tested, although it is quite possible that if the missing parents of children in the sample could have been tested, this situation might have changed.

With P (predicate type) fixed at 30% predicative responses, and M (mixed-predicate type) at 23-29%, two fathers and three mothers were determined to be true predicate types; one father and two mothers were mixed-predicate types, and the rest were defined as non-predicating (N). Although the $X^2$ value of the 3 x 3 analysis performed on the parent-child dyads remains far below the level of statistical significance at the .05 level, some interesting trends can be seen in the distribution of the data. Summary figures from the original contingency table are presented in Table 32, on the following page.

The observed figures for homogeneous dyads (parent and child sharing the same reaction type) are about twice what would be expected through the operation of chance for both predicate and non-predicating types. In other words, predicate parents tend to have predicating children, and non-predicate parents tend to have non-predicate type

Table 32

Chi-Square Analysis, Parent-Child Dyads

| Dyad | Observed | Expected | $X^2$ |
|---|---|---|---|
| P parent, P child | 4 | 1.88 | 2.39 |
| P parent, M child | 2 | 1.88 | 0.01 |
| P parent, N child | 1 | 3.23 | 1.54 |
| M parent, P child | 3 | 2.96 | 0.00 |
| M parent, M child | 3 | 2.96 | 0.00 |
| M parent, N child | 5 | 5.07 | 0.00 |
| N parent, P child | 0 | 2.15 | 2.15 |
| N parent, M child | 2 | 2.15 | 0.01 |
| N parent, N child | 6 | 3.69 | 1.45 |
| Total | 26 | -- | 7.55 |

children, about twice as often as might be expected. Other dyadic combinations are quite close to the expected figures, with the exception of the seventh category (non-predicate parents with predicate children), where the observed is far below the expected: when neither parent is a predicate type, there are no predicate type children in the household, although the workings of chance would apparently place some of them there. Again, because the total numbers analysed are too small to be subjected to a valid chi-square procedure, there can be no level of significance attached to the results of the analysis.

Within the limitations of small sample size, a refinement of the picture presented by parent-child dyads is achieved when the dyad of mother and child is analysed. Here, the comparison with the Furst sample is a more direct one. Again, there are twice the number of pairs in the present group as in her sample, and the resultant $X^2$ figure is almost 2.5 times higher than hers, although it remains below the .05 level of significance. A summary of results from the original 3 x 3 contingency table is given in Table 33, on the following page.

Table 33

Chi-Square Analysis, Mother-Child Dyads

| Dyad | Observed | Expected | $X^2$ |
|---|---|---|---|
| P mother, P child | 3 | 1.07 | 3.48 |
| P mother, M child | 1 | 1.07 | 0.00 |
| P mother, N child | 0 | 1.85 | 1.85 |
| M mother, P child | 4 | 2.96 | 0.37 |
| M mother, M child | 3 | 2.96 | 0.00 |
| M mother, N child | 4 | 5.07 | 0.23 |
| N mother, P child | 0 | 2.96 | 2.96 |
| N mother, M child | 3 | 2.96 | 0.00 |
| N mother, N child | 8 | 5.07 | 1.69 |
| Total | 26 | -- | 10.58 |

In this distribution, the occurrence of predicate-type children in association with predicating mothers is three times what would be expected, and the rate at which non-predicate mothers have children who are non-predicating is about 1.5 times the expected rate. Mixed reaction-type mothers, with their strong penchant for predication, have predicate children about 1.3 times more often than expected, and where mother's predication rate is at least 23%, there are fewer non-predicate type children in the household than might be expected. As was the case in the Furst sample, no non-predicate mother had a child who was a predicate type; and when the only parent taken into account is the mother, it seems to be the case that no predicating mother had a child who was a non-predicate type.

A comparison of reaction-types between mothers and daughters in the sample must rely on a very small number of pairs, only fourteen, too few for any level of significance to be determined. However, the pattern of distribution remains essentially the same as was seen with the mother-child dyads. The $X^2$ figure improves slightly when the two mothers and one daughter with borderline predication figures of 29% are moved from the mixed category into the category of predicate types.

Table 34

Chi-Square Analysis, Mother-Daughter Dyads

| Dyad | Observed | Expected | $X^2$ |
|---|---|---|---|
| P mother, P daughter | 4 | 3.21 | 0.19 |
| P mother, M daughter | 3 | 2.57 | 0.07 |
| P mother, N daughter | 2 | 3.21 | 0.46 |
| M mother, P daughter | 0 | 0.35 | 0.35 |
| M mother, M daughter | 1 | 0.28 | 1.85 |
| M mother, N daughter | 0 | 0.35 | 0.35 |
| N mother, P daughter | 1 | 1.42 | 0.12 |
| N mother, M daughter | 0 | 1.14 | 1.14 |
| N mother, N daughter | 3 | 1.42 | 1.76 |
| Total | 14 | -- | 6.29 |

However, with P fixed at 29%, the pattern of distribution changes, in that now, for the first time, a predicating daughter is to be found in the household of a non-predicate type mother. Oddly enough, this individual's father is also a non-predicate type, and of her five siblings, only one, the youngest brother, achieved a predicate rate as high as 24%. In the absence of more extensive information, one is left to wonder at the origin of this woman's anomalous preference for predication.

In this distribution, observations in all the dyadic categories remain fairly close to the expected figures, except in the cells of mixed-reaction type children of either mixed or non-predicate type mothers, and in the final category of non-predicate type dyads. Although the appearance of a predicate-type daughter with a non-predicate type mother is, in this analysis, what would occur simply by chance, it is quite remarkable given the patterns established earlier.

Contingency figures were also determined for other combinations of parents and children, and with P fixed at other points. The results are summarized as follows:

Table 35

Chi-Square Analysis of All Dyads

| Dyad | Total | P=.30 | P=.29 | P=.23 |
|---|---|---|---|---|
| Parent-Child | 26 | 7.55 | 6.57 | 5.07 |
| Mother-Child | 26 | 10.58 | 7.86 | 7.23 |
| Mother-Daughter | 14 | 5.00 | 6.29 | 3.80 |
| Mother-Son | 12 | 4.60 | 5.87 | 4.67 |
| Father-Child | 24 | 2.40 | 1.00 | 0.00 |
| Father-Daughter | 11 | 1.33 | 1.33 | 1.33 |
| Father-Son | 13 | 3.36 | 1.42 | 0.69 |

The figures are the result of 3 x 3 analyses, except for the last column, where 2 x 2 analyses were performed. Again, it must be noted that no single grouping of dyads in the sample was large enough to produce a chi-square analysis with statistically significant results.

Although it is impossible to make any valid generalizations from these figures, it does seem as though there is a slightly higher correlation between the figures of mother and child, at all values of P, than between any other intrafamilial dyad. The figure for mother-daughter correlation is highest when P=.29, and the same is true for the mother-son pair, although the actual figure is somewhat lower (6.29 for mothers and daughters, 5.87 for mothers and sons). Figures for fathers and their sons are higher at all three P values than the figures for fathers and daughters, and when P=.30, the difference is in the ratio of 2.5 to 1.

In this analysis, mothers and sons correlate somewhat higher than do fathers and sons at all levels, suggesting that the key factor in the appearance of predication in the children--if any exists at all--may be found in the influence of the mother in the household. It is interesting to note that this result differs from the comparisons of parents and children in terms of the Spearman rank order correlation of

their associative responses, noted earlier, in which fathers and children correlated at a somewhat higher level than did mothers and children. In the absence of any post-hoc significance tests on these observations, however, they are put forth only as descriptions of phenomena observed in this sample; and the reasons for the difference between the Spearman results and the chi-square results remain, at this time, unexplored.

The slightness of these figures prevents any positive conclusions from being drawn as to the significance of the apparent redundancy of reaction-type within normal families. In a 3 x 3 analysis with an appropriately large number of subjects, the chi-square figure would need to reach 15.51 in order to attain a .05 level of significance. With only 26 dyads reported, the highest level of significance attained in this sample was 10.58, the figure achieved when mothers and children were compared. In a 2 x 2 analysis, only the mother-child dyad (7.23) approximates the 7.81 figure necessary for significance at the .05 level, but again, the numbers are too small for appropriate validity to be attained.

However, the trends inherent in the data might well become more apparent if greater numbers could be added to the sample. Further work with a larger population will be required to decide the question of significance either for or against the intuition of Jung, Riklin and Furst: that it is no accident that the same reaction-type tends to occur among multiple members of the same household.

## The Experiment in Deductive Reasoning

At the conclusion of the word association test, subjects were asked, in the second part of the experiment, to complete a standardized test in deductive logic, one of the seven sections of the Ross Test of Higher Cognitive Processes. The juxtaposition of the two kinds of instruments, the one a free-flowing, oral-auditory, subjectively-oriented, essentially open-ended experience, and the other a serious, pencil-and-paper exercise with real right and wrong answers, demanding reading comprehension and concentration of attention, was one that many subjects found quite jarring; the effort required to shift gears mentally was evidently no easy matter for some.

As a discipline of thought, deductive logic may be among the most dreaded of all "higher cognitive" skills, and part of the disaffection many individuals feel toward it, quite apart from the dry and unrelated way in which it is so often taught, may derive in part from a cognitive style rooted in a preference for predication. It was Jung's belief that the "feeling function," one of the four modes which operate in his theory of cognition, does not easily accommodate the process of the "thinking function." Because there is much in his description of the "feeling type" individual that is reminiscent of his earlier analysis of the traits of the "predicate reaction-type," it seems worthwhile to examine critical thinking ability, in one of its classical forms, against predication as an associative reaction type. Jung's theory would suggest an inverse correlation between predicative reactions and logical reasoning skill.

Experimental conditions. Thirty-eight of the individuals who participated in the word association task went on to complete Part II of the Ross Test. The parents of Families 4, 7 and 11 were not asked by the test administrator (in each case a member of their own family) to take the test, due to considerations of age and failing eyesight. Logistical difficulties prevented the participation of three of the individuals who responded to the word association test by telephone; in three other cases, the administrator judged that the patience of the subject would not bear a prolongation of the experimental period. In one case, the subject failed to complete the last page of the test before turning it in, and in the final instance--unfortunately an individual with one of the highest predication figures in the sample--the subject turned the test booklet back at once with the comment that he knew he would not do well if he tried to take it.

The group of those who did not participate in the deductive portion of the experiment consisted of eight persons who were classified as non-predicate types in the analysis of word association results; three who were predicate types, at the criterial level of 30% predicate responses; one borderline predicate type (P=29%), and two mixed-predicate types. Although the loss of their contribution is regrettable, their removal from the sample did not appreciably change the overall distribution of response-type frequencies.

Subjects who took the test were given ten minutes to complete its eighteen true-false questions. Most took less than five minutes to give their answers. Thirty-five subjects took the test immediately after the word association portion was concluded, in the presence of the administrator. If subjects expressed difficulty in understanding

the written directions, the administrator gave an explanation that helped to clarify the process, prior to the beginning of the test. Once the test had begun, subjects with expressed difficulties were invited to write their comments directly on the test paper, but otherwise received no support from the administrator. The remaining three subjects, all of whom live at some distance from their designated administrators, received the test by mail and completed it under their own supervision.

The instrument. According to the administrator's manual, the deductive reasoning portion of the Ross Test of Higher Cognitive Processes was developed to measure ability in the "Evaluation" (level 6) subgroup of Bloom's Taxonomy of Educational Objectives, Handbook I: Cognitive Domain, "Judgments in Terms of Internal Evidence," and in particular, "the ability to indicate logical fallacies in arguments."[12] As a whole, the seven parts of the Ross Test are considered adequate for the assessment of "higher-level thinking skills" in "gifted and non-gifted" individuals of at least fourth-grade level.

In formal construction, Part II of the Ross Test is a series of true-false questions about possible conclusions to the premises of a formal syllogism. It consists of six sets of premises, or predicative statements, four cast in the classical mode of major and minor premise, and one each containing three and four premises. Three are categorical syllogisms, two are conditional, and one an informal statement of associated facts. At the end of each series of premises, three possible conclusions are stated, and the respondent is asked to determine whether each of the conclusions does or does not follow from

the given premises. A copy of the test is included at the end of this report, as Appendix 2.

The Ross Test was chosen from among other tests of logical reasoning because of the peculiar nature of its predications. Unlike those classical syllogisms which require a movement from known (or at least believable) premises to a conclusion which contributes to the general state of knowledge, the premises of the Ross Test are built on contrafactual predications, nonsense words, and substantives which are quite startling in their sensory immediacy. Individuals who are attuned to the perceptual dimensions of reality, and who are inclined to make evaluative judgments about that reality, two characteristics which Jung found in association with predicative verbal behavior, were thought by the experimenter to be likely to suffer cognitive interference in the sort of processing required to work with the Ross premises.

Thus, any difficulty that such individuals might have with reasoning, or critical thinking, as such would be magnified by their predicted inability to suspend their disbelief sufficiently to move through the vivid, but impossible, universe of the Ross Test. Those whose response pattern gave no hint of a preoccupation with the sensory and evaluative qualities of predication, on the other hand, were expected to operate quite easily with the words of the Ross premises.

Results of the analysis. In Table 36, the scores of the individuals who took the Ross Test are listed in the order of their predicative response rating. The figures in the "Ross" column indicate the number

of items missed, out of a possible eighteen; the "P" figures are percentages of predicate reactions on the word association test.

Table 36

Predication Rates Compared with Ross Test Error Rates

| Subject | P | Ross | Subject | P | Ross | Subject | P | Ross |
|---|---|---|---|---|---|---|---|---|
| 1. 081 | 43 | -5 | 14. 061 | 29 | -2 | 27. 015 | 18 | -4 |
| 2. 102 | 40 | -1 | 15. 012 | 29 | -1 | 28. 074 | 17 | -2 |
| 3. 053 | 38 | -3 | 16. 024 | 29 | -1 | 29. 113 | 17 | -1 |
| 4. 103 | 35 | -5 | 17. 034 | 27 | -8 | 30. 062 | 16 | -0 |
| 5. 031 | 33 | -2 | 18. 023 | 26 | -3 | 31. 033 | 15 | -2 |
| 6. 142 | 32 | -5 | 19. 051 | 26 | -3 | 32. 046 | 15 | -6 |
| 7. 073 | 31 | -8 | 20. 075 | 25 | -7 | 33. 032 | 14 | -3 |
| 8. 104 | 31 | -4 | 21. 048 | 24 | -9 | 34. 044 | 14 | -3 |
| 9. 076 | 31 | -6 | 22. 022 | 23 | -4 | 35. 047 | 13 | -3 |
| 10. 101 | 31 | -5 | 23. 014 | 23 | -0 | 36. 021 | 12 | -6 |
| 11. 083 | 31 | -0 | 24. 045 | 21 | -0 | 37. 011 | 12 | -0 |
| 12. 043 | 29 | -3 | 25. 141 | 20 | -3 | 38. 013 | 9 | -0 |
| 13. 077 | 29 | -5 | 26. 151 | 20 | -4 | | | |

A cursory glance at this list gives the impression that it is top-heavy in terms of missed items on the Ross Test; and indeed, of the ten individuals who were highest in predication (P greater than .31), six missed five or more items; seven missed four or more, and eight missed at least three. One made six mistakes, and one had the second worst score in the entire sample, with eight incorrect answers.

At the other end of the spectrum, the ten individuals with the lowest predicate ratings (P less than .17) seemed to do quite a bit better as a group: three had no mistakes at all; five missed two or less, eight missed three or less, and no one missed more than six.

The scores of the ten highest in predication accounted for a total of 44 errors, for an average of 4.4 per individual. The ten lowest in predication missed 24 altogether, making an average of 2.4 errors for each individual. The difference--with the predicate types

erring in deduction at nearly twice the rate of those lowest in predication--is a fairly striking result.

When the scores of the borderline predicate-types (P=.29) are added to those whose predication rate was .31 and above, the average error rate is lowered to 3.7, which still remains 1.5 times higher than the average rate of the comparable number of individuals from the bottom of the list, a figure which rises to 2.5 errors per person. The inclusion of all the individuals who were identified as mixed predicate-types in the analysis of word association results brings the average error rate for the group of twenty-one subjects to 3.9 mistakes per individual, as against 2.5 per person for the fifteen subjects classified as non-predicate types. In general, then, it seems as though individuals high in predication on the word association test make mistakes in deductive reasoning one and one-half to two times as often as individuals with a low proportion of predicative responses.

Table 37, on the following page, gives a ranking of subjects in accordance with their scores on the Ross Test; those with the most errors are at the top of the list. The top ten on this list have an average predication rate of 27.5%. The individual with the highest percentage of predicates is among this group of ten, and only two of the ten are individuals who gave less than 24% predicates on their word association tests.

The average predication rate for the lowest ten subjects on the list is 22.7%, a figure which is surprisingly close to that of the top ten, and indeed, four of these high scorers were also high in percentage of predicates. Post-test interviewing of these individuals

Table 37

Ross Errors Compared With Predication Rates

| Subject | Ross | P | Subject | Ross | P | Subject | Ross | P |
|---|---|---|---|---|---|---|---|---|
| 1. 048 | -9 | 24 | 14. 022 | -4 | 23 | 27. 074 | -2 | 17 |
| 2. 073 | -8 | 31 | 15. 151 | -4 | 20 | 28. 033 | -2 | 15 |
| 3. 034 | -8 | 27 | 16. 015 | -4 | 18 | 29. 102 | -1 | 40 |
| 4. 075 | -7 | 25 | 17. 053 | -3 | 38 | 30. 012 | -1 | 29 |
| 5. 076 | -6 | 31 | 18. 043 | -3 | 29 | 31. 024 | -1 | 29 |
| 6. 046 | -6 | 15 | 19. 023 | -3 | 26 | 32. 113 | -1 | 17 |
| 7. 021 | -6 | 12 | 20. 051 | -3 | 26 | 33. 083 | -0 | 31 |
| 8. 081 | -5 | 43 | 21. 141 | -3 | 20 | 34. 014 | -0 | 23 |
| 9. 103 | -5 | 35 | 22. 032 | -3 | 14 | 35. 045 | -0 | 21 |
| 10. 142 | -5 | 32 | 23. 044 | -3 | 14 | 36. 062 | -0 | 16 |
| 11. 101 | -5 | 31 | 24. 047 | -3 | 13 | 37. 011 | -0 | 12 |
| 12. 077 | -5 | 29 | 25. 031 | -2 | 33 | 38. 013 | -0 | 9 |
| 13. 104 | -4 | 31 | 26. 061 | -2 | 29 | | | |

revealed the fact that three had studied formal logic at some time in their past, and one had previously taken the Ross Test as well. The fourth was quite surprised at her high score, since she had only been guessing at the answers. When the data for the three who had studied logic is set aside, the average rate of predicates for the ten best scorers on the Ross Test falls to 18.3, nearly a full ten points less than the average for the ten who missed the most items on the test.

A further refinement of this picture becomes possible through an examination of the composition of the group that forms at each level of error. When the sample is divided into predicate and non-predicate types at the criterial percentage of 30%, all those who missed five items and half of those who missed five or more were predicate-types. When borderline predicate types are included, 58% of those who missed five or more and half of those who missed four or more can be defined as predicate types.

When the scores of predicate and mixed predicate types are combined, 100% of those who missed more than six are in their company,

as are 71.4% of those who missed six or more, and 83.3% of those who missed at least five.

Conversely, when predication is defined at 30%, and those who studied formal logic are excluded from the sample, there was no predicate type individual with a perfect score. Only 10% of those who missed less than two are predicate types, as are only 9.1% of those who missed three or less. With the addition of figures for the borderline types, the proportions remain the same: no member of the group had a perfect score, and only 7.1% of those who missed less than three belonged in the predicate category. When the mixed predicate types join in the sample, 14.3% of those who missed less than three have the requisite proportion of predicates, and the remainder, 85.7%, are all individuals that can be identified as non-predicate types, with less than 23% predicate responses on the word association test.

A final aspect of this list that requires examination is a frequency distribution of scores: 2.6% of the respondents missed half the questions on the Ross Test; 5.3% missed eight of eighteen; 18.4% missed more than one third of the items. 31.6% made at least five mistakes, and 42.1% had at least four errors. A total of 57.1% of the sample missed three or less, with the largest single percentage, 21%, making three mistakes; 26.3% missed less than two, and 15.7% achieved a perfect score.

When the list is divided in half, eight individuals in the top half had at least 30% predicates, as contrasted with only three in the lower half, two of whom had studied deductive logic. Seven of the thirteen individuals in the top third of the list can be identified as predicate types by this criteria, as against two in each of the middle

and lower thirds. When P is fixed at 29%, ten of the nineteen individuals with the most errors are included as predicate types, as compared with three (not including the three who studied logic) in the half with the highest Ross Test scores. With the addition of the mixed predicate type respondents, fifteen of the worst-scoring nineteen individuals can be considered high in predication, with the same three (or eight, if those who studied logic are included) holding their own among the nineteen with the highest scores. With the list divided into thirds, the figures are still more telling: eleven predicate or mixed types appear in the worst-scoring third of the group, five in the middle, and only two among the third with the best scores, those who missed, at most, one item on the test.

By way of comparison, the scoring information given in the administrators' manual to the Ross Test indicates that an error rate of six, or 67% correct responses, is the average score for a non-gifted student in the sixth grade. By contrast, a gifted student in the sixth grade would be expected to miss no more than three questions on the test. On average, non-gifted children miss three items more than gifted children at all grade levels tested (fourth, fifth and sixth).

When raw scores are converted into percentiles, a perfect score falls into the 91st percentile for gifted students in the sixth grade, and the 99th percentile for non-gifted students. Three errors, a common score in this sample, would rank at the 48th percentile for gifted, and the 87th percentile for the non-gifted. With five mistakes, an individual would fall at the 17th percentile for gifted sixth-graders, and the 65th percentile for non-gifted students in the sixth grade.

None of this, of course, is to suggest that those predicate type subjects with high error rates are less intelligent than others with better scores; in fact, the Ross Test was found not to correlate with standard measures of intelligence. It may suggest that they have not had training in deductive logic comparable to that which may have been given to a gifted sixth-grader; yet again, it may indicate that their concern with the sensuous quality of each predicate in the Ross Test prevented them from putting the predicates together in a way that would eliminate inappropriate conclusions. There is nothing to find fault with in the logic of these individuals' daily lives; the most that can be said is that the artificial practice of the syllogism is not one in which they have cared to develop a high degree of skill.

As a final analysis, a Pearson Product Moment Correlation was performed on the Ross error rates and predication rates of subjects in the sample. The result, r=.57, suggests that there is a moderately strong correlation between high predication rates and high numbers of errors in deductive reasoning, at least as measured by the syllogisms of the Ross Test of Higher Cognitive Processes. The fact that predicate types had two times the rate of errors as those who were non-predicate types is certainly a phenomenon that merits further study, and additional work with other kinds of logic tests might reveal whether the anomaly is to be found in the thinking function of the predicate type individual, or in the peculiar predication of the Ross Test of Higher Cognitive Processes.

## Conclusions

The experiment described in this chapter was designed to examine two different dimensions of thinking, both related to measures of verbal behavior. The test of word association, administered to fifty-two members of fifteen families was intended to highlight similarities in associative patterns and reaction styles shared among members of the same household. The test of deductive reasoning, given to thirty-eight of the subjects of the word association test, was performed in order to show comparative facility in this critical thinking skill among individuals of different associative reaction styles. In both examinations, the focus of attention was the reaction style distinguished by a preference for predication.

Limitations of the study. In the course of the analysis, comparisons were made between findings in the current sample and results from the experiments in word association performed by C.G. Jung, Franz Riklin, and Emma Furst and the Burgholzli Clinic in Zurich between 1904 and 1904. There are, for a modern researcher, several difficulties in working with the published data of Jung's research team, not the least of which is the difference in population and the vastly different social and cultural setting in which the subjects of that time and place raised their families and led their lives. Furst's families, in particular, were more extended groups of relatives and tended to be of a greater age than the subjects of this sample, most of whom were nuclear groups of parents with minor children. The absence of instruments of mass media, and the different standards of public

education, which obtained in turn-of-the-century Switzerland might be among the contributing factors in the higher agreement in familial association as against association of nonrelated individuals than was evident in the present sample. In any event, a direct comparison between the two samples did not prove to be possible.

A second, and equally daunting, difficulty is presented by the methods of the Burgholzli analysis itself. At the time, the Swiss researchers were on the cutting edge of statistical or psychometric investigation, not simply in the realm of verbal association as such, but in the ancillary phenomena of reaction-time, pulmonary and galvanic skin response, a line of research which foreshadowed the modern medical interest in the interface between emotional and biophysical or somatic phenomena. In many respects, they were creating the discipline of word association research as they worked; frequency tables and standardized word lists had not yet been invented (the first such table was not published until 1910), and, as we have seen, Jung went so far as to invent a mathematical formula of his own in order to quantify some of the qualitative differences he and his student observed in the patterns of their data.

Working with pen and paper at the turn of the century, limited to the manual calculation of means and "mean variations," neither Jung nor Furst had access to any of the procedures that modern statisticians would recognize as valid. Their word list was not subjected to any validity test, nor were their results examined through any post-hoc test of significance, and it is impossible to rule out entirely the factor of subjectivity in the procedure which they followed in assigning responses to the relational categories of their

classification system. As a consequence, any discussion of their findings must remain at the level of description.

In the present work, the same limitation as to the word list remains, but with an added complication. The list chosen for use with the present sample was not the same list used in the early Burgholzli research; it was based on a later version of the list which had been neutralized of emotionally-loaded stimulus-words, and had been toned down even further for the purposes of administration to pre-adolescent children. As a consequence, many of the reactions to these commonplace substitute words are also commonplace; thus there was less opportunity for the exhibition of significant group patterns that may have emerged if Jung's highly-charged stimuli had been used, and emotional themes on which family members might have shown agreement, and which might have differentiated family members from nonrelated individuals, were not subject to examination.

As part of the determination of agreement, Jung and Furst examined the dimension of verbal content--what it was that the respondent said to the stimulus, not simply the way, or category, in which he responded. Qualitative similarities between and among family members have not been analysed in this study, although the data remains for further work; nor were the close intrafamilial alliances, those between some fathers and sons, for example, further examined. Those areas, where the evidence of "familial agreement" showed most clearly, are reserved to an analytic realm which is altogether outside the scope of this research.

In addition, this experiment stopped after only one hundred words had been administered. Jung's original research involved a test of at

least two hundred words, as did Furst's; some of their subjects were asked to associate to four hundred stimuli. The determination of reaction-type, therefore, is somewhat less than secure in this work, since Jung found that it was often not until the end of the longer test that an individual's true "style" would emerge.

The composition of the families in this sample, though no less heterogeneous in this sample than in Furst's, posed difficulties for statistical work that were not as problematic with the descriptive approach she adopted. Equal n's in families would have made direct comparisons among them more possible, and would allow for the establishment of more reliable ranges within which the associative behavior of normal families can be expected to take place. Although the logistics proved to be impossible, it would have strengthened the sample if intact families could have been tested. The parent or children who were missing from the sample families might have held the key to significance in pattern redundancy in their household, but unfortunately, the truth of the matter will never be known.

The small sample size made a number of statistical tests which might have been performed impracticable, including the chi-square, which was designed to examine the significance of pattern redundancy. The results may be suggestive in terms of trends, but within such slight tolerances as to forbid discussion. The same is true of the comparison of average family rank order correlations with the average rank order correlations of nonrelated individuals. No post-hoc significance tests were performed on the results of any of the statistical analyses, so the figures must stand without the assignment of any degree of significance.

Outcome of hypotheses. With the foregoing limitations in mind, any conclusions based on this work must be held as preliminary and tentative in the highest degree; prior to validity and significance testing, it would be premature to make any positive claims based on the work reported in this chapter. Nonetheless, the data gathered in this study seems at least suggestive with respect to three of the hypotheses, and somewhat more strong in the case of the fourth.

The first hypothesis, that pattern redundancy in families occurs at statistically significant levels, could not be proven because the sample size was too small for a reliable chi-square test to be performed. However, even with the small number of dyads subjected to each test, the dyad of mother and daughter, when analysed in a 2 x 2 format as either predicate or non-predicate type, did come to within a few points of the 7.51 chi-square result necessary for significance at the .05 level. A larger sample size might serve to strengthen this trend.

The second hypothesis, that predication is the dominant reaction-style in any family in which it occurs in one of the parents, was also suggested by the evidence. In all but one case, predicating parents were shown to have at least one predicate-type child, and in that exceptional case, if all the children could have been tested, it is possible that it also would conform to the pattern of the other families. Furthermore, in households where neither parent was a predicate type, there were no predicate types found among the children. In the absence of acceptable significance tests, this result must remain, like the similar results obtained by Furst, descriptive only.

Mothers and daughters, the objects of the third hypothesis, were seen to have the closest degree of conformity of any familial dyad when reaction-patterns were tested by the formula devised by C.G. Jung to show associative similarity. However, Spearman correlations performed on a different set of data, the classified responses, showed mothers and daughters to be close, but not as close as fathers and sons, or as close as parents are with one another. When category choice was examined, children were found to be more similar to their fathers than to their mothers, but to a degree which is probably not significant.

The final hypothesis, on the interference between predication and deduction as modes of thought, seems to be supported by the evidence of this experiment. Subjects identified as high in predication on the word association test made nearly twice as many mistakes on a test of deductive logic as did those subjects with few predicative responses, when only these two factors were examined. A Pearson Product Moment correlation between percentage of predicates on the word association test and number of errors on the deductive logic section of the Ross Test of Higher Cognitive Processes yielded a result of $r=.57$, indicating a moderately strong correlation between high predication rates and high numbers of mistakes in deductive reasoning.

A further intention of this work, above and beyond the testing of the four initial hypotheses, was to establish a set of parameters within which members of normal families might be expected to agree with one another in associative response. In this sample, any two members of a family were found to produce the same word to a given stimulus, on average, just under 20% of the time; any given individual member's response was matched by a response by any other family member about 30%

of the time. When the dimension of response category was examined, these figures rose by a factor of two, with responses of any two members coinciding between 34-38% of the time, and any member sharing responses with any other member on 50-60% of the stimulus words.

The degree of difference between "family" and non-family associations, although not among the original hypotheses of this work, was a dimension examined by Furst in her population of more than one hundred subjects. Her 8,000 manual calculations according to Jung's formula for the quantification of difference yielded figures suggestive of a small but discernible closeness in family associations as compared with the associations of unrelated people. In the present work, an analysis of variance might have been a useful procedure for bringing any effect of "family" to light. The comparisons of related and non-related individuals' Spearman correlations gave an average result of .29 for family members and .25 for unrelated individuals overall. Although this small difference was not tested for levels of significance, it was analysed further to reveal the fact that individuals related to each other had correlations on their word association tests at the level of 0.40 and above about one and one half times more frequently than did non-related individuals in the population at large (20.8% for related individuals, 14.8% for non-related individuals).

Although the significance of this phenomenon has yet to be determined, and indeed it may prove not to be significant on further analysis, it does seem at least suggestive of a "family factor" which may involve individuals in patterns of verbal reaction specific to the family as a group, and may serve as one of a number of launching-points for further research in the area of family associative behavior.

Directions for further research. This work, as mentioned earlier, is the fourth in a series of theoretical explorations of the material contained in the first article of Volume 1 of C.G. Jung's Diagnostic Association Studies, "The Associations of Normal Subjects," coauthored with Franz Riklin; nor is it likely to be the last. Previous studies by this writer have focused on Jung's complex theory, in light of modern cognitive and structuralist ideas of associative clustering and semantic fields; on Jung's view of repression, as evidenced in the data of his word association experiments, and in comparison with the Freudian clinical model of repression and the various defense mechanisms, including the controversial phenomenon of "perceptual defense," which have been tested to greater or lesser effect in experimental laboratories by a number of cognitive psychologists; on his classification schema, in which an incipient "levels of processing" approach to associative encoding and retrieval can be seen; and finally, on a criterion-based approach to his associative typology, using a statistical perspective to reinterpret the "types" assigned by Jung to the participants in the first Burgholzli experiment on the associations of normal subjects.

The family dimension, explored in the present study, is certainly not the final theme worthy of exploration in Jung's earliest publication on verbal associative behavior. The interface between verbal association and visual imagery, which underlies his article like a structural support, is one element which lends itself to experimental investigation. Longitudinal work, such as that done by Jung with subjects 19 and 24 of his initial experiment, might serve to demonstrate the stability of reaction-type over time, thus opening

toward a study of personality in which the word association test might conceivably be correlated with such tests as the Myers-Briggs Type Indicator.

But even within the bounds of the family research begun in this study, much more remains to be done to establish reliable and statistically valid baselines for the associative behavior of family members. This work is, in essence, preliminary; it was intended to provide the experimenter with experience in techniques of administration and analysis of the word association test that can be used in subsequent work with larger populations and a more adequate statistical design. Perhaps the most valuable result of the present work is the quantification of the Jung-Riklin classification system, in its hierarchical arrangement reflecting decreasing tension in logical relatedness between stimulus and response; the coding scale presented in this chapter can be used in computer-assisted analysis of response patterns, although it must await validity and reliability testing before its use can be too widely generalized.

In terms of the response patterns evidenced in this study, an analysis of variance should still be done in order to isolate the meaning of the small differences which appeared in this sample between related and unrelated individuals. Significance tests should be performed on the correlational averages to determine whether a difference of four points between related and unrelated individuals is meaningful, assuming that correlational averages themselves represent a meaningful way of ascertaining levels of difference. And comparison of sample response frequencies with normative associative frequencies ought also to be done.

Assuming, for the moment, that the difference between family and the general population proves to be insignificant from a strictly statistical perspective, the establishment of that fact in itself might be of tremendous importance in the future work to which this study is only a prologue. As mentioned in the introduction, this project was conceived to follow in the tradition of the Burgholzli doctors, who looked first at psychometric patterns of normal subjects before beginning clinical work with pathologically disturbed individuals. In this paradigm, the small--and perhaps statistically insignificant--difference between related and nonrelated individuals in this sample might be indicative of the level at which a "family factor" operates within a normal population. The difference might be found to increase, perhaps, in dysfunctional family groups whose thought and behavior are distinguished by pathological enmeshment, to the point that "family resemblance" becomes a problem.

Such a new hypothesis, however, belongs more properly to a subseqent phase of research. What remains to be examined here, however, are the implications of the most striking result to emerge from the present findings: that there is a moderately strong correlation between preference for predication on the word association test, and greater numbers of errors on a test of deductive reasoning. This finding seems to support Jung's theory, described in Chapter 3, that there is interference between the two cognitive functions he called "thinking" and "feeling." The metacognitive implications of this finding will be discussed in the chapter which follows.

# C H A P T E R  V

## IMPLICATIONS FOR METACOGNITIVE PRAXIS

When Aristotle taught his course on reasoning, which became codified from his lecture notes in the five books of the Organon, his point of departure was predication: the categories of being, quality, attribute and action which may be asserted of any object. With the mastery of categorical assertion, the student of his method would have all the tools necessary to construct propositions, predicative statements with truth value, and would be ready to combine propositions in such a way as to deduce from what was stated some other, ungiven truth. Clearly, it was his experience that thinkers could move on from one stage to the next, although the step may have seemed neither natural nor easy at first; but indeed, as the evidence of this study suggests, it is just this movement, the transcendence of the static proposition with its truthful given, that the individual who prefers predication seems less inclined than others to make.

There is much in Aristotle's approach to language and logic that would inform a modern discussion of "critical thinking skills;" but unfortunately, the rigorous beauty of his system has been undervalued in recent times, perhaps because of the historical overemphasis on method which has rendered the deductive syllogism an empty exercise (Baron, 1985, Ennis, 1987), perhaps because of an intellectual bias within American education which values innovation over continuity. Nevertheless, the practice of deduction, and of judging deductive conclusions, is a major component of what Robert Ennis, of the Illinois Critical Thinking Project, has termed "critical thinking ability;" and

many of those who are currently part of the educational movement in critical thinking might be somewhat surprised to learn that their new approach to thinking has very old antecedents indeed.

"Critical thinking," as Ennis defines it, is "a practical reflective activity that has reasonable belief or action as its goal" (1987, p. 10). It implies not only the operation of a set of methods, but also a particular disposition toward reason and reflection, a personal attitude which values clarity, order, flexibility, open-mindedness, and an analytical approach to information. The result of this alliance between method and disposition is reasonable belief, an opinion which can stand the test of argument to the contrary, and which serves as the basis for reasonable decisions and actions.

Ennis' criteria for the critical attitude bear striking resemblance to the characteristics attributed by C.G. Jung to the thinking disposition in his 1921 monograph Psychological Types. But Jung's discussion of the positive aspects associated with the thinking function was balanced by an assessment of those qualities which might militate against the development of critical thinking ability in an individual; these qualities are the foundation of what he called the "feeling" disposition, an approach to information which is rooted in the immediacy of predication.

Vygotsky's developmental work (1986) has provided a theoretical framework within which predication can be seen as the permanent residue of childhood's egocentric speech patterns, and the natural mode of an individual's "inner speech." He suggests that it becomes externalized as a mode of communication with others only within closed systems whose members are all engaged in a single frame of reference. Brown (1958b)

speaks tellingly of the shaping influence a parent's predications may have on the world-view of a child, leading to the formation of attitudes or prejudices which may seem appropriate in context of the family system, but may clash with the values of the collective society. Laing (1972) goes so far as to suggest that a habit of evaluative predication within a household can have disastrous longterm effects on the child's self-concept and ability to think.

An individual who has been overnourished on predicates, then, may come to a course in critical thinking skills with a background which predisposes him to fail. All the hallmarks of what Jonathan Baron calls "poor thinking" (Baron, 1985) are in evidence in the predicative attitude: a need for certainty, an overconfidence in the immediacy of sensory data, a preference for delimited possibility, an unwillingness to examine opinion, a belief that "thinking" is difficult or useless. Predication is, by its nature, a hedge against ambiguity, a form of categorical and determinate negation; it rules out multiple possibilities and alternatives, and its concrete specificity is the very opposite of the abstraction which is required for reflective thought.

Baron's work on rationality and intelligence has included a study of factors which might inhibit the processes of critical thought. Paramount among these forces are personal attitudes and values which are developed in the home and reinforced by the socio-cultural norms which operate in an individual's environment; he is explicit in his recognition of the potential for family attitudes to sabotage a teacher's efforts to cultivate rational thinking skills. A child who exhibits what may appear to be resistance or "mental laziness" when

given some critical thinking task in a classroom might actually be manifesting the dynamic of a vast alternative system of thought, a rationality with rules and methods of its own which may violate the rules of academic rationality, but are no less adapted to the circumstances of that child's world than formal logic might be to the world of the academician.

Sensitivity to such background paradigms is an essential component in any attempt to make logical methods attractive to individuals whose rationality runs by other rules. The opinions and attitudes characteristic of the predicative, or to use Jung's term, the feeling, disposition, are not evidence of "immature" thinking, which can be developed through casual instruction in method. They may rather be the products of a fully-developed form of thought which operates by criteria equally "critical" as those by which "critical thinking" proceeds, and as such, may require a massive transformation in order for the rules of academic rationality to begin to operate.

Not without cause did Jung designate feeling as a "rational" function, since reason, ratio, is, in its essence, the predication of relationship. Thinking operates with the relationships between concepts, with the coordination of abstractions; feeling operates with relationships between values, through an association of attributes which are grasped at the level of concrete reality. As preferred ways of relating to the data of the environment, both deserve understanding and tolerance, but only the former is accepted within the educational community, and the latter is often made to suffer unnecessarily through teaching and testing methods which assume that there is, by definition, only one right way to think.

Luria's series of "anti-Cartesian experiments" in Soviet Central Asia (1979) revealed the fundamental ethnocentrism inherent in such an attitude toward thinking. He connected the ability to "reason," in the critical sense, with prior experience of systematic instruction in grammar. Simple premises and predications which reflect the known world are, he found, quite adequate in primary socio-cultural conditions. It is only when external circumstances require the movement beyond the concrete that abstract reasoning becomes at all useful.

One need not go abroad to discover that critical thinking may be neither useful nor desirable within certain communities, but Luria's point as to the interconnection between language and logic is profound, and in some respects, subversive of the established educational order in this society. Seen in its light, the current movement in teaching "critical thinking skills" may be little more than an elaborate form of damage control for the failure of the educational establishment to maintain appropriate standards of instruction in the formalities of language at the primary and secondary level.[1]

Put another way, the laudable goals of critical thinking programs would benefit from a systematic approach to language, of the kind that Aristotle himself outlined in his methods course. It is significant that he chose to devote so much attention--two complete books--to the process of predication and the construction of well-formed propositions, before moving to the more arcane matters of deduction, dialectic and paradox. The same sequence might be helpful to the individual of feeling disposition, when he is faced with the necessity of learning to think critically. It is an approach which values the

predicate, which establishes itself firmly in the known universe, which allows for the statement of a truth, and permits a moment of rest in the security of the given. It is just this safety and groundedness that a predicate type individual may need, before he is launched into the troubled waters of critical thinking. But programs in "critical thinking" often begin with the premise that relativity is better than certainty, that authority must be repudiated, that judgment--the guiding faculty of the feeling function --must be suspended, demands which may well be too abrupt and too dislocating for the predicative disposition.

A negative experience of the process of "learning to think" may guarantee the foreclosure of an individual's option to develop the thinking function. But if such damage at the hands of undoubtedly well-meaning instructors can be avoided, however, the natural dynamics of psychological equilibrium can assist the feeling individual in the development of his thinking function. The opposing, or as Jung terms it, the inferior, function of thinking holds an enormous fascination for the person of feeling disposition, precisely because it is underdeveloped. It is the missing piece of his cognitive puzzle, and represents all the undiscovered potential of his future development. But because the operational criteria of thinking and feeling are mutually opposed, they cannot be forced to coexist, and Jung warns against any attempt to approach the inferior function directly. He suggests instead a method of development which will enlist the support of one of the perceptual functions, sensation or intuition, in helping the individual learn to shift safely and comfortably from one information-processing mode to the other.

Even so handled, however, the transition is not an easy one to make. The cognitive habits of a lifetime are difficult to alter, and even if the process begins in childhood, it may be forced to work against the linguistic and cognitive preferences of the family system, the distillation of cumulative lifetimes, generations of cognitive habit. Such work may of necessity go beyond the limits of formal education, and into the ultimate realm of metacognitive praxis, psychological analysis.

Rather than recognizing its own appropriate boundaries, however, education has tended to take upon itself the role that properly belongs to analysis. Classical psychoanalytic theory, with all its doctrinal overtones, underlies the "critical thinking" approach to a remarkable degree.[2] Richard Paul, of the Center for Critical Thinking at Sonoma State University, for example, makes an argument for the development of thinking skills which stems directly from the Freudian paradigm. People have a primary and secondary nature, he declares, the former egocentric, irrational, opinionated and defensive, the latter "an implicit capacity to function as rational persons" (Paul, 1987, p. 130), an innate tendency which requires diligent and systematic practice in order to succeed in its task of recognizing and correcting the inadequacies of the primary nature. The goal of this work is the development of "a passion to seek reasons and evidence," Paul says, and any instruction which does not foster this evidentiary and discriminative rationality does not, in his view, deserve the name of education.

Although Paul's argument stresses the importance of dialectical (his term is "dialogical") process in breaking down the irrationality

of "egocentric identifications," his solution to the problem of one form of monolithic thinking is the substitution of another, equally monolithic form, just as Freud's answer to the vitality of the primary process was the repression of the secondary process. Given such a framework, the praise Paul bestows on the ability to enter sympathetically into the "mind set" of another has a somewhat hollow ring; such cognitive rapprochement can only take place on the playing-field of systematic rationality, a field on which not everyone may be equally suited to play.

While Paul, Baron, Ennis and others in the critical thinking world have stressed the superiority of rational thinking and the critical point of view, a second stream of cognitive theory recognizes the existence, and value, of "multiple intelligences," operating with modes of perception and information-processing which are quite distinct from the bipolar rational/irrational dichotomy of mainline critical thinking theory. The diversity with which human beings approach the data of the world is celebrated in Howard Gardner's Frames of Mind (Gardner, 1983), in a way which is compatable with Jung's theory of functional typology.

Drawing on research in the neurophysiological and biological fields which had earlier established the theory of hemispheric dominance in cognition, Gardner suggests that every individual has access to seven independent forms of information processing, and that each individual's cognitive profile is a result of the specific combination he makes of these distinct "intelligences." Logico-mathematical intelligence is one of the possible modes in which an individual may prefer to function; linguistic intelligence is another. Historically, the assessment of "intelligence" has depended on measures

of skill in these two areas, yet five other domains, equal in importance, which Gardner identifies as musical, spatial, kinesthetic, interpersonal, and intrapersonal intelligences, have been neglected and devalued by the educational establishment, and individuals whose natural combination of functions inclines them to one of these unrecognized intelligences have been ill-served by an overemphasis on the systematic rationality of linguistic and logical ability.

Gardner's sensitivity to alternative modes of cognition is reminiscent of Jung's theoretical challenge to the Freudian concept of unidimensional rationality.[3] Both theories emphasize the variability of perception, the relative importance of sensation and abstraction, of matter and of form, of pattern and relationship; both stress that the cognitive system depends on the interplay of a number of different functions, each attuned to a different dimension of reality, each operating with its own rules of analysis and synthesis. Jung's feeling disposition might find its home in Gardner's "spatial intelligence," with its concern for the visual world; or again, in the "interpersonal intelligence" of Gardner's theory, with its caring discernment of mood and atmosphere.

A child of feeling disposition, if offered such options to develop his natural inclinations in his early years, might then be able to approach the tasks of logical thought from a position of strength, and come with an open mind to the beauty and clarity of systematic thinking. Such an individual, forced prematurely or without adequate preparation into the strait-jacket of logico-linguistic structure, on the other hand, is certain to develop an aversion for rational thought from which he may never recover.

The key to discovering the mode of one's natural inclination, as Jung suggests, lies in the patterning of everyday language, in the preference for a particular kind of associative relationship, and in the clusters of ideas that constellate around the sounds and meanings of words. But a question arises as to the origin of that "natural" disposition: that which has become so automatized and habituated as to seem natural may in fact, he suggests, be the product of speech patterns instilled in childhood by the language habits of parents; and far from serving the purposes of natural development, may hinder the development of one or more of his four "intelligences," to use Gardner's elegant expression.

The effect of language on attitude has been recognized by scholars and practitioners of the art of rhetoric at least since the days of Aristotle. But its influence on an individual's mental health and stability may be somewhat less obvious. Whorf was among those who have pointed out the etiological role of language in the compulsion of neurotic behavior. Bateson's work with schizophrenogenic families suggests that cognitive processes can actually break down under repeated violation of the metalogical and metalinguistic rules of communication, when interaction among family members creates a context in which the formal aspect of the message is at variance with its verbal content.

Language abused may lead to cognitive dysfunction, and provides the means through which symptoms of the dysfunction are conveyed as well. The distinctive speech patterns of schizophrenia, for example, as Bateson suggests, can be compared to a conflation of predicates in a syllogism: where normal thought moves through the predicates to a

conclusion, the schizophrenic will draw a relationship of equality between the predicates and remain trapped in his own fictitious identification, unable to move beyond his distorted recombination of the given.

While the overt symptoms of cognitive dysfunction may be manifested by a single individual, both Bateson and Laing agree that the entire family, the system itself, is the living source of the dysfunction. This was Jung's view as well, as can be seen from his early writings on the family, and although his own therapeutic career was spent in working with individuals on the end-results of their attempts to adapt to the experience of family interaction, a number of innovative clinical psychologists working in South Africa and in London have recently begun to take the Jungian concept of collective patterning directly into therapeutic work with dysfunctional families (Papadopoulos and Saayman, 1989).

It is not to be expected that examples of pathological conformity, such as the one discussed by Jung (see Chapter 3), would have been found in the sample population of the present study of verbal associative behavior in normal families. It would be equally mistaken, however, to deny on the basis of the present sample that such cases exist. Future investigation may indeed discover that evaluative predication is at the heart of such systemic dysfunction, as Jung's clinical work indicated, and as Laing of the Tavistock Clinic also seems to suggest.

In the clinical setting, the word association test may take on new significance and open new avenues of approach to systemic dysfunction, and the maladaptation of personal "types" to one another. No longer of

"merely theoretical importance," as Jung himself had described it in his Clark University lecture of 1909, verbal association within families may serve as a practical technique for revealing cognitive similarities at the systemic level which exert an influence on individual thought and behavior.

Further experimental work with normal families, building on the work begun in this study, may succeed in establishing reliable parameters within which normal associations may be expected to coincide, parameters which can serve as a baseline against which abnormal processes may be contrasted. One might speculate that, given an appropriately designed instrument,[4] pathologies of identification, the paralyzing possession of unconscious role-playing, the destructive dynamics of the dysfunctional family drama, all might come to light, and be shown to differ from the patterns and levels of agreement found in normal families such as those of the present study. The themes and images which emerge from a group association test in the clinical setting may offer powerful evidence of the collective patterns which structure the interactions of the group, indeed perhaps the most compelling evidence that can be brought to light, for as Jung himself found, beneath the phenomenon of the association is the grammar of thought itself, the deep-lying structure of relationship to which the word is a most eloquent and honest witness.

The exposure of patterns--of language, of thought, of behavior--is the essence of any metacognitive work, and the precondition for any process of conceptual change, whether it take place in the context of education, as in Bateson's vision of "secondary learning," "learning to learn," or in the realm of therapeutic analysis. Both approaches are

transformative of the quality of thought itself; both have recourse to the tremendous restorative power that is released through clarity of thought and insight into underlying order. Jung's theory of cognitive functions suggests that an individual's mental health requires a balance between the thinking and feeling functions, but the development of the ideal state of cognitive harmony can only be achieved by a struggle against the tension of these two opposing forces.

For many people, the struggle may seem too difficult to engage; for others, the educational system itself may serve as an impediment to the struggle. The individual who prefers "thinking," who is encouraged to explore the world through logical rationality and who excels in the tasks of academia, may find himself lost at some point in his life, isolated by an impoverished feeling function. The predicative personality, who may begin life with a disadvantage as regards thinking, may be confirmed in his intuition that he "can't" think rationally by unfeeling teachers, and go through life without once experiencing the satisfying clarity of systematic thought. And unfortunately, for the development of the whole personality, the feeling individual, who is the one most critically in need of developing the thinking function, may be the one most resistant to it as well.

For the student who comes from a family whose thought is overdetermined by evaluative judgments, or worse, from a dysfunctional household where nothing is clear or secure, critical rationality may not be an immediately acceptable alternative. On the other hand, the cultivation of the thinking function may be such a child's best defense against becoming overwhelmed by the emotional chaos of the household.

Strengthening the thinking function may be seen as literally a matter of life and death, requiring the utmost sensitivity and professionalism on the part of the teacher, or therapist, into whose presence such a child may come.

As Baron and others have suggested, prior to critical skill is critical attitude, a sense of security with rational analysis, the questioning of assumptions, the sequence of cause and effect, which cannot be effectively transmitted by a teacher who is insecure within the framework of his own system of thought. If, on the other hand, he is too rigid, too much under the domination of his own "thinking" function, his lack of feeling may alienate those who have the most to learn from him. What is needed is a process of mutual interchange, mutual influence and mutual development; for while the predicative student is at the task of learning to think, the thinking pedagogue might learn something about values and sensory realities from the feeling individual.

Genuine human development requires more of education than that everyone should become a systematic logician. But by the same token, everyone should be allowed to have a positive experience of reasoning, to enjoy the refreshing clarity of formal logical thought, which, even when it enters the "critical thinking" curriculum, is preceded by abject apology and left behind with great relief by teachers and students alike. It is no wonder, given its historical treatment, that logic is looked upon as anxiety-provoking by the vast majority. It is too often introduced without adequate preparation, without groundwork of the kind--to return to the Aristotelian metaphor with which this chapter opened--that Aristotle so carefully laid in his courses.

The predicament involved in developing the thinking function of the predicative personality is not one which can be addressed easily. It is not a matter for some new prescriptive pedagogy or curriculum unit. It cannot be achieved by the formulation of more slogans, acronyms and devices to assist students to remember discrete critical procedures or operations of thought. The differentiation of a critical consciousness out of the matrix of an unexamined life can hardly be scripted, since it is, in and of itself, the creation of a unique human individual, one who comes to the process with a unique set of experiences, understandings, values and patterns of reaction to both language and the environment.

Any true educational process--and under this rubric psychoanalysis is also to be included--must take into account the tremendous variety of cognitive habit or disposition in which individuals present themselves, and rather than imposing a strict template on everyone, must begin with the strength of the individual--the preferred "intelligence," in Gardner's sense, the personal learning style, the personal typology discovered by C.G. Jung.

The capacity for critical consciousness exists to some degree in everyone, no matter how primitive, or how damaged, his background, as Luria's fieldwork and Jung's psychiatric research so tellingly revealed. The challenge for educators is to cultivate the thinking faculty in a sensitive, positive and non-threatening way, related to the patterns of development each individual has brought from his own background, keeping in mind the fact that those backgrounds may be overdetermined with predicative value judgments and an aversion to the labor required for "thinking." Individuals from those backgrounds may

not be ready to move on in "critical thinking" as quickly as someone from a more objective, thinking-oriented household--but the educator who abandons the slow one or the resistant one with a poor grade in "reasoning skill" has failed in his own mission, and compounded the problem as well.

The operation needed in this work is a gentle and compassionate leading out from the limitations of the habit of judging--not a judgmental or dismissive confrontation of them, or a slick and facile exposure of their inadequacy, their "incorrectness." It moves with the laws of logic, not through dictation in an unrelated and rigid fashion, or through meaningless and nonsensical exercises, but in a living, organic way. Most people never see a syllogism in the entire course of their lives--but they live with them on a continuous basis. It is perfectly legitimate, therefore, to wonder "why" one should study logic as long as its ultimate use remains a mystery, as it almost invariably does in the course of formal instruction, even instruction in "critical thinking."

But the fact is that logic is as much about revealing premises as it is about drawing conclusions. The process of forward motion through the terms of a deductive syllogism may be next to useless for the purposes of most people's daily lives. But beneath every predication, every value judgment, every prejudice, may lurk a universal premise, an archetypal patterning of the individual's conceptual universe which will exercise its ruthless power until it can be exposed, through a "reversal" of the normal direction through which logic is conducted.

Such a forward-and-backward running approach meets the learner on his own ground, as Plato and his student Aristotle would have done, and

works with his language, his conceptual world, the patterns of reaction that are evidenced in the interchange of language between two people, the one revealing, the other discerning, listening, questioning, then himself revealing, in a dynamic and living rhythm which allows the other to discern, and learn to discern, for himself. The moment in which pattern is discovered between them--pattern in behavior, in language, in thought--is the moment of liberation from its tyranny. The only tool the work requires is language: the material in which the dysfunction is revealed is also the source of its transcendence. The method is the dialectic.[5]

Aristotle's focus on the language of predication may be--as he himself no doubt realized--the best starting point for the development of skill in reasoning. His extraordinary care for the precision of language served as the foundation on which the critical consciousness of Western civilization for the following two thousand years was constructed. Perhaps he understood, better than we do today, that imprecise formulations of thought, clothed in inadequate terminology, can impede the operation of clear and coherent reason. But he knew as well that in dialogue, through speech--<u>dialexis</u>--language can be reshaped to a more adequate representation of reality, fostering a more adequate adaptation to the necessity of circumstance. And perhaps he might have glimpsed its healing power as well, its power to constellate order out of chaos, to channel the force of emotion along networks of associations arranged and rearranged in such a way as to mitigate harm.

We could do worse, at the end of our millenium, than take another look at the fundamental approach to thinking bequeathed to us from a past that valued reason as the quintessential attribute of the free

individual, a reason tempered with feeling and with sense, devoted to the task of individual and social development. Perhaps through the ancient approach to human reason, we might rediscover in language the mediating principle between individual and system, mind and society. A change in language, as Whorf said, can transform our appreciation of the Cosmos; it may serve as well as the source of both psychological and ecological harmony.

# NOTES

## Introduction.

[1]Sir Francis Galton's work with composite portraiture was reported in his Inquiries into Human Faculty and its Development (1907), and is discussed by Brown (1958b, p. 87-88), and Anglin (1977, p. 11), where it is cited as an argument for the existence of conceptual "prototypes." Jung (1971) uses Galton's work as an analogy for his sketches of the psychological types; Vygotsky (1986) also mentions it, and says it cannot serve as an adequate model for the process of concept formation.

[2]Jung's initial experiment is reported in "The Associations of Normal Subjects," coauthored by Franz Riklin (Jung, 1973). Furst's work was translated as "Statistical Investigations on Word Association and on Familial Agreement in Reaction Type Among Uneducated Subjects" (Jung, 1918). Jung's lectures at Clark University in Worcester, Massachusetts, were published as "The Association Method" and "The Family Constellation" (Jung, 1973). By modern statistical standards, these works would be considered qualitative in nature, since they do not go beyond work with means and standard deviations. This is not a criticism of the level of analysis pursued in these texts; more advanced statistical methodology was not available at the time.

[3]The theory of multiple intelligences is the work of Howard Gardner (1983). Primary and secondary process thinking were first proposed by Freud (1950) in 1900. Piaget's theories of the development of logic are discussed in Gardner's history of the structuralist movement (1973). Dispositional bias is discussed in Baron (1985). The predicative nature of inner speech is described by both Vygotsky (1978, 1986) and Luria (1982).

[4]This is not, of course, to suggest that conformity represents the only form of pathology, or that conformity is in and of itself pathological. Jung's psychiatric focus, however, was on the pathology of conformity, imitation and identification (see Chapter 3), and it is my personal interest as well.

[5]The work of Sabina Spielrein has been studied by Carotenuto (1982) and Bettelheim (1983), and is also discussed in the Freud-Jung correspondence (1974). Alexander Luria began his psychological career with a fervent devotion to the ideas contained in Jung's word association articles, as he attests in his memoirs (1979).

## Chapter I.

[1]M.D. Eder suggested, in the introduction to his translation of the Burgholzli Studies in Word Association (1918), that Jung had derived the insights leading to his conceptions of the persona and the collective unconscious from his work with the word associations of families. The linguistic dimension of the collective unconscious has been explored in depth by Papadopoulos (1980, 1984) and Kugler (1982).

[2]The controversy between Platonic and Aristotelian viewpoints is apparently still raging in the fields of psycholinguistics and cognitive psychology, as can be seen from a number of articles in Simon and Scholes (1982).

[3]Freud is actually discussing the "abnormal" process of condensation in this passage, but it may be seen as merely an intensification of the normal process of concept formation.

[4]There may be variations in the process which might be accounted for by the concept of "labelling" with reference to the links of an associative network.

[5]These bits of information are, of course, the categories of Aristotelian logic. The term "predication" itself comes from Boethius' sixth-century Latin translation of Aristotle's Categories, a treatise on the formation and analysis of simple propositions. There is much in Anderson's approach that is reminiscent of the Aristotelian system; the "cognitive revolution," in fact, seems to have gone to great intellectual and technical lengths to restore a mode of analysis that would have been perfectly accessible, despite its inelegant computer-inspired expression, to the logically trained minds of the classical age.

[6]Cognitive psychologist Carol Smith suggests that infants, as well as children of the age discussed by Brown, are capable of conceptual abstraction.

[7]Carey (1988) argues that this process involves not only differentiations, but also "coalescences," which lead to the formation of superordinate category conceptions in young children.

[8]These "late syntagmatic" responses may be characteristic of the "predicate type" respondent observed by Jung, Riklin and Furst in their work with the associations of adults; see below, Chapter 4. It seems as though the developmental sequence is not a strict one; young children can evidence "mature" ordinate, subordinate and superordinate responses, and adults can persist in the predication which is characteristic of children. The process may be one of a successive relocation of emphasis, rather than an evolution of the capacity to associate in specific categories.

Chapter II.

[1]It is significant that Saussure's associative complexes are not hierarchically arranged, as are those of the later structuralist psychologists, such as Deese and Pollio (see Chapter I). Further on the construction of Saussure's complexes, see Kugler (1982).

[2]The therapeutic implications of this theory were not lost on Whorf; see, for example, the passage in one of his late essays, "Language, Mind and Reality (Whorf, 1956, p. 269): "neuroses are simply the

compulsive working over of word systems, from which the patient can be freed by showing him the process and the pattern." Whorf's writing abounds with references to the theoretical work of Jung, which must have had a profound effect on his own psychological viewpoint.

[3]Saussure's influence on the Russian formalists, who in turn influenced both Vygotsky and Luria, is traced by Jameson (1972). Vygotsky makes explicit reference to the work of Sapir in at least one of his books (1986). Luria (1982) mentions a critique of the Sapir-Whorf theory, but does not develop it at length. The position taken by Vygotsky on the social origin of language is, of course, the opposite to that espoused by Piaget.

[4]Both Vygotsky and Luria emphasize a great deal in their writings; I have chosen not to replicate all their underlinings, in the belief that they would rather distract attention than enhance it.

[5]For a more recent view of this process, see Carey (1988).

Chapter III.

[1]This connection was explored in a previous study, "C.G. Jung's Diagnostic Association Studies: A Cognitive Perspective," (unpublished, 1990). The levels of processing theory was first enunciated in an article by Craik and Lockhart (1972) and is unique among cognitive models in that it does not rely on a computer analogy to explain the functioning of the human mind.

[2]Jung and Riklin proposed the existence of six reaction types in all, of which three were varieties of the complex type.

[3]Jung's adult subjects who were found to prefer predication might possibly be described by Entwisle (1966) as those who have made a shift back to "late syntagmatics."

[4]Educational level seems to have been the distinguishing factor between these two objective types. Uneducated people responded with value-neutral ordinates and definitions; educated objective types responded with more linguistically-advanced reactions. Jung's subsequent research suggests that the preference for a reaction type is stable over time; see for example, his longitudinal study of Subjects 19 and 23. However, it is at least implied that formal education may play a role in changing a reaction type, and that emotional disturbance may temporarily transform an otherwise objective individual into a "complex" type.

[5]That Jung used his writing as a method of resolving his complexes was suggested by his wife Emma, in a letter to Freud of Nov. 6, 1911 (Freud and Jung, 1974, p. 456); the application of the term "self-analysis" is that of Papadopoulos (1980, p. 244).

[6]Transformations and Symbols of the Libido was later substantially rewritten and appears in the collected works of Jung as Symbols of

Transformation (1956). In the interest of historical consistency, I have used the 1912 version in this work. Vygotsky (1986) traces the polarity between "directed" and "non-directed" thinking to psychoanalytic theory by way of Eugen Bleuler's theory of "autistic thinking;" Bleuler was the director of the Burgholzli Hospital at the time of Jung's psychiatric research. Ultimately, the distinction may go back to the psychology of Plato (Republic, Book 4, 439D).

[7]Jung singles out the training in dialectical logic fostered by the scholastic philosophers during the medieval period of Western civilization as particularly noteworthy in this historical evolution of directed thinking.

[8]In the later version of this work, Jung expanded this section to include an argument to the effect that both world-views, that of the rational and of the fantasy process, were equally grounded in psychological reality, and thus were equally valid.

[9]An example of this irrational process of conceptual coordination might be the "bisociation" process of creativity discussed by Koestler (1964). Much of the current "right/left brain" literature might also find a place in this discussion.

[10]The differentiation between what is to be accepted and what is to be rejected is the criterion in the operation of ancient Stoic logic, which arose as a challenge to the methods of the Aristotelian school. Jung does not discuss the body of Stoic literature, but it would be interesting to trace his analysis of thinking and feeling through the fundamental philosophical opposition showed by the Stoics to the Peripatetics. On Stoic logic, see Mates (1973) and Rist (1978). Jung's theory of the four functions has classical antecedents as well, in the four stages of cognition presented in the Platonic "allegory of the line" (Republic, Book 6, 509D and following), which influenced Western philosophy both directly and through the works of the Neoplatonists, including Porphyry and Boethius.

[11]This is a point that has been made by James Hillman (von Franz and Hillman, 1971).

[12]Jung attributes this statement to his director, Dr. Eugen Bleuler.

[13]Prior to publication, Jung sent Dr. Furst's manuscript to Freud; it is clear from his remarks in his letter that he was more interested in the adaptation of statistical methodology to his complex theory than in any particular aspect of family behavior. Freud's reply focuses entirely on Furst's analysis of individual psychology, and says nothing about the family dimension (Freud and Jung, p. 66ff). Although Papadopoulos and Saayman (1989) make an eloquent case for the depth of Jung's interest in the family, it does not seem to be in evidence in this correspondence. Emma Furst remained with the Freudians after Jung's split in 1913.

[14]The coefficient of difference between this pair was 0.5, considerably lower than any of the pairs tested in the present

experiment, and almost certainly pathological. Further on the contaminating effect of the predicate type, see Jung, "The Significance of the Father in the Destiny of the Individual" (1961). Freud discusses cases of such close psychological engagement as examples of telepathy in his lecture on "Dreams and Occultism" (Freud, 1965).

[15]Further on this concept, see Bateson on the phenomenology of analogic communication (1972), and Vygotsky's analysis of animal communication: "a frightened goose. . .does not tell the others what it has seen but rather contaminates them with its fear" (1986, p. 7). Such is the mechanism of empathetic engagement. It is the absolute antithesis of thinking: rational, fantasy, critical, creative, or otherwise, and belongs with the phenomena of participation mystique studied by Jung in their psychotic manifestations. The ancients recognized its danger: they called it bewitchment, or possession by a god, and did not dare to invoke its effects casually. We with our lofty theories of creativity are not nearly so wise as were they.

Chapter IV.

[1]Quite a number of individuals asked if they could participate, in fact, including friends and roommates of adult children living out of town. One participant in the study suggested that the word association test would make a wonderful parlour game for families and friends alike, and ought to be marketed as such. The sheer fun people had with it was an unexpected outcome of the experiment.

[2]Specific familial intersections are as follows: Family 4's first daughter is the parental companion (pc) of Family 5; Family 4's oldest son is the father of Dyad 13. Family 7's first daughter is the mother of Family 9; the fourth daughter is the wife of Dyad 12. Families 8 and 9 are, in point of fact, collections of related dyads rather than families; however, their long-term social closeness seemed to justify the inclusion of inlaws as family members in some aspects of the analysis. in the analysis of related against unrelated individuals, these members of extended families were excluded from the calculation.

[3]Reaction-time data is not part of the analysis presented in this report, but was taken in 21 cases and is available for future study. Reaction-time is a significant factor in the analysis of individual responses, but was not considered by Furst in her work with the associations of families.

[4]Alterations of the Brill version of Jung's stimulus list are as follows. One represents a choice of Jung's original word over Brill's substitution (no.78, fremd, strange, given as "friend" in the Brill list). Four instances (no. 32, 43, 52, and 81) are alternative translations of the German original, and two others (no. 62, 94) are words which represent a related, although not identical, concept. In the case of the five remaining alterations, (no. 36, "play," no. 40, "ride," no. 85, "dog," no. 89, "fire," and no. 100, "talk," instead of "die," "pray," "stork," "bride," and "abuse," respectively), substitute words were chosen from the original Jung-Riklin list and inserted at

points where the pattern of stimulus-words might be likely to touch on or exacerbate an emotional complex. If it were the purpose of the test to explore individual psychology, then any complexes associated with each of the deleted words could adequately be revealed by responses to other related words on the list. Since this was not the purpose, however, it was decided to lighten the list in the areas of religion, sex, birth, death and violence represented by those five stimulus words, and to offer more neutral terms instead. In particular, it was thought to be highly inappropriate in context of the present experiment to end a list of terms to be read to children with the stimulus-word "abuse."

[5]These principles of classification are as follows:

1. All opposites and antonyms, substantive or adjectival, are classified as contrasts (external responses).
2. All implied opposites which are substantive (where no true opposite is possible, e.g. "brother-sister") are classified as ordinates (internal responses).
3. All potential coordinate responses which seemed intended as synonyms are classified as such (external responses).
4. All part-whole relationships are classified as subordinate-superordinate, and vice versa.
5. All clearly egocentric responses (those in which the association is "me," "I," "mine" and the like) are classified as indirect responses.
6. All substantive attributes (e.g. "fur-animal," "bird-feathers") are included as indefinite grouping responses.
7. All paralinguistics and kinesics are classified as failures, even though they may have been intended to serve as a "meaningful" response.

It should be noted that no formal computation of the statistical validity or reliability of the Jung-Riklin classification system has yet been done.

[6]This analysis was performed on fifty individuals, before the data from Dyad 15 were obtained; it is doubtful that they would have significantly influenced the results.

[7]The individuals in Jung and Riklin's sample divide fairly evenly into four main groups, three of which reflected a specific reaction category, the ordinate, the predicate, and the linguistic-motor response. A fourth group gave associations which reflected no specific categorial approach to the stimulus word, but rather bespoke some inner emotional reflection on the stimulus; their mixed production was described as being organized around "complexes," or affectively-charged clusters of associations with highly personal content. The identification of a "complex type," of which Jung and Riklin offered examples of three degrees of subdivision, requires a consideration of factors which go beyond the simple classification of response words into their appropriate relational categories, and for that reason, although the present discussion will refer to a "mixed reaction type" in instances when no single relational category is found to predominate, this designation is not in any way meant to be interpreted as referring to the presence of complexes. And even though nearly all

of Jung and Riklin's "complex type" subjects show the diffuse figures of a mixed reaction style, the mixed type, as discussed here, is not to be taken as identical to the Jung-Riklin complex type.

[8]Jung and Riklin's use of the term "predicate type" has psychological implications beyond the identification of a tendency to produce predicates more than a third of the time on a word association test. Their "predicate type" individuals were distinguished by an ability to produce vivid internal imagery in response to the stimulus-word, and proved incapable of dividing their attention in the distraction portion of the Burgholzli experiment. Because these two factors were not investigated in the present experiment, it may not be entirely appropriate to refer to those with high predication rates as "predicate types" in the technical sense of the term. For lack of a better term, they are so designated in this text, but with the understanding that they may not share the other characteristics distinguishing Jung and Riklin's "predicate types."

[9]This would, in fact, be the case if the children conformed to the pattern observed by Entwisle (1966) in young children. Children too young to have made the "paradigmatic shift" would have responded with syntagmatic (predicative) reactions, classified as "internal" responses, and would thus not show the "blunting" associated with an increasing number of external reactions.

[10]Furst (1918, p. 441) attributed this increase to the tendency of older people to allow themselves more access to their emotions. She also found predication to be inversely correlated with educational level, in contradiction to the observation made by Jung and Riklin, 60% of whose predicate-type respondents were among their well educated subjects.

[11]In the present sample, there were twelve mother-son dyads, eleven father-daughter dyads, twelve father-son dyads, and fourteen mother-daughter dyads, for a total of 49 parent-child dyads altogether. Mothers were present in all eleven analysed families, fathers in only eight of them.

[12]"Ross Test of Higher Cognitive Processes: Manual," p. 5. The test has been in use since 1976.

Chapter V.

[1]Vygotsky (1986) credits Piaget with the insight that grammar must precede logic in a child's cognitive development. An educational system which bypasses the fundamentals leaves little for later instruction to build upon.

[2]This fact becomes all the more surprising in light of the evident absence of a critical attitude on the part of some critical thinking theorists toward the work of their own unacknowledged and unnamed authorities. The popularity of these secondary thinkers is in direct proportion to their failure to identify their sources, and

unfortunately, their clientele is not intellectually well-enough versed to be able to identify the sources on their own. There may well be those who, in good faith, believe that the primary and secondary nature expounded by Paul is an insight which originated with him, or that "dialogical process" is something new under the sun.

[3]Gardner (1983) imagines that Freud would have been appreciative of his theory of multiple intelligences. It is unclear what would have led him to this conclusion. Jung, on the other hand, would certainly have welcomed the insight Gardner has brought to the problem of personality and cognition.

[4]Such work would most certainly require the construction of a different word list than the one used in the present study; furthermore, the test would need to run to a minimum of 200 words. The procedure of adapting the word list to the specific situation presented by the client was one Jung frequently employed.

[5]This is dialectic in the specifically Platonic sense, not the dialectic of Hegel, Marx, Sartre or any of the modern philosophical or political dialecticians. Jung referred to his own therapeutic method as dialectical, and may have had in mind some passage like this one from Plato's Republic (Book VII, p. 254): ". . .the method of dialectic is the only one. . .doing away with assumptions and travelling up to the first principle of all, so as to make sure of confirmation there. When the eye of the soul is sunk in a veritable slough of barbarous ignorance, this method gently draws it forth and guides it upwards, assisted in this work of conversion by the arts we have enumerated." Plato believed, however, that a true dialectical exploration could not be done with individuals prior to the age of thirty, and that a rigorous course of instruction in music and mathematics should precede any inquiry pursued by means of dialectic. Anicius Boethius (see Chapter 1, note 5, above), the sixth-century Roman public administrator, musicologist, and avid student of the interface between language and logic, whose great project of translation literally bequeathed the texts of Aristotle to a Roman empire on the very brink of the Dark Ages (a slough of barbarous ignorance indeed) made an impassioned plea for the study of logic as a means of staving off social and cultural disaster. His career ended in disaster, with an unjust imprisonment and execution, but prior to his death he was able to complete a brief manuscript, The Consolation of Philosophy, which may contain the first recorded use of the dialectic for psychotherapeutic purposes. In an earlier essay, I described this small masterpiece as a complete course in the methodology of critical--and creative--thinking.

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# A P P E N D I X 1

## List of Stimulus Words, Word Association Experiment

1. head
2. green
3. water
4. sing
5. death
6. long
7. ship
8. pay
9. window
10. friendly
11. table
12. ask
13. cold
14. stem
15. dance
16. village
17. lake
18. sick
19. pride
20. cook
21. ink
22. angry
23. needle
24. swim
25. journey
26. blue
27. lamp
28. sin
29. bread
30. rich
31. tree
32. stab
33. pity
34. yellow
25. mountain
36. play
37. salt
38. new
39. custom
40. ride
41. money
42. stupid
43. notebook
44. despise
45. finger
46. dear
47. bird
48. fall
49. book
50. unjust
51. frog
52. separate
53. hunger
54. white
55. child
56. pay attention
57. pencil
58. sad
59. plum
60. marry
61. house
62. love
63. glass
64. quarrel
65. fur
66. big
67. carrot
68. paint
69. part
70. old
71. flower
72. beat
73. box
74. wild
75. family
76. wash
77. cow
78. strange
79. happiness
80. lie
81. conduct
82. narrow
83. brother
84. fear
85. dog
86. false
87. anxiety
88. kiss
89. fire
90. pure
91. door
92. choose
93. hay
94. quiet
95. ridicule
96. sleep
97. month
98. nice
99. woman
100. talk

A P P E N D I X  2
Part II, Ross Test of Higher Cognitive Processes

## Section II, Deductive Reasoning

In this part of the test, you will be asked to read some statements and then decide what conclusions could logically follow from what the statements say.

Read the following statements:

All quarks are purple.
All purple things melt in the sun.

If you assume these statements to be true, which of the following conclusions would logically follow from them?

Therefore,

Quarks melt in the sun.
All purple things are quarks.
All things which melt in the sun are purple.

The first conclusion, "Quarks melt in the sun," does follow from the statements above. The other two do not follow, since other things besides quarks can be purple (such as grapes), and other things will melt in the sun (such as snow). You would mark your answer sheet this way:

Quarks melt in the sun.

A. conclusion follows . . . . . (A) ☒
B. conclusion does not follow. . . . . (B) ☐

All purple things are quarks.

A. conclusion follows . . . . . (A) ☐
B. conclusion does not follow. . . . . (B) ☒

All things which melt in the sun are quarks.

A. conclusion follows . . . . . (A) ☐
B. conclusion does not follow. . . . . (B) ☒

You will be given some statements like the ones above. Do not be concerned about the truth of the statements—just assume that the statements are true. You must decide whether the conclusions beneath them do or do not follow from the information given in the statements. More than one conclusion may follow, or none of the conclusions may follow.

When you are told to do so, turn to the following page.
Read the statements carefully. Then read each conclusion.
Mark your answer sheet (A) if the conclusion follows.
Mark your answer sheet (B) if the conclusion does not follow.

If spiders can fly, then spiders have wings.
Spiders do not have wings but they all have feathers.
Therefore,

15. Either spiders fly or they have wings.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

16. If spiders have feathers, then they fly.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

17. Some spiders have no feathers.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

All palimons are known to be fish eaters.
Palimons are also migratory creatures.
Therefore,

18. All fish eaters are palimons.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

19. All fish eaters are migratory.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

20. All migratory creatures are palimons.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

All of Joyce's pets have four legs, but none of them have tails.
No gremlies have four legs and no gremlies have tails.
Therefore,

21. Some gremlies have tails, but none have four legs.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

22. If a gremlie has a tail, it will have four legs.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

23. None of Joyce's pets are gremlies.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

Ten Arabs left the town of Sahib and went into the desert with eight camels.
One week later, five of these Arabs arrived at the first oasis.
Each one was riding on a camel.
The camels were very thirsty and immediately began drinking water from the oasis.



*(Go on to the next page.)*

Therefore,

24. The three camels who did not arrive at the oasis returned to Sahib.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

25. Arabs can travel from Sahib to the first oasis in less than nine days.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

26. The three camels who did not arrive at the oasis are not being ridden by Arabs.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

If a person is a Caledonian, he is a pragmatist.
Persons who are Simians are also pragmatists.
Therefore,

27. Simians are pragmatists.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

28. Caledonians are Simians.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

29. If you are a pragmatist you are a Simian.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

All Frenchmen eat meat.
Frenchmen from Normandy eat only beef and Frenchmen from Brittany eat only mutton.
Some Frenchmen are blond.
Therefore,

30. Some mutton eaters are from Brittany.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

31. All Frenchmen eat beef.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

32. Blond Frenchmen from Normandy eat only beef.
    A. conclusion follows. . . . . (A) ☐
    B. conclusion does not follow . . . . . (B) ☐

*(This is the end of Section II.)* **STOP!** Please close your test booklet. Do not open it again until your teacher tells you to do so.

Section II
Score: _____

# APPENDIX 3
## LEXICON OF RESPONSES

(First 50 respondents only. Number in parenthesis indicates frequency of response)

**head:** toe (9), foot (8), shoulders (6), feet (3), body (2), brain (2), hair (2), eyes (2), games (2), neck, shoulder, Ed, brains, cold, tail, tails, heart, family, me, ear, dick, butt, (*)
**green:** blue (20), grass (7), yellow (4), red (3), purple (2), nail, pink, foot, money, black, water, tree, plant, head, white, peppers, orange, Irish
**water:** wet (6), drink (4), blue (3), ocean (3), swim (3), cold (2), fire (2), sand (2), H2O (2), sea (2), air (2), ice (2), mayim, pure, water, land, beach, clear, fall, falls, sled, brook, tea, snow, wash, snake, salt, steam, pink
**sing:** song (20), dance (5), music (4), voice (2), bottled, rupture, opera, loud, note, choir, chorus, church, hymns, notes, tune, choral union, songs, whistle, object, --, rap, yell, cry
**death:** life (21), birth (2), wish (2), funeral (2), me (2), end (2), dentist, black, cold, grim reaper, heaven, sadness, alive, Poe, misery, Woody Allen, live, eternity, grief, dirt, undertaker, die, napalm, peace, sorrow
**long:** short (43), life (3), tall, string, line, winding
**ship:** sail (14), boat (13), ocean (4), sea (3), sailing (2), water (2), wreck (2), awash, ahoy, anchor, cruise, float, shore, oil, shape, fool, fools
**pay:** money (25), work (4), day (2), toll, peg, hair, cash, scale, good, rent, spend, party, wages, debt, remit, later, not, not enough, broke, --, paymaster, shit
**window:** pane (12), glass (10), door (6), sill (3), light (3), view (2), broken (2), frame (2), clear (2), shade, "pain", Quincy, look, see, box, look, wash
**friendly:** nice (9), happy (5), mean (4), hostile (3), ice cream (3), unfriendly (2), dog, waitress, smile, courteous, pleasant, monkey, people, neighbor, short, helpful, ghost, Quaker, cheerful, warm, amicable, me, sad, hate, frank, stubbornness, mad, loving, family, --
**table:** chair (31), cloth (4), top (3), chairs (3), dirty, tennis, silverware, spoon, eat, legs, house, manners, network
**ask:** question (14), receive (8), tell (6), why (4), answer (3), seek (2), reply (2), care, say, (phrase), speak, please, demand, help, told, offer, given, give
**cold:** hot (34), warm (5), ice (2), nose, coal, hope, soft, hand, freezing, heat, snow, grip
**stem:** flower (20), rose (7), stern (2), plant (2), leaf (2), blossom (2), petal, from, stamina, root, branch, turn, piece, glass, --, thorn, base, peas, trees, apple, greens
**dance:** sing (13), music (6), walk (4), waltz (3), hop (3), move (3), ballet (2), song (2), fast (2), twist (2), club, jitterbug, dancing, floor, happy, around, polka, play, shoes, sit
**village:** town (14), people (13), city (4), house (4), country (2), Indians (2), pretty, hut, shepherd, houses, villain, small, green, hot, cottage, blacksmith, idiot

**lake:** pond (11), water (9), ocean (5), river (4), sea (3), swim (3), placid (2), fish (2), glassy, lace, clear, shore, Champaign, green, tree, restful, cold, cool, swan boats
**sick:** well (13), ill (9), healthy (4), health (3), medicine (2), mind, dog, old, dying, fever, dead, bed, weak, thermometer, me, better, poor, not well, ail, tired, puppy, cold, humor, flu
**pride:** joy (12), prejudice (4), proud (3), lion (3), -- (3), honor (2), self-esteem (2), courage (2), card, country, punishment, "goeth before a fall," (2), fall (2), people, humility, passion, honesty, loyal, happy, lie, accomplishment, invention, anger, pompous, sorrow
**cook:** food (12), clean (10), eat (5), burn (2), raw (2), meat, done, house, spaghetti, hook, winter, heat, fishing, pan, often, job, make, ship, meal, roast, fry, good, never, hungry
**ink:** pen (17), well (6), blot (4), write (3), blue (3), black (3), red (2), blotter (2), paper (2), damage, foot, business, spot, paint, mess, pencil, lead
**angry:** mad (13), sad (11), happy (8), upset (2), joy (2), --, me, squid, frustrated, anger, mean, cry, red, temper, shout, hate, nice, irate, sin
**needle:** thread (19), sew (11), point (3), sewing (3), haystack (3), pin (2), extraction, pins, lion, tattoo, medicine, stick, nose, pain, sharp
**swim:** water (10), sink (7), drown (3), dive (3), lake (3), float (3), ocean (2), sea (2), pool (2), fun (2), swam, pleasure, wet, sport, murky, suit, jog, can't, sun, exercise, paddle, beach, tide
**journey:** trip (14), travel (10), adventure (3), long (2), far (2), thousand miles, earth, bad rock bands, center of the earth, dot, life, mountains, path, backpack, end, unknown, roads, Ohio, London, vacation, voyage, forward, me, tour
**blue:** green (9), sky (7), red (6), black (3), white (3), water (2), purple (2), ocean (2), pink, color, lagoon, flag, ink, gold, cold, moon, Frank Sinatra, sad, grass, coat, eyes, velvet, clear, door
**lamp:** light (30), shade (11), post (3), table, bulb, illumination, candle, see, on
**sin:** evil (6), bad (5), hell (3), wrong (2), church (2), mortal (2), confession (2), mean, none, fun, religion, pale, God, how, repentance, confess, redemption, dirt, -cerely, Kristen, hook, daily, offense, death, joy, good, embarrasment, kill, deed, lie, enemy, fall, burn, blessing, --
**bread:** butter (18), water (14), food (5), wine (2), dough (2), glare, blood, eat, milk, wheat, peanut butter, chew, jelly, crumbs
**rich:** poor (43), money (3), food, mousse, rest, wish
**tree:** leaves (7), green (6), wood (4), plant (3), flower (3), leave (3), fall (3), top (2), house (2), shade (2), trunk (2), limb (2), leaf (2), leafs, grass, bark, chop chop, shrub, spring, bush, timber, branch, bird
**stab:** knife (16), wound (7), kill (7), cut (2), hit, blood, hurt, no!, stick, stale, heart, Puerto Rican, gore, back, dagger, death, dead, fight, bleed, shoot, bad, sharp
**pity:** sorrow (12), sad (7), sorry (4), poor (4), -- (3), compassion (2), don't, pittance, help, (*), ending, jealousy, tears, scorn, people, bullshit, shame, pathetic, sympathy, happy, pain, empathy, crook, blessing
**yellow:** green (9), orange (5), flower (5), blue (4), rose (3), brown

(2), white (2), sun (2), buttercups (2), fever (2), ribbon (2), banana (2), --, rope, bright, dandelion, bus, gold, purple, black, coward, vegetable

**mountain:** top (9), climb (6), hill (5), snow (4), high (3), height (2), molehill (2), stream (2), valley (2), peak, sky, dew, mound, ice, landscape, mountains, range, woods, pretty, lake, ski, higher, forest, walks

**play:** game (7), fun (7), theater (3), work (3), enjoy (2), Shakespeare (2), happy (2), children (2), L'il Abner, play set, ground, friends, theater, jump, hopscotch, around, recess, good, room, act, hard, run, frolic, stay, fall, sports, show, games, toys, pen

**salt:** pepper (39), water (4), food (2), battery, salt, shaker, swing, earth

**new:** old (44), expensive, clothes, nu?, basic, needle, new

**custom:** tradition (9), ritual (3), habit (3), house (3), -made (3), -- (2), design (2), old (2), radio, fit, customer, culture, mores, religion, song, won't, custard, foreign, hassle, dance, travel, airport, lore, trait, built, car, cars, usage, task, ethnic, nothing

**ride:** horse (8), car (7), walk (6), bike (4), travel (2), joy (2), drive (2), fair, --, trip, train, fun, carnival, amusement park, (phrase), bull, rob, rode, fast, bus, ferris wheel, rollercoaster, merry-go-round, journey, free, sit

**money:** cash (10), spend (4), dollar (2), green (2), none (2), wealth, dough, (phrase), rob, exchange, dollars, need, rich, checks, wealthy, avarice, sin, people, good, work, a lot, bills, paper, security, tree, shop, hungry, power, freedom, pay, bucks, never, wish, broke

**stupid:** smart (18), dumb (12), silly (3), idiot (2), pet tricks, stupidity, inane, unintelligent, bright, dull, poor, fool, idiotic, unhappy, goofy, handicap, me, L., --

**notebook:** paper (11), pencil (6), pen (5), notes (5), write (3), school (3), pad (3), writing (2), class (2), homework (2), spiral, memos, papers, cover, study, Hasefer, looseleaf, reading book

**despise:** hate (36), love (3), -- (2), Julienne, despondent, despite, enemy, deceit, dislike, admire, sad, like

**finger:** hand (10), thumb (8), nail (7), point (5), ring (3), toe (2), tip, jam, hands, touch, plan, death, punch, bone, pull, print, digit, middle, -licking, lake, writing

**dear:** doe (5), animal (4), love (4), hunter (3), honey (3), sweet (3), antelope (2), John (2), antler, antlers, dog, liar, nice, bear, sweetheart, darling, fond, hunt, heart, Marie, Mom, endearment, elk, shot, none, friend, close, valuable, chain, Bambi, leather, rabbit

**bird:** fly (16), sing (4), song (3), cage (2), tweet (2), house (2), feathers (2), feather, (visual), flower, horse, parrot, Auntie, in the sky, cardinal, wing, of, paradise, jay, fly away, bath, avian, sparrow, flight, birdseed, dog

**fall:** winter (7), drop (4), hurt (4), down (3), trip (3), water (3), foliage (2), spring (2), get up (2), autumn (2), free, Niagara, guy, crash, fast, air, cold, cool, pretty, plunge, leaves, (phrase), thump, ouch, jump, stand, stand up

**book:** read (22), paper (4), cover (3), mark (3), reading (2), end (2), open (2), bag, -ish, story, knowledge, pen, magazine, page, pages, shelf, worm, learning, candle

**unjust:** unfair (16), wrong (4), fair (4), justice (3), just (3), cruel (3), -- (2), court (2), evil, jail, corrupt, illegal, jury, Angelica, ugly, bad, travesty, liar, law, unequal, loose

**frog:** toad (13), leap (8), green (7), pond (5), jump (4), reptile (2), tadpole (2), twitch, fraud, croak, ribit, turtle, hop, fantasy, genus, fly
**separate:** together (9), apart (8), divorce (4), divide (4), part (2), equal (2), eggs, severance, despise, care, in between, put together, not together, pull, love, combine, move, marriage, congeal, split, alone, pull apart, broken, depart, sad, departed, take apart
**hunger:** thirst (10), pain (9), food (4), eat (4), starve (3), starving (3), pang (2), poor (2), starvation, hungry, stomach, yearn, bad, pains, illness, skinny, despair, famished, strike, full
**white:** black (33), snow (2), man, trash, glare, apron, pure, bride, brown, jealous, sheet, flat, cloud, flag, blue, red, dove
**child:** play (6), adult (6), kid (6), baby (5), mother (3), little (3), boy (2), love (2), son (2), grown-up (2), joy (2), tot (2), cute, -hood, whining, smile, Jamie, me, man, children, body
**pay attention:** listen (12), ignore (3), -- (2), school (2), strict (2), span (2), concentrate, think, daydream, distracted, short attention span, acknowledge, alert, yes ma'am, not me, forget, thought, teacher, observe, me, stop it, heed, to what, huh, attend, never, concentration, fall asleep, learn, fool around, see, hear, wander
**pencil:** pen (26), paper (10), write (3), lead (2), eraser (2), writing, sharpener, neck, notebook, holder, pad
**sad:** happy (32), glad (4), cry (3), unhappy (3), face, mad, melancholy, cheerful, pensive, blue, sorrow, sorry
**plum:** fruit (10), purple (9), peach (7), cherry (3), pudding (3), tree (3), apple (2), pear, red, eat, fall, apricot, nectarine, pit, grape, sloe, tart, juicy, Jack, granite
**marry:** wed (8), divorce (5), dead (2), quite contrary, John, narrate, engage, Paul, wife, death, Robin Hood, woman, ring, family, see, happiness, unwed, ball and chain, love, with children, church, happy, separate, commitment, haste, single, mistake, unhappy, repent, ring, bachelor, lover, spouse, join, lamb, divorced, why, no
**house:** home (16), live (4), car (2), apartment (2), building, (visual), hold, maison, work, brick, rooms, cat, dwelling, lot, cold, live in, big, family, buy, barn, shoe, camping, white, mortgage, fence, Police Academy, bills, light, security, shack
**love:** hate (24), cherish (2), marriage (2), heart (2), husband (2), care, oh--Lynn, (phrase), lords, bump, goddess, people, person, happiness, good, caring, mate, peace, joy, death, yuk, fulfillment, romance
**glass:** break (9), window (4), water (4), clear (3), broken (3), drink (3), cup (2), bottle (2), house (2), --, figurines, tumbler, tinker, shiny, stone, transparent, tree, wine, dish, drinking glass, table, ice, sand, mirror, houses, cup, plastic
**quarrel:** fight (24), argue (4), angry (4), spat (3), -- (2), argument (2), yell, rabbit, disagree, sad, ocean, reef, beautiful, unhappiness, make up, water, talk
**fur:** coat (15), soft (7), animal (6), mink (2), dog (2), ball (2), hair (2), cat, animals, skin, tree, sable, stole, fuzzy, critter, wall, -ry, animal killer, smooth, beaver, bunny, brown
**big:** small (26), little (17), large (3), monstrous, tall, boat, better
**carrot:** orange (12), stick (6), rabbit (4), cake (4), vegetable (4),

Bugs Bunny (3), potato (2), food (2), cucumber, rabbits, the thing, red-orange, top, cook, carol, eat, long, peas, bugs, dick, peas
**paint:** brush (13), house (8), thinner (3), red (2), paper (2), picture (2), colors (2), wall (2), walls, purple, paintbrush, easel, draw, painter, color, never, art, work, weather-beaten, pretty, enamel, flower, pictures, marker
**part:** separate (8), whole (6), hair (6), piece (3), play (3), car (2), --, some, all, section, divide, leave, arm, sever, cut, parking, break, time, broken, tear, fraction, combine, transplant, goodbye, fix, small, middle, body
**old:** new (34), young (11), decrepit, man, older, used, car
**flower:** rose (5), petal (4), bloom (4), stem (3), bud (3), pot (2), blossom (2), tree (2), pretty (2), daisy (2), seed (2), lovely (2), child (2), arrangement, flour, grow, tulip, smell, vase, Mom, bee, spring, white, bunny, beauty, sex, cactus, sweet
**beat:** red (8), drum (6), hit (6), fight (4), vegetable (2), best, heart, dance, tired, egg, juice, whip, wife, sugar, club, win, won, carrot, hurt, up, eggs, rhythm, sour, nasty, cane, music, free, loss, --
**box:** cardboard (9), square (5), car (4), fight (3), present (3), carton (3), spar (2), bag (2), (visual), boxer, hold, can, in, round, storage, black, store, crate, container, big, package, money, pack, brown, string, gift, circle
**wild:** tame (15), wooly (3), animal (3), free (3), calm (3), flower (2), tiger (2), crazy (2), young, stallions, horse, unruly, self, tamed, friendly, thing, streets, play, Trodges, Eric, wire, west, flowers, woman, me
**family:** love (5), home (5), friends (4), together (3), ties (2), close (2), tree (2), parents, small, people, five, brother, unity, us, group, three, furnishing, children, clan, good, happy?, friend, loved ones, room, many, happiness, crazy, divorce, gathering, household, circle, house, unit, cousins
**wash:** dry (16), clean (11), clothes (11), rinse (3), dishes (2), laundry (2), washer, care, fold, cloth, --
**cow:** milk (22), moo (6), horse (6), calf (3), pasture (2), Ron, cower, cud, big, mule, spotted, me, fat, Holstein, chicken, farm
**strange:** odd (14), wierd (11), familiar (3), unusual (3), different (2), pickle, potato, friendly, everything, string, sure, fellow, unnormal, normal, ex-wife, me, family, you, people, queer, Bobby, custom, concern
**happiness:** sadness (9), love (3), sad (3), glad (2), joy (2), contentment (2), good (2), gladness, teddy bears, hardness, pig, vacation, white, rare, elusive, travel, unhappiness, people, smile, pleasant, tranquility, nintendo, prosperity, child, wife, warm puppy, goodness, unhappy, elate, (phrase), sorrow, laughing, gaiety, wealthy
**lie:** truth (10), down (4), untruth (3), steal (3), fib (3), deceit (3), deceive (3), deception (2), cheat (2), don't (2), -- (2), lime, evil, fabricate, tale, wrong!, still, dishonest, prevaricate, tell, treachery, Benedict Arnold, you, see
**conduct:** behavior (12), effort (2), action (2), good (2), bad (2), exemplary (2), correct (2), lead (2), corrigate, perform, actions, order, propriety, --, poor, gross, -ivity, yes, behave, electric, lead, demeanor, language, attach, direct, music, orchestra, orchestration, manifest, disconduct, teach, grade

**narrow:** wide (21), thin (7), small (4), slim (3), margin (3), -minded (2), road (2), normal, pass, myopic, border, shoes, thick, inlet, bone
**brother:** sister (40), son (2), -hood (2), mother, friend, little, border, relative, kind
**fear:** scared (9), afraid (4), brave (4), anxiety (2), light (2), courage, (2), -some, forward, monster, old, death, bravery, no, unknown, excitement, fright, agony, horror, frightning, loathing, just, egg, ok, sad, shy, timid, fearless, hate, worry, anger, climate, no fear, scary
**dog:** cat (43), -gone (2), Bandit, Katy, mouse, fur, puppy
**false:** true (24), lie (6), untrue (3), truth (2), teeth (2), lies, not right, heart, real, -ies, answer, not, furrow, fake, hope, perspective, -hood, wrong
**anxiety:** attack (13), fear (6), -- (4), nervous (3), stress (2), happiness (2), now!, uncomfortable, Arbus, wierd, hope, separation, upset, rushing into, worry, anger, caffeine, unrest, daily, tension, nerves, sad, pain, stillness, depression, anxiousness
**kiss:** hug (12), love (11), lips (5), affection (2), death (2), tell (2), smooch (2), peck, goodbye, coarse, good, foreplay, hickey, chocolate, make up, yuk, passion, back, 108 FM, hate, --
**fire:** hot (9), burn (9), water (7), heat (2), house (2), plug (2), hose, wire, sun, alarm, smoke, ice, salt, bug, reject, place, hurt, starter, calm, unemployed, rain, wild, bacon, man, burning
**pure:** white (7), clean (3), unadulterated (3), snow (3), natural (2), dirty (2), good (2), water (2), wholesome, essence, -ify, porous, rich, salt, juice, virgin, hot, true, love, --, tainted, just, and just, coke, gold, new, strange, innocence, rain, soiled, unpure, simple, innocent, fake
**door:** knob (13), open (12), window (9), close (2), entrance (2), nail, drawer, hinge, gate, lock, out, closet, group, house, egress, opening, handle
**choose:** pick (15), select (5), choice (2), decide (2), change (2), food, shoes, constrain, choices, passage, correctly, pepsi, to, not, see, opt, --, guess, family, spits, song, shirt, avoid, options, special, socks, one, elect, take
**hay:** grass (6), horse (6), horses (4), needle (4), ride (3), straw (3), yellow (3), what? (2), stack (2), mow (2), cow (2), market (2), farm (2), food, sun, field, barn, --, love, harrow, eat, alfalfa
**quiet:** loud (18), noisy (6), peace (3), peaceful (3), solitude (2), time (2), calm (2), room, soothing, good, silent, outspoken, -tude, quarantine, sad, field, still, noise, soft, storm, short
**ridicule:** laugh (5), taunt (3), tease (3), -- (3), make fun (3), joke (2), stupid, Saturday Evening Post, righteous, ridiculous, funny, unjust, unjustly, put down, shame, deception, no, making fun of, make a fool of, fool, persecute, scorn, deride, make fun of, compliment, degrade, pick on, mistreat, nasty, fun, embarrassed, comment, sad, dislike, insult, love, hate
**sleep:** awake (12), tired (6), peace (3), nap (2), night (2), sound (2), dream (2), now!, fleas, wild, wake, long, unusual, comfortable, good night, pillow, good, wake up, weary, snore, day, deprivation, restless, quiet, eight hours, peaceful, up, sigh
**month:** year (18), day (8), week (3), teeth (2), days, day/year, montage, calendar, May, 30, 30th, years, four weeks, moon, birthday, eat, September, January, February, December, August, July, end

**nice:** good (6), bad (5), sweet (4), easy (3), happy (3), person (2), mean (2), pleasant (2), kind (2), false, cat, nights, looking, stars, unjust, nice, spice, great, last, pretty, day, loving, weather, yes, friendly, ok, kiss, quiet, naughty, lousy
**woman:** man (35), men, -hood, worm, hold, marry, love, child, daughters, babe, pretty, good, Mom, flower, fat, complain
**talk:** speak (10), loud (4), quiet (4), conversation (3), chatter (3), silence (2), chat (2), yell (2), cheap (2), discuss (2), voice, walk, speech, yes, slow, openly, listen, say, show, happy talk, work, soft, see, torrent, not, laugh

(*) subject asked that the response not be reported.
-- failure

# APPENDIX 4
## INTERNAL FAMILY GROUPINGS, VERBAL RESPONSES IN COMMON

FAMILY 1

4 Responses in Common
sad/happy
big/small

3 Responses in Common
head/toe
sing/song
long/short
bread/water
rich/poor
mountain/top
child/play
child/kid
PA/listen
pencil/paper
quarrel/fight
beat/red
brother/sister
dog/cat
false/true
quiet/loud
month/day
woman/man

FAMILY 2

4 Responses in Common
cold/hot
needle/thread
rich/poor
salt/pepper
new/old
dog/cat

3 Responses in Common
death/life
long/short
ship/sail(ing)
table/chair
dance/sing
pride/joy
journey/travel
lamp/light
bread/water
ride/horse
notebook/paper
white/black
sad/happy
love/hate
big/small
old/new
narrow/wide
brother/sister
month/year

FAMILY 3

4 Responses in Common
new/old
despise/hate

3 Responses in Common
green/blue
long/short
dance/sing
swim/water
rich/poor
stupid/smart
frog/pond
white/black
sad/happy
paint/brush
old/ne
brothe ister
dog/cat
false/true
woman/man

FAMILY 4

9 Responses in Common
long/short
rich/poor
new/old
dog/cat

8 Responses in Common
lamp/light
salt/pepper
brother/sister
woman/man

7 Responses in Common
table/chair
cold/hot
love/hate
white/black
old/new

6 Responses in Common
sad/happy
cow/milk
false/true
sleep/awake

5 Responses in Common
green/blue
book/read
pencil/pen
house/home
wild/tame
wash/dry
narrow/wide
choose/pick

4 Responses in Common
sing/song
death/life
ship/boat
ask/question
village/people
cook/clean
pity/sorrow
unjust/unfair
frog/toad
marry/wed
love/hate
fur/coat
big/little
hay/grass
quiet/loud
month/year

FAMILY 5

3 Responses in Common
long/short
cold/hot
rich/poor
new/old
despise/hate
strange/odd
brother/sister
dog/cat
false/true
fire/hot

FAMILY 6

3 Responses in Common
long/short
village/town
sick/well
journey/trip
rich/poor
salt/pepper
new/old

FAMILY 5 (con't)

3 Responses in Common

white/black
sad/happy
old/new
brother/sister
dog/cat
woman/man

FAMILY 7

6 Responses in Common

long/short
pay/monney
salt/pepper
brother/sister
woman/man

5 Responses in Common

table/chair(s)
cold/hot
rich/poor
new/old
despise/hate
book/read
love/hate

4 Responses in Common

stem/flower
needle/thread
bread/water
stab/knife
stupid/smart
big/small
old/new
beat/hit
cow/milk
strange/odd
dog/cat
nice/good

3 Responses in Common

19 pairs

FAMILY 9

3 Responses in Common

long/short
pay/money
table/chair(s)
quarrel/fight
old/new

FAMILY 11

4 Responses in Common

long/short
table/chair(s)
salt/pepper
new/old
woman/man

3 Responses in Common

head/foot
village/town
lake/pond
bread/butter
rich/poor
despise/hate
white/black
love/hate
big/little
wild/tame
narrow/wide
brother/sister
dog/cat
month/year

# A P P E N D I X 5

## INTERNAL FAMILY GROUPINGS, CATEGORIAL RESPONSES IN COMMON

FAMILY 1

| 5 Responses in Common | |
|---|---|
| F & 4 children | 3 |
| M & 4 children | 1 |
| F,M,1d,1s,2s | 1 |
| F,M,2d,1s,2s | 1 |

| 4 Responses in Common | |
|---|---|
| F,2d,1s,2s | 7 |
| F,M,2d,1s | 1 |
| F,M,1s,2s | 1 |
| M,1d,2d,1s | 1 |
| M,2d,1s,2s | 1 |
| F,1d,2d,1s | 1 |
| F,M,1d,1s | 1 |

| 3 Responses in Common | |
|---|---|
| F,M,1s | 8 |
| F,1s,2s | 7 |
| 2d,1s,2s | 5 |
| F,1d,1s | 4 |
| F,2d,2s | 3 |
| M,1d,1s | 3 |
| F,2d,1s | 2 |
| M,1d,2d | 2 |
| M,2d,1s | 2 |
| F,M,1d | 2 |
| M,2d,2s | 1 |
| 1d,2d,1s | 1 |
| F,1d,2s | 1 |
| M,1d,2s | 1 |
| 1d,1s,2s | 1 |
| F,M,2s | 1 |
| M,1s,2s | 1 |
| F,M,2d | 1 |

FAMILY 2

| 3 Responses in Common | |
|---|---|
| F,M,s | 12 |
| F,d,s | 7 |
| M,d,s | 6 |
| F,M,d | 4 |

FAMILY 3

| 3 Responses in Common | |
|---|---|
| F,M,2s | 9 |
| F,M,1s | 8 |
| F,1s,2s | 7 |
| M,1s,2s | 7 |

FAMILY 4

| 8 Responses in Common | |
|---|---|
| 1,2,3,4,5,6,7,9 | 3 |
| 2,3,4,5,6,7,8,9 | 1 |
| 1,2,3,4,6,7,8,9 | 1 |
| 1,2,3,4,5,7,8,9 | 1 |
| 1,2,4,5,6,7,8,9 | 1 |

| 7 Responses in Common | |
|---|---|
| 1,4,5,6,7,8,9 | 2 |
| 1,2,3,4,6,7,9 | 1 |
| 1,2,3,4,5,6,8 | 1 |
| 1,2,3,5,6,8,9 | 1 |
| 1,2,3,5,6,7,9 | 1 |
| 1,2,4,5,7,8,9 | 1 |
| 1,3,4,5,7,8,9 | 1 |
| 2,3,4,5,6,7,9 | 1 |
| 2,3,4,6,7,8,9 | 1 |
| 2,3,4,5,6,7,8 | 1 |

| 6 Responses in Common | |
|---|---|
| 1,2,4,7,8,9 | 3 |
| 1,2,3,5,6,8 | 2 |
| 1,3,4,6,7,9 | 1 |
| 1,4,5,6,8,9 | 1 |
| 1,2,4,6,7,9 | 1 |
| 1,2,3,6,7,8 | 1 |
| 1,4,6,7,8,9 | 1 |
| 1,2,3,4,5,7 | 1 |
| 2,3,6,7,8,9 | 1 |
| 2,3,4,5,6,8 | 1 |

| 5 Responses in Common | |
|---|---|
| 1,4,7,8,9 | 1 |
| 1,2,3,5,8 | 1 |
| 1,2,3,7,8 | 1 |
| 1,2,3,5,6 | 1 |
| 1,2,4,5,6 | 1 |
| 1,2,3,5,7 | 1 |
| 1,3,5,7,9 | 1 |
| 1,2,5,7,9 | 1 |
| 1,2,3,5,9 | 1 |
| 1,3,6,7,8 | 1 |
| 1,2,4,6,9 | 1 |
| 1,4,6,7,9 | 1 |
| 2,3,4,7,9 | 1 |
| 2,5,7,8,9 | 1 |
| 2,3,4,6,7 | 1 |
| 2,4,5,6,7 | 1 |
| 3,4,5,6,7 | 1 |
| 3,4,6,7,9 | 1 |
| 4,5,6,7,9 | 1 |

| 4 Responses in Common | |
|---|---|
| 1,2,3,5 | 3 |
| 4,7,8,9 | 2 |
| 4,5,6,8 | 2 |
| 2,3,5,8 | 2 |
| 1,6,7,9 | 1 |
| 2,4,5,8 | 1 |
| 4,5,6,7 | 1 |
| 2,7,8,9 | 1 |
| 2,5,6,8 | 1 |
| 3,4,7,9 | 1 |
| 2,6,7,9 | 1 |
| 1,2,8,9 | 1 |
| 1,3,5,8 | 1 |
| 1,3,4,5 | 1 |
| 4,5,8,9 | 1 |
| 2,4,7,9 | 1 |
| 1,3,6,8 | 1 |
| 1,3,8,9 | 1 |
| 2,3,7,9 | 1 |
| 4,6,7,8 | 1 |
| 4,6,7,9 | 1 |
| 1,4,7,8 | 1 |
| 1,2,3,8 | 1 |

| 3 Responses in Common | |
|---|---|
| 2,7,9 | 4 |
| 1,3,5 | 3 |
| 4,7,9 | 3 |
| 2,4,5 | 3 |
| 4,5,7 | 3 |
| 1,6,9 | 2 |
| 1,8,9 | 2 |
| 3,5,8 | 2 |
| 3,4,6 | 2 |
| 1,2,3 | 2 |
| 1,5,6 | 2 |
| 1,7,9 | 2 |
| 1,4,5 | 1 |
| 2,3,9 | 1 |
| 2,5,6 | 1 |
| 1,2,8 | 1 |
| 6,7,8 | 1 |
| 3,7,8 | 1 |
| 5,7,9 | 1 |
| 1,3,9 | 1 |
| 2,7,8 | 1 |
| 4,8,9 | 1 |
| 2,5,8 | 1 |
| 1,4,7 | 1 |
| 2,8,9 | 1 |

FAMILY 4 (con't)

| 3 Responses in Common | |
|---|---|
| 1,2,9 | 1 |
| 2,7,8 | 1 |
| 4,5,6 | 1 |
| 2,5,7 | 1 |
| 2,3,8 | 1 |
| 4,6,7 | 1 |
| 3,8,9 | 1 |

1=Father
2=Mother
3=1st daughter
4=1st son
5=2nd daughter
6=3rd daughter
7=3rd son
8=4th son
9=grandson

FAMILY 7

| 5 Responses in Common | |
|---|---|
| F,M,1d,3d,4d | 4 |
| F,1d,2d,3d,4d | 4 |
| F,M,1d,2d,3d | 4 |
| F,M,2d,3d,4d | 2 |
| F,M,1d,2d,4d | 1 |

| 4 Responses in Common | |
|---|---|
| F,1d,2d,3d | 5 |
| F,M,2d,4d | 4 |
| M,2d,3d,4d | 3 |
| M,1d,2d,3d | 3 |
| F,M,2d,3d | 3 |
| F,2d,3d,4d | 2 |
| M,1d,3d,4d | 2 |
| F,M,1d,2d | 2 |
| F,M,1d,4d | 2 |
| F,M,1d,2d | 1 |
| F,M,3d,4d | 1 |

| 3 Responses in Common | |
|---|---|
| F,M,2d | 6 |
| M,3d,4d | 4 |
| M,1d,4d | 3 |
| F,1d,4d | 3 |
| F,M,4d | 3 |
| F,1d,2d | 3 |
| 1d,3d,4d | 3 |
| F,M,3d | 2 |
| F,2d,3d | 2 |
| F,M,1d | 2 |
| 1d,2d,3d | 2 |
| M,1d,2d | 2 |
| 2d,3d,4d | 1 |
| 1d,3d,4d | 1 |
| M,1d,3d | 1 |
| F,3d,4d | 1 |
| M,2d,3d | 1 |

FAMILY 11

| 3 Responses in Common | |
|---|---|
| F,M,2s | 12 |
| M,2s,4s | 6 |
| F,M,4s | 4 |
| F,2s,4s | 4 |