Primary Process Thinking

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Primary Process Thinking

Theory, Measurement, and Research

Robert R. Holt

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Preface

This monograph distills about fifty years of intermittent effort to understand, clarify, and put to work the psychoanalytic theory of thinking.[1] That theory consists primarily of the concepts of primary process and secondary process, and some propositions concerning them.

When George Klein and I founded the Research Center for Mental Health at New York University (NYU) in 1953, our central objective was to find ways of working empirically with that theory, to test, refine, and elaborate it. We fell considerably short of that ambitious aim, but it did lead to a fruitful research program on non-conscious processes and various kinds of disordered cognition. Though we plunged in with some experiments on what came to be known as subliminal perception, we realized from the beginning that it was going to be necessary to put a good deal of work into assembling the psychoanalytic theory of thinking from scattered sources and finding ways to test it empirically.

George, being more at home in the laboratory and eager to follow up on some promising initial work on metacontrast (a masking effect), I gradually took over major responsibility for the theoretical work (but see Klein, 1976). Only slowly did I see that Freud's cognitive theory was embedded in his metapsychology. The result was a considerable enlargement of the tasks of clarification and of the historical study that seemed necessary for an understanding of how Freud came to think and write as he did. Much of the yield of that work is contained in a book (Holt, 1989).

Fairly early, however, I was struck by a happy realization that the work could be divided into two parts. When Freud wrote about the primary process in a theoretical vein, the discourse was mainly *metapsychological*, but he also left us a considerable body of *phenomenological* writing about it. Though the former was cast in frustratingly obscure and abstract terminology, the latter

was gratifyingly concrete—the language of direct clinical observation. I was able to translate it rather easily into specifiable scoring rules for detecting the hallmarks of the primary process in Rorschach responses, and, in about fifteen years, put the resulting scoring system through ten revisions with the aid of several colleagues and many students. Each revision was tested by application to empirical research problems, work that contributed to the continual refinement and elaboration of the scheme. It was further modified to make it applicable to other texts besides verbatim responses to inkblots, notably manifest dreams, thematic apperception test (TAT) stories and other narratives, and free verbalizations.

So, though the scoring system is cast partly in an anachronistic terminology with a metapsychological flavor, it is grounded firmly in clinical observation and has been developed throughout with the corrective negative feedback from further controlled observations. The measures to which it gave rise, such as the Index of Adaptive Regression, turned out to have many interesting and even useful relationships to independently measured variables of diverse kinds. That feedback has suggested further revisions of the original theory of thinking.

The present work has the following plan. First comes a consideration of the theory of the primary and secondary processes, followed by an introduction to the scoring scheme that constitutes what was once called their operational definitions. The concluding chapter restates the psychoanalytic theory of thinking in non-metapsychological terms using concepts that are as consistent as I can make them with current work in neuropsychology and the brain sciences. It also shows the relevance for this theory of some of the major findings of research with the primary process scoring, and some overall conclusions.

Volume 2, published on the accompanying compact disc, contains the complete scoring manual, with details about its reliability and validity. Each category of the scoring system is related to the theory and its application is illustrated by many concrete examples. It is designed to be self-teaching, so that anyone who wishes to follow up any of the many research leads scattered through this work can do so.

Then (in the CD) follows a set of chapters reviewing and summarizing the published research and much of the unpublished work, constituting a demonstration of the method's construct validity, plus a concluding chapter focused on needed future research. An appendix presents some normative data.

* * *

Along the path, stretching across more than five decades, leading to the presence of this book in your hands, I have been assisted by so many students

and colleagues that I am almost certain to overlook some of them in the following listing. To the unmentioned, my apologies as well as thanks. For the theoretical understanding out of which the manual grew, I owe an inestimable amount to my late friend and teacher, David Rapaport. I am grateful also to Charles Fisher, Merton M. Gill, George S. Klein, Benjamin B. Rubinstein, and Roy Schafer, with all of whom I have had many valuable conversations about the psychoanalytic theory of thinking, often with specific reference to the scoring system. In the text I mention my large debt of gratitude to Joan Havel. Another early colleague who contributed some permanently valuable suggestions is Fred Pine; thanks, Fred! Shortly before his lamentable death, my old friend from Topeka days, Martin Mayman, generously permitted me to make some modifications of his manual for scoring form level and to include it in this work. Marty had many talents, but little for self-promotion, and he published all too slowly. I am happy that his major work on form level will at last be available to Rorschach workers generally.

My thesis students Carol Eagle, Leo Goldberger, Helene Kafka, Robert Langan, James McMahon, Anthony Philip, Judith Rabkin, Hector Rivera, Carlan Robinson, Reeva Safrin, Theodore Saretsky, Marcia Shorr, and Roberta Weiss made valuable contributions to the scoring method's development and extension as research assistants and/or in their dissertation research on one or another aspect of primary process thinking. In addition, Carol Eagle worked out an adaptation of the method to dreams and TAT stories, which she has kindly let me revise and expand into chapter 10 of volume 2.

Another series of research assistants, with good computer skills, who worked so hard to eliminate the bugs in a finally abandoned program (written by someone who will remain nameless here) to computerize an ambitious plan for a normative study described in the preface of volume 2, include Marc Johnson, Thomas Kelly, and Tim Strauman. They earned my lasting gratitude.

I hope that the many psychologists who have given me information about their unpublished work will forgive me for thanking them collectively. They have delved into attics and storerooms to fish out doctoral dissertations, sending me photocopies of key data, even at times complete copies. But I must single out for very special acknowledgment two colleagues who have distinguished themselves by their generosity. Douglas Heath made excellent use of the "pripro" scoring in his monumental studies of adult development, then giving me back everything from raw data to his published books, notably including several special analyses of his data which he did for me. Charles Ducey has shared with me not only the fascinating findings of his dissertation but some of the fruits of many years of training clinical interns in the pripro method, one of which appears in volume 2 as appendix B.

Over the years, my secretaries at NYU—Anna Campittello, Dorothy Gorham, and Kathy Detmer, but especially Betty Brewer and William T.

Francis—worked tirelessly and with invaluable precision to type the various drafts of the manual, to duplicate and distribute it, to maintain numerous extensive files of related correspondence and data, and to keep me from sinking into the disorganization threatened by too many irons in too many fires. Finally, there has been a gratifyingly large number of colleagues who have written to purchase copies of the manual and who, later on, shared with me in the most helpful way the fruits of their labors with it, not only their results but in many instances their raw data. Truly too many to list here, their names and relevant publications appear in the bibliography. Gian Vittorio Caprara and Bjorn Christianson (who brought me to Rome and to Bergen to give seminars on scoring) and Germain Lavoie have been my doughtiest foreign allies. Sandra Russ, Sidney Blatt, and Donald Quinlan not only sent me copies of books and papers containing their work with the scoring manual, but have given parts of the manuscript valuable readings. I owe great debts of gratitude to two other friends and colleagues who have patiently labored through an enormous first draft: Morris Eagle and Rosemarie Sand.

Professor Lavoie has done so much more than anyone else—championing and teaching my method, stimulating generations of graduate students to use it in their thesis researches, reanalyzing some of their data for me, contributing imaginative and clinically sensitive indices, and more recently reading the manuscript of this book and offering countless valuable suggestions about it—that he deserves special acknowledgment and thanks. It has been a deeply gratifying privilege to work with him, and with all of these good people.

For twenty-six of the years (1962 through 1988) when the manual was being written, tested, reworked, and disseminated through informal channels, the work was supported by a Public Health Service Research Career Program Award (MH-K6-12, 455) from the National Institute of Mental Health, to which I am grateful indeed for making it possible for me to do work that could not easily have fit the mold of ordinary research grants. I thank also the funders who showed enough faith in what turned out to be a doomed project to give me small grants to try to salvage the originally botched computer programming: The Foundations Fund for Research in Psychiatry, a faculty research fund at New York University, and the Foundation for Psychoanalytic Research.

More recently, kind librarians at the following institutions have cheerfully and skillfully assisted my bibliographic endeavors: the Austen Riggs Center, Harvard University, the University of Wisconsin, New York University, and the town library of Wellfleet, Massachusetts. They and several computer experts have greatly speeded the completion of what turned out to be a longer project than ever contemplated.

At the time when this project had passed its golden anniversary, in 2002, I thought it was well on the way to publication and stopped searching the literature. Unforeseeable difficulties with a non-performing publisher caused four more years to drag on unproductively. Finally, another publisher is getting these pages into print as I approach my ninety-first birthday.

Robert R. Holt
Truro, MA

NOTE

1. The present brief account of that half-century-long quest has been expanded in the preface to volume 2.

Chapter One

Theoretical Foundations

The complex research project reported here began with an effort to assemble and elucidate the psychoanalytic theory of thinking. Very early, my colleagues and I made one greatly simplifying assumption: that it would suffice, for our purposes, to concentrate almost exclusively on the writings of Sigmund Freud. Mastering them seemed daunting enough without taking on what was already, half a century ago, a formidable literature of other psychoanalytic writings. Since George Klein and I had met as members of David Rapaport's Research Department at the Menninger Foundation, and continued a collaboration with him via mail and frequent visits, our approach bears the imprint of his example and his powerful mentorship as well as of several seminal writings (e.g., Rapaport, 1951a, 1959/1960).

The present chapter will therefore begin with the theory of the primary process as I understood it when the system for measuring its manifestations was being developed, which determined the scoring scheme's basic structure. Next will come a consideration of efforts by other writers to revise and reconceptualize Freud's theory of thinking. It ends with my present understanding of relevant theory.

A HISTORICAL NOTE

First, however, a few words about the historical origins of Freud's concepts. As usually presented (e.g., by all of Freud's biographers), the distinction between primary and secondary processes had no history prior to the 'Project' (1895/1950): "the 'Project' gives a clear indication of what is probably the most momentous of the discoveries given to the world in *The Interpretation*

of Dreams—the distinction between the two different modes of mental functioning, the Primary and Secondary Processes." (Strachey, 1953, p. xv)

In retrospect, it seems remarkable that so many generations of scholars, not exclusively the psychoanalytic ones, have so credulously accepted the dictum that Freud was the first to discover the key distinction between rational and irrational thought, or the mental processes of sane and insane persons. If references to similar distinctions in prior literature are pointed out, of course, analysts will say that they were only casual observations given commonsense articulation in ordinary language rather than a theoretical formulation, ideally an explanatory one. Yet it does not take much familiarity with the writings of Freud's teachers and prior generations of psychiatrists to find references to what amounts to his basic distinction, often couched in technical terminology.

Indeed, Meynert, Freud's supervisor and mentor in his brief psychiatric training, distinguished a primary and a secondary ego (i.e., *ich*; Meynert, 1884/1885, pp. 169–76, as quoted by Amacher, 1965, pp. 33–35). The primary ego was first in development, being constituted of the earliest associations between drive states and experiences of gratification. In Ellenberger's (1970) summary,

> Later, a secondary ego was constituted, whose function was to control the primary ego, and which was the substructure of ordered thought processes. As a clinician, Meynert described *amentia,* a mental condition with incoherent hallucinations and delusions, which reproduced a state of infantile confusion when there was no ego control. Meynert equated the cortical activity during dreaming with the cortical activity that produced amentia. (p. 479)

It seems evident, therefore, that Freud was quite familiar with this basic distinction between two types of thinking and with Meynert's terminology, in which the two types of thought process were associated with structures called primary and secondary ego. What more natural, then, for him to take over these ideas and the genetic hypothesis embodied in them, together with the hypothesis that the system of later-attained logical and realistic thoughts helped to control and contain the more primitive kind, and attach the labels 'primary' and 'secondary' to them? If Freud had not had such a perduring ambition and need to claim priority for his particular version of concepts, it would not now be necessary to include this deflation of the hyperbolic flattery in the statements by Strachey (just quoted) and by Jones (1953, p. 389):

> a theme of the utmost importance, the distinction Freud established between what he called "primary processes" and "secondary processes." It was perhaps his most fundamental contribution to psychology.

THE THEORY AS FREUD LEFT IT

As generally understood, Freud's theory posits two antithetical kinds of cognition, a more primitive form sometimes called "ideation," and a more sophisticated form worthy to be known as "thinking." The former, the primary process, he said, prevails in the unconscious, the latter in consciousness; the former is developmentally earlier (in both ontogeny and phylogeny), less realistic, less time-bound, oriented toward immediate satisfaction of instinctual urges, while the latter is logical, attuned to the efficient attainment of goals in reality with the delayed gratification of impulses that is necessary.

From the first, my understanding of the theory of primary and secondary processes was greatly influenced by Rapaport's formulations, particularly in the last chapter of his *Organization and Pathology of Thought* (1951a). That chapter summarizes and integrates a high proportion of the literature he had collected in the earlier chapters and his extensive commentaries on it, with some creative extensions and elaborations of his own aimed at producing a comprehensive, internally consistent theory. Here are a few salient quotations from it:

> Conceptions like "participation," "omnipotence of thought," "pars pro toto," all express consequences of this "free mobility," [of cathexis or psychic energy] and of its corollary, the complete interchangeability of the representations of a drive. This interchangeability is in turn the consequence of the fact that at this stage of memory-organization there do not yet exist discrete and well-delineated "objects" or "ideas," but only "diffuse" ones. (d) The thought-process based on drive-organizations of memory, and using cathexes which are freely displaceable and strive towards discharge in terms of "wish-fulfillment," are conceptualized as the "*primary process*" (p. 694).[1]
>
> Thus besides the drive-organization . . . there began to develop, superimposed on and cross-cutting it, an experiential connection-system of progressively more differentiated and discrete ideas. In this network, however, only minute amounts of cathexes could be displaced, and no longer to *any* other representation of the same drive, but only to those meaningfully connected in terms of experience. . . . In this new organization of memory, the transition from one idea to another was no longer determined by a belongingness to the same drive, but rather by a *connectedness along the pathways in reality* toward the need-satisfying object. . . . The cathexes operating within this new [conceptual-]memory organization, limited in displaceability and amount and not striving toward direct and complete discharge, were conceptualized as *bound cathexes*. . . . The new form of thought-processes is usually conceptualized as ordered or goal-directed thinking, or the *secondary process* (p. 697).

A little later (between 1954 and 1957), I read the successive drafts, first of Rapaport's (1959/1960) major theoretical monograph and then of the paper

by Rapaport and Gill (1959/1967) on the points of view and assumptions of metapsychology, relying on them as guides toward the clarity I sought. Early in his monograph, Rapaport presented The Structure of the System, epitomized in ten propositions, each of which was subtitled a different "point of view." These included but went considerably beyond the dynamic, economic, and topographic points of view that Freud had laid out as comprising metapsychology, his most ambitious and abstract level of theorizing. With Gill's help, Rapaport was able to distill his earlier list of ten points of view down to five, expounding a set of principles and definitions that were considerably more explicit and consistent than Freud had ever provided (Rapaport & Gill, 1959/1967).

As I restudied the *Interpretation of Dreams* (Freud, 1900/1953a, especially chapter 7), I organized what Freud had to say there about the primary process under the headings of six metapsychological points of view: Freud's three, plus three that Rapaport and Gill proposed (one of which, the structural, subsumed Freud's topographic; but I kept those two separate as Rapaport had in 1959). The result was Table 1.1. It is not easy to find quotations that are limited to one point of view; often Freud invoked two or more in one statement. For example: "In order to arrive at a more efficient [Adaptive] expenditure of psychical force [Dynamic], it is necessary to bring the regression [implicitly Genetic] to a halt before it becomes complete" (Freud, 1900/1953a, p. 566).

At the risk of stating the obvious, let me pause to make a few clarifying points. Freud was working with dreams reported by his patients and their "associations" to elements of these dream texts. His data also included their complaints of symptoms and related associative material. Nowhere in all of that did he find any direct access to distorting or other defensive processes; those were inferred and constructed by him in a creative effort to make sense of his data and to work with them therapeutically. The new understanding of dreams and their significance, which he presents in his early masterwork, *The Interpretation of Dreams* (1900), starts with his basic insights that dreams are basically the fulfillment of wishes, and that such fulfillment is disguised by defensive necessities. He laid out his understanding in the form of a hypothesis that behind the manifest dream-text is another text, that of the latent dream-thoughts (which he constructed as the end-result of his interpretations), and proposed that the discrepancies between these two texts result from defensive distortion of the latter.

In his big chapter on the dream work, Freud singled out processes of displacement and condensation as fundamental means of achieving distortion and disguise. Not until his final, theoretical chapter 7 did Freud introduce the term *primary process* as collective term for these operations. From the begin-

Table 1.1. Major Propositions about the Theory of Thinking in Freud (1900)

Primary Process	*Secondary Process*
Dynamic Point of View	
It aims at identity of perception (concrete, hallucinatory ideation); wish fulfillment by the shortest path (p. 566)	It aims at identity of thought (more abstract, non-hallucinatory thought) detouring to gratification through reality (p. 556f)
Economic Point of View	
The cathecting [drive-]energy is free and easily capable of discharge, by condensation and displacement; the ideation has cathexis from unconscious wishes but does not have preconscious cathexis (pp. 595, 605)	The cathecting energy is bound, most of it kept in a state of quiescence, discharge inhibited by means of hypercathexes (p. 599). Synthetic, rational properties are associated with hypercathexis (pp. 601–603, 575).
Topographic Point of View	
Usually unconscious, but need not be (p. 605). Occurs only if "an unconscious wish, derived from infancy and in a state of repression, is transferred to it" (p. 598; also *Dynamic*). Even stronger: "the irrational processes . . . are carried out only with thoughts that are under repression" (p. 605).	Usually conscious, but need not be
Structural Point of View	
The only process admitted in the "first system," the system *Ucs.* (pp. 601, 566)	The process resulting from inhibitions imposed by the second system, *Pcs-Cs*
Adaptive Point of View	
It cannot cathect anything unpleasant; it is ruled by the pleasure principle (p. 600); may be strongly dominated by affects (implied on p. 602); it seeks gratification by shortest path, which is "incorrect," not "efficient" (p. 566).	It can and must cathect unpleasant memories by inhibiting their discharge into unpleasure (p. 601); affects are restricted to signal quantities (also *Economic*); makes possible "expedient" effective action for gratification (p 566).
Genetic Point of View	
It is present from the first (p. 603), though in pure form only as a fiction (pp. 598, 603); it is regressive (p. 566)	Present in germ from the first (implied by the "fiction" statement) but secondary processes "unfold" only during the course of life, and inhibit and overlay primary process only quite late (p. 603).

ning, then, the primary process was a hypothetical procedure in a hypothetical "psychic apparatus." Since both the input and the processes within that black box were inferred in the course of interpreting a dream, the result was indeterminate, like an equation with too many unknowns to be solvable.

It is important to take note of Freud's characteristic procedure of becoming so accustomed to his theoretical constructions that he tended to lose sight of their hypothetical nature and to speak as if he had empirically discovered them. Freud's followers naturally followed in his footsteps, and they took it for granted that he had actually observed such a construct as the primary process when he wrote so often as if he had done so. The result is that in the literature of psychoanalysis there is hardly the slightest suggestion that any other way of conceptualizing the *hypothetical, assumed* distorting process of dream work is possible. I stress this point in hopes that the reader will not slip into the usual error of hypostatizing "the" primary process as if it is a given, something we must find a way of fitting into our contemporary psychological theories while we look for a way of measuring it.

About a decade after writing his first major book, Freud restated his ideas about the theory of thinking in a notable small paper (1911/1958b). Table 1.2 summarizes these "formulations on the two principles of mental functioning" and their linkage to primary and secondary processes (though oddly enough the latter terms occur nowhere in the paper). As in Table 1.1, notice how the great majority of the attributes of the two processes are metapsychological, having to do with purely hypothetical structures, energies, and processes.

Though Freud mentioned the primary and secondary processes from time to time thereafter, he did not make any further substantial changes in the theory. In his major paper, "The Unconscious" (1915/1957), however, he listed a number of implicitly phenomenological qualities of processes in the System Ucs.: indifference to contradiction, incompatible ideas instead being combined in compromise formations; "no negation, no doubt, no degrees of certainty . . . timeless . . . not ordered temporally, not altered by the passage of time" (1915/1957, p. 186f). At that time, however, he clearly distinguished the above characteristics of unconscious processes from "primary process (mobility of cathexis)," seeming to want to limit it to its economic meaning.

When, in 1923, he introduced the so-called structural hypothesis, substituting the id in most respects for the System Ucs., he attributed to it most of the properties formerly listed as characterizing the unconscious, including the pleasure principle and the primary process. He did add one point, however: in discussing visual imagery, he remarked that "Thinking in pictures is . . . only a very incomplete form of becoming conscious. In some way . . . it stands nearer to unconscious processes than does thinking in words, and it is unquestionably older than the latter both ontogenetically and phylogenetically" (Freud, 1923/1961a, p. 21).

Table 1.2. The Theory of Thinking in Freud (1911)

Primary Process	*Secondary Process*
Regulated by the pleasure principle	Regulated by the reality principle
Genetically older; residue of an early developmental stage when it was "the only kind of mental process"	Later, more adult
Mostly unconscious and nonverbal; when conscious, focused on pleasure or unpleasure	Conscious, verbal processes which comprehend sensory qualities, use attention and notation in memory
Presentation of ideas; hallucinatory ideation; phantasying	Thinking (experimental action) which restrains motor discharge
Motor discharge gets rid of "accretions of stimuli" by turning inward, leading to expressive movements and affects	Motor discharge (now *action*) is used to alter external reality
Uses and discharges large quantities of freely displaceable cathexes	Uses and discharges small quantities of bound cathexes (energy/tension/stimuli)
Closely connected to the sexual instinct	Connected to the ego instincts
Pleasure ego: wishes, seeks pleasure, avoids unpleasure	Reality ego: strives for what is useful and guards against self-damage[1]
Seeks immediate gratification by any available means	Seeks ultimate gratification (pleasure) by roundabout route through reality
Wards off unpleasure by repression	Impartial passing of judgment (true/false)
Entirely disregards reality testing; equates reality of thought and external reality	Uses and respects reality testing

[1]These concepts of pleasure ego and reality ego had a very transitory existence in Freud's writings; he quickly and permanently abandoned them. The attempts of later writers to revive them have been fruitless.

In its basic formulation, then, the theory of thinking is summarized and outlined in Tables 1.1 and 1.2.

After getting this much order into Freud's scattered statements about the two types of thinking, I began to feel increasingly uncomfortable with much of it. The central issue, at first, was the ambiguous nature of psychic energy. In *The Structure of Psychoanalytic Theory*, Rapaport (1959/1960) had put forth the hypothesis that it was a transformation of ordinary physical energy, but I was never able to get him to explain that to my satisfaction. He encouraged me to marshall my arguments and line up the evidence that his proposition was inconsistent with various of Freud's statements, and then he suddenly died.

At the time of Rapaport's death, Gill (1967) was restudying the concept of primary process. The result was a paper that influenced me a good deal, though in some ways it confused me further. After reviewing all that Freud wrote about the topic and the contributions of many other psychoanalysts,

Gill concluded that all of the other alleged mechanisms of the primary process could be reduced to condensation and displacement. He stressed, however, his finding that these were economic (energic) concepts, while many of the other alleged properties of primary process thinking (e.g., tolerated contradiction) were observable properties of thought products resulting from displacements or condensations. He also suggested that they could be viewed as the results of looking at the primary process from other metapsychological points of view. Most important, he assembled convincing evidence that, as Freud used them, it was necessary to assume that condensation and displacement were basic tools of any kind of ideation or thought, from the extreme of pure primary process all the way across a continuum to the other extreme of pure secondary process.

At that time, just after the height of my own commitment to Rapaport's version of classical psychoanalytic theory, I identified the referents of primary and secondary process as follows:

> Fortunately, when Freud (1911) linked the primary process to the pleasure principle and the secondary process to the reality principle, he gave us two independent and empirically useful criteria, which can help us decide to what extent any particular manifestation of displacement or condensation approaches the one pole or the other. Thus, the more thought (and also affect and behavior) can be characterized as an unrealistic seeking for immediate gratification, the more it is to be considered primary process. . . . And the more thought or behavior is organized by adaptive considerations of efficiency in the search for *realistic* gratification, the more it approximates the ideal of secondary process. . . . Note that wishfulness and realism are not logical opposites and thus are two criteria, not one. (Holt, 1967b, p. 294n)

Neither Freud's major pronouncements about the primary process (summarized in Tables 1.1 and 1.2) nor my definition enable us to state, with any confidence, that any particular thought *product* is the result of the primary process. We will return to this important distinction between process and product in a little while.

My definition expressed my growing conviction, buttressed by Gill (1963, 1967), that primary and secondary process could be viewed as separate systems of thought only at a crude first approximation. In his 1963 monograph, Gill proposed the replacement of the ego-id dichotomy by a hierarchy of impulse-defense configurations. From the standpoint of any lower level in this hierarchical structure, the ones above appear to be ego and to function by the secondary process, while the ones below are id, functioning according to the primary process. In practice, one had to recognize that there was no way to draw sharp dividing lines; instead, a serious student of thinking dealt with

continua, with gradual transitions from wishfulness to neutrality, from instantaneous to indefinitely postponed gratification, from the most to the least realism, and with degrees of efficiency, order, and logical clarity of thought. Indeed, Rapaport (1951a) had made the same point:

> Furthermore, there is no sharp dichotomy between either form of memory-organization, or either kind of concept-formation [i.e., those of primary and of secondary processes]; there is rather a continuous transition. (p. 709)

THE ASSAULT ON METAPSYCHOLOGY AND ITS CONSEQUENCES

By this time I had learned an important lesson about theoretical work: A good theory is a *system* of ideas, which implies that one cannot tinker with one part free from any concern about the consequences for other parts of the theory. I had learned that the theory of thinking was part of metapsychology and could not be fully clarified and made testable until much work was done on the larger theoretical matrix. And one of the most glaring deficiencies of the latter was its remoteness from any kind of observation. Freud had given no hint of any way that any metapsychological concept could be measured or directly observed—surely not the economic point of view, including the concept of psychic energy itself. Yet the program of research in which my theoretical inquiry was embedded was committed to finding a way to *measure* the primary process.

By the time of Rapaport's death, then, I was convinced that the economic point of view and related concepts had to be abandoned. The more I studied the rest of metapsychology, the more the conviction grew within me that it was equally futile, being rife with logical or semantic flaws and referring to a hypothetical system and processes in it that were safely isolated from any conflict with reality—hence, empirically useless.

A good many other scientifically minded writers from within psychoanalysis had been coming to similar conclusions. For example, Lawrence Kubie (beginning in 1947) was expressing ever more doubt about economic and structural concepts. Brody (1978, p. 4) summarizes it thus:

> He soon expressed his belief that psychic energy was an inadequate and non-heuristic explanatory concept (1952). Later he referred to "a gain in simplicity and clarity for psychoanalysis, if the descriptive 'structural' metaphors can be dropped from our vocabulary, both because of their static implications and because of the vulnerability to anthropomorphic misuse as pseudoexplanatory principles" (1967, p. 172). [Both references are to works by Kubie.]

Yet Kubie held back from a full-court press against metapsychology as a whole, as did the other early critics.

In responding to a request to assess the status of psychoanalytic theory as a whole (Holt, 1985), I listed fifteen authors or collaborating pairs who had published searching critiques of metapsychology in the preceding twenty years, the earliest of which were two important papers by Rubinstein (1965/1997b, 1967/1997c). I subsequently learned that the substance of the criticisms presented there and a good deal more had been contained in an unpublished paper of Rubinstein's, the "thesis" presented for his graduation from the Topeka Psychoanalytic Institute in 1952 (see Holt, 1997a, pp. 605–63: an appendix giving the text, Rubinstein, 1952 [1997a], its historical context, and my commentary). I in turn published a series of eleven papers during two decades beginning in 1962, later collected in a book (Holt, 1989), subjecting all the metapsychological points of view to a methodological and historical critique. After rereading Rubinstein's unpublished 1952 paper a few years later, however, I concluded that, in very large part but without conscious awareness, my own work had been an expansion and elaboration of my friend's pioneering but virtually unknown paper.[2]

The collective indictment of metapsychology may be summarized in the following propositions:

> There is no consensus on the relationship between metapsychology and the clinical theory.
>
> Concepts are poorly defined, overlapping with one another in part or completely.
>
> Concepts are often reified, abstractions treated as if they were substantial entities.
>
> Metapsychology contains many self-contradictions, mutually incompatible propositions.
>
> In developing it, Freud committed other logical errors and fallacies of reasoning. He made extensive use of metaphor and other figures of speech at points of theoretical difficulty to divert rather than to satisfy a critic. Much of it is a translation into other terms of outdated physiology, anatomy, and early evolutionary biology. Metapsychology fails to take clear and consistent stands on basic philosophical issues.
>
> Psychic energies, forces, and structures are implicitly assigned a metaphysical status separate from the world of material reality; hence, they cannot be measured.
>
> Metapsychology is a closed system with no explanatory power. (Adapted from Holt, 1985)

This critique of metapsychology led inexorably to the conclusion that, fatally flawed, it needed to be wholly replaced, not merely revised and corrected. At the same time, a good many of the critics (beginning with Ru-

binstein) had set forth the insight that metapsychology could not simply be deleted, as a few writers urged who believed that the clinical theory of psychoanalysis could be developed into a satisfactorily self-contained conceptual undergirding for clinical practice. Rubinstein (1975, 1976) made more progress toward the systematic clarification, hierarchical reorganization, and consistent reformulation of the clinical theory than anyone else, yet he saw clearly its limitations as a science.

In brief, his argument is that we can confirm or refute many *particular* clinical hypotheses, those referring to specific cases, by the careful collection of clinical data. Yet these hypotheses contain and in critical ways rely upon a number of unobservable theoretical terms, such as unconscious fantasy and the various defense mechanisms. Those terms are embedded in the most abstract propositions of the clinical theory, the *general clinical hypotheses*, which are accordingly not testable by the psychoanalyst's own data. Yet, he argues, the processes described in these hypotheses must refer to bodily happenings, in the brain in particular, if we are to follow the lead of the other sciences in abandoning metaphysical dualism and strive for a monistic but organismic theory of a unified mind and body. Throughout his career, Rubinstein held to the conclusion that psychoanalysis needs *a* metapsychology, not the one Freud left us but another cast in *protoneurophysiological* terms. That meant, he was careful to add, concepts that could be interpreted in psychological terms but also, in principle and eventually, neurophysiologically as well. It is easy to misunderstand him as advocating a reductionist abandonment of truly psychoanalytic concepts, instead of seeing his truly organismic/systemic orientation. Let me stress here that I too have been keenly aware of the dangers and fallacy of reductionism, and have never proposed giving up psychological concepts for neuroscientific ones.

Following some other lines of thought, I concluded (Holt, 1989; 1994) that many of the problems of psychoanalysis and its theories stem from Freud's early flirtation with and then abandonment and rejection of philosophy. For awhile in his second year at the University of Vienna he considered switching from medicine to philosophy. Perhaps the longing he expressed a few times in later years for his "original goal" accounts for his having "ruthlessly" suppressed it—an emotional reaction that may have prevented him from looking into his own implicit metaphysical commitments. He would have found, I believe, that they were a confused mixture of implicitly religious animism, materialistic mechanism, and an emerging pragmatism.[3] To put psychoanalysis on a more satisfactory theoretical basis, therefore, I have argued that it would help a good deal to begin with an explicit grounding in one metaphysical system that seems congenial to the most advanced and sophisticated of contemporary sciences: systems philosophy (Holt, 1989, chapter 14).

In summary: Freud's theory of thinking is part and parcel of his outmoded and indefensible metapsychology. All attempts to revise, amend, or otherwise rehabilitate it have so far failed for the following reason:

> The often unappreciated difficulty is that what is labeled as a simple problem in "economics" is, in fact, a problem with fundamental postulates and thus the *entirety* of Freud's model. Freud's model, like complicated models in general, cannot be easily revised by the simple substitution of a single concept. The alteration of one of the fundamental premises has profound effects on the model as a whole, and it is further impossible to segregate aspects of Freud's model into neat, easily differentiable sections that can be dealt with in isolation. (McCarley & Hobson, 1977, p. 1220)

CRITERIA FOR A REFORMULATION

After the abandonment of metapsychology, the task of the past quarter-century was threefold: (1) to account for the major, well-established facts about thinking by a new or revised theory, (2) to develop one that is explicitly detached from that old general theory and free of its fallacies and other flaws, and (3) such a theory should be in principle capable of being expanded to encompass the entire observational basis of psychoanalysis, both clinical and investigative, thus replacing metapsychology as the general theory of psychoanalysis. At the least, a satisfactory reconceptualization of Freud's theory of thinking should be capable of extension into the larger realm as well as being compatible with present neuroscience, or knowledge about the entire nervous system and its functioning.

RECENT ATTEMPTS TO REFORMULATE THE THEORY OF THE PRIMARY PROCESS

Theoretical writers about psychoanalysis have continued to talk about the primary process from time to time, often offering some new ideas about modifying it. After having surveyed some of this literature, I have concluded that almost all of it fails to satisfy the criteria suggested above: it does not address any particular body of fact, beyond referring to shared clinical experience, and does not challenge most of Freud's metapsychology, much less offer a satisfactory substitute. As to the second and third criteria, the work I have surveyed falls into two groups. One body of work rejects metapsychology and attempts to replace it with a new basic theoretical model, but does little or nothing to reformulate Freud's theory of thinking. The others, which offer

ideas about recasting the theory of primary and secondary processes, fail to satisfy the second criterion. We shall consider them in that order.

Cybernetics (see, e.g., Wiener, 1948) and the theory of information introduced by Shannon and Weaver (1949), which had such a profound effect on contemporary technology and—more indirectly—on Western culture, eventually were taken up by psychoanalytic theorists. Several of them thought they saw in these revolutionary scientific advances a promising new substitute for metapsychology. The most sustained attempts were made by Peterfreund (1971) and by Rosenblatt and Thickstun (1977). Both works begin with a critical examination and rejection of Freud's metapsychology.

Peterfreund writes:

> My own conclusion about the concepts of primary and secondary processes is that even as descriptive, essentially low-level generalizations, they are inexact and confusing, and have little relationship to contemporary scientific thought. . . . How helpful are the concepts of primary and secondary processes in conceptualizing the developmental steps which Gesell and Piaget have so clearly and carefully delineated, steps which reveal increasingly complex thought processes? Not only are they of little help, they actually confuse the issues. (1971, p. 269)

He ends his discussion of these allegedly most important concepts by concluding, "In general, the concepts of primary and secondary processes are inadequate, and there is no need for them in an information-systems frame of reference" (p. 271).

Peterfreund offers, however, an extended discussion of sleep and dreaming. He summarizes his "unified approach to the phenomena of sleep and waking" thus:

> All psychological phenomena, in both sleep and waking, correspond to the activity of complex information-processing programs. . . . All . . . are therefore multidetermined and, in a sense, represent "compromise formations." During sleep, (a) inputs [e.g., sensory] are markedly diminished; (b) there is a deactivation of many programs and subroutines, and apparently a general decrease in programming sophistication; (c) monitoring standards are changed; (d) programming tends to branch to personal, emotional, archaic themes, to conflicts, and to sexual and aggressive strivings [a tendency that is not well accounted for]; and (e) new sources of information and new programming levels may become active as a result of newly arising stimuli, e.g., sexual stimuli. (p. 285)

Not surprisingly, this "unification" is achieved in large part by minimizing differences. For example, Peterfreund dismisses the idea that dreams are wish-fulfillments by arguing that one comes to wishes just as easily by following the

same free-associative procedure starting from any waking cognitive content. He relies a good deal on the fairly well-established fact that the organization of thinking does depend, to a considerable extent, on the continuous input of information from external reality (see volume 2, pp. 547–49), but that does not explain why dreams have such a large content of organized, intelligible content nor why the conscious communications of psychotics contain so much that is usually considered primary process.

Venturing into the realm of the Rorschach test, Peterfreund slightly misquotes a classic example of a "contamination" response, a form of condensation. Rorschach's psychotic patient said of a green area on Card IX, which resembles a bear, that it was a "grass-bear" (not "grassy bear"). It was clear, in the original presentation, that the color of the area suggested grass and the shape suggested a bear. Rather than report two responses, the patient combined them in an unrealistic way. Why? "Probably expressing a deep archaic theme," Peterfreund vaguely and not very helpfully suggests.

Peterfreund's basic idea, a sort of Ockham's-razor conservatism about postulating unnecessary entities, is defensible, but in my opinion his solution overlooks a number of problems. First, his approach would not distinguish between primary process and what I call crude secondary process (see below, p. 22). Interferences with the normal aids to keeping thought orderly and rational, such as he cites in points (a) through (e), page 13, could allow the emergence of condensations, displacements, contradictions, and other hallmarks of primary process thinking, but they could equally well produce erroneous, slovenly, vague, or otherwise substandard secondary process. Second, his approach leaves unexplained the fact that formal signs of primary process emerge at times without any indication that strong (or "archaic") motives are at work, in normal as well as psychotic persons' thought products, and not only in creative endeavors. The third major defect of this approach is that it allows no *defensive* role for condensation or displacement.

Peterfreund does not specifically address the problem of modeling thought as distinct from overt action, but proposes a six-stage algorithmic model based on information processing for all of it. He barely sketches it out, however, and only in a machine example starting with a simple thermostat (which in a way senses an aspect of the environment and actuates a response, preprogrammed to be appropriate), and adding levels of complexity that involve processing information, making decisions, memory, and further adaptive action based on continual feedback. Perhaps little more could be asked of a pioneering attempt of more than thirty years ago.

Nevertheless, he makes some useful comments about thinking considered as information processing. For example, he notes that the achievements of even ordinary thought would be impossible if the brain were not, like some

modern computers, organized to carry out many routines simultaneously (multiple parallel processing), and without awareness.

By contrast, though Rosenblatt and Thickstun (1977) also base their reconceptualization of psychoanalytic theory on generally received conceptions of modern science, including cybernetics, information theory, and the systems outlook,[4] the concepts of primary and secondary processes are parts of psychoanalysis that they retain as still useful. For present purposes, it is not necessary to recapitulate most aspects of their basic theory. It discards the notion of a psychic apparatus for the central nervous system, assumed to operate in terms of organizations called schemata. The authors summarize their introduction of cognitive concepts thus:

> *All human experience is actively symbolized or encoded through the interaction of incoming sensory data (first neurally encoded through the process of registration) with memory systems as well as with currently active motivational systems and their respective appraisal processes. This initial process of symbolization constitutes perception and creates the person's perceptual world, determined by his past experience, current motivations, and associated affects.* (p. 124; all italics are present in the works cited unless otherwise noted.)

Next, they present "core propositions" about symbolic activity:

> *The processing of symbolic elements . . . is a continuous cerebral activity. . . .*
>
> a. *The small part of this activity that achieves a felt phase in the waking state is experienced as conscious thought or cognition.*
> b. *The portion that achieves a felt phase during sleep is experienced as dreaming.*
> c. *Such symbolic processing may occur in at least two distinct modes, each with its own rules of processing: one mode, most commonly functioning unconsciously or in altered states of consciousness, corresponds to "primary process"; the other mode, often occurring consciously, corresponds to "secondary process."*
> d. *Creative thought or insight corresponds to the achievement of a relatively novel configuration of symbolic elements, and may be viewed as a new symbolization of experience.* (p. 126)

And that is about all that Rosenblatt and Thickstun (1977) have to say about our main concern. A little later, in a summarizing table, they comment about primary and secondary processes: "Both concepts [are] retained, but [are] divested of structural and energic bases—[they] refer instead to two different modes of symbolic processing that involve both cognition and affect" (p. 130). The final reminder is useful, that we must not treat cognitive

processes too abstractly as if detached from all aspects of emotion; the discussion is disappointingly brief, however.

In a subsequent paper (Rosenblatt & Thickstun, 1994), they adopt the position of Margolis (1987), that pattern matching is the fundamental operation of thinking. The basic such match is between a current perceptual input and stored memories of similar situations, and they use Margolis's term *jumping* for making the quickest, most obvious match, which presumably has survival value for primitive people in a world of predators. The more leisurely step of *checking* uses feedback from results of the jump to achieve a better match. Struck by the similarities between these concepts and Freud's pleasure principle and primary process on the one hand, and reality principle and secondary process on the other, and with a nod to Noy (1969), they propose hasty, unreflective pattern matching as a model for the primary process.

In my view, these two authors made a fine beginning, but they did not develop a detailed enough theoretical model of the person's anatomical/physiological structure and functioning to accommodate the observations accumulated in several decades of attempted application of Freud's theory to actual data. As working clinical analysts, not researchers on cognitive topics, they probably did not experience a need for such elaboration. Their treatment of primary and secondary process thinking is, to put it charitably, elementary.

Palombo (1985) explicitly undertook to build on Rosenblatt and Thickstun's work, but focused on the theory of the primary process. He spoke of the advantages of giving up Freud's "physicalistic, entropic model" (p. 407), as if he were really going to abandon metapsychology, some aspects of which he criticized as untenable and rife with contradictions. Soon, however, it becomes apparent that, like most critics from within psychoanalysis, he did not realize that Freud's structural concepts were an intimate part of metapsychology. Not only did Palombo cling to the *ego*, he used it and other psychic agencies as homunculi—not by direct assertion, but by constantly slipping into metaphorical personification. Surprisingly, that is true even of the primary process: "In the theoretical model I am proposing. . . , the primary process is the psychic agency directly responsible for the earliest stages of structure formation." That was not a momentary slip; again and again, he treats this process as if it were an active agent that does things.

One of its important tasks is "the construction of the impulse" from internal stimuli, "generated repetitively by an instinctual source" (p. 414), phrases that indicate how far Palombo was from having reconsidered Freud's outmoded theory of motivation. "The internal stimulus originates as [only] a signal of need or distress" (p. 414). "Aim and object must in fact be constructed in context by an evaluative function of the adaptive ego" (p. 415). The memory of this coupling thereafter is available for the constructing of impulses, now

attributed to "the id . . . a mechanism for bringing together and matching current stimuli . . . and action programs . . . (. . . memories). It is, in fact, a primitive part of the ego" (p. 416).

Like Rubinstein (1974) and Rosenblatt and Thickstun (1977), Palombo put great emphasis on the process of matching and the appraisal processes that must accompany it. To simplify his complex and ingenious theory: Palombo focused on condensation as implicitly a matching of two images by superimposing them. That produces a crude but quick matching, which is presented as thus having adaptive value (compare Rosenblatt & Thickstun, 1994, on "jumping"). In the rest of the paper, the primary process is reduced to condensation—and only one type of that, image fusion—which gets credit for the consolidation of memories assumed to take place via dreaming.

From even this crude summary, it should be apparent that, despite its insights and ingenuities, Palombo's attempt did not satisfy the three criteria listed above. Not surprisingly, in his more recent and much more promising theoretical work, Palombo (1999; Holt, 1999b) does not attempt to revise this effort but focuses his new concern with complexity theory on the therapeutic psychoanalytic process (yet still clinging to the concept of ego).

Another who drew on cybernetics in his attempt to reconceptualize the primary process was Noy (1969). He did not, however, embed it in a sustained endeavor to criticize or reconsider metapsychology. Indeed, he continued to use many metapsychological concepts in an uneasy mixture with entirely different terms, mainly *feedback.* Nevertheless, because his paper has been widely cited, I will briefly consider its main points.

His proposals boil down, first, to proposing that secondary process be thought of as thinking corrected by feedback, while primary process is thinking not so corrected. Second, he makes explicit and stresses the egocentricity or self-centeredness of primary processes, a property that was implicit in Freud's saying that they operate according to the pleasure principle and Rapaport's related concept of drive-organization. That is clarifying, even though Noy errs, I think, in urging its definitional use: "I would . . . define the primary processes as functions which assimilate any new experience into the framework of the gradually developing 'self nuclei'" (p. 37). Secondary processes, therefore, are those that operate on "input and memories . . . according to the relations between the perceived elements, not according to their effect on the self." I doubt that such definitions would be practically useful; they are, rather, theoretical propositions worthy of consideration, though he gives no indications of how one might go about testing them.

The first proposal has a certain plausibility, for surely it is easy to demonstrate that the relative control and organization of what is usually considered secondary process thinking does intimately involve corrective feedback. It is

not so obvious, however, that a lack of such feedback is sufficient to conceptualize the characteristic distortions of the primary process. Lack of feedback produces error; but must all faulty or erroneous thinking by that very token be attributed to the primary process? A good many years ago, confronted by actual data, Goldberger and I concluded that it was useful to introduce a third possibility: "regressed" or *crude secondary process*. Thus, if someone responds "74" when asked for the product of 6 and 9, a good case can be made that usually, a person would check any such first answer that came to mind, reject and correct it. But in what way did the original erroneous guess entail condensation, displacement, symbolization, and so forth? It may have done so only in the trivial sense that whenever one thing is incorrectly substituted for another, displacement can be invoked. By the same token, however, when a correct answer is substituted for the error, one would have to call that, too, a displacement, perhaps adding "in the service of the ego." In either of the last two examples, invoking displacement seems nothing more than a purely verbal trick. Since attention constantly turns from one thing to another, nothing is gained by calling any such act a displacement.

As to the second idea, Peterfreund (1971, p. 269f) makes the excellent point that not all instances of (implicitly egocentric) action in the service of immediate gratification can be considered primary process–like. He gives the example of an immediate and quite adaptive reflex of dodging if something is suddenly thrown at one's head. A more homely example would be the reflexive jerk of the hand off a hot stove: an adaptive act, involving feedback, which is nevertheless automatic, beyond conscious control, and clearly in the service of the pleasure-unpleasure principle. Though it also meets Noy's first criterion for secondary process, it lacks most of the generally accepted hallmarks of rational, logical thought, though it is realistic and adaptive.[5] The same is true for eating what is on one's plate at a meal. And sometimes a flash decision, a pattern match based on a single point of similarity, turns out to be correct and adaptive.

One of the generally acknowledged fathers of modern cognitive psychology, J. S. Bruner (1986), began an influential paper by these words:

> There are two . . . modes of thought, each providing distinctive ways or ordering experience, of constructing reality. The two (though complementary) are irreducible to one another. . . . Each of the ways of knowing, moreover, has operating principles of its own and its own criteria of well-formedness. They differ radically in their procedures for verification. (p. 11)

His two kinds are not primary and secondary processes, however, but, first,

> the paradigmatic or logico-scientific one, [which] attempts to fulfill the ideal of a formal, mathematical system of description and explanation. It employs

> categorization or conceptualization and the operations by which categories are established, . . . and related one to the other to form a system. [It is] . . . regulated by requirements of consistency and noncontradiction. . . . it is driven by principled hypotheses. [The other is narrative; it] establishes not truth but verisimilitude. . . . the types of causality implied in the two modes are palpably different. . . . a story . . . is judged for its goodness as a story by criteria that are of a different kind. (pp. 11–13)

He usefully reminds us that "the" secondary process is in fact a large realm, containing at least two systems achieving order and intelligibility in different ways. After this promising beginning, however, the paper disappointed me by concerning itself mainly with the esthetic aspects of narrative, not the cognitive strategies by which it achieves its generally unchallenged place in the realm of secondary processes. To the extent that he speaks about structural criteria of the goodness of a story, he does little but put into more elaborate terms the lean rules Murray (1943) embodied in his instructions for the TAT. (See volume 2, chapter 10, for my application of those rules to the analysis of narratives).

Putting together the above-mentioned dichotomies and several others to be discussed below, Epstein (1994) claims that there is a growing consensus:

> Theorists outside the psychoanalytic tradition have begun to formulate a new view of the unconscious. . . . sometimes referred to as the *cognitive unconscious,* [it] is a fundamentally adaptive system that automatically, effortlessly, and intuitively organizes experience and directs behavior. . . . most human information processing occurs out of awareness and is governed by a different set of principles from both those of conscious, rational thinking and the primary-process principles of the Freudian unconscious. (p. 710)

Epstein summarizes his proposal in table 1.3. He appeals to evidence from everyday life that people do seem to operate in these two different modes, emphasizing the many ways in which ordinary cognition tends to be emotional, intuitive, influenced by narratives and pictures; the frequency of irrational fears and superstitions; and the ubiquity of religious beliefs. Persuasive though this section is, often backed up illustratively by quantitative data, what is lacking is any evidence that either set of features constitutes a *system*: that the features necessarily imply one another or are in fact highly intercorrelated.

He then cites approximately two dozen authors (or teams), beginning with Aristotle, who have proposed similar schemes, plus a good many others who have adduced evidence supporting them. They are grouped into neopsychoanalytic views, proposals from experimental-cognitive, developmental, and social-cognitive psychologists, narrative versus analytical processing, and experiential versus rational processing. When one considers the divergence of emphases and the embeddedness of the conceptions in different, incompatible theories,

Table 1.3. Comparison of the Experiential and Rational Systems

Experiential system	*Rational System*
1. Holistic	1. Analytic
2. Affective: Pleasure-pain oriented	2. Logical: Reason oriented
3. Associationistic connections	3. Logical connections
4. Behavior mediated by "vibes" from past experiences	4. Behavior mediated by conscious appraisal of events
5. Encodes reality in concrete images, metaphors, and narratives	5. Encodes reality in abstract symbols, words, and numbers
6. More rapid processing: Oriented toward immediate action	6. Slower processing: Oriented toward delayed action
7. Slower to change: Changes with repetitive or intense experience	7. Changes faster: Changes with speed of thought
8. More crudely differentiated: Broad generalization gradient, stereotyped thinking	8. More highly differentiated
9. More crudely integrated: Dissociative; emotional complexes; context-specific processing	9. More highly integrated: Cross-context processing
10. Experienced passively and preconsciously: we are seized by our emotions	10. Experienced actively and consciously; We are in control of our thoughts
11. Self-evidently valid: "Experiencing is believing"	11. Requires justification via logic and evidence

Slightly abridged from Epstein (1994), p. 711.

plus the fact that many propose three or four systems rather than two, putting them all together seems a triumph of what Epstein calls the use of a "broad generalization gradient" or what Holzman and Klein (1951) call *Leveling*.

Before his paper is completed, Epstein has proposed stretching his Experiential system far enough in one direction to encompass the cognition of prehuman species and in another to include mature wisdom and creativity. It may account for many kinds of cognitive errors but is also claimed to be, "under many circumstances . . . more effective in solving problems than the rational system" (p. 719). He even tentatively proposes that we could achieve a greater "change in our understanding . . . if . . . it were concluded that the primary process corresponds to a degraded state of the experiential mode of operation" (p. 720).

My own judgment of this ambitious scheme is the Scottish verdict, "not proven." Despite the undisputed allure of overarching, all-inclusive dichotomies, I believe that for scientific purposes we do well to discipline our enthusiasms to await more critical analysis and data. If cognitive-emotional systems are intended to refer to empirical realities, they cannot be established by fiat

or baptism. Nevertheless, Epstein may very well be on the scent of something really useful, perhaps an adaptive counterpart of the basically maladaptive "crude secondary process" that I have proposed. We shall have to see.

PROCESS VS. PRODUCT

Let us pause and remind ourselves of the distinction between primary process as a recognizable form of thinking, detected in reported thought products such as verbalizations, and as a hypothetical procedure of generating such products. All we have to work with are the *products* of thinking, for thought *processes* are intrinsically as unobservable as those that maintain steady breathing. We can, under special circumstances, become aware of our breathing and control it consciously. Just so, sometimes we can become aware of the processing of cognitive data and carry it out in awareness. But thought products remain the data our theories must explain.

Lashley (1958, quoted in Peterfreund, 1971, p. 221) was more emphatic: "*No activity of mind is ever conscious.* There are order and arrangement, but there is no experience of the creation of that order. . . . When we think in words, the thoughts come in grammatical form with subject, verb, object, and modifying clauses falling into place without our having the slightest perception of how the sentence structure is produced."

Usually, people assume that we think quite consciously. To be sure, we are aware of what we are thinking, but that is the product of unknown processes that hardly ever appear in consciousness. I agree with Lashley almost entirely, but he seems to have overlooked one thing.

A thought process that is being learned is carried out fully in awareness, or at least largely so. When processes have not yet become fully automatized we must push them ahead in a conscious way. For instance, when learning the algorithms of ordinary arithmetic, a child learns each step of the process of, say, multiplying numbers, talking himself through a particular exercise, first repeating the sequence of steps aloud and then subvocally. Later, after much practice, the actual processes proceed effortlessly and without awareness. Clearly, we need postulate nothing like repression to banish them from consciousness. Other processes, such as those by which we search our mnemonic storage for words or images for matches in the ordinary business of recognizing the familiar, never took place consciously. They are part of what is becoming known as the *cognitive*, as distinguished from the dynamic or defensive, *unconscious* (Eagle, 1987; Kihlstrom, 1987).[6]

Nevertheless, there is an important difference between two kinds of processes in thinking: those that compose and construct thoughts, and those by

which they are checked and corrected. The former is the realm of primary or secondary process; the latter, the realm of feedback. Pattern matching is clearly involved in both, but is far more central to correcting a first draft than to producing it, a procedure that must draw on at least the linguistic structures that Chomsky has done so much to elucidate. See also Rubinstein (1974/1997) for a detailed model of classificatory processes, showing the many operations it requires other than pattern matching.

Thus, it makes a certain amount of sense to consider any self-correction, such as the secondary revision of dreams, as part of the general set of rational thought processes, and thus part of secondary process, but failure to consider the complexity of secondary processes leads to such oversimplifications as that introduced by Noy.

THE "DATABASE" OF THE PRIMARY PROCESS

Though most of what Freud wrote specifically about the primary process was cast in metapsychological terms, he did in fact found much of it on some extended efforts to grapple with sets of facts and observations. Characteristically, he did not describe his database in anything like the ways we expect of contemporary scientists, but as he wrote about dreams (1900/1953a, 1901a/1953b), jokes (1905b/1958b), and parapraxes (1901b/1960), at least, it becomes evident that he did have such a collection of material. Perhaps for that reason, others have assumed that there was no need to repeat his observations.

The other data he cites are those of the free associations of analytic patients and in particular the dreams, fantasies, and symptoms of neurotics, the language of schizophrenics, hallucinations, the thinking of infants and children, various forms of humor, poetry, and other creative products. He makes occasional references to the magical thinking of primitive peoples, also (Freud, 1913–1914/1955). These realms may be divided into the psychopathological, the developmental (comprising the anthropological because of Freud's phylogenetic approach), and the creative.

None of these kinds of thought products presents pure samples of primary process thinking. Some dreams are strikingly bizarre, unrealistic, and magical, but in their manifest texts others are utterly prosaic and ordinary. Some schizophrenics' speech is so riddled with peculiarities and obscured by deviant logic, odd preoccupations, and idiosyncratic formulations as to be wholly unintelligible, but the same patients on other occasions make their complaints or demands in plain speech. So it goes down the line. Even hallucinations range from the plainly psychotic to others easily overlooked as misperceptions. In each case, even if we take the most extreme examples, for them to be

known to us they have to be in verbal form, and no sample of language can be grasped well enough to be studied if it does not follow some basic structural rules, which are manifestly integral to speech.

It is plain, therefore, that we cannot be sure that any given verbalization belongs in a set of specimens of primary process, just by knowing who uttered it. We must have other, more intrinsic criteria. The data demand, also, that these criteria not be dichotomous but more scalar to match the facts' continuous nature. Freud's remarks suggest a major criterion he used for deciding that language is a product of primary process thought: unintelligibility; and a minor one: strangeness. He did not invoke either in any systematic way, however. He treats data in the amiably casual way of a gifted amateur, like the gentleman-scientist of the early nineteenth century, rather than with the discipline and respect one expects from a scientist today. *Autre temps, autre moeurs.*

He set himself the task of extracting meaning from seemingly unintelligible texts, like his patients' and his own dreams and the delusional writings of Judge Schreber. He then used the resulting "skeleton keys" to open less obvious locks (to use his own metaphor), finding meaning where many assumed there was none, postulating all the while an unconscious distorting process that concealed sense beneath nonsense. Sometimes the result seemed uncannily accurate, his intuitive decodings being independently verified (Choisy, 1963, pp. 5–7). All too often, however, reliable verification was not to be found and was generally not even sought.

A further difficult ambiguity was introduced by Freud's disinclination to make a clear distinction between facts and theories. Understandably, he was interested in primary *products* only as a means whereby to make inferences about the primary *process*, and spoke of the latter so often as a discovery that most psychoanalysts followed unquestioningly. The point is important enough to bear repetition: One can no more observe the *processes* of thought, either in others or in one's own introspections, than the process by which two hydrogen atoms bind to one of oxygen. Unlike the chemist, however, who has at his disposal a powerful and massively validated theory to extend his virtual vision beyond what he can observe directly, the psychologist or psychoanalyst of today—over a century after Freud's original attempts—must rely heavily on what his data teach him, without much help from the theory.

When I began what turned into an attempt to measure primary products, I had no idea that I was stumbling my way into a half-century-long, intensive study of a database, which might yield insights into the theory of thinking. As compared to the free associations of several patients listened to every day over many years, what I worked with may seem meager: several hundred Rorschach protocols, scores of texts of dreams and TAT stories, and

smaller bodies of other miscellaneous data to which my scoring scheme was applied. They had the great advantage, however, of existing as transcribed texts, susceptible to repeated study by many workers. That made possible a fine-grained analysis that is impossible for the clinician who works only with the spoken word supplemented by incidental observations (such as of body language and emotional expressions).

Though the data and the method did not enable me to generate much by way of a new cognitive theory, much less a complete substitute for metapsychology, they have proved useful in attempts to revise the theory of the primary process, the topic of chapter 3. The next section sets the stage for that effort.

TOWARD A POSTMETAPSYCHOLOGICAL THEORY OF THE PRIMARY PROCESS

Granted that no grand theoretical context exists within the terms of which to elaborate a conceptual explanation of all types of thought, let us see what can be done to bring the psychoanalytic theory of thinking up to date. I will confine myself mainly to the primary process, since I believe that psychoanalysis has little to add to the study of the rest of it, including ordinary (not always highly rational) thought.

Let us begin by approaching the theory of the primary process afresh, as much as possible restating it in nonmetapsychological language: What do we have? For the sake of clarity, I am going to reduce it to a set of propositions.

1. There exist (at least) two systems of thought, different in kind from one another because they have different organizing principles.
2. The **primary process system** derives its organization, Freud said, from the wishful pursuit of gratification by the most direct means (the pleasure principle). Thus, a person at times goes off on ill-fated shortcuts, taking what seems the most direct route instead of proceeding to a goal by the actually most economical path. Hence, it is implied that primary process thinking is heedless, impulsive, or reckless, not adequately delayed, though purposive.

2a. A somewhat different (but overlapping) organizing principle is magic, a traditional procedure in which wish fulfillment is also sought unrealistically, but by means of prescribed rituals.

3. Persons may not be aware of their own wishes or defenses against them, however, and often pursue goals of which they are unconscious; hence, an onlooker does not easily see that the behavior or thought has a purpo-

sive organization. That is one of the reasons why the products of primary process thinking often seem puzzling, random, crazy, or mysterious.

4. Such thought comes to the fore, driven by wishes or by defenses, when the second system relaxes control. Or, it is the intrinsic method by which unconscious processes operate.
5. Hence, it is developmentally earlier—more childish and also more primitive.[7]
6. In primary process thinking, ideas do not maintain their proper identity, but shift about and combine in unrealistic and unconventional ways, resulting in condensations and displacements.
7. The system of the **secondary process** arises from considerations of *respect for reality and efficiency in attaining goals* (the reality principle). Thus, it is adaptive—effective (as Freud said, "correct") in actually getting the striver to the gratification of attaining his goals.
8. Its structure is an *orderly succession* of elements (ideas, thoughts) which *maintain their identities*—are reliably the same over time and despite use.
9. Moreover, the realistic advantage of the efficient pursuit of goals implicitly demands respect for the laws of *logic*, which are disregarded in the primary process.
10. To be adaptive, it must constantly *correct course* by taking the structure of reality into account, ideally through forethought (*planning*) but at the least by taking advantage of *feedback* (reconsideration). Thus, Freud called it "experimental action": implicitly and in advance, we run through the steps needed to reach the goal and assure ourselves that they will work, that the chosen path is the most direct and effective.

The psychoanalytic theory of thinking, when thus stripped of its metapsychological trappings, is basically that of common sense, which is built into our language. Most of us speak of thinking in dualistic ways, contrasting careful, controlled, precise, tightly ordered, considered, and responsible thinking with careless, uncontrolled, imprecise, loose and disordered, heedless and self-centered thinking. "On second thought," we say, implying that first thought is often impulsive, leaps to conclusions, goes off half-cocked, and thus is ineffective, while second thought is more thoughtful, anticipates consequences of possible actions rather than plunging into them heedlessly, hence restrains the willful wishfulness of "first thought." Freud's conception of the delay of gratification so that the experimental action of the secondary process can take place is thus only a slight transformation of commonsense psychology.

The developmental psychology implicit in our everyday language likewise bears a striking resemblance to Freud's. We often speak of the child as a little

savage, or as a wild animal in need of taming. These idioms betray an implicit theory, that ontogeny recapitulates phylogeny: the individual retraces the developmental course of his/her evolutionary ancestors in the stages of growing up. Our commonsense psychopathology is similar, implying a dichotomy of (adult, civilized) sanity versus craziness as a regression to the wild, savage, and infantile. "Losing one's mind" means losing secondary-process, grown-up, acculturated modes of thinking, allowing what is ordinarily relegated to the world of dreams to come into the open sunlight of awareness.

The lack of originality in Freud's theory of thinking does not necessarily mean that it lacks validity, however. For the moment, let us see how much further we can get with conceptual and methodological analysis. In discussing each of the above ten statements, I shall consider what empirical data are available to support it.

Re #1 *(There exist two systems of thought):* Are the primary process and secondary process *systems* of thought? Unfortunately, I know of no generally accepted criteria by the use of which to answer that question. As we have seen, Bruner (1986) argues persuasively that there are two quite different cognitive systems within the general realm of the secondary process, the scientific and the narrative ways of constructing reality, each with its own operating criteria. Narrative seems a plausible candidate to be called a system of thinking, a way of organizing knowledge sequentially in time as a story about a central figure with whom the audience may identify. But what Bruner calls the "paradigmatic or logico-scientific one" strikes me as hardly unitary. He describes it as "attempts to fulfill the ideal of a formal, mathematical system of description and explanation . . . [using] categorization or conceptualization and the operations by which categories are established, instantiated, idealized, and related one to the other to form a system" (Bruner, 1986, p. 13). Plainly, he is not talking about his own experiences as an experimental scientist, but about such ideal figures as Whitehead and Russell (1910, 1912, 1913) and their tour-de-force unification of mathematics and logic into one system, and perhaps also the attempts of psychologists like Hull and Spence to follow a strict hypothetico-deductive procedure. The procedures of empirical science have been reduced to other less formal and internally consistent systems by philosophers of science, more than once as it happens, and despite the complaints of many workers in the scientific vineyards that their own lived reality is messier.

So we have at least three different systems of thought (narrative, logical-mathematical, and empirical-scientific) within the confines of secondary process, if we accept the implication of Freud's dichotomy, that all cognitive processes must end up in one box or the other. In that same box with the large "2" emblazoned on it, however, must be contained all the thinking of

plain ordinary folks with no claim to be novelists, mathematicians, empirical scientists, or philosophers. As anyone knows who has even a smattering of what has been happening in cognitive science in recent decades, ingenious intellectual pranksters like Kahneman and Tversky (e.g., 1984; Tversky & Kahneman, 1974) have shown that most of us rely, not on strict logical or scientific ways of thinking, but on a series of heuristics in order to find our ways through the intellectual thickets concealed in innocent-looking problems. The congeries of such useful rules of thumb enable us to get by quite nicely, thank you very much; we are satisfied with our bounded rationality and its "satisficing" (as Simon [1956, 1982] put it). A growing body of workers in social psychology propose such thinking, which they call "associative," as yet another system of thought, contrasted with "rule-based," effortful, logical thinking of the second and third types just described (Chaiken & Trope, 1999).

Another approach to the study of the general realm of secondary process thinking, centered on the (largely psychometric) tradition of work on intelligence and other abilities, has developed what is called a *modular* view. A prominent spokesman, Fodor (1983) argues that we should conceive of the mind as a number of separate devices or subsystems, each of which processes information in a somewhat different way. Psychologists like Guilford (1967) and Gardner (1983, 1999) have put forward evidence that verbal, graphic or pictorial, mathematical, and other kinds of ability are quite independent of one another. The modular point of view seems to generalize those facts to something like a conception that modules are separate systems operating on different kinds of subject matter and in different ways.

If you will go that far with me, you will have opened the door to a possibly unwelcome guest, whose bad manners, uncouth appearance, and halitosis betray the fact that he hasn't learned to do things properly. The fact is, most of those who have written about thought have tended to ignore this bum, the ordinary thinking of ordinary people, and idealize thinking just as Freud did in his (all too brief) discussions of "the secondary process," and Bruner likewise. Most such writers seem to assume, without stating it, that of course the person on the street does make a deplorable mess of logic and math, and probably couldn't become a decent scientist or writer of tales, but there is no system to those errors. It seems taken for granted that mistakes of thought result from the intrusion of *random*, not systematic error. Not by Freud, of course; he was convinced that slips of tongue and pen and other kinds of mistakes (or, in Strachey's coinage *parapraxes*) were motivated and thus were intrusions of the primary process. Contemporary students of faulty thinking, who generally prefer the Kahneman-Tversky approach (e.g., Tversky & Kahneman, 1974) stressing everyday reliance on rules of thumb, are not convinced, and logically of course even if one accepts at face value Freud's

ingenious explanations for his collection of lapses, they in no way prove that all errors of thought are motivated.

I know of one notable effort to argue for the systemic character of a still further series of faulty ways of thinking that don't coincide with any of those mentioned so far. In a series of ingenious studies of the cognitive processes of children, Piaget and his collaborators described a sequence of successive developmental stages, only the last of which can be identified with logical, scientific thinking (much of the research was summarized by Piaget & Inhelder, 1966/1969). True, this formidable body of work has been subjected to exhaustive critique in recent decades. When strictly replicated, his work holds up; but detailed exploration of his stages using somewhat different tasks shows that he generalized overconfidently. Each of the sequential systems of sensorimotor and concrete operations, for example, proves to be less tightly organized than he thought, and many children turn up at several stages simultaneously, depending on the tests used. Nevertheless, it is widely conceded in developmental psychology that there is a residue of validity to the phasic conception of cognitive development, and that the stages (with many subdivisions) he described do exist, if less than universally. Each describes a system of thinking that is neither a collection of random interferences with "adult, logical thought" nor merely the mixture of primary and secondary processes that Freud predicted.

So many candidates to be designated cognitive systems, and we haven't even considered "the" primary process yet! In the terms of the present discussion, however, I think that it deserves to join the throng. Freud made a pretty good case that the intrusion of primitive wishes caused the formal deviations from secondary process standards, and Gill (1967) argued rather persuasively that all of those autistic deformations could be viewed as the work of condensation or displacement (or both). I have not come across any later psychoanalytic writer who makes a persuasive case that primary process thinking may be further divided into two or more (sub)systems.

Re #2 *(Primary process is organized by shortcut wishfulness):* Can we attribute the systemic character we have provisionally allotted to the primary process to the pleasure principle? I find it difficult to muster a defense of the notion. The concept of "the pleasure principle" adds nothing to the observation that much of what we call primary process thinking is wishful (or, in the metapsychological jargon, drive-determined). Conceptually, Freud seems always to have sought the security of suspenders as well as a belt. Many critics of metapsychology have deplored the needless layering of redundant, would-be-explanatory terms that resulted. It should be sufficient to use hedonistic wishfulness as a descriptive term. Data seem clearly irrelevant to the issue.

Re #2a *(Primary process is magical thinking):* Nevertheless, let us consider the idea of magic as a useful description, possibly even an organizer of the system. Disordered, psychotic thinking is often called magical and is contrasted to scientific thought. As the latter is realistic and logical, so magical thinking always has elements of unrealism and often violates the rules of logic (disregards contradiction, uses *pars pro toto* or other forms of metonymy, and predicative reasoning). We know that scientific method works, and it is characteristic of modernity and our empirically successful culture that we do not believe in magic any more than we do in the supernatural world of ghosts, monsters, fairies, evil spirits, and other imaginary creatures. Yet our popular culture of movies, TV, comic books, and computer games is full of it. A further argument can be made that the world of religious rituals and prayers to make wishes come true is logically equivalent to that of magic. It continues to have a powerful hold on us, for all our claims to be adult, secondary process thinkers.

The essence of magic seems to be in its deviant logical structure. That seems quite familiar when we examine it, though magic is undeniably pervaded by wishfulness. Fairy godmothers grant wishes, which come true in *unrealistic* ways: bags of gold appear out of thin air, poor boys are transformed into rich princes with access to sexually entrancing women of high social status (princesses) and are given great power (half of the kingdom), by the mere wave of a wand or the utterance of magical phrases. The most casual examination of fairy stories or magical folk tales from almost any culture easily reveals this feature. *Fears* prevail there as well as wishes; indeed, black—fearful—magic is at least as common as the white, wishful kind. Witches and wizards are always up to some necromancy to bring about feared, evil ends—which, nevertheless, *they* wish for.

The means-ends organization of magic is distinctive, also. *How* does the wicked wizard or good fairy accomplish the transformation of reality by fear or wish? At first glance, it may seem quite arbitrary, but there are rules. If wishes were horses and a hero rode as soon as the thought occurred to him, there would be no enchantment, little of that sense of wonder and mystery that gives magic its special aura. That is perhaps the result of the gap between the magical procedures—passes in the air, the muttering of strange, unintelligible words, burning exotic substances—and their result, or between means and end. Ideally, however, they are not totally and arbitrarily unrelated. The best magic conveys an uncanny sense of meaningfulness despite mystery. Freud made us recognize that quality as the presence of unconscious meaning, defensively warded off from awareness. And what he said about condensation and displacement gave the clue to the technique of mystery: there remains a meaningful link between symbol and its unconscious significance, which

may be a physiognomic quality, a partial iconic or functional resemblance, an allusion, or the like. Behind those terms lies the atomistic conception of meaning as divisible into partly meaningful fragments, familiar to us from psychoanalysis, and the principle of pars pro toto: as long as a small part of a meaning is preserved, embedded into a misleading context, a bridge remains over which unconscious thought may travel.

Transparently, poetry uses similar devices. The tropes or figures of speech are just such bridges by which thought may pass, though the thoroughfare is illegal according to the official rules of scientific thought. As I have argued elsewhere (Holt, 1997a, p. 170), metaphor is more poetically powerful than simile because it asserts unreal identities ("the sea *was* molten glass") on the basis of a similarity (partial identity or fragment) of meaning, which the simile contents itself with pointing out. And the metaphor, like a dream symbol, takes on special power and resonance when there are multiple linkages between the two, some of which are not obvious (unconscious). Compare a banana and an intercontinental ballistic missile as metaphors or symbols for a penis; aside from their common, obvious similarity to it of shape, one asserts a benign oral attractiveness, the other a penetrative and explosive threat.

The idea that magic is an organizing principle, however, falls apart as soon as one examines it closely. *Magic* is just a descriptive term for the transformations assumedly caused by wishes and fears. One might say that the formulas and devices of magic introduce only a little delay, which is paid for by the uncanny esthetic quality of mystery and awe attending them. Freud taught us to look for bad parental imagoes behind the witches and evil wizards of lore, but the transformation is not explained by calling it magical. Again, data do not seem relevant.

But then, the search for an organizing *principle* of a system is misguided. Popper (1957, 1962) would have called it an instance of methodological essentialism. Those who work in the tradition of GST and its contemporary versions (systems science, dynamic systems approach, complexity theory) do not use such Aristotelian notions. One might think that a fractal pattern, for example, is generated by an organizing principle like "every part contains within it the basic structure of the whole," but instead it is produced by a simple mathematical formula. The search for such organizing constructs as the pleasure principle and reality principle is an anachronistic hangover from a prescientific era, especially when one attributes some kind of causal efficacy to it. In just such a lapse, Freud spoke of "the almost omnipotent pleasure principle" as an agent. That is metapsychological theorizing at its most mischievous. We must look elsewhere to find what causes the primary process to hang together as much as it does.

Re #3 *(People are often unconscious of the purposes that direct their behavior, contributing to the strange or mysterious quality of the primary process):* In part, the reminder that wishes may be unconscious can be used to resuscitate the second proposition, that the formal deviations of thought from the secondary process ideal are caused by powerful motives, which override considerations of logic and reality. Thus, simply by invoking this idea a psychoanalyst can brush aside empirical evidence that the wishfulness of primary process thought is often not visible, as is so often the case with manifest dream content. Caution in proceeding is essential here. Despite the lingering reluctance of some skeptics outside the psychoanalytic movement to accept the very idea of unconscious motives, there is a great deal of evidence for it,[8] and it remains an indispensable procedural tool for most clinicians and cognitive scientists alike. At the same time, we must try to avoid the temptation to invoke the mysterious and often elusive unconscious whenever we find it convenient to our argument.

In clinical practice, many psychoanalysts have learned from the great mistake of Freud's early career and are chary about assuming that they do not need specific evidence to back up assumptions about what a patient unconsciously wants. Theory more than experience led Freud to his certainty that hysterical women had been abused sexually by their fathers, and he gave up this so-called seduction theory because his efforts to force it on his patients drove them away instead of curing them. It is a reasonably well-established position that people may be and often are unaware of the goals of their behavior, not that they always are, and not that any particular hypothesized set of unconscious wishes like the Oedipus complex is universally present. So, an analyst is alert for indirect evidence of such unconscious wishes, but does not offer interpretations until there is an accumulation of evidence—ditto, the diagnostic tester. A first hypothesis about what unconscious motive is determining certain clinical data may well be mistaken (though quite congruent with theory); evidence of what seemed to be an oedipal conflict, for example, may turn out to be based instead on sibling rivalry.

The tentative verdict on the proposition about the role of unconscious wishes (including fears) and defenses, then, must be that it is a valuable heuristic, but not provable as a general statement. Hence, even expanding it to include defenses as well as more appetitive motives is not enough to make it safe to attribute the formal aspects of primary process entirely to unconscious "dynamics."

Re #4 *(Primary process: motivated or intrinsic?):* This complex proposition includes a reiteration of the idea that primary process comes into play

under the influence of aroused wishes, fears, or defenses when the controlling influence of the secondary process is weakened, plus an alternative: that the primary process is the "language of the unconscious." Let us begin with the first of these ideas, maintaining a wariness about treating abstractions as causal entities. After the above argument that we cannot meaningfully treat the complex congeries of cognitive functions grouped together under the heading secondary process as if it were a single system, it makes no sense to speak as if that "process" could control the primary processes. Nevertheless, it is arguable that conscious, generally adaptive thinking cannot occur without a series of conceptually and empirically distinguished controlling operations. Following the argument of #1, above, however, once one abandons the simple dichotomous notion that the only alternative to the ideal of secondary process thinking is the primary process, the weakening of cognitive controls could equally well permit the emergence of developmentally earlier or cruder, more erroneous forms of non-primary-process thought. Goldberger (1961) presented evidence that both effects were experimentally found.

The second point has an implication for unconscious cognitive processes: that not just the effects of defenses but something about the lack of consciousness itself prevents thinking from being logical and realistic, appearing instead in formats we call symbolic, allusive, distorted by condensation and displacement, and (consequently?) tolerant of contradiction and timeless.

Historically, these alternative conceptions were preferred by Jones and by Silberer, respectively (see Rapaport, 1951b/1967, pp. 373–74 on the Silberer-Jones controversy). On the basis of his observations of his own hypnagogic images, Silberer (in Rapaport, 1951a, chapters 8 & 9) proposed that similar states of consciousness with a "low energy level" were by nature conducive to a symbolic mode of thought, while Jones maintained that it was the result only of repressed impulses. Rapaport reminded us that, as long ago as 1920, Paul Schilder proposed a solution to this conflict. He first observed that deviant formations characteristic of "thought disorders appear in normal thinking as preliminary phases of problem solving, remembering, etc." (Rapaport, 1951b/1967, p. 371). Then he proposed the bold generalization that every thought we generate goes through a microdevelopment from modes more like primary process to others more like secondary process.[9] In thought disorders, whether caused by damage to the brain or by diseases such as schizophrenia, the ordinarily present layers of delaying and synthesizing functions are impaired so it does not take much assistance from conflicts or repressed impulses for the primary process to emerge.

Aside from some anachronistic aspects, Schilder's position that both could be right, depending on other circumstances, seems to be logically plausible and consistent with the experience of many clinicians. Often, patients pro-

duce transparently symbolic transformations of themes they strongly resist acknowledging, but it is also commonly found that after an issue has been thoroughly explored and worked through, it still appears in dreams in familiar symbolic disguise.

In his several writings about these matters, Rapaport (1951a; see also Gill, 1967) often went considerably beyond the first-approximation, dichotomous approach of which Freud was so fond. He argued cogently for the view that there is a continuous series of states of consciousness from the most alert and vigilant to ordinary waking to drowsy, further into the several stages of sleep, not to mention special states induced by drugs, sensory monotony, and such practices as meditation. Moreover, he assembled evidence, much of it anecdotal and including a series of self-experiments (Rapaport, 1951c/1967), that as one descends levels of consciousness, thinking is increasingly taken over by symbolic, transformative, dreamlike ways of processing information. He repeated and extended Silberer's (1909/1951a, 1912/1951b) self-observations in hypnagogic states, and generally replicated the latter's findings. The data from Silberer's and Rapaport's self-observations are persuasive and fascinating to read, though we should hesitate to generalize, remembering that they come from two highly intelligent, introspective intellectuals. Rapaport reports, on reviewing two months of records after he had trained himself to record his mental content by automatic writing, that as reflective awareness decreased and the ability to exert effort waned, the predominant form of the thought went from verbal to visual, there was an increase in what he called implicativeness (as when in a dream you know something that hasn't been made explicit), a simplification of syntax, and a shift in the logic to "participatory, syncretic, and animistic forms," and finally that "condensation, displacement, substitution prevail" (Rapaport, 1951c/1967, p. 395).

The same configuration recurs so often that it is difficult to reject the proposition that there is indeed a cognitive system which we call primary process, perhaps not tightly coupled but recurrent and recognizable, which tends to come to the fore as vigilance relaxes and consciousness dims.

Re #5 *(The developmental proposition):* Freud especially liked the conception that the primary process is developmentally prior. It lent itself to one of his pet notions, borrowed from Haeckel, that ontogeny recapitulates phylogeny. So, the thinking of children and primitive peoples, assumed to be behind us in an evolutionary series, ought to be mainly primary process. Freud seems never to have asked himself how a creature capable only of primary process thought could survive long enough to reproduce itself. His data-free generalization easily succumbs to open-minded examination of the actual thought products of both children and nature peoples. Curiously, Freud had a great deal more

experience with young patients than is commonly realized (Bonomi, 1994) during his years of primary responsibility for the pediatric neurology service at the University of Vienna Hospital. That antedated his development of psychoanalytic ideas, however, and he seems to have focused primarily on his young patients' neurological problems. He had no opportunity to do anthropological field work, either. Those who have devoted themselves to studying thinking in these two populations (e.g., Piaget, 1951, 1952; Lévi-Strauss, 1963, Cole & Scribner, 1974) report little that resembles Freud's description of the primary process. And the case that I made a number of years ago (Holt, 1967a) that both types of thinking undergo somewhat separate development has not, to my knowledge, been seriously challenged.

That near-failure of the central developmental proposition of the psychoanalytic theory of thinking raises doubt about the conventional practice of referring to primary process as *regressive*.

The whole notion of psychopathology as a type of regression implicitly raises the same objections: Neither neuroses like hysteria nor psychoses like schizophrenia can be seriously viewed as developmental reverses or throwbacks to earlier stages in the development of the person or the species. To be sure, some psychiatric patients do display childishness, fetal postures, or other symptoms that suggest a retrogression to past stages, but these phenomena are relatively isolated and not typical of all psychopathology. Hughlings Jackson, from whom Freud borrowed the term *regression*, did his neurological work in a time of great excitement about Darwin's discoveries when they were being rather indiscriminately applied to all kinds of matters.

Why then, you may wonder, do I cling to the outmoded terminology, as in referring to the creative use of primary process as "adaptive regression?" All I can use in my defense is the plea of established usage. Just as the United States clings to inches and pounds when the rest of the world uses the much more rational metric system, only because making such a change would be so cumbersome, I was discouraged at the prospect of altering a concept so firmly established in the literature. But I really don't think that letting primary process into discourse is regressive!

Re #6 *(In the primary process, ideas fragment and recombine):* The proposition that ideas do not maintain separate identity in the primary process clearly refers to the hypothetical and unobservable process. In the end, however, it is an inference from observations like composite images, especially unrealistic and idiosyncratic ones that must have had subjective origin. The first person who imagined a griffin, with head and wings of an eagle and hind quarters of a lion, was obviously able to break up the natural identities of two quite different creatures and combine them in thought, and the same is true of other mytho-

logical monsters. This bit of theory therefore merely postulates a plausible means by which observed facts might have come about. It remains a challenge for a more sophisticated cognitive theory to account for such condensations.

Re #7 *(The secondary process is realistic and adaptive):* Setting aside the issue of "organizing principles" of systems, already discussed, only a weak case can be made that "the" secondary process is a cognitive system. There is, of course, a large body of research on "normal, adult" thinking. Indeed, so vigorous has the experimental psychology of thinking become that many of its exponents (e.g., Gardner, 1985), noting convergences in findings and methods from linguistics, anthropology, artificial intelligence, neuroscience, and philosophy, have declared the existence of a new "cognitive science." Even a cursory review of current literature in this field suggests that there is little enthusiasm for the monolithic view of adaptive thinking, ordinary or extraordinary, implied by Freud's conceptualizing it as in effect a unitary process. Informal observations suggest the same conclusion: Most people seem to be capable of thinking on several levels. Some people are sharp and accurate observers but slovenly in putting thoughts into words; some lack creativeness but are excellent critics. Everywhere, then, there is evidence for a multivariate view of thinking as an assembly of multiple abilities (Guilford, 1967; Gardner, 1983, 1999), many functions, and diverse processes, which simply does not lend itself to a single theory or conceptualization. For scientific purposes, the secondary process is an ideal type (in Max Weber's sense[10]) long since replaced in cognitive psychology by a large number of abstract analytical variables.

Re #8, 9, and 10 *(Secondary process thinking is orderly, stable, logical, self-correcting):* Specific propositions about secondary process thinking, such as that it reliably maintains and uses the identity of ideas, respect for reality, planning, goal-seeking efficiency, other aspects of adaptiveness, the use of self-corrective feedback, and logic, have all become topics for specialized research and conceptualization. It is not clear to what extent these propositions are definitions rather than empirical predictions susceptible to test.

For most scientific purposes, then, the loosely organized cognitive quasi-systems that Freud observed and conceptualized have very limited usefulness. In a number of clinical contexts, too, they may be eschewed. We have here a curious, seemingly contradictory state of affairs. On the one hand, there are several reasons to abandon the concepts of primary process and secondary process:

(a) They are part of metapsychology, a thoroughly discredited, creakily anachronistic, useless theory.

(b) They imply that thinking goes on in some combination of just two ways, whereas there is little empirical evidence for the usefulness of such a dichotomy, and those two ways turn out to be multifarious.
(c) Detailed empirical studies of the language by means of which people tell us about their thinking or with which they produce responses to psychological tests or speak about their dreams, etc., lend themselves to much more complex conceptualization and to cognitive theories that bear only slight resemblances to Freud's.
(d) Developmental psychology, following Piaget's pioneering researches, finds at least four distinguishable levels or systems of thinking, none of which corresponds to the primary process.

Yet, on the other hand, few clinicians have found that they need a substitute for the old familiar dichotomy in their therapeutic work. And (as I shall argue in the next chapters) the enterprise of scoring "manifestations of primary process in Rorschach responses" plainly works, shows internal consistency and repeatability, and yields respectable correlations with external criteria.

How could that be? One answer begins in a simple distinction introduced above: between the *process* of thinking and its *products*. No matter how a person generates ideas, he or she must communicate them if they are to be studied; thought products—which are all we have to work with—are our data, and thought processes are theoretically constructed to account for these data. If we fail to take into account certain aspects of the interpersonal situations in which the data are gathered, we can easily go astray and forget the distinction just stressed.

The testing situation is one of interpersonal communication, as are other situations in which data on thinking are gathered, such as psychotherapy or experiments. These situations differ in more or less subtle respects; but in all, there is a thinker and someone to whom he/she reports or relates something. These encounters take place within larger systemic contexts—institutions like hospitals, clinics, laboratories or other research centers in universities, private consulting rooms, and therapists' offices, for a few examples. Most of those contexts are professional rather than informal ones such as occur within families or between friends. All of them exist in a general cultural system that silently shapes and steers communicative processes. A few of the cultural givens are the assumptions that both parties will use the same language and will in other ways attempt to make sense to one another. In a professional context, it is silently agreed without the need for explicit rules that the participants will not attack or seduce one another but, regardless of whatever attraction or repulsion they feel, will get on with whatever ostensible business they have to attend to. It is generally understood that communication in these contexts

should have a minimum of the following qualities: use of words to impress, confuse, excite, embarrass, or shock the other, to inspire and recruit him/her to a cause, or to arouse strong emotions.

All of these considerations operate to guide and control the communicative processes of the participants. The examiner (tester, or therapist, or experimenter; for simplicity, let us assume a female examiner and a male subject) generally adopts a manner of more or less friendly impersonality, and speaks accordingly. That is, she uses a minimum of either technical jargon or street slang; she tries to get right to the point without extraneous display or joking; she avoids any language that would make the other feel attacked, unduly pressed, or disapproved of, seduced, or led into some other kind of interpersonal situation than the professional one. By doing so, she implicitly models the kind of language she expects, which helps call up the appropriate guiding sets in him. Obviously, if she started a session by telling a dirty joke, or by insulting and berating the subject/patient, quite different sets would be activated in him.

The upshot is a normative expectation that the person who is producing thought products will do so in a certain style: rational, intelligible, equable, more or less neutral and businesslike, oriented toward the realistic attainment of goals. That happens to coincide rather remarkably with what we call the secondary process. By the same token, it is expected that he (the person communicating thought products) will monitor his own thinking and censor or appropriately modify it so as to exclude whatever would seem inappropriate because it expresses or arouses too much emotion, incites fear, libidinal excitement, or aggressive tension, or because it does not make sense, violates expectations about realism and rationality, or is too egocentric to be readily intelligible. The kinds of thought products that should be so censored or communicated only in domesticated ways match very well what Freud called the primary process.

Notice, however, that this consideration of situational constraints helps mainly in helping to explain the seeming coherence of secondary process thinking. Some years ago (Holt, 1967a), I contended that most cultures have a literature of religious books, myths, legends, fairy stories, and the like, which constitute another set of external factors that help shape the complex we call primary process thinking. That literature teaches belief in magic and/or supernatural influences and causes, and attributes to villains or devils the sinful drives and lusts that are forbidden to good people. Altogether, one can argue that we are all indoctrinated into a cultural style of primary process. Other sources of its cohesion will be discussed further in chapter 3, when we shall evaluate the theory of primary and secondary processes again in terms of currently available empirical evidence.

NOTES

1. Rapaport's prominent use of the concept of the drive organization of memories and his stress on wish fulfillment in discussing the primary process encouraged me to develop the Content scores, the initial focus of the scoring system (see vol. 2).

2. A person of genuine humility and altruism, Rubinstein never brought that fact to my attention.

3. Here I am adopting the terminology and outlook of Pepper (1942). The argument is developed more fully in my book (1989) and in my notes on some of Rubinstein's papers (Holt, 1997a).

4. Since the work of Gedo and Goldberg (1973) was hailed in its preface by Grinker as a fruitful application of General Systems Theory (GST) to psychoanalysis, one might expect that their book offers some ideas about how GST might help reformulate the primary process. In fact, however, Gedo and Goldberg show little evidence of contact with GST, citing only Bertalanffy (1968) and taking from that book only the idea that different theories that are not reducible to one another may be retained if ordered in a hierarchy. In my understanding of it, that is virtually a parody of GST. Moreover, they make no effort whatsoever to question Freud's theory of thinking or to reconceptualize it. In his subsequent book (1979), Gedo did accept the then-contemporary critique of metapsychology and certain alterations to the theory of primary process suggested by Rapaport (1960/1967e), Holt (1967a), and Noy (1969), and proposed a substitute metapsychology centered on "a self-organization as a hierarchy of goals and values" (p. 243). Gedo does not develop this proposal in a way that reformulates Freud's theory of thinking, however. Bowlby (1969–1980, 1981) acknowledged the influence of both Peterfreund and Rosenblatt and Thickstun, and made some use of concepts like information-processing systems in his important alternative to metapsychology. Bowlby's work was grounded mainly in evolutionary biology, ethology, and developmental psychology, however, and had little to say about such subjective phenomena as thinking. Likewise, a recent and stimulating application to psychoanalysis of the contemporary version of GST, the theory of complex adaptive systems and coevolution (Palombo, 1999), does not address the issues under consideration here.

A word should be added about the work of Dorpat (1991a, 1991b, Dorpat & Miller, 1994) also. He has published a good deal about the primary process, assembling ideas put forward by others with few additions of his own except for his conception of "primary process meaning analysis." Starting from the position of other critics that the unconscious, including primary process, is not cut off from the outside world, he argues that "what in the past have been called [primary process] derivatives are actually the end products of a process of meaning analysis in which individuals unconsciously evaluate their interactions with the external world and represent their conclusions about those evaluations" (1991a, p. 3).

5. Noy, too, urges that we distinguish between the content of thought and its processes, noting that we are aware only of contents. He is quite right, then, when he says that we cannot use the criterion of consciousness to distinguish secondary from primary processes. Unfortunately, he fails to maintain this position consistently.

6. Note that these authors' conception of the cognitive unconscious is much more focused than that of Epstein.

7. Freud's developmental theory assumed that ontogeny recapitulates phylogeny: the child goes through stages of growth that had been experienced by his or her ancestors through prehistory and history. We can easily discard that and leave intact his statements that the primary process precedes the secondary in the development of the child (though those, too, need to be strongly qualified; Holt, 1967a).

8. For examples, see Bornstein and Masling (1998) and Fisher and Greenberg (1995).

9. Much of the work of the group around Smith (e.g., Smith & Carlsson, 1990) and Kragh (e.g., 1955; Kragh & Smith, 1970) at Lund University in Sweden on percept-genesis offers partial support for this hypothesis.

10. See Parsons (1937), especially chapter 14. An ideal type is an instance-based concept, a type because it describes a recurring pattern of coexisting attributes, and ideal in the sense that it is rarely or never fully encountered in actual observation. A diagnosis or syndrome is a good example.

Chapter Two

From Theory to Measurement

Developing the Primary Process Scoring Method

From the days of my first association with David Rapaport, in February 1946, my interests in theory and in research have gone hand in hand. He was able to recruit me to Topeka to learn diagnostic testing because he presented it not as a bag of professional tricks but as a chance to learn psychoanalytic theory and its practical application simultaneously.

I especially appreciated Rapaport's attempts to ground everything on an expanded ego psychology, spelled out in the "rationale" sections of his major work, *Diagnostic Psychological Testing* (Rapaport, Gill, & Schafer, 1945–1946/1968), which had just appeared. It contrasted refreshingly with the prevailing tradition of the Rorschach literature, which simply stated the "meaning" of each traditional score on the basis of accumulated (but almost never explicated) clinical experience. All too often, the reputed wizards of *Rorschachlehre* would shrug when asked by their awed students how they reached their conclusions about the "deep dynamics" of patients after having heard sometimes only a few responses, alluding to intuition and clinical experience, and they seemed to take a perverse pride in their inability to explain any further.

Rapaport had little respect for that kind of showmanship. He pointed out the fact that there was often no way to test the alleged insights against objective independent criteria, especially when they were couched in a special lingo of Rorschachers. Moreover, his way of working offered a kind of professional practice that simultaneously provided a useful service and stimulated intellectual growth. His grasp of psychoanalytic theory was simultaneously so wide and so deep as to be legendary, but his orientation was at once reverential and open-minded. He believed that psychoanalysis had everything to gain by enrichment from academic psychology, of which he was also a profound student, and he worked constantly at integrating the two bodies of knowledge.

On joining the staff of the VA hospital in Topeka in 1946, I found that my first duty was to attend training sessions with Rapaport, to learn his approach, his scoring systems and administrative techniques for the tests, and the network of theoretical hypotheses he had worked out to undergird interpretation. While we were reading, attending daily training sessions, and being grilled by him, we were simultaneously attempting to function on the job in the exciting milieu of a ground-breaking psychiatric institution, Winter VA Hospital, under the charismatic leadership of Karl Menninger. Learning had to progress quickly; within a year, we were supervising the next group of trainees.

About five years later, I met Bruno Klopfer at an APA conference. He was at work on a new, expanded, and improved exposition of his widely used Rorschach system (Klopfer, Ainsworth, Klopfer, & Holt, 1954), determined to profit from criticisms of his first book (Klopfer & Kelley, 1942). In particular, he hoped to counter the charge that the approach lacked theoretical foundation. He invited me to contribute a chapter considering the test from the standpoint of personality theories, on the recommendation of a mutual friend who knew of my interest in theory, not because of my knowledge of the Rorschach test.

I decided to approach this interesting challenge, not by considering Rorschach phenomena or scores and asking what they might be measuring in terms of various theories, but the other way around: taking up a series of theories and asking how they might help us to understand responding to Rorschach inkblots. Psychoanalytic theory posed a special challenge, for I was strongly committed to it but did not easily see ways to do more than pass along what I had recently learned.

In my section on psychoanalysis, I wrote about Rapaport's contributions and mentioned his analysis of what he called "verbalizations" (Rapaport, Gill, & Schafer, 1945–1946/1968, pp. 424–63), but did not yet grasp their relevance to the primary process.[1] I did, however, get an idea from Kris's (1950) proposition that the degree to which thought was organized according to the secondary process corresponded to the degree to which its energy was neutralized, and Hartmann's (1950, p. 87) statement that neutralization meant "the degree to which certain . . . characteristics of the drives (such as their direction, their aims) are still demonstrable." These formulations suggested to me "that a thought product is the result of neutralized cathectic energy to the extent that evidences of any kind of libidinal or aggressive aims are lacking in it" (Holt, 1954, p. 548).

It was a short step to creating a simple scheme for scoring the Rorschach, which at first I called a "neutralization index," while becoming increasingly aware that I was trying to measure primary versus secondary process think-

ing. It was essentially limited to most of what soon became the first of three general categories of scores, those of Content: responses with plainly evident libidinal or aggressive themes. The neutralization index was simply the percentage of responses free of any such "instinctual" content. Libidinal wishes were subdivided roughly in accordance with the stages of psychosexual development described in the *Three Essays on the Theory of Sexuality* (Freud, 1905a/1953). It seemed desirable to subdivide forms of aggressive imagery also, though since the theory provided little guidance I tried a couple of ways of slicing that pie before adopting the one presented in volume 2. All told, there are twenty types or classes of motives or aims, which I call *Content variables*. Why so many? Nothing in the theory dictated how extreme or primitive a wish's expression must be in order to qualify as no longer neutralized. So I split the particular indicants of each type of libidinal wish into the more blatant and crude (calling them Level 1) and the more civilized and socially acceptable (Level 2).

In my first attempt to apply the scheme, I scored available Rorschachs from young physicians who had applied to the Menninger School of Psychiatry and who had been selected for special study because their performance as psychiatric residents had been rated as among either the best or the worst. I hypothesized that having a high capacity for neutralization should characterize the best residents.

One of the first things I learned from that informal exploration was that, though there was a nonsignificant trend in the predicted direction, there were interesting qualitative differences in the scorable responses of the more and less competent young psychiatrists. One exception to the general trend, for example, had a low neutralization index but was a highly rated resident, "a sensitive and rather creative fellow, composed and quite well-adjusted" (Holt, 1954, p. 549). I then recalled another of Kris's remarks: "during many types of creative processes . . . the ego may use the primary process and not only be overwhelmed by it" (Kris, 1952, p. 312), a phenomenon Freud had described and which Kris called "regression in the service of the ego." So I went back to the Rorschach protocol of this anomalous subject, and found that his libidinal and aggressive responses were well controlled, with good form accuracy (i.e., precisely seen), and enlivened with occasional humor and artistic touches. That was my first inkling of what became additional scores attempting to capture and quantify a person's means of controlling and defending against his or her own primary processes.

After moving to New York in 1953 to direct the new Research Center for Mental Health, I continued to work on building the scoring manual. My co-director George Klein and I had decided to focus on empirical studies

of the psychoanalytic theory of thinking. I scoured Freud's writings for his many hints about concrete operational indicators of the primary process, as well as studying his theoretical remarks about it and the secondary process. Constantly, I looked for ways to make it all concrete, usually with the aid of a body of experimental data.

As I pondered Freud's descriptions of clinical instances of condensation and displacement, I began to realize that they closely resembled a large part of what Rapaport had taught as indications of schizophrenic thought disorder in the ways responses were verbalized (hence, they were "verbalization scores"). Though often not in any demonstrable way evidences of "drive domination" or "failure of neutralization," they plainly should be considered manifestations of primary process. So I put them under a new general heading, which I called Formal Aspects (or sometimes Formal Deviations).[2]

For a couple of years in the mid-1950s, I was greatly assisted in the development of Formal (and of Control and Defense) scores by the collaboration of Joan Havel, an experienced diagnostic tester who could draw on a large body of Rorschach data from her own practice. Together (Holt & Havel, 1960), we traced the lineaments of the "form varieties" (Rapaport's phrase) of the dream work's devices and those of the joke work that Freud (1905b/1958) had described, onto actual interpretations of inkblots. We reversed Gill's (1967) procedure of reducing all of the alleged properties of the primary process to condensation and displacement; that is, we treated the phenomena like symbolism, autistic logic, and the protean contradictions as direct indicants not requiring reductive restatement in terms of "psychic energy," in which we were ceasing to believe. The result was the forty-one categories of Formal Aspects of primary process, again divided into more and less extreme (Levels 1 and 2).

Havel and other coworkers and assistants helped me in the similar process of identifying many varieties of ways people control the emergence of primary process thinking and defend themselves against it after the fact. It was relatively simple to specify the ways the "defence mechanisms" described by Anna Freud (1936/1946) showed up in Rorschach protocols, profiting particularly from the prior work of Rapaport and of Roy Schafer (1954). I drew on what I had learned from them and many other clinical psychologists, notably Martin Mayman (1970) and David Shapiro (1965), to categorize the more unfamiliar realm of mostly adaptive Controls. From his work on the Thematic Apperception Test (TAT), I borrowed my old friend Silvan Tomkins's (1947) insightful classification of ways people have of coping with unacceptable wishes by putting them at a distance (I dubbed them types of Remoteness). It should be apparent that the use of humorous and esthetic contexts as ways of taming primitive impulses and unruly distortions of thought owes a good

deal to Kris (1952). From Kris's conception that a creative person can put his or her primary processes to use, and then turn them off at will when they have done their job, I derived the Sequence scores. They note the evidences a person gives, in a series of responses to one blot, of allowing some primary process through and then modulating or suppressing it. The similar concept of Delay comes directly from Rapaport, to whom it was a central theme in the taming of impulse. It could easily be coordinated to a person's holding back primary process material until the inquiry, the phase of testing in which the examiner goes over the responses a second time in an effort to understand where each was seen, how it came about, and the like. In this way, the third major division of scoring categories grew to a list of sixty-three Control and Defense scores.

In teaching us, his students, his craft of diagnostic testing, Rapaport emphasized that the task had only begun when one had settled on a tentative diagnosis for a patient. To be most helpful to colleagues charged with the daily management of patients and the choice and conduct of treatment, it was most desirable to delineate strengths as well as weaknesses, remnants of adaptive functioning before the presenting decompensation, and beginnings of positive functioning on which new ways of coping could be built. The Controls and Defenses clearly show that heritage; but so too do some of the other aspects of the finished system: the overall ratings of each response.

Rorschach himself had initiated the practice of examining each response to the question, "What does this look like?" to make a judgment about how well the described person, animal, object, or what not actually resembles the blot (or part of it) in question. That came to be called scoring the "form level," originally a simple dichotomous decision: a "good" (+) or "bad" (−) match. Rapaport (Rapaport, Gill, & Schafer, 1945–1946/1968) specified the relevant psychoanalytic concept (reality contact, appraisal of reality) and in his critical analysis of the perceptual-associative processes involved singled out the importance of assessing a person's "critical controlling function" (p. 289). This capacity to stand back from one's immediate response and appraise it objectively shows up at its best in well-adjusted, highly intelligent persons, and shows gaps or functions poorly under the assault of decompensation. Hence it provides the single most useful guide to the general level of adaptiveness of a person's cognition.

Rapaport also added an independent and clinically valuable dimension to be judged: to what extent was the concept invoked by the respondent a definitive form (e.g., a face), a vague one (a cloud), or something wholly amorphous (blood, night). His student Mayman (1956, 1970) further differentiated Rapaport's scheme and assembled a valuable set of examples for each of the nine resulting categories into a scoring manual. With Mayman's

permission, I simply incorporated his scheme and manual into mine (see volume 2, chapter 8).

Another of Rorschach's intuitive decisions was to make a rough judgment of the degree to which a response was very common (Popular), at one extreme, or rare (Original) at the other. Rapaport interpreted the dimension thus tapped as creativity, another adaptive resource. That was the theoretical warrant for adding another rating scale, Creativity, which I expanded from Rorschach's implicit three points to six.

One reason I have emphasized the way the present scheme for measuring the primary process developed out of a concern with diagnostic testing is that it helps explain something that persons from a different professional background find surprising or puzzling. That is the fact that this approach to primary process pays no direct attention to a central property that Freud claimed for it: that it was a method of reading and understanding bewildering communications from the Unconscious. So let me be explicit that learning this system does almost nothing to help one interpret dreams, understand schizophrenic language, or otherwise perform feats of translating a manifest text to get at its putative latent content of meaning. Perhaps it helps somewhat to be intimately familiar with the irrational cognitive strategies of the primary process, but that alone does not unlock the mysteries. Such interpretation, at least for the foreseeable future, is an intuitive skill closer to that of an artist than of a scientist, though it is conceivable that a way may be found some day to make it into a problem open to systematic empirical study.

Fairly early on, it became evident that it would be valuable to have an overall measure (via a rating scale) of the degree to which the manifestations of primary process in a Rorschach response seemed to demand that something be done to make them tolerable to conscious experience and acceptable communications to another person. I did not find any generally used theoretical concept calling for such a score (which I called Defensive Demand, abbreviated as *DD*), but it has proved useful. Likewise its logical counterpart, Defensive Effectiveness (or *DE*)—a rating of the degree to which the processes of control and defense succeed in producing a plausible, possibly interesting, but at least not disturbing or displeasing interpretation of the inkblot, responsive to the examiner's request. Such adaptive responding received scores from +.5 to +2 (by half-steps), while negative scores (from −.5 to −3) indicate increasing degrees of disorganization, distress, and dilapidation—obvious indicants of psychopathology. Each of these points on the rating scales was described and exemplified, to make it possible for different users to agree in their application of them.

A doctoral student of mine, Carol Eagle (1964) raised an interesting theoretical question: Are there individual styles of primary process that are

consistent across such different types of response as talking about Rorschach blots, telling TAT stories, and reporting their dreams? To study the problem, she undertook to extend and generalize the scoring system so that it could be applied to all three of these classes of clinical data. Subsequently, to facilitate its use with free associations, I revised and extended her extension of the method. The result is presented in volume 2, chapter 10.

The growing scoring manual contained all the scoring categories with rules for applying them and many examples. In less than two decades it went through ten mimeographed editions. I began presenting papers about the new method at professional meetings and publishing them. Moreover, a good many of my students did dissertations using the method and went on to publish relevant research findings (see bibliography). These activities stimulated inquiries from colleagues in many places, to whom I made available mimeographed copies of the manual at cost. So the word got around, and a good many people began doing research using it, because it was the first (and for some time, the only) tool available for measuring aspects of the primary process and its vicissitudes.[3]

RELATION OF THE PRIMARY PROCESS SYSTEM TO PARTICULAR SCHOOLS OF PSYCHOANALYSIS

The primary process system was conceived during the era when ego psychology was riding high on the psychoanalytic scene, and when I was working within that frame of reference. During the decades that have gone by, ego psychology has fallen out of favor not only with me but more generally. Is the primary process system therefore mired in an anachronistic type of psychoanalytic theory? Does anyone who undertakes the job of learning and applying it commit her- or himself to an outmoded approach to clinical or personological matters?

I strongly believe that the answer to these questions is No! Just as Freud built better than he knew, creating in the primary process a concept that has outlived the death of his metapsychology in terms of which he defined it, I believe that the primary process scoring system has a demonstrated robustness and value that makes it useful pretty much regardless of the user's own theoretical commitments. In this way, it is similar to the MMPI: you don't have to be a Kraepelinian or believe that mania or psychasthenia are "mental diseases" to find that test's clinical scales useful. Their meaning is carried in large part by their empirical correlates. People use those scales, in clinical contexts as well as in research, as measures of the somewhat vaguely defined but meaningful clusters of correlated variables.

Just so, I present the primary process system with the evidence that many of its indices and scores have a similar kind of rich meaning. It seems unlikely that many people will want to have a measure of condensation solely because of anything Freud said about that hypothetical mental process. But knowing that various indices made from the several scores under the heading, Condensation, have the correlates listed in volume 2, chapters 13 to 17, we can get an idea of the kind of person who will give more than the usual one or two of them. He (and perhaps to a lesser extent, she) will have an unconventional and unstereotyped enough mind, for example, to be better than average in endeavors requiring originality, the capacity to break accustomed sets in solving problems, or creative production.

"But is this not still a one-person psychology?" some may ask. "We have gone beyond that, with today's emphasis on interpersonal relationships, object relations, transpersonal psychology, and the like. We ought to rely instead on one of the interpersonally oriented, new scoring schemes for the Rorschach."

That point deserves a serious answer, as well. The Rorschach, TAT, and other projective tests, as well as dreams, are all primarily measures of intrapersonal phenomena—the thoughts, feelings, and reactions of a single person, often a patient. By their very nature, the enterprises of diagnostic testing or personality assessment necessarily focus primarily on a text that is dominated by the words of one person. That is true despite the above emphasis on the importance of the interpersonal context in which the data are gathered and their influence on the text. The professional who uses the resulting data may have any of the currently common theoretical orientations: neobehaviorist, classically Freudian, Sullivanian, self-psychological, object-relational, Adlerian, eclectically psychodynamic, whatever. Data from tests, like the transcripts of interviews, are basically theory-neutral, capable of being put to the service of almost any theoretical outlook. Rorschach himself was a psychiatrist with leanings toward psychoanalysis without formal membership in any society; that has not prevented people of many theoretical persuasions from using his scoring scheme as well as his blots.

For some purposes, assessment does center mainly on interpersonal processes, not the innards of any one participant in them, and newly produced scoring systems focused on other aspects of interpersonal behavior than are implicit in my scheme may well be more useful sometimes. Not always, however. One instrument for such study, the interpersonal Rorschach, lends itself nicely to primary process scoring. In an unpublished dissertation, Simard (1970) shows how the patterns of interaction in a schizophrenic's family are elucidated by a primary process analysis of the group's conjoint responses to the Rorschach cards.

As I argued in the preceding chapter, contemporary ways of conceptualizing thinking, dreaming, and the production of responses to the Rorschach and TAT do not need or imply anything much like primary and secondary processes. Nevertheless, as I said in that chapter, the fact that the data we have to work with come from professional situations leads to this conclusion: the kind of talk that is "normal" and expected under these circumstances closely resembles Freud's secondary process, the rest falling into two distinguishable types: the kinds of talk that are implicitly taboo (essentially Freud's primary process), and what is not shocking or deviant in the sense of being upsetting but is merely immature, inadequate, or erroneous (crude secondary process).

Thus, the scoring method does not require fealty to any particular theoretical point of view. As the only detailed, textually based, operational realization of some of Freud's concepts, it may be used equally well by those who still believe in metapsychology, by adherents of any modern school of psychoanalysis, and by those who have no interest in psychoanalytic theory as such but merely want a way to distinguish the above empirically demonstrable types of thinking, which have been proved to be of practical interest.

NOTES

1. The phrase *primary process* appears only once in the book, and that in a footnote to the section on tests of concept formation. Rapaport's term *verbalizations* refers to aspects of Rorschach responses that had not been scored in previous systems, referring mainly to ways that schizophrenics verbalize their interpretations of the blots.
2. Throughout this work, capitalization of words indicates that they are being used to designate scores or indices.
3. The principal alternatives known to me are adaptations or simplifications of the method presented here. Other related techniques, which are generally called measures of schizophrenic thought disorder rather than primary process, all trace a common ancestry: Rapaport's "verbalization scores."

Chapter Three

Toward a New Psychoanalytic Theory of Thinking

David Rapaport sought to assemble and integrate the psychoanalytic theory of thinking as the final chapter of his monumental *Organization and Pathology of Thought* (1951a). When I turned to it as a possible starting point for the present effort, I found it more exclusively metapsychological than I had recalled it. But, like Freud, Rapaport was also a keen clinical observer, and in his work on psychological testing he not only scrutinized many varieties of thinking with the help of diagnostic tests but also left us his relatively modest attempts to conceptualize the processes that gave rise to those data.

In two ways, I have found Rapaport's work an invaluable guide in attempting a new synthesis. As I hope to show, his nonmetapsychological conceptualization of the processes involved in the production of test responses yielded three critically valuable concepts—attention, concentration, and anticipation—which hold up well under a multidisciplinary contemporary scrutiny.

Second, in one of his last great insights, he focused on a central fact about human psychology. He sometimes called "the human miracle" the conversion of a passive baby, utterly dependent on parents and caretakers for survival, into an active seeker, doer, and creator. Perhaps if he had lived long enough to see his paper on activity and passivity (Rapaport, 1967) in print, he might have discerned its nonmetapsychological relevance to his grand obsession, the psychoanalytic theory of thinking.

For, as I have pursued that same quarry in the decades since his death, I have repeatedly noticed how many aspects of primary process share the quality of passivity. It is particularly noteworthy in dreams, where almost universally we drift along in a story line over which we have no control (with the rare exception of lucid dreams). It first occurred to me, however, that primary process thinking was passive when I was trying to understand some ways patients respond to Rorschach blots, notably arbitrary color and what Rapaport called

"fabulized" combinations. The less jargonistic term with which I replaced it, "arbitrary," could give a false impression, for the responding patient does not foist an inwardly derived conception on the blot but responds as if there were no choice: the face has to be green because that's the way it's painted; the prairie dog has to be climbing on the butterfly because that's the way they are positioned in the picture. The stance in both instances is profoundly passive. By contrast, the normal person matter-of-factly (*but actively*) ignores whatever in the blot doesn't fit the idea it suggests to him, selecting and using what does correspond to reality. In considerable part, I came to realize, a passive cognitive approach leads to the hallmarks of the primary process, while an active stance produces the kinds of thinking we call secondary process.

Realistic, effective thinking requires some effort. Even to repeat back what an examiner says to you requires *attention,* as Rapaport taught; doing mental arithmetic demands *concentration.* Even to follow directions to look at something requires actively directing attention in place of passive contemplation. Actively taking charge of what goes on in one's mind and getting a job done, exerting effort rather than just going with the flow—these characterize logical, scientific thought but also the practical solving of everyday problems, satisfying the demands of one's job or social role. When we relax, let our minds drift, they go into the mode of wishful fantasy, or of playing with ideas without the effort of respecting rules.

We shall, therefore, come back to these ideas of Rapaport's as the theory takes shape.

In an attempt to cover much in a modest space, this chapter proceeds by setting forth a skeletal series of propositions, usually with minimal exposition. It tries to sketch a general theory of thinking, with particular attention to conceptualizing all the cognitive phenomena that Freud and most analysts since him have been concerned with. Then follows a set of (mostly) empirically testable propositions, followed by reports of empirical results of doing the indicated research, and some reflections on feedback from data to theory.

I should make it plain, however, that the progression of these sections is logical, supplied mostly after the fact, not historical. The empirical work was done by many hands, in many places, over a series of years. And even though the basic ideas of the theory have not changed much, putting them into their present form was the last step.

DIGRESSION ON CONTEMPORARY COGNITIVE SCIENCE

One of the most exciting and fruitful developments in psychology and related disciplines during the past quarter century has been the emergence of cogni-

tive science. Building on a tradition of cognitive psychology, under the influence of simultaneous rapid advances in the neurosciences and in information theory and computer science, a broader and more interdisciplinary approach has emerged involving all these fields and several others. One of its brashest and most conspicuous branches is artificial intelligence (AI), the attempt to model intelligent and other mental processes by means of computers. Those developments have strongly influenced cognitive psychology.

Two parallel approaches in AI deserve a little attention here. One, the symbolic, attempts to model mental processes and contents directly. The other, usually called integrated parallel processing or connectionism, works at a subpsychological level. Its units are roughly modeled on neurons and the connections among them on synapses, and the larger entities thus created are sometimes called neural networks/nets, but this school of thought is frankly mechanistic, and it wholly fails to consider the many neurotransmitters that play important roles in living nervous systems or the many influences of the glia. As Block (1990) says, "The computer model of the mind has a built-in antibiological bias" (p. 261), though its goal is to create machines that somehow generate minds. Some AI adepts, including a few philosophers, urge the functionalist approach, defining mental properties as identical with the functions of computer systems. Many others, however, even in the AI community, concede that functional analysis does not logically produce intentionality, the property a symbol has of meaning something beyond itself (which may be what Freud and many other psychoanalysts call "the psychic"). In short, one might say that the ultimate stumbling block for "hard AI" of the connectionist type is the mind-body problem.

Ironically, some of the most vocal believers in emergence are the "bottom-up" cognitive scientists. They start with very simple operations performed by primitive processors (operating devices like programs), feeding their output to other processors that perform slightly more sophisticated operations, passing output on to successively higher levels of producing systems. Such networks can be trained to make extraordinarily subtle discriminations (e.g., between acoustic signals reflected by mines and by rocks; or among the English phonemes associated with all the letters of the alphabet), duplicating or exceeding the work of humans. With further extension of such work, they hope, intelligent, adaptive, meaningful, and perhaps conscious events will emerge. The other school, who might be called top-downers, without rejecting emergence, do not feel that it can be counted on to make the leap from the physical to the mental, and work with symbolic (psychological) concepts only.

The former group of workers tends to lean on the computer analogy and the argument that minds process information just as computers do, concluding that there is no reason in principle to think that information-processing

machines of sufficient complexity, capacity, and sophistication could not eventually have minds too. The second school is more likely to object that feelings and emotions make up an important part of what minds consist of, and cannot be reduced completely to their informational content; feelings are not even intentional though usually conscious. These workers (e.g., Damasio, 1999; Lakoff & Johnson, 1999; Searle, 1999) give more weight to the fact that minds are properties of living organisms with organic bodies.

I undertook about a year's immersion in these literatures, hoping to find some fresh thought about primary process thinking. But with a few exceptions, notably Hofstadter et al. (1995), they have little or nothing to say about cognitive processes that are not optimally efficient at one or another type of problem solving, so there will be little reference to the AI literature here.

There is another, more fruitful and very biological trend in contemporary cognitive neuroscience, however, grounded in brain anatomy. In addition to the valuable old method of correlating functional loss with damage to particular parts of the brain, there has been, in the last few years, an explosion of new, enormously productive techniques of tracking actual processes in the living brain and relating them to ongoing phenomena, subjective as well as behavioral. An exciting upsurge of new work on schizophrenia and on dreams has brought forth relevant findings, some of which I have tried to integrate into what follows. Because progress in this field is so rapid, with several competing schools of thought, my necessarily selective review may be obsolete in some details by the time this work is published.[1] Like the cognitive-science/AI literature, however, the emphasis is overwhelmingly on rational cognitive processes. A neuroscience of emotion is at last appearing, but even in Damasio (1999) and LeDoux (1996), a couple of the best and most widely read works in this field, there is hardly more than a passing reference or two to love and nothing about sexuality! Rage, yes; hatred, no. The hopeful new journal, Neuro-Psychoanalysis, may yet bridge this gap.

A useful and sobering consequence of my attempt to find my way around in some of the recent neuroscientific literature has been to realize how difficult and in a way arbitrary it is to delineate an area like thinking to be conceptualized and, one hopes, explained. Rapidly I found that it was necessary to state at least some generalities about perception, memory, communication, motivation, and emotion as well, and I was much tempted (after reading Damasio, 1999; see also Panksepp, 1998 and Watt, 2000) to add consciousness. Damasio so persuasively presents his case for the intimate interlocking of bodily grounded feelings, the sense of self, and cognitive relations to "objects" (meaning anything mentally presented, including an emotion, a memory, or the perception of a relationship) that one easily gets the sense that there are rich implications there for a modern psychoanalytic theory. I held back, however: too big a job, and undoubtedly premature. I content myself with the hope of inspiring some

readers to discover Damasio's work (and that of other workers in affective neuroscience) and to build bridges between it and psychoanalysis.

Before going further, I would like to frame this inquiry in some general principles and assumptions. In assembling them, I have leaned heavily on the work of Benjamin B. Rubinstein (Holt, 1997a), and of Douglas R. Hofstadter (Hofstadter et al., 1995).[2] They share a number of fundamental assumptions, though Rubinstein was concerned primarily with developing a theory about more extensively meaningful psychological phenomena, a largely verbal realm, and Hofstadter with producing operative computer realizations in restricted (nonverbal) minirealms. Much of Rubinstein's work shows his continuing focus on understanding the processes of clinical psychoanalytic work, notably how interpretations are formed. For that reason, he did not go deeply into an attempt to develop a theory of thinking. Though both wrote about topics within the realm of primary process (Hofstadter without ever mentioning that concept), neither undertook the task I am addressing: to produce a theory of thinking that accounts for how primary processing takes place, resulting in primary products, a theory that putatively accounts for the major findings of research presented here in volume 2.

In what follows, the core propositions of the theory are set in **bold face** to distinguish them from accompanying text, explanatory or commentary. When they can be directly related to the ten basic statements about the existing psychoanalytic theory of thinking as presented at the end of chapter 1, the relevant ones are cited thus: {Statement 1}.

1. BASIC ASSUMPTIONS
   - 1.1. **The theory must be protoneurophysiological: consistent with contemporary neuroscience**—at least, with what I know of it—**but still a psychological theory, dealing with symbolic, meaningful concepts rather than either concrete anatomical structures or abstract neural nets.** It takes no stand on Chalmers' (1996) "hard problem" of consciousness and does not try to confront the mind-body problem head-on. It seems too risky to stake everything on an assumption that one can guess the ultimate solution and not necessary to try.
   - 1.2. **The primary focus of theoretical attention is on the assumed locus of all action (in the most inclusive sense), the *person*, a psychophysically neutral, organismic concept of the individual human being as being at once a system of subsystems and a subsystem of superordinate systems.** Thinking is done not by egos or minds or brains but by persons.
   - 1.3. **For the most part, indicated by their tentative, conditionally voiced wording, theoretical statements in what follows are to be**

understood as probabilistic rather than nomological. That is, they almost all allow for exceptions or individual variations in the way they are manifest. Therefore, each probabilistic statement is subject to clarifications of conditions under which the indicated outcome does or does not occur, and may be read as an indication of a direction for needed future research.

2. FUNDAMENTAL PROPOSITIONS

Next comes a set of basic (general clinical) hypotheses,[3] taken from Rubinstein (1975) with little alteration.

2.1. The hypothesis of motivational determination, "activities of all kinds are motivated": **Thinking of any kind is motivated, is oriented toward the attainment of goals.** I do not want to get into the very complex issues of what motivation is and how it is produced, beyond what Rubinstein presented in his 1974 paper (see below). Like him, "I use the word 'motive' as a generic term, referring not only to wishes and desires, but . . . also to such complex motive-like dispositions as fear, anger, love, hate, and curiosity" (loc. cit., p. 281)—otherwise known as basic emotions (LeDoux, 1996).[4]

2.2. **Motives are assumed to be systemic happenings involving both psychological and anatomical-physiological subsystems, on the one hand, and larger ecological and sociocultural systems on the other.** These super-personal, or environmental, systems provide press (threats, assaults, temptations/ incitements, and opportunities to gratify motives; Murray et al., 1938) as well as culturally accepted or prescribed means by which a person's motives are expected to function. Thus, motives are not reducible to "drives" assumed to be inner physiological needs or homeostatic necessities, though there is a critical place for those as well as external inciters, which seem to be equally important instigators of purposive action.[5]

2.2.1. **Through their religions and legal codes, cultures condemn some motives as evil, sinful, and/or criminal. Thereby, they exert pressure on people to defend themselves against acknowledging or expressing those motives, which typically become unconscious. Such motives tend to form the wishful and fearful core of primary process thinking**. {Statements 2 & 3}

2.2.2. **As these value judgments become internalized, children learn to condemn some of their own wishes and impulses, many of which become unconscious. Thus, the wishful core of primary process is also originally** (and lastingly) **primitive, crude, and immature** (infantile or childish). {Statement 5}

2.3. Motives may be divided into several classes:

2.3.1. First, according to Rubinstein's hypothesis of unconscious motives, *some* motives operate with, others *without* the person's awareness that he or she has such a motive, and is nevertheless trying to bring about a particular goal-state: **Ready access of a motive to full consciousness is one extreme of a continuum, extending at the other to full unconsciousness and maximal difficulty in becoming aware of it.**[6]

2.3.1.1. **To be unconscious, motives and certain other mental contents must ordinarily be rendered unconscious, for example, if they are unacceptable, the person represses them or excludes them in other ways.** The "other contents" include unacceptable or frightening memories and unacceptable realizations about oneself or about significant sectors of one's world (Rubinstein, op. cit., p. 294).

2.3.2. **Motives differ in their *primitivity*: some are egocentric, unmodulated, more evidently connected to events of early childhood, and/or to fantasies dating to a person's early years, while others originate in adult activities, pursuits, and interests—again, a continuum though most readily stated in terms of extremes.** {Statement 5}

2.3.3. **Motives differ in the emotions they arouse, from none to very great, in particular pleasurable *excitement* and the degree of *threat* (sensed danger of death or personal disruption, social rejection, loss of the love or respect of important others, loss of self-esteem, guilt, shame) which their acknowledgement would entail.**

2.4. **Inner conflict (often perceived as painful or unpleasant to varying degrees, from minor annoyance to absolute intolerability) arises from the objective or the felt/assumed incompatibility of motives, and the resulting feeling motivates action of some kind (overt or covert) to resolve the conflict.—**Rubinstein's hypothesis of the resolution of inner conflict. For example, love or ambition may conflict with greed or fear; one cannot take revenge on a loved person for some injury received without chancing the loss of that person's love.

2.4.1. **A common method of resolving conflict is to seek a compromise, in which each motive may be at least partly fulfilled** (Freud's compromise formation, common in primary process thinking).

2.5. **All motives—including unconscious ones—have an inherent likelihood of influencing or directing the course of trains of thought, and vary (perhaps in part randomly) in their level of activation, which is operationally identical with that likelihood.** This is a version of "The hypothesis of the persistent manifestation potential of unconscious motives," Rubinstein's (p. 282) substitute for Rapaport's Freudian formulation, "instinctual (or motive) pressure."

2.5.1. The proposition that **thinking** is motivated implies that it **has a means-end structure**, which Freud called experimental action: implicitly exploring possible paths to goals and choosing the one that implies, from previous experience, the least danger (e.g., anxiety) and the most gratification (e.g., pleasure). {Statement 10}

2.5.2. **During REM sleep, more primitive motives have easier access to dream consciousness than during the waking state.**[7]

2.5.3. **When a person is awake but at a low level of activity** (agency) **and vigilance, relatively primitive motives tend to play a large role in organizing thought.** Daydreaming is a good example.

2.6. **A train of thought "may be seen simultaneously as the *means* for the fulfillment of one motive, as the *fulfillment* of another, and as the *partially equivalent fulfillment* of a third."** This is a version of Rubinstein's (1975, p. 286) hypothesis of convergent motives; cf. Murray's (Murray et al., 1938) fusion and subsidiation—means-ends organization—of "needs"; Freud's overdetermination.

2.7. **Motives of a major subclass are usually called *defenses* or defense mechanisms; they range from the least to the most mature and adaptive. At the high end of maturity, they are called *controls.*** A thought product may be produced simultaneously by the fulfillment of a wish and by the operation of a defensive maneuver.

2.8. Rubinstein's general clinical hypotheses include two related ones on the *fragmentation* of concepts or images. He remarks that "both play a crucial role in the process of dream interpretation" and probably in the construction of dreams as well.

2.8.1. **The process by which object representations, including representations of contexts, are constructed** (see 3.3) **is subject to some degree of reversal to their constituents, resulting in fragmentation.** {Statement 6}

2.8.2. **Fragments from different representations may be recombined, presumably by classifiers; the result is often a form of condensation.**

Now, some basic assumptions about *cognition*, beginning with the intake of information. Notice that these apply to primary and secondary process alike:

3. Perceiving.
   - 3.1. **When a scene is presented to the eyes of a healthy, mature person, the input is transmitted to the occipital cortex and related visual areas, and at some point becomes psychological as well as neurophysiological.** Similar propositions are assumed for other sensory modalities.[8]
   - 3.2. **The basic process in perception and perhaps in all cognition is *classification*, a process of cataloging carried out by *classifiers*, cognitively unconscious psychological operators.** It is often called categorization.[9]
   - 3.3. **The fundamental (and nonconscious) classifying operations of recognition are carried out by *subclassifiers,* performing *feature analysis.* They provide data for object classifiers or situation classifiers, which integrate the features into a pattern and then *match* this pattern to stored patterns in memory.** Note that "object" here may be a word, sensation, or feeling, a person or a thing.[10]
   - 3.4. **Subclassifiers' matching performance, like virtually every other mental function, is subject to some degree of error; therefore, it must be checked by some (also imperfect) monitoring function.** (Concerning monitoring, see 5.5)
     - 3.4.1. **Errors of either type produce what Hofstadter (1995) calls concept-slippage, which provides some flexibility or fluidity to thinking:** "Generalization outwards from a conceptual center is an automatic unconscious process that pervades thought." It is the "context–dependent tolerance of conceptual mismatch" (p. 201). It goes on not only in the process of recognition but whenever concepts are used.
     - 3.4.2. **Individual differences in this generalized tendency for concept-slippage constitute a cognitive style** or group of styles, when consistent.
     - 3.4.3. ***Jumping*** (Margolis, 1987), **or making the quickest, most obvious match without self-correction through a monitoring process, can (but does not always) produce gross cognitive inefficiencies.** The resulting percepts or other thought products may be classified as distant associations or as results of other formal properties of primary processing.

DIGRESSION: THE EVOLUTION OF PRIMARY PROCESS

From the standpoint of evolutionary psychology, it is obvious that no organism capable only of primary process could survive long enough to reproduce, or at least would be under such severe selective pressure that it would quickly die out. Epstein (1994) put it this way.

> Freud's conceptualization of the unconscious . . . is essentially a maladaptive system, . . . not up to the task, for either human or nonhuman animals, of promoting adaptive behavior in the real world. Operating under the direction of the primary process alone, individuals would starve to death amidst wish-fulfillment hallucinations of unlimited gratification. (p. 709)

It is not evident that the last inference can be justified by anything Freud wrote, but the basic point is troublesome. How then can we account for the fact that the species that is capable of the greatest achievements of intelligence and adaptation does have the capacity for primary process?

There has to be an adaptive advantage to being able to function in a highly disciplined, realistic, logical fashion, and also loosely, playfully, humorously, and creatively. What, then, is so valuable about being able to have nonrational experiences: of esthetic enjoyment, of awe and wonder, of amusement and laughter, of ecstasy and transcendence?

An organism that forms concepts and memories precisely, with no ambiguity and only a minimum of random error, can become highly adapted to a stable, highly predictable environment. But as mobile a creature as us human beings gains part of our unusual degree of adaptability not simply from greater intelligence but by virtue of flexibility, which implies some slippage of concepts or blurring of boundaries between them. A delicate balance must be struck between so much sloppiness that precision and reliability are seriously compromised, and so much clarity of distinctions and segregation of inner representations as to create rigidity. (Compare Kauffman's [1995] conception that life itself dwells in a narrow band between realms of order, with deadly stasis, and of chaos, with dangerous unpredictability.)

We can assume, therefore, that variations in the control of cognitive boundaries by mutated genes enabled some of our humanoid ancestors to gain an adaptive edge by an increase in their cognitive flexibility, perhaps making possible more inventiveness and ingenuity. More to the evolutionary point, they may have also had a specific advantage in competition for mates by greater esthetic and humorous capacity. Men who can adorn themselves with more striking imaginativeness, sing better tunes, create more attractive abodes, clown more goofily, and in other ways attract women and make them laugh seem to make out better sexually than their

more plodding and duller confreres in most cultures today. Why not also near the dawn of the species?

An increased capacity for something like primary process thinking implies liabilities as well, of course. The freedom to break up the usual unities of perception and thought, to recombine them in ways that are amusing, beautiful, or useful, brings with it a vulnerability to psychosis and other disorders of thinking. It is perhaps relevant that anthropologists have not discovered any sizeable cultures that don't have some psychotics among their participants.

3.5. **Matching processes occur in a working space, analogous to the working memory of a computer.**[11] Thus, when a copy of something like a subclassifier or a concept is taken from storage for a contemporary processing operation, it may be transformed as required without necessarily affecting the original in long-term memory.

3.6. ***Massive parallel processing*** **is assumed: once a feature is found, it activates to some degree a set of related concepts, presentations (precursors of images), memories, and/or fantasies, each of which is somewhat likely to set off simultaneously a tentative train of thought, exploring various hypothetical outcomes of the way the features may be or are being integrated.**

3.6.1. **Perception is always a process of *constructing*** **presentations before conscious recognition.** The process is often called *microgenesis.*[12] The result helps to produce Hofstadter's "generalization outwards from a conceptual center" (1995, p. 75).

3.6.2. Often**, there is a good deal of overlap between several such tentative trains, so that at a certain unknown point, a threshold is reached, a satisfactory degree of matching to memory is attained, and a combined perceptual hypothesis or presentation becomes a conscious image.**

3.6.3. At other times, **the parallel processes compete, and only the one that recruits the most confirmatory information attains consciousness.**[13]

3.6.4. **Both percepts and mental images are constructed from external (stimuli) as well as internal sources (memory). When the role of external input is minimal or absent, the result is a mental image, which, if vivid enough, may under appropriate circumstances be interpreted as a real perception—a hallucination**.[14] There are, however, great individual differences in the capacity to transform presentations into mental images. As Segal (1972) has shown, it is possible to set up conditions under which normal subjects at times report

perceiving objects that have not been shown, or report having mental images of objects that are in fact faintly depicted.

3.7. **Other subroutines, cognitively unconscious psychological processes, are specially attuned to the *affective* implications of these tentative explorations. If a feature-generated process reaches a threshold value for anxiety, fear, pain, or the like, a set of (still unconscious) defensive processes is triggered.** If enough threat is implicated, what was otherwise a promising trend toward a conscious presentation can be aborted (denial, perceptual defense) or diverted into a second-best hypothesis. The result may be a perceptual distortion. (See also role of cognitive controls in thought, 5.5–5.5.7.)

3.7.1. **Great affective intensity or emotional importance can make a process gain conscious, imaginal status in persons who do not ordinarily experience waking mental imagery.** The result is usually a hallucination.

3.8. Propositions stated up to this point have implicitly accounted for only assimilative perception, not for accommodation (to adopt Piaget's useful distinction). It is necessary to assume, therefore, that **previously unnoticed features do register in the perceptual system and may attract notice and the formation of new subclassifiers.** Such a process is obviously necessary for the initial formation of most if not all feature-finders in infancy.

3.9. **Percepts differ in their vagueness versus definitiveness and in their accuracy or degree of match between the representation and the represented bit of reality.** There are striking differences among persons in their usual levels or styles of perceptual performance along these dimensions, also.

4. MEMORY (THE STORAGE OF INFORMATION)

4.1. **Several kinds of memory must be assumed, including working memory (primarily executive), and two forms of storage for content, short-term and long-term storage.** The distinction between executive and content memory is not often made, the situation being somewhat complicated.[15] Working memory is conceived of as a space in the brain where the person's immediate business is transacted. It therefore contains a lot of content, which is often operated on, but which is stored elsewhere. I presume that it goes first into some site for short-term memory (the particular locus in the brain depending on different localities for faces, for other kinds of images, for words, etc.) and then into more permanent storage—again, not necessarily one site for everything. Add in William James's caution: the notion

that thinking is made up of recurrent specific "ideas" is as mythical as the jack of spades, and things get complicated. The word "storage" is not to be interpreted as implying a "recording" in any particular gyrus. The executive functions carried out in working memory, such as attending, concentrating, analytic and synthetic operations, etc., likewise may or may not "reside" there and just there. The brain is a system, not a bunch of separate mechanisms.

4.1.1. **Working memory is important in all executive functions, and is essential to adaptive (secondary process) thinking.**[16]

4.1.2. In addition, **performative memory is the storage of nonverbal skills** like riding a bicycle or playing a piano. It is usually contrasted with "declarative memory" of content.[17]

4.2. **There exist silent devices for transferring a thought from short-term to long-term memory, and others for retrieving memories.**[18]

4.2.1. **Such *retrieval* processes may transfer a copy from storage to the workplace of short-term memory without the person's immediate awareness of it, or they may directly present the memory into the stream of conscious thought, with or without the person's deliberate effort at recall.**

4.3. **Retrieval is prone to error, more so under organismic conditions generally conducive to cognitive difficulties: effects of aging, insult to the brain, physical or mental illness, drugs, fatigue, stress, strong emotion, and other conditions that induce altered states of consciousness** (see 5.7). Many but not all such errors fall under the general heading of concept slippage. Some are motivated.

5. THINKING (THE PROCESSING OF INFORMATION)

5.1. **Thinking consists of the inferred processes by which *thoughts* or *thought products* are produced, providing us with observable data**.[19]

5.1.1. **Units of meaning (verbal or not) are called *concepts*.**

5.2. **Conscious experience is a flow of such thoughts (including percepts), plus feelings and emotions** (James's stream of consciousness).

5.2.1. **That stream may be conceptually broken up into segments called *thoughts* or concepts, and *images*—all types of conscious quasi-sensory phenomena and perceptions. All of it is more or less suffused with or accompanied by *feelings*, under which term I mean to include affects (e.g., pleasure, pain) as well as vague, nonverbal, bodily based sensory inputs, and the awareness of *emotions* (complex organismic events such as anger and joy, which may exist without consciousness of them).**

5.2.2. **Thoughts may be verbal, imaginal** (imagistic)**, or imageless; they may have any degree of consciousness or unconsciousness.**

DIGRESSION: THE THEORY THAT THOUGHT IS LANGUAGE

From my standpoint (just expressed, in 5.2.1 and 5.2.2), it is remarkable, indeed amazing, how prevalent is one or another version of conceiving thought as language. As Lakoff and Johnson (1999) point out, that particular "metaphor plays a central role in the practice of analytic philosophy" (p. 250), the school that was dominant for many years, "from Russell and Carnap through Quine, Davidson, Montague, and Fodor" (p. 251). It went along with what Dummett (1993) called "the extrusion of thoughts from the mind": some authors' conception that thoughts have an objective existence, being representable in written symbols, and need not be considered as psychological in nature. It seems that they were dealing exclusively with thoughts in Popper's (Popper & Eccles, 1977) World 3, forgetting their origin in World 2, the realm of subjective phenomena, which is our primary concern.

The very influential movement of AI also incorporates the metaphor of thought as language or as sequences of written symbols. Indeed, it must; the procrustean influence of the computer not only as model but as working tool requires an ultimately digital or quantal subject matter, with the demise of analog computing. I am tempted to speculate that the long desert years of behaviorist dominance of psychology caused too many of us to forget the persuasive argument of William James (1890) for the stream of consciousness, which takes the basic nature of mind not to be punctate but continuous. I would add also the reflection that intellectuals are wordsmiths, immersed in a verbal world and addicted to writing to and arguing with one another. Little wonder that they exaggerate the role of language when they develop theories of the mind generally and thinking in particular.

I will simply assert, without going into the details of the argument, that preverbal infants and nonverbal animals, too, construct "inner" or conscious representations of their environments and process information, since it seems inconceivable that animals would have survived and reproduced otherwise. Thus, many nonverbal creatures have some kinds of nonverbal thought, as we do too.

So, when I argue below that the structure of language has a pervasive effect upon thinking, please do not misunderstand me as denying or slighting the fascinating and important realm of nonverbal thought and conscious states, especially feelings and sensory imagery. There is almost literally a

world of difference between the feeling of joyfulness and the word joy. *The former is so grounded in my body and its obscure but pervasive contributions to my stream of consciousness—especially the biochemical ones—that I am skeptical about the hopes of enthusiasts for AI that thinking can ever be fully realized in a nonliving apparatus of inorganic makeup.*

5.3. **The degree to which thinking develops and becomes adaptive is limited or stimulated by an interactive combination of genetic and environmental influences, resulting in individual differences in *abilities***.

5.4. **Any mental process, once begun, tends to continue along paths of least resistance.**

5.4.1. **When for one reason or another a line of possible thought has been somewhat activated, it is correspondingly somewhat likely to be drawn into ongoing transmission**. Resistance to transmission of a neural/mental process diminishes with learning and with *priming*.

5.4.2. **The well-established phenomenon of priming refers to the variably high state of activation into which thought processes may be put, corresponding to a readiness to have certain kinds of percepts or thoughts, especially if linkages have been established through earlier learning.**

5.4.3. **Priming may occur through the agency of active motives and interests, through the effects of context, especially that of most recent instruction or percepts, or through the effects of old but meaningful memories that have been recently stimulated.**

Controlling Functions

Quite early in his attempts to conceptualize primitive and deviant thinking, Freud (1900/1953a, p. 603) introduced the idea that "the secondary processes . . . inhibit and overlay the primary ones." {Compare Statement 4.} That was his way of grouping together, without needing to specify them, a number of monitoring, guiding/steering, correcting functions (which Noy similarly lumps together under the heading, feedback). They are most prominent in mature, conscious, thought of the type Hartmann and Rapaport called autonomous. It seems desirable to try to specify these cognitive controlling operations and to develop testable hypotheses about conditions that affect their efficacy.

5.5. **For thinking to be adaptive and thus have survival value, devices here called *cognitive controls* have been developed (through evolution) to organize, direct, maintain, and monitor it.**[20]

5.5.1. **Under the interacting influences of genetic programming and social experience, cognitive controls develop in the person, starting in earliest babyhood and usually achieving optimal effectiveness in early maturity.** Note that such controls may operate to shape the development of all forms of thought and feelings.

5.5.1.1. **Some, but not all, cognitive controls achieve the gradual elimination from conscious thought of most aspects of thinking grouped together under the heading primary process.**[21]

5.5.1.2. **Some cognitive controls, which develop slowly and to some extent phasically** (by steps)**, eventually enable persons with the requisite endowment to attain a state of mature cognitive function known as the secondary process.** {Statement 5}

5.5.1.3. **Most people most of the time function at intermediate levels with approximate, good-enough thinking, neither "true" primary nor secondary process. When cognitive controls do not function very well despite excluding most aspects of primary process, the result is here called "crude secondary process."** That includes a lot of the sloppy, casual, everyday thinking that at best enables us to get by and at worst is scorned as stupid. Oddly, it was ignored by Freud and other analysts, and until recent decades by cognitive psychologists also.

5.5.2. ***Monitoring* refers to a set of related controlling functions, assumed to be mostly but not entirely unconscious.** They may originate partly in the internalization of parental observation and correction and are partly innately given.

5.5.3. **Some monitoring functions, with obvious adaptive value, consider a range of possible external dangers into which a possible course of thought or action might stray, as well as dangers of violating internal standards resulting in guilt, depression, or other negative affect.**

5.5.4. **Monitoring implies a number of parameters or thresholds, which may be set or changed under the influence of stress, drugs, disease, or state of consciousness, but differently for**

each such organismic state. Notably, there is less monitoring during REM dreaming.[22]

5.5.5. **Monitoring implies the checking of incoming information (feedback) against a set of standards, which may differ from one person or time to another.** The rigid, overcontrolled thought products of some people imply similarly stringent standards. The fluid, lusty, exuberantly emotional speech of others implies a very different, more relaxed set of standards. Some examples: Creative persons are more likely to admit or promote, among competing subprocesses, those that meet *esthetic* standards; prissy or overly inhibited persons will have higher thresholds for admitting taboo topics; schizophrenics' and manics' self-monitoring may be in various degrees of dilapidation. Perhaps the oddness of schizophrenic thought is attributable in part to highly idiosyncratic standards for monitoring, as well. {Statement 10}

5.5.6. **When monitoring (feedback) processes indicate that it is safe to do so, a developing cognitive process may produce conscious thoughts.[23]**

5.5.7. **In most persons, monitoring excludes from conscious, communicated thought the most potentially threatening primitive motivational content** (see 5.5.1.1) **and the most formally deviant types of thought** (see 7.4)**. In others, monitoring keeps out almost all potentially dangerous phenomena, like fantasies and mental images.**

5.6. **Anticipation is a complex function, in which ongoing thinking and acting are observed, evaluated against an implicit plan, and corrected when they stray too far.** Rapaport (1968, p. 188) postulated it as a psychological structure,[24] which guaranteed that a thought process would proceed to its goal; others prefer the term "expectancy." In part, he conceived of it as a conscious, phenomenological concept, as when one interprets some signal as a portent of what is to come. More and more, as his theorizing proceeded, he tended to conceive of it as a silent organizer of thought, keeping it on track. {Statement 10}

5.6.1. **Anticipations may be generated by the demands of the person's situation, including immediate tasks set by others (e.g., test instructions), by his or her social roles, political and religious beliefs and ideologies, and so forth.**

5.6.2. **Used more actively and in an extended way, anticipation becomes planning.**[25]

5.6.3. **Such a complex function involves many parameters, which may vary as a function of personality, psychopathology, and the usual sources of error, resulting in variable effectiveness.** The route to gratification may be a long and indirect one, while strong motives tend to take ineffective but apparent shortcuts to fulfillment of wishes. Distractions appear in the form of momentary priming of detours or blind alleys. Or the general "temperature" of the mind may be so high that random or motivated errors become more likely.

5.7. **The tendency of the full spectrum of sources of error in controlling functions to disrupt or impede thought and to break up cognitive wholes is called "*temperature*"** (after Hofstadter).[26] The presence of intense emotions, generally caused by primitive motive-systems, is one of the major causes that raise "temperature"; so is stress. Certain states of consciousness and other organismic states such as physical illness and drug effects have similar effects. When the "temperature" rises, the work of anticipations as well as other controlling, monitoring, and steering devices tends to deteriorate.

5.7.1. **Specifically, the more removed from full, vigilant, focused consciousness the state of awareness is in which thinking operates, with the exception of mentation occurring in unactivated, NREM sleep, the more poorly the controlling functions operate and hence, thinking tends to deviate from the ideal of the secondary process more extensively.**[27] {Statement 4}

5.7.2. **The organization of thought is dependent to some degree on continuous contact with external reality.** One reason for the special characteristics of cognition during sleep is that the person's steady contact with a structured environment is interrupted.[28] To some degree, the persistent coordination of features in representations of real objects, persons, situations, and so forth, reflects the latter's existence as separate systems. It may be assumed that this systemic nature is conducive to the self-organization of corresponding representations. In any event, the contribution of this recurrent input of reassuringly familiar and stable information about one's environment was long overlooked as a source of the organization of thought. {Statement 7}

5.7.3. **The effect of emotion on reasoning goes beyond phenomena implied by the concept of "temperature."** Even moderate affective arousal can cause judgment to be less rational.[29]

5.8. **When the thinker musters *deliberate effort* and concentrates on a problem, the efficacy and adaptiveness of thinking improves markedly.** Most of the thinking described so far has proceeded in a sense passively, mostly nonconsciously and thus without the direct intervention of the thinker. Yet as everyone who has grimly stuck to a task despite fatigue or distractions knows, concentration can make a great deal of difference. It seems to require Damasio's *extended consciousness.*[30]

DIGRESSION: THE PROBLEM OF AGENCY

Here we are launched into the consideration of an issue that goes far beyond cognition. In psychoanalysis, it surfaces as the problem of "ego autonomy." In philosophy, it crops up as the problem of free will (usually pitted against determinacy, though as I and others have argued, that is a false opposition; Holt, 1989, chapter 9). As a number of writers have pointed out, one of the striking deficiencies of behaviorism—though presented by Skinner (1971) as more of an advantage—is its commitment to the view that all behavior is determined and controlled by an organism's external environment. I don't think Skinner ever explained how he himself could originate new ideas and undertake novel projects.

In the first pages of this chapter, I briefly reviewed Rapaport's treatment of the issue under the heading activity vs. passivity (Rapaport, 1967), and argued for a strong link between cognitive passivity and primary process thinking. Now I must add that agency/activity should not be thought of in all-or-none terms, and that passivity is ***not*** *a necessary or constant part of primary process thinking. True, when one relaxes and lets the mind wander, thinking tends to take on the hallmarks of primary process. But it has been demonstrated repeatedly that instructions either to "let yourself go, be loose, free, and creative" or "make up a fairy story or a nightmare" result in thought products with many attributes of primary process (see vol. 2, chapter 13). Some people can produce it actively and deliberately; see below.*

5.8.1. **Concentration is notoriously vulnerable to the set of interferences alluded to repeatedly above: fatigue, altered (nonvigilant) states of consciousness, stressors and pathologies of various kinds** creating high "temperature."[31]

5.9. ***Unconscious fantasies—postulated*** **recurrent, motivated narratives—typically involve "high-temperature" and/or primitive motives. I assume that such fantasies exist in memory and**

are capable of being primed and of participating in thought-formation even if some are too threatening to be admitted to conscious thought more than rarely.

5.9.1. **Having a narrative structure, unconscious fantasies can impart a storylike form to thought products such as dreams and conscious fantasies.** To what extent an unconscious fantasy becomes conscious, in full and undisguised, will depend on the situation and recent history of the person, as well as extant defenses and controls.

5.9.2. **Some of the thought-paths being pursued in parallel processing are more or less directly influenced by motives, including fears, preoccupations, and defenses, and thus may set off unconscious fantasies, especially "favorite," well-rehearsed ones, connected to enduring dispositions.** This assumption provides for Kubie's (1967) hypothesis of a continual stream of preconscious processing accompanying conscious thought.

5.9.3. **Because the controls characteristic of consciousness are lacking, unconscious fantasies tend to have the formal features of the primary process.** Since such fantasies are known only inferentially, as constructions by the analyst, assertions about their organization cannot, however, be directly tested.

6. Communication (The Transmission of information to others)

6.1. **Language is an intrinsically social function, involving the participation of the person in larger, sociocultural systems, notably the family.** It is learned through interacting with other people, and it remains rooted in and dependent on interpersonal relations.

6.1.1. **The more that a person withdraws from meaningful contact with other people, the more likely his linguistic functioning is to deteriorate.**

6.1.2. **When a person grows up in a family where there is dysfunctional communication, the child will tend to develop similar linguistic dysfunction** (Wynne & Singer, 1963).

6.2. **The basic capacity to learn language is a genetically given property of the human organism. Hence, language tends to be intrinsically organized in ways of which the speaker knows nothing, and these fundamentals** (e.g., phonation, use of discrete words to indicate persons/objects, actions, etc., basic sentence structure) **tend to remain when many other cognitive functions deteriorate, as long as key areas in the brain remain intact.**[32]

6.2.1. **Because language plays such a central part in human life, in personal development, and in the greatest achievements of many arts and all of science, it tends to shape, organize, and help to control *all* mental phenomena and processes.** (To a smaller extent the same may apply to the use of mathematical symbols.) A nameless fear is usually easier to bear when it gains a name; a terrifying new sensation becomes manageable when it is identified and classified. Surely this way of gaining control and coping with problems plays an important role in all psychotherapy, the "talking cure." But sometimes, naming a vague fear may turn it into terror.

6.2.2. **An important achievement of early development is the attainment of object constancy.**[33] **Invariant, recognizable things and people lend themselves to being named, which contributes further to their stable integrity.** In reality, of course, nothing remains the same with the lapse of time, though the water in one glassful is undetectably different from another; and although every lover wishes the beloved never to change, wrinkles and gray hairs do appear with insidious slowness.

6.2.3. **The more that verbal and other representations retain their realistic organization and fidelity to real objects and other systems, the more thinking tends toward the secondary process ideal.** {Statement 8}

6.3. **Linguistic monitoring functions maintain the intelligibility of language, a complex process involving empathy, a controlled identification with the other, as well as the application of implicit and consciously known grammatical and rhetorical rules.**[34]

6.3.1. **Psychotics and other persons who are grossly deficient in empathy are therefore likely to use language in inappropriate, idiosyncratic ways, which may be noticed as "peculiar."**

6.3.2. **More strikingly deviant or "queer" use of language requires a schizophrenia-specific deterioration of linguistic functions that may not be limited to monitoring.**[35]

6.3.3. **Highly narcissistic persons tend to lack empathy and to be insensitive to the general social taboo on egocentricity in speech but, if not psychotic, do not produce queer speech.**

6.4. **Verbalized thought varies along an important continuum, ranging from concrete to abstract.** It should not be necessary to spell out

the crucial significance of abstract thinking for civilization's finest accomplishments.

6.4.1. **The higher the "temperature," the more thought approaches the concrete pole.** Various kinds of cortical damage have long been known to produce the same effect.

6.5. **Children are exposed very early to *narration*, an important form of verbal communication, as soon as they get basic linguistic competence, and hear so many stories that they overlearn their basic elements:** A narrative has a central character, or hero; a beginning, a series of events often involving some kind of conflict or difficulty for the hero to overcome, and an ending. A good, interesting story arouses the listener's emotions and identification with the hero.

6.5.1. **Though some of the most complex and artistically acclaimed achievements of literature are narratives** (novels, epic poems), **narrative organization of thought is one of the first to develop in children** except perhaps in the case of those with greatly impoverished early lives and autistics.

6.6. **The narrative structure of dreams as well as other forms of thought products is vulnerable to high "temperature" and to certain kinds of brain damage, though it tends to be one of the last types of thought organization to remain.**

6.7. **An important social invention for maintaining control over verbal thought is *logic*.** Like perfectly grammatical and rhetorically impeccable language, logically clear and cogent discourse is held up to schoolchildren as an ideal to strive for, and some people get training in the discipline. Even for those who do not, to produce argument in a logically correct way is a widely accepted goal, clearly a way to control wishful shortcuts or appeals to emotion.[36] {Statement 9}

6.7.1. **Different types of errors or logical fallacies may be associated with different kinds of psychopathology**. Von Domarus (1944) proposed that the key to understanding schizophrenic language was the recognition that it used predicative reasoning (technically, asserting the consequent; he called it "paleologic"): the assumption that because two entities share a common attribute, they are the same. In the samples of schizophrenic language I have examined, it is the commonest logical error, but others, such as denying the antecedent, converting a conditional, and the undistributed middle may be found also. I have never seen any demonstration that the *relative* frequencies of different fallacies are different in schizophrenics and in normal persons, however. In context, what impresses me is the patients' struggle to find

a source of certainty in an ambiguous situation, so they try to straighten out their thoughts by what they believe is logical reasoning despite their inability to use it properly. The hypothesis deserves investigation, however.

6.8. **Dialogue, the kind of speech that occurs in diagnostic or therapeutic interviews and in psychological testing, is structured by a set of implicit understandings shared by mature normal persons.** A few examples: by and large, speakers alternate, avoiding speaking simultaneously, and interrupting seldom; when one person is pursuing a topic that seems to interest him, the other does not initiate a new topic without at least some conventional, transitional phrases; it is expected that as new topics are introduced, they bear some intelligible relation to what has preceded. Partly, such conventions are known as "good manners"; some of them are dictated by the social roles and statuses of the participants; some conventions are local and vary with major news events. Psychologists use the concept of *sets* to account for the effects of such implicit rules in steering conversation.[37]

Now follows a set of attempts, using the above propositions, to develop explanatory hypotheses for the emergence of various formal aspects of thought described by Freud as primary process in nature. In all of them it should be understood that some monitoring and steering/controlling functions operate at lower levels, whether relaxed or degraded.

7. FORMAL ASPECTS OF THE PRIMARY PROCESS[38]

7.1. **As a consequence of fragmentation (2.9.1) and the recombination of fragments (2.9.2), the various forms of *condensation* described by Freud come about, in which parts or features of preexisting representations** (images and words) **are put together with varying degrees of realism**.

7.2. **The same assumptions provide for the various observable types of *displacement* and *symbolization*, in which the usual connections among representations are disrupted, emphasis shifts unexpectedly, and unusual or distant associations result**.

7.3. **Under conditions of high "temperature," or in persons whose repertory of cognitive controls suffices to allow it, and/or if the situation is supporting and permissive enough, a "normal" person may relax some of the monitoring and other shaping and directing functions for organizing thought-sequences without feeling threatened, with any of the following consequences:**

7.3.1. **The work of eliminating *contradictions* may be interrupted, and conflicting features of representations may**

be allowed to coexist or mutually incompatible assertions may appear in verbalizations.

7.3.2. **The monitoring of thinking for logical consistency may be impaired and fallacies may be presented as cogent arguments.**

7.3.3. **The monitoring and other controls of language may be altered so that its appropriateness or even intelligibility may be impaired.**

7.4. **The above formal features of primary process thought together constitute the "bizarreness" of dreams and psychotic language**.[39]

7.5. **The formal features of primary process characterize unconscious and psychopathological thought, emerging into conscious thought of conventional, noncreative persons mainly under conditions of high "temperature." Therefore, they tend to be unfamiliar, threatening, and disavowed if experienced** ("I must be going crazy!").

7.6. **The formal features of primary process may appear in thinking because of the operation of relatively immature defenses.** I am referring here to the classification of defenses on a scale of maturity, by Vaillant (1996). In practice, it is often difficult to know whether a given formal deviation is the result of a primitive defense in an immature person or whether a seldom-used defense is mobilized by a more mature person to deal with the threat of the unwanted emergence of primary process into consciousness.

7.7. **The formal features of primary process may be organized and appear in culturally prescribed ways, through the child's early exposure to magical and supernatural narratives,** such as fairy stories, myths and legends, religious stories and doctrines, and conventional representations of dreams and fantasies. {Statement 2a}

The psychoanalytic theory of creative activity is much less developed than one might suppose. True, there is Kris's book (1954), featuring his concept, *regression in the service of the ego*, in which he made some often quoted remarks, for example, "Inspiration . . . [is] a state of 'creative madness' (Plato)" (p. 60), in which the ego controls the primary process and puts it into its service. At such times, "impulses and drives, otherwise hidden, emerge. The subjective experience is that of a flow of thought and images driving toward expression." In the subsequent phase of elaboration, one finds "dedication and concentration" (p. 59). But both he and Freud (in the latter's occasional remarks about creativity) primarily emphasized untestable metapsychological hypotheses and stressed content issues, saying nothing about the role of formal aspects of primary process in creative thinking.

8. Creating New Information.
   - 8.1. **In order to produce novel thought products with marked social utility or other value, persons need to perturb usual, conventional patterns of thinking in controlled ways.** The state of mind in which such creative thought best occurs is often called *adaptive regression* or regression in the service of the ego.
     - 8.1.1. **A cause or consequence of such a shakeup is to allow primitive motivational content to become conscious.**
     - 8.1.2. **Another such disruptive device is the deliberate relaxation of certain monitoring standards or other controls that are usually considered desirable for communicated thought.**
     - 8.1.3. **For the resulting disruption to be useful rather than frightening or otherwise maladaptive, it must remain controlled in most other respects.**
   - 8.2. **The cognitive style of creative and humorous persons tends to relax some rules for concept matching, with a somewhat similar effect as that of raising "temperature," increasing conceptual slippage/fluidity.**
   - 8.3. **Some people have an unusual capacity to be alert to and aware of previously unnoticed features of perceptual input, an accommodative ability that is important for creative thought** (a point made by Schachtel, 1959, pp. 243–48, as well as by more recent authors).
   - 8.4. **Culture provides a number of special contexts and social roles, including art, science, and humor, in which "regressive" thought is allowed and in fact encouraged because of the social value put on the results. Invoking such contexts helps the person maintain active control.**

DIGRESSION ON LIMITATIONS OF THE PRECEDING SECTION

First, the developmental aspect of the theory of thinking has not been treated as fully as it deserves. My acquaintance with it is too scanty to enable me to add anything to the discussion in volume 2, chapter 17. (Very briefly, the trend of data in many studies is rather generally in the expected direction, toward decreasing predominance of primary process thinking and increasing effectiveness of cognitive controls, but with many exceptions, reversals, and so on.)

Second, I have tried to keep in mind the fact that neither schizophrenic thought and language nor dreams are synonymous with primary process thinking, each having its own special qualities. Schizophrenia is, to begin with, not a

single disorder. The nature of the pathology of thinking in simple schizophrenia differs profoundly from that in acute paranoid or unclassified schizophrenia. (By and large, the disorder of simple schizophrenics' thinking is mainly in its vagueness, its wandering lack of structure or purposefulness; it is woolly and badly focused, but not delusional or dreamlike. The theory needs extension to account for it.) Any particular psychotic may be functioning pretty normally at any given time. The sector of contemporary cognitive neuroscientific literature on this condition that I have cited is focused on patients with "positive symptoms," which are picked up in such measures of thought disorder as that of Johnston and Holzman (1979), but even that only approximately measures primary process. Hence, data on how the brain functions in schizophrenics, even when the findings are correlated with the Thought Disorder Index, do not necessarily tell us how that organ works to generate the primary process.

The situation with dreams is even more problematic. We can be pretty sure that the most bizarre, "dreamlike" dreams occur in REM sleep, and there is by now a lot of information on what circuits are active and what is happening biochemically during that stage. It is easy to lose sight of the fact, however, that the great majority of dream reports are humdrum rather than fantastic, whether they come from awakenings in the laboratory when the agreed signs of Stage 2 sleep are present, from diaries kept on morning arisings, or from other sources. According to Domhoff (2001, p. 19), they are "in large measure coherent and reasonable simulations of the real world." Thus, most dream reports have little that could be coded as manifestations of the primary process. It is therefore risky to treat the biological data on REM sleep as if they tell about the underpinnings of primary process thinking.

In my defense, I can plead only that when these two literatures converge, suggesting similar patterns of brain activity, it seems reasonable to attribute those similarities to shared attributes on the cognitive level. If the present work stimulates research in which events in the brain can be monitored in synchrony with tape-recorded Rorschach testing of various kinds of schizophrenics and nonpatients, we may be able to distill out what is common to their primary process thinking and what is attributable to other aspects of the disorder. A similar kind of useful research on dreaming would gather a full spectrum of biophysical and biochemical data during a REM period before an awakening to obtain the subject's report. Primary process scoring of the verbal protocols would make it possible to look for common biological indicia accompanying passionate and/or distorted dreams in distinction to those accompanying prosaic dreams.

Definitions

There follows a set of empirically oriented definition statements about thinking which makes it possible to test parts of the preceding theory. Consistent

with the position argued here, primary and secondary processes are treated as end-points of a series of continua, assumed to be interrelated. "Measures" are from the pripro scoring system presented in volume 2.

i. At the *primary process* extreme, the influence of motives is strongest, dominating thought by preoccupations with, for example, sex or violence; at the *secondary process* extreme, the content of thought shows no direct evidence that it is motivated, being entirely taken up with neutral matters.

   Measures of motives:[40] Indices of libidinal and/or aggressive content (Σ or *% Content Level 1,* Σ or *% Lib* or *Lib 1;* Σ or *% Ag* or *Ag 1*).

ii. At the primary process extreme, formal deviations from secondary process standards penetrate conscious, communicated thought to the maximum; at the secondary process extreme, they are entirely eliminated from communication.

   Measures of formal deviations: Indices of formal aspects (Σ or *% Formal* or *Formal Level 1;* similar indices of *Condensations, Displacements, Contradictions, Symbolism, Verbalizations,* and *Miscellaneous Distortions*).

iii. It is possible to detect, in someone's language and behavior, evidences that many of the controls and defenses are operating with which people attempt (albeit usually unconsciously) to make acceptable, cope with, and defend themselves against the emergence of primary process in conscious waking thought.

   Measures of controls and defenses: (numerous sums, proportions, and ratios; see volume 2, chapters 3, 6, 9, and 10).

iv. Measures of visual perceptual adequacy: Indices of Form Level (*Mean Form Level*); Σ or % of each Form Level category.

v. Measure of felt threat associated with emerging primary process: *Mean DD (Demand for Defense).*

vi. Measure of the effectiveness of controls and defenses in coping with demand for defense: *Mean DE (Defensive Effectiveness).*

vii. Measure of adaptive regression (regression in the service of the ego): *ARI (Adaptive Regression Index).*

viii. Measure of creativeness of thought products: *Mean Cr* (Creativity rating).

   Note: It is impossible, at the time of writing, to study the process of thinking *while it occurs* in such detail and precision as to allow most of the above theoretical propositions to be directly tested. But fortunately it happens that people differ reliably and detectably in their tendencies to engage in most of the kinds of processes described. That assumption is necessary to make plausible the interpretation of research findings as bearing on the psychoanalytic theory of thinking. Incidentally, that

is also the only way it is currently possible to study repression: people differ greatly in the extent to which they habitually repress unacceptable representations, measurable by observable aspects of their behavior logically connected to the degree of such repressive style (Eagle, 2000).

ix. Therefore, statements about how thinking works, or how processes unfold, may be translated into statements about habitual (stylistic) individual differences in such matters. This assumption underlies most of the following predictions.

TESTABLE PROPOSITIONS

We are ready, at last, to convert the above theory into testable predictions.[41] Many more might be listed; indeed, a good many more propositions have been addressed in the many researches listed in the bibliography, but many are not clearly related to the theory as just stated. I have tried to frame the above theoretical statements in ways that lend themselves to testability, in hopes that some readers will take up the challenge. See also the last chapter in volume 2.

In each instance, the above-listed theoretical propositions from which it was derived are cited, plus indications of relevant indices or scores from the system presented in volume 2, and finally mentions of relevant data from volume 2, when available.

A. The more fully alert and conscious a person's state, the more nearly will thinking approach the ideal of the secondary process; conversely, as the state in which cognitive processes go on approaches full unconsciousness those processes should ever more closely approximate the primary process.[42]

Basis: 5.7.1, the proposition asserting a relationship between state of consciousness and controls of the organization of thought.

Relevant evidence: Several investigators have developed techniques of measuring a capacity or tendency to enter special or unusual states of consciousness. Four researchers have tested the hypothesis that persons who are capable of letting primary process into waking thought in controlled and useful ways (scoring high on adaptive regression) should be the most likely to enter such states of consciousness, or the related hypothesis that persons who experience such altered states would be more open to admitting primary process into their Rorschach protocols. All studies reported some positive results, but with only slightly overlapping sets of primary process indices.[43] Despite the fact that Freud said nothing to the effect that the *manifest* dream might contain more primary process than ordinary waking discourse, 5.7.1 clearly implies that the influence of the sleeping-dreaming state of consciousness would encourage the emergence of primary products. Carol Eagle

(1964) modified the primary process scoring system, originally focused on the Rorschach test, so that it might be applied to narratives like dreams and TAT stories. Using data from her appendix, I was able to compare the average frequency of total primary process in dreams—reported by subjects on being awakened when their EEGs indicated they were dreaming—and in TAT stories told under normal circumstances. By each of the measures she used (*Total Primary Process,* Σ*Level 1,* Σ*Formal,* and Σ*Condensations*), there is more primary process in the TAT stories than in the dreams, though the difference is significant ($p < .001$) only for the Total index. (Instructions for the TAT encouraged subjects to tell "dramatic stories," and for one card to make up a nightmare.)—Hypothesis tentatively disconfirmed.[44]

Another way to test the hypothesis is to get samples of thought products under ordinary waking conditions and from the same persons under the influence of psychedelic or mind-altering drugs. The results of researches using alcohol and LSD generally confirm the prediction, but specific effects differ according to the sex and personality structure of the subject and according to the situation. (Partial confirmation, plus information about possible parameters—measures of conditions under which the hypothesis does or does not hold.)

Several relevant investigations sought to test the hypothesis that ideation in the hypnotic state is more subject to primary process intrusion than in the normal state. All of the four investigators (or teams) obtained some positive evidence.—A well-replicated finding; for details, see volume 2, chapter 13.

B. The more that language takes verbal form or is structured (as symbolic systems are) as a sequence of discrete, recognizably stable entities, the more closely it approximates the secondary process ideal; and the more intangible, fluid, nonverbal, and metamorphic it is, the more it approaches the primary-process ideal. Therefore, persons who tend to experience sensory, nonverbal imagery more easily and frequently than others should be able to allow primary products into waking thought (i.e., should have a capacity for adaptive regression).

Basis: 6.2 and subparts, propositions about the role of language in making thought more like the secondary process; also, 5.5.7.

Relevant evidence: Seven researches have addressed this topic with mixed results. Only one reported entirely negative results, and none unambiguously supported the hypothesis. It seems to work better for males than for females, but the critical issue is that even within the realm of visual imagery (neglecting various other kinds of sensory imaging) there exist many types, which align themselves quite differently with aspects of primary process. In findings from some of my own research, the frequency of visual images during sensory deprivation and under the influence of LSD, besides being unrelated

to each other, were both strongly correlated with tendency to produce various *specific* aspects of primary process but in a completely different pattern.—Partial confirmation, with indication that the effect is strongly dependent on parameters about which we have much to learn.

C. Persons who have little tolerance for primary process modes of thought will be disturbed when they are deprived of perceptual contact with the structure of external reality, which should allow deviant thoughts to become conscious or should degrade the quality of those that do appear. Contrariwise, those who are on good terms with their own primary processes should withstand being perceptually isolated with less upset, even positive enjoyment, and with better maintained cognitive control.

Basis: 5.7.2. The organization of thought depends somewhat on contact with reality.

Relevant evidence: The first test of the hypothesis provided consistently positive, confirmatory findings. Goldberger (1961) markedly impaired student volunteers' contact with reality by putting each on a bed in a soundproof room with halved pingpong balls fastened over his eyes, which gave only patternless visual stimulation for eight hours. Those who had previously shown a greater capacity for adaptive regression in their Rorschachs enjoyed the experience more, maintained better control over their thinking, and reported less boredom or distress than those whose Rorschachs gave evidence of more maladaptive regression. Despite a failure to replicate these encouraging findings using a very different sample of male subjects (Holt & Goldberger, 1961), in other centers of research on sensory deprivation Goldberger's measure of adaptive regression or approximations to it did prove a reliable predictor of good response to sensory deprivation versus emotional disturbance and/or quitting in three studies (see volume 2, chapter 13, for details).—Indeed, despite the failure just cited, it seems to be the best-replicated finding on individual differences in reaction to perceptual isolation or sensory deprivation.

D. The more a person is capable of producing creative thought products, the greater her or his capacity for adaptive regression: access to primitive motivational content and formal features of primary process thought without emotional disruption and with good cognitive controls.

Basis: 8.1 and 8.2. Creativity requires the controlled disrupting of conventional patterns of thinking and cognitive slippage, facilitated by creative people's cognitive style.

Relevant evidence: This hypothesis has been tested in two ways. First, if artists whose creative work was widely recognized and respected were using primary process in the indicated way, they should show more capacity for adaptive regression when given the Rorschach test than otherwise similar persons without such achievements. Second, in a sample of ordinary persons, the

better they perform on tests designed to measure creative abilities, the more their Rorschachs should indicate the capacity for adaptive regression.

In ten studies, the first method has yielded strong and consistent evidence that several types of creative artists (in the graphic arts, musical performance, and to some extent literature) have ready access to the primary process. In five studies, they excelled comparison groups on the adaptive regression index, as well as on various measures of the amount of primary process, except in one group of adolescent schizophrenic art students. There, the most creative subgroup produced higher scores on both *ARI* and *Defensive Effectiveness* but not on any measure of the quantity of primary process in their Rorschachs. As to the other five studies, the adaptive regression index failed to discriminate the most and least graphically creative third-grade students in one, and it was not used in four others—where, however, the most creative subjects' Rorschachs contained more primary process, especially of the more obvious and blatant sort. The findings are best replicated in painters and in all-male groups.

The remaining eleven studies are of the second type, using tests of creativity with unselected samples of adults or children, the results being correlated with Rorschach indices of primary process. Despite its limitations, the creativity test method usefully asks a more difficult question: Are smaller degrees of creativeness over a more restricted range still significantly associated with independent assessments of capacity for adaptive regression? The results are complicated and not strongly supportive of the hypothesis. The main finding of note is that positive results came almost entirely from male subjects.

In short, the weight of the evidence seems to me impressively positive—for males. As usual, the Rorschach primary process scores that have shown statistically significant relationships to measures of creativity have varied from study to study, but then so have the populations sampled and the kinds of creative functions considered as criteria. Despite the confusions, we are left with a theoretically interesting message: that more creative persons—predominantly, males—have more controlled access to primary process modes of thought than less creative ones. Sometimes, if they are in general well-controlled, secure, and healthy, both men and women who perform well on tests of creativity often have access to a good deal of primary process *without* the usual indications of adaptive control and defense. Much work remains to be done to clarify the parameters of the hypothesized effect. Specifically, though the role of gender remains an unsolved mystery, the finding that Kris's hypothesis holds for males and not females is an unexpected contribution to the theory of the primary process.[45]

E. In psychotic persons, as compared with less seriously disturbed patients, the primary process breaks into and disrupts conscious thought in an

uncontrolled way. That has long been the psychoanalytic conceptualization of schizophrenic thought disorder, as the emergence of primary process thinking from unconsciousness into conscious thought and language.

Basis: 5.5.5, 6.3.1, 6.7.1, and 7.4. In schizophrenia, monitoring may be impaired or use idiosyncratic standards, defects in empathy conduce to queer language, and logical thinking is impaired.

Relevant evidence: Fourteen studies address the usefulness of primary process scoring in the diagnosis of schizophrenia. In general, the more the researchers focused on the less socialized, more blatant, and poorly controlled manifestations of primary process, the better fit between their findings and the hypothesis. A few studies have used measures of adaptive versus maladaptive regression, and they find that schizophrenics achieve the predicted lower scores than similar normal persons. When the more clinically useful question is asked, how schizophrenics differ from other severely disturbed patients, they are found to have more blatant forms of primary process, especially the formal deviations, with pathological defenses and defective cognitive control. Upon improvement, the primary process produced by schizophrenic patients is better controlled and is experienced as less threatening.

The finding of improved effectiveness of defenses and controls after successful treatment has been replicated in some nonpsychotic patients, too. There are a couple of indications, however, that measures of primary process do not yield useful findings in research using patients whose symptoms are predominantly of the acting out ("alloplastic") type. Again, full details about all the relevant researches are given in volume 2, chapter 15.—Partial confirmation.

F. In childhood, the predominance of primary processes gradually gives way to the secondary process (Freud). Restated, the amount of primitive motive content and formal deviations tends to decrease until adolescence.

Basis: 5.5.1.1. Cognitive controls mature in their effectiveness during the preadult years, gradually excluding manifestations of the primary process.

Relevant evidence: In three out of four researches, the amount of primary process declines during the years of childhood studied, tending to rise in adolescence, while its control advances fairly steadily (there was no clear trend in the non-confirming study). That statement is consistent with Freud's pronouncement that during childhood the secondary process gradually supplants the primary. Such cognitive controls as perceiving accurately, delaying impulsive responding, taking appropriate distance, and invoking extenuating contexts are all clearly aspects of what Freud called secondary processes. Yet it must be conceded that the same results would have been predicted from a number of other theoretical starting points, or from common sense. The more complex and detailed findings (presented in volume 2, chapter 17) are not predictable from psychoanalysis, or from any other theory known to me.—Partial confirmation.

G. There are stable individual differences in the ways in which primary process shows up in people's thought products. The various indices produced by applying my scoring system to Rorschachs, TATs, dreams, or other clinical data should therefore measure aspects of people that are relatively stable in time. Presumably, if scores from a test given at one time show little similarity to ones obtained a week later, the measures are too much influenced by momentary circumstances, or else the measured aspects of a person are transitory rather than qualifying as stable traits. Moreover, if measures of different components of the complex pattern we call primary process act like stable and reliable traits of personality, they should prove to be good predictors of other personality traits or of types of behavior.

Basis: ix, the assumption of stable individual differences in most types of cognitive functioning.

Relevant evidence: In half a dozen studies, measures of the stability or repeatability of major indices of primary process and its control hold up as well as most other scores on personality tests do, over short periods (weeks) and longer ones (up to a dozen years or more). See volume 2, chapter 11, for the details. The second approach is likewise supported by data: many relevant correlations with independently measured traits of personality may be found in volume 2, chapters 13–16. The hypothesis is strongly confirmed.

PRIMARY AND SECONDARY PROCESSES RECONSIDERED

Let us return for a moment to some of the data mostly relegated to footnotes in above sections, and think about their implications. For instance: by means of "the working memory functions of the prefrontal cortex . . . information is updated on a moment-to-moment basis or retrieved from long-term stores, held in mind, and used to guide behavior by ideas, concepts, and stored knowledge" (Goldman-Rakic & Selemon, 1997, p. 437). That is a way of saying that what is loosely called the working memory actually includes a great deal more, perhaps being implicated in any exertion of mental effort, any attempt to monitor, control, and correct one's own thinking. Surely it comprehends Rapaport's basic triad of attention, concentration, and anticipation and helps us to see the relevance of his more general concept that these are all *active* functions. More generally yet, since logical thought also requires, at the least, adequate functioning of these same loci in the frontal lobe, we can tentatively conclude that the general realm of secondary process thinking has an underlying common source in at least one region of the brain, which gives it a solid basis to be considered some kind of more or less unitary entity.

I hasten to add that all of the just-named functions undoubtedly require the coordinated operation of numerous other parts of the brain. The modern approach to localization is not to be confused with the naïve notions of phrenologists and many of their more reputable contemporaries. A person walks; her legs alone don't do it. A pair of legs separated from a body, even if somehow kept alive, could not possibly walk. Yet there is no denying that legs play a critical role in that function as well as a number of others, such as kicking. There is probably no part of the body, as well as of the brain, that does only one thing. No gyrus operates only as the "seat" of one and just one function, power, faculty, whatever.

Nevertheless, other authorities in the brain sciences (e.g., Stuss & Levine, 2001; Miller & Cohen, 2001) agree in finding somewhat separate brain systems roughly corresponding to reason and emotion, or rational control and disruptive motivation. They stress the close interrelationships of the controlling cortical areas (e.g., dorsolateral prefrontal) and the more emotionally involved ventral prefrontal and limbic systems. Yet, listening to the complaints of a subset of these biological researchers that no one in their fraternity paid much attention to emotion or motivation until quite recent years, one easily gets the impression that Descartes' old dichotomy dies hard. Even those who specialize in the neurology of emotion may be more influenced by it than they realize.

The anatomically oriented work is not the only source of support for the primary-secondary process distinction, however. The coordination of the various parts of the human organism involved in, say, solving problems, seems to be attained with the aid of something psychologists mostly have not been taught to consider so relevant: a regime of neurotransmitters. Just as the dorsolateral prefrontal areas play a critical part in orientation, self-reflective awareness, and focused concentration on a task, so also does an aminergic dominance of neuromodulation; so it seems in late 2002. That biochemical regime supports various aspects of waking, alert, effective thinking, and thus contributes to the legitimacy of conceptualizing the secondary process as a system.

Correspondingly, the contrasting biochemical regime of cholinergic dominance might help knit together the looser strands of the primary process. At least in REM sleep, according to a prominent and empirically grounded theory (Hobson et al., 2000), in tandem with the deactivation of the prefrontal areas just discussed, it allows a great deal more cognitive slippage, without self-monitoring and in a general climate of passivity. I was struck by Hobson's claim that—again, in REM sleep and thus possibly at other times—this pattern of neuromodulation by means of adrenaline (epinephrine) and acetylcholine instead of noradrenaline and serotonin coincides with activation of

limbic areas including the hypothalamus and amygdalae and parts of the brain stem, known for some time to be implicated in the most primitive motives and emotions of rage, lust, and terror.

Unfortunately, however, I have found no evidence that cholinergy plays any special role in relation to the positive symptoms of schizophrenia (e.g., delusions, hallucinations). Researchers are investigating many neurotransmitters, hormones, neuropeptides, and other biochemical influences on this kind of psychopathology, and though biochemical anomalies abound in the patients, most psychotic states are not much like dreaming.

Nevertheless, I have emerged from a brief immersion in recent work on brain and behavior with a tentatively renewed belief that there can be a theory of primary and secondary processes. To be sure, ever since I found that the Content (motivational) and Formal aspects of primary process do have a strong and reliable statistical correlation, I have felt vindicated in having devoted so much effort to developing the scoring scheme, and in having persuaded so many students to learn and use it too. But since I was working with equal zeal to examine, and ruefully discarding, its theoretical basis in metapsychology, without being able at first to see any way to defend the proposition that these "processes" were systems, it felt insecure.

It still remains the case that the new biological foundation is statistical, too. The initial enthusiasm for Aserinsky and Kleitman's (1955) discovery of REM sleep and its strong association with dreaming led many workers to treat REM-dreaming versus NREM-dreamless sleep as a clean dichotomy. Soon reports of dreams or dreamlike "mentation" began to be obtained from people wakened from stages of sleep without rapid eye movements, creating a lot of controversy. It turns out, just as in psychology, that none of the observed correlations approached unity; there are lots of observable bases on which to make a judgment of "dreaming sleep" and though they tend to go together quite well, exceptions abound. No biological scientist should ever go broke betting on individual differences. I remember Karl Pribram's telling a class in brain anatomy that when you actually start cutting up cerebra you won't find each one looking just like the pictures in the textbooks—in their fine details, brains are configured as differently as faces.

What about all of those types of nonprimary process thinking for which I tried to make a case in chapter 1, many of which I have lumped together as *crude secondary process*? I doubt that anyone anywhere knows, as I write these words, which of them will stand the test of time. They constitute a set of challenges to our colleagues in cognitive neuroscience. Are there subtle differences in the neurotransmitters at work when people are getting the right answers to logical problems and when they are relying on attractive but treacherous heuristics? Will the same circuits in the brainstem, midbrain,

and cortex light up when subjects are spinning out stories and when they are composing music? There are enough good questions here to keep a large national institute of brain scientists working busily in tandem with cognitive psychologists for decades.

CONCLUSION

Finally, my dearest hope for the present book is that its *implications for the future of psychoanalysis* may become known. I am convinced that it has several such implications, important ones. Everyone knows that psychoanalysis is under attack today and is more seriously endangered than ever before. During approximately the last quarter of the twentieth century, critics of a new generation looked at Freud's writings more closely, more penetratingly, and with more sophisticated methodology than ever before. Some, among whom I count myself, have done so in hopes of saving the discipline from its own excesses and from Freud's weaknesses as a scientist, casting out the dross in order to hold fast to what is precious. That seems doubly important at a time when so many voices are calling more loudly than ever for the total rejection of psychoanalysis—as a therapy, as a science, and as a movement. The fact that much of what even so extreme and negative a critic as Frederick Crews (1995) or Malcolm Macmillan (1997) has to say is valid and cogent makes it far more difficult to reject their nihilistic and overreaching conclusions (Holt, 1999a).

Crews and others like him conclude that Freud's theories lacked any observational basis, being drawn entirely from nonempirical sources. Moreover, Wilcocks (1994) and Webster (1995) take as gospel Macmillan's claim to have demonstrated that free associations are not only fatally flawed by contamination with the analyst's preconceived theories but "there are not and can not be [sic!] any guidelines to how these data should be interpreted" (Macmillan, 1997, p. 563).

If nothing else, this book should make it amply clear that Freud's conception of the primary process must have been based on careful and analytical observation of his own dreams and his patients' productions, or else his detailed descriptions of how condensation and displacement show up in dreams, jokes, and psychopathological productions could not have served as such an excellent guide to constructing a viable scoring system. And that system itself, *with* the validating data assembled here, comprise guidelines to "how these data should be interpreted."[46] The claims that no such system could be constructed, and that no two analysts could ever agree on the application of Freudian concepts to data, should be difficult to maintain now that we have demonstrations

of what *can* be done. It is not easy to get agreement; I found that it took years of writing rules, trying them out, finding where the sources of disagreement lay, and reiterating the whole process, to attain good judge reliability on what are and what are not instances of specific kinds of condensations, displacements, and so on. But it can be done because it has been done.

The last line of defense both Crews and Macmillan take when confronted with evidence of the predictive power of operationalized psychoanalytic concepts is to protest that none of the empirical findings had been specifically predicted by Freud and are not "even related to anything particularly psychoanalytic" (Macmillan, 1998, p. 137).

It is doubtless true, in a very literal sense, that Freud never predicted that some future measure of adaptively controlled primary process would be significantly correlated with any particular measure of divergent productivity. But to take that as an admission of his failure misses the point so badly as to appear willful. Because Darwin had no inkling about genes and their modus operandi would not justify total rejection of his work on the grounds that modern evolutionary science works with new concepts, even though most of them can be traced back directly to him. It is the fate of many great pioneers in science, at least in the biological and behavioral sciences, that in a generation or so their specific theories look quaint and are no longer used in any literal way. We judge a theory fertile if it gives rise to a significant body of empirical research and develops into something scientifically useful, not whether in its original terms it proves invariably prescient.

It will have been evident to any but the most casual reader that I am anything but a true believer in orthodox psychoanalysis. I have been at some pains to show that the theoretical formulations about primary process on which Freud set greatest store, the metapsychological ones, are without merit and their only claim on our interest today is historical (Holt, 1989). Nevertheless, it is equally obvious that the work reported here would not have been done if Freud had not written about hypothetical mental processes in the way he did. The changes in his concepts that have taken place are normal and usual in science. When Crews charges that "Freud's uniquely psychoanalytic ideas have received no appreciable corroboration, and much discouragement, from independent sources" (op.cit., p. 108), it turns out that he can take that position because he rejects any and all corroborative research as not bearing on the "uniquely psychoanalytic ideas"—that is, those in Freud's original wording.[47] Perhaps a professor of literature can be forgiven for not understanding how science normally works; psychologists at least should understand the relationships between earlier and later stages of a science.

In his analyses of his own dreams, Freud showed how, again and again, they reassured him that he had after all amounted to something despite his

father's disparaging prediction following a childhood lapse: "The boy will come to nothing." A generation of modern critics are maintaining that Jakob Freud had it right: in trying too hard to become a great scientist, they say, Sigmund cut too many corners and framed theories that seemed unassailable precisely because they could not be tested. Yet, when appropriate changes are made, some of his concepts prove not only to be empirically useful but to lead into productive lines of research—a kind of work that owes much to him even though he might not have recognized a lot of it as psychoanalytic.

So, to the most derogating and skeptical of Freud's contemporary detractors, I submit the present book as perhaps the strongest evidence to date for the following assertions:

1. Some of Freud's concepts can be made operational (i.e., can be coordinated with feasible observations) without diverging appreciably from either the letter or the spirit of what he wrote.
2. It is possible to get independent observers to apply these operational definitions to clinical data with a high degree of reliability, repeatedly.
3. It is possible to obtain replicable confirmation of several propositions from the psychoanalytic theory of thinking.
4. That theory has shown itself to be highly fruitful in stimulating numerous productive programs of empirical research, which have deepened and enriched the theory.

The demonstrated validity of these four propositions makes the goal of a psychoanalytic science seem not only attainable but worth striving for.

NOTES

1. The review of literature was ended in 2002.

2. Anyone interested in looking further into the ideas sketched here should become thoroughly familiar with these two main sources. Many details may be drawn from them to flesh out these bare bones.

3. I make no systematic attempt to distinguish clearly between assumptions, postulates, or axioms, and hypotheses in this first attempt at a modest degree of systematization.

4. Damasio (1994, 1999), LeDoux (1996), Panksepp (1998), and others agree that emotions and motives are so closely related as to be almost inseparable in their brain substrates. Panksepp (1999), responding to Shevrin's complaint that he had conflated motives and affects, said: "Affect and motivation are so integrally intertwined that conceptual separation of them, which is quite easy at the semantic level, will be quite impossible at the neural level." (He has told me since, via e-mail, that his point

obtains on the primary-process level of emotion and motive; probably not, on the secondary.) Damasio (1999) locates the critical brain regions as the ventromedial prefrontal areas, the amygdalae, hypothalamus, basal forebrain, and brainstem nuclei. Panksepp (1998) emphasizes the role of several neurotransmitters and neuromodulators: dopamine, oxytocin, brain opioids, and prolactin (mainly in reward-related, appetitive emotions and attachment), and a variety of neuropeptides, including substance P (especially in rage).

5. These are my preferred reformulations of Rubinstein's general situational hypotheses: The hypothesis of situation-specific responses (which he broke down into situational generalizations, situational quasi generalizations, and clinical situation correlation statements, depending on the degree to which they are assumed to apply to more than one person), the hypothesis of in part functionally equivalent situations (e.g., transference responses to different persons or situations), and the hypothesis of merely subjective situations (one experienced by one person only, nonconsensual).

6. For reasons of convenience, as well as conventional usage, I shall continue to use the expression *the unconscious*, which should be understood as a shorthand way of saying "the group of memories and other contents that are capable of becoming fully conscious but which at the moment are more or less blocked from awareness." Likewise, I shall at times speak of "the primary process" despite all that I have written here arguing that the phenomena alluded to, when closely scrutinized, (sometimes) lend themselves better to conceptualization in terms of several continua. Ideal types, as Max Weber called them, are unquestionably handy first approximations, which serve well enough if one takes pains to avoid reifying them.

7. It is now well established that in REM sleep, "Brainstem and diencephalic structures [e.g., the amygdala, anterior cingulate, hippocampus and other parts of the limbic system, and the hypothalamus] also contribute information in specific modalities via specific circuitries . . . resulting in distinctive dream features such as directionality of eye movement, . . . and instinctive behavior and feelings such as rage, terror, or sexual arousal" (Hobson et al., 2000, p. 824). Stickgold, Hobson, Fosse, and Fosse (2001) propose, further, that dreams are "constructed largely from . . . primarily weak neocortical associations available during REM. Although the process of incorporation of these weak associates is unknown, we predict that associated emotions, mediated by both the amygdala and medial orbitofrontal cortex, play an important role" (p. 1056). It is notable that in NREM sleep, those structures are deactivated, and the content obtained when people are awakened is relatively flat, prosaic, and lacking the dramatic features of REM dreams (see also Nielsen, 2000).

8. Damasio (1999) contends that before an image can become conscious, it must be connected to the proto-self, a body-based process that contributes the subtle, often overlooked feeling, that *I* (the perceiver) am affected by the perceived object. Thus, he is one of the few theorists who have produced a satisfactory answer to the question posed over fifty years ago by Klein and Schlesinger (1949), "Where is the perceiver in perceptual theory?"

9. There is good consensus among workers in the neurosciences that identifiable loci in the parietal cortex provide (at least partial) storage for specifiable types of content, for example, for human faces. Like almost every other generalization of this

kind, however, the issue looks more complicated the more closely one examines it, and these researchers almost unanimously reject the "phrenological" notion that a simply definable concept is stored in a single locus.

10. This process takes place with the critical involvement of working memory (LeDoux, 1996, p. 271; see also note 15, below).

11. Following Goldman-Rakic (1992), I assume that it is identical with short-term working memory and intimately involves the prefrontal cortex.

12. See note 10 to chapter 1. The Lund group's term *percept-genesis* is equivalent to microgenesis.

13. Miller and Cohen (2001, p. 170) assert as a "general principle that processing in the brain is competitive: Different pathways, carrying different sources of information, compete for expression in behavior, and the winners are those with the strongest sources of support."

14. For a more detailed discussion, see Rubinstein (1974/1997, pp. 212–18) and Holt, 1972). There are many complications that cannot even be hinted at in the present presentation. Kanwisher (2001) has the following relevant thoughts:

> There is now fairly compelling evidence from several different techniques showing that perception without awareness is possible. Thus, a strong neural representation in a given cortical area is not sufficient for awareness of the information so represented, raising the question of which perceptual information will reach awareness. I speculate that in order for a focal neural representation to reach awareness it may have to be accessible to other parts of the brain. (p. 109)

15. I am grateful to my friend Philip Holzman for clarifying these issues for me. See also 4.1.2, below for a further subdivision.

16. "The dorsolateral prefrontal cortex is a structure specialized for the central executive function of working memory. . . ; its deactivation in REM would thus result in the disorientation and bizarre uncertainties . . . characteristic of dream mentation. Failures of working memory are prominent in dreaming. For example, scene shifts are experienced without reflection" (Hobson et al., 2000, p. 826). "Negative symptoms and behavioral disorganization in the disorder [of schizophrenia] can be understood as a failure in the working memory functions of the prefrontal cortex by which information is updated on a moment-to-moment basis or retrieved from long-term stores, held in mind, and used to guide behavior by ideas, concepts, and stored knowledge" (Goldman-Rakic & Selemon, 1997, p. 437).

17. It is evident that performative and declarative memories are quite uncorrelated, because severely amnestic patients (with damage to the temporal lobes, notably including the hippocampus) can learn and retain a sensorimotor skill like a pursuit rotor as well as normals while unable "to learn anything whatsoever about the place, the people, the apparatus, and the instructions for the experiment" (Damasio, 1999, p. 299). In most of what follows, "memory" (not further specified) means declarative.

18. An intact hippocampus is critical to these functions (Damasio, 1999).

19. I do not follow Rapaport in distinguishing between thought and ideation. Furthermore, I feel that it is premature to assume that even the most sophisticated

emerging techniques of tracking or imaging processes in the brain constitute data about *thinking*.

20. "The prefrontal cortex has long been suspected to play an important role in cognitive control, in the ability to orchestrate thought and action in accordance with internal goals. . . . we propose that cognitive control stems from the active maintenance of patterns of activity in the prefrontal cortex that represent goals and the means to achieve them. They provide bias signals to other brain structures whose net effect is to guide the flow of activity along neural pathways that establish the proper mappings between inputs, internal states, and outputs needed to perform a given task" (Miller & Cohen, 2001).

21. As I read Damasio (1999, chapter 6), it seems that defenses against threats posed by the possibility that certain thoughts might be conscious and communicated are part of his "second-order neural pattern" located mainly in midbrain structures: the cingulate, thalamus, and superior colliculus, which are midway between the higher (prefrontal) cortical structures and the critical loci for basic emotions and motives.

22. According to Hobson, Pace-Shott, and Stickgold (2000), a good deal of neurological evidence indicates that planning, foresight, and other executive functions depend primarily on the dorsolateral prefrontal cortex, which is relatively deactivated during REM dreaming. The work of Goldman-Rakic and Selemon (1997) indicates that the dysfunction of this prefrontal area, or of circuits in which it plays an important role, is responsible for poor monitoring & disturbances in schizophrenics' thinking.

23. That does not imply that the process itself becomes conscious; with Lashley (1958) and many others, I assume that it continues its silent and manifold operations embodied in neural circuits without the metaphorical light of awareness.

24. Under the influence of Hofstadter's tendency to attribute functions to "codelets," bits of programming, I am less ready than I was a few decades ago to postulate a structure more or less automatically whenever a function seemed to be operating or was needed to account for findings. I have also become aware that neural structures may have or perform multiple functions.

25. Planning is one of the executive functions allocated by various workers (e.g., Damasio, 1994; Goldman-Rakic, 1992/1999; Hobson et al., 2000) to the dorsolateral prefrontal cortex.

26. I have adopted Hofstadter's metaphorical concept, for the effect of several kinds of influences on hypothetical (and mostly unconscious) psychological operations, tending to increase random error and thus undermine the effectiveness of a range of guiding and controlling functions. I use it as a shorthand way of indicating the impairing effect on thought of a variety of organismic conditions, like fatigue, strong emotion, physical and mental illnesses, unusual concentrations in the bloodstream of substances both intrinsic (e.g., hormones) and extrinsic (drugs), and environmental conditions (stress). I am uncertain whether to include states of consciousness as causal or merely as often useful indicators that an obscure intrinsic cause is at work, disrupting thought. It is also unclear to me whether the effect of damage to the brain, though similar in some ways to a raising of "temperature," is probably to be looked for first in terms of interference with known functions of the areas concerned.

An important direction for research is to determine whether a rise in "temperature" is accompanied by changes in the dominance of different neurotransmitters and neuromodulators.

27. The qualification concerning NREM mentation is included because of the phenomenon of "paradoxical sleep," the *higher* level of cortical arousal during REM sleep, when the most vivid and bizarre dreams occur. After a careful review of the literature on NREM mentation, Nielsen (2000) concludes that reports by subjects awakened from the deepest stages of sleep generally are static, bland, and lacking in the ordinary hallmarks of dreaming—formal characteristics of the primary process. Apparently exceptional instances of truly typical dreams obtained outside of REM periods are probably not exceptions because of the procrustean nature of the REM-NREM distinction imposed on a less clear-cut reality.

28. "The blockade of external sensory input and its functional replacement by internally generated REM sleep events . . . provide the specific activation of sensory and affective centers that prime the cortex for dream construction" (Hobson et al., 2000, p. 831).

29. In a study of moral reasoning, Greene, Sommerville, Nystrom, Darley, and Cohen (2001) presented subjects with two similar stories, in each of which the lives of a group of people could be saved by an action that sacrificed the life of one. In the first, the hypothetical action was indirect, and most agreed that the sacrifice was justified. In the second version, a hypothetical person had to push another to his death to save the lives of several people. Though in abstract ethical terms, the situations were the same, most subjects now refused the option requiring them to imagine directly killing another. As determined by functional magnetic imaging, the most active brain areas in the first condition (and in neutral, nonmoral items) were the right medial frontal gyrus and both parietal lobes; in the second condition, the medial frontal gyrus, posterior cingulate gyrus, and the angular gyrus (all on both sides) and all emotion-related areas, were much more active.

30. Concentration, entirely a phenomenon of the secondary process, occurs only with the full participation of the *autobiographical self* (Damasio, 1999, chapter 7). Damasio does assume that some (lesser) degree of focused attention is a part of core consciousness. The full achievements of intellectual work require full and flexible access to the resources of the entire cortex and a good part of the deep, subcortical brain. (See also note 35).

31. E. Hartmann (1998) has found that the level of cortical norepinephrine drops dramatically during sleep, and hypothesizes that this neurotransmitter helps maintain focus, a high signal to noise ratio. Hobson et al. (2000) report supportive evidence, and have expanded the point in their AIM model of dreaming. In it, the M stands for "modulation," a term referring to the complex and slowly changing pattern of facilitation and inhibition by the large group of neurochemicals that govern slow transmission. As Greengard (2001, p. 1029) puts it, it may be helpful to think of "fast synaptic transmission as the hardware of the brain and slow synaptic transmission as being the software that controls fast transmission." Stickgold et al. (2001) report that the dominant aminergic modulation of the waking state (prominent use of the neurotransmitters serotonin and norepinephrine [or noradrenalin]) changes to cholinergic

predominance (use of acetylcholine) in REM sleep. "We propose that this modulatory factor M is involved in the regulation of such conscious state functions as directed attention, deliberate thought, self reflective awareness, orientation, emotion, memory, and insight" (Hobson et al., 2000, p. 833). Recent research in neuroimaging (summarized by Peoples, 2002) strongly implicates the anterior cingulate cortex (ACC) of the frontal lobe in the willed control of behavior. This area is "engaged during many types of tasks involving processing of stimulus information in relation to an array of motivational events and actions . . . suggest[ing] a global and integrated contribution of the ACC to motivational influences on behavior" (Peoples, 2002, p. 1623). Recent research (Shidara & Richmond, 2002) shows that subsets of ACC neurons have a graded response to the degree of reward expected, and increases in such correlates of expectations seem to facilitate *persistence* in goal-seeking behavior even when rewards are delayed. These findings support Freud's view that secondary process thinking requires a signal-quantity of affect in order to be effective (1900, p. 602). That, incidentally, shows that he was not a victim of Descartes' error (Damasio, 1994) of supposing that the most effective thinking is entirely free of affect.

Finally, Stickgold et al. (2001) report that their team has done research on cognitive functions during the period of "sleep inertia"—the first few minutes after awakening, for which there is evidence that the brain remains in its prior state. Their findings, "that semantic priming favors weaker associations after REM awakenings than after NREM . . . and that solving anagrams is similarly enhanced after REM . . . support the contention that REM favors more 'fluid thinking' than NREM, perhaps as a result of the decreased aminergic and increased cholinergic modulation" (pp. 1054–1055).

32. These have long been considered to be primarily Broca's and Wernicke's areas in the frontal and temporal lobes, respectively, of the left cerebral hemisphere.

33. The same phrase is used in psychoanalysis and in experimental psychology of perception, for somewhat similar phenomena. In both, strictly speaking, what gains constancy is the *representation* of an object. As is usual in psychoanalytic writing, "object" here means a person of emotional importance. In the literature of psychology, it has a much broader meaning, encompassing any person or thing in the baby's world: as its representation takes on stable recognizability despite transformations with every change of viewpoint, it is said to achieve constancy. The first of the dimensions of individual difference in cognitive style to be identified (Holzman & Klein, 1951), called leveling versus sharpening, is a measure of the extent to which people are sharply aware of changes in perceived objects or tend not to notice them, clinging to the comforting assumption of constancy.

34. In one study, psychiatrists judged more empathetic showed a higher degree of right frontal activation than others judged to have poorer empathy for patients in therapy. More generally, devices that maintain proper organization of language at the level of sentences and narratives are located in both dorsolateral prefrontal regions (Stuss & Levine, 2001). For that reason and because of other such evidence against the hypothesis that the left hemisphere produces the secondary process and the right side of the cortex produces the primary process, I do not give it much credence despite suggestive EEG evidence like that of Martindale, Hines, Mitchell, and Covello (1983).

35. This characteristic deviancy in the use of language, "a dysfunctional semantic system" (Nestor et al., 1998, p. 223), may arise primarily from aberrant interactions of brain regions rather than specific lesions in, say, temporal structures, though the latter have been implicated in several studies of schizophrenics. Shenton et al. (1992) have found significant correlations between the volume of the left posterior superior temporal gyrus and Holzman's Thought Disorder Index. Holzman (2003) adds, "An earlier, independent study had shown that the severity of auditory hallucinations was related to a tissue reduction in the same area, the left superior temporal gyrus (Barta, Pearlson, Powers, Richards, & Tune, 1990)." Studies of *damage* to the same part of the brain, however, show much more profound inability to use language rather than queerness (Nestor et al., 1998). In a more recent study, using PET instead of MRI scanning, schizophrenics were cleanly separated from controls by their using different *patterns* of brain activity to perform tests of working memory (Meyer-Lindenberg et al., 2001). The schizophrenics made more use of inferotemporal, (para-) hippocampal, and cerebellar structures, while the normal subjects' pattern emphasized the usual dorsolateral prefrontal and anterior cingulate areas. In addition, recent advances in understanding of the biochemical abnormalities of neurotransmission in schizophrenia require that a full explanation of any symptoms of this psychosis must include the neurochemical level.

36. Though I had in mind classical (Aristotelian, syllogistic, propositional) logic, the point holds equally well for more sophisticated modern logics, like symbolic and fuzzy logic. Despite its misleading name, the latter is quite rigorous. Notice that good logical functioning requires the uninhibited functioning of the prefrontal cortex (Hobson et al., 2000).

37. Schafer's (1954) chapter 2, "Interpersonal Dynamics in the Test Situation," remains the best exposition of the unspoken mutual influences on dialogue in psychological testing that I know of. See also the final two pages of chapter 1.

38. At the date of writing, there was little to report from the neuroscientific literature on possible biological bases of specific formal aspects of primary process, or even groupings of them. One failure is perhaps worth noting, however. Nestor et al. (1998) found no correlation between Holzman's Thought Disorder Index, which overlaps substantially with my indexes of Formal Level 1 responses, and MRI evidence of pathology in the dorsolateral prefrontal areas that subserve schizophrenic thinking, according to Goldman-Rakic's (1992) hypothesis, or in basal ganglia (see, however, note 34). The following remarks by Stuss and Levine (2001) may be particularly relevant to understanding formal primary-process deviations found in TAT stories and dreams: "At the level of story narrative, lesions in left dorsolateral and prefrontal regions may produce impairments. Left-sided lesions result in simplification and repetition (perseveration) of sentence forms, and omissions of elements. Right-sided lesions cause amplification of details, wandering from the topic and insertion of irrelevant elements, and dysprosody, all leading to loss of narrative coherence." (p. 410)

Finally, Stickgold et al. (2001) report that their team has done research on cognitive functions during the period of "sleep inertia"—the first few minutes after awakening, for which there is evidence that the brain remains in its prior state. Their findings,

"that semantic priming favors weaker associations after REM awakenings than after NREM . . . and that solving anagrams is similarly enhanced after REM . . . support the contention that REM favors more 'fluid thinking' than NREM . . . The cognitive changes seen during REM [dreaming] may be the combined result of three physiological characteristics . . . (i) the shift in neuromodulatory balance from aminergic to cholinergic, (ii) the decreased activity in DLPFC [dorsolateral prefrontal cortex] and increased activity in both the anterior cingulate cortex and amygdala . . . and (iii) the decreased outflow of information from hippocampus to neocortex. . . . Taken together, these findings . . . may explain, in part, various features of REM dreams, including their bizarre, hyperassociative quality." (pp. 1054–55)

39. They appear in REM sleep with the blockade of sensory input, the deactivation of the dorsolateral prefrontal cortex, and the cholinergic dominance of that state. Possibly some combination of such influences, brought about by pathology or drugs, causes the "regressive" emergence of these formal deviations in waking thought and speech; again see note 34.

40. "Measures" are from the pripro scoring system presented in volume 2. The indicants listed here are *not* exhaustive. They include only the most obvious (and not always the most useful) measures that are available. Regular English equivalents of these abbreviations, with full details on what the scores refer to, may be found in volume 2, chapters 4–8.

41. Lest I seem to be claiming more than I am, let me reiterate that this whole chapter was written after the completion of all of the research summarized in volume 2. I have attempted, however, to frame the following "predictions" in essentially the way they were conceived before the findings were known, so that the contribution of research to the current formulation of theories may be clear.

42. A unique self-experiment by Rapaport (1957) produced striking, if anecdotal, confirmation. As noted elsewhere, however, the proposition has been partly disconfirmed by many observations that reports of mental content during the deepest stages of sleep with minimal cortical activation contain little if any fantastic, emotional, cognitively distorted, or emotionally "hot" content, much less than dreams from REM periods which in several ways are more like wakefulness and less like coma.

43. That last fact reinforces the conception of the primary process with which chapter 1 ends: it is not a tightly organized, unitary system of thought, but a loosely coupled one, consisting of a number of related types of cognitive-affective operations, which tend to be associated. An important task for further theoretical-cum-empirical work is to discover the conditions—in the person and in the situation—under which the components (e.g., libidinally or aggressively tinged ideation, and thinking that is formally deviant in a number of different ways) are strongly or weakly correlated with one another, and with other observed variables. The research literature summarized in the accompanying volume contains many testable hypotheses of this kind. Meanwhile, it is to be expected that since different researches use subjects and situations that differ in largely unknown but perhaps relevant ways, their positive findings will involve somewhat different measures of primary process.

44. I should note, however, that the dreams were gathered by awakening subjects after a day spent under the influence of 100 gamma of pure LSD-25. The study should

be replicated under wholly normal conditions before one can be sure how to interpret the results, though they are congruent with the data reported by Domhoff (2001).

45. After surveying ninety-eight published attempts to test psychoanalytic hypotheses, Masling, Bornstein, Fishman, and Davila (2002) report that, regardless of topic, when subjects of both genders were used, results were stronger with men than with women. The finding about creativity may therefore possibly be part of a more general masculine bias in psychoanalytic theory.

46. True, the kind of interpretation that is guided by the research summarized here is not what is generally understood by many people. None of the primary process research shows anyone how to interpret the contents of dreams as Freud did. Nevertheless, getting people to agree on what are the indirect indicators of orality and anality, or of projective and counterphobic defenses, is relevant to some of the interpretive work that the clinical analyst does in the consulting room.

47. The same point is made by Erwin (1996); see my critique (Holt, 1997b).

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KEY

*General presentations, reviews, and primarily theoretical discussions

#Case studies; other nonquantitative presentations of investigations

+Related techniques and applications with considerable adaptation

Unmarked references are to reports of research, published and unpublished through 2002, when the search ended, plus one more published in 2005.

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About the Author

Robert R. Holt, Ph.D. (Harvard, 1944) was trained in diagnostic testing and psychoanalytic theory at the Menninger Foundation in Topeka, Kansas, under the tutelage of David Rapaport, and was associate member of the Topeka Psychoanalytic Society 1947–1954. Holt joined the Menninger Foundation in 1947, later becoming director of its psychological staff. In 1953 he went to New York University to direct the Research Center for Mental Health, of which he was codirector (with George S. Klein) from 1963 to 1969. He served as professor of Clinical Psychology from 1958 to 1988, was founding director of the Program on Peace and Global Policy Studies at NYU from 1982 to 1989, and has since become professor emeritus. From 1962 to 1988, he held a research career award from the National Institute of Mental Health. He is a past president of the American Psychological Association's Division of Clinical Psychology, which gave him its award for distinguished contribution to clinical psychology in 1974. He has served on the editorial boards of seventeen journals and the Freud Encyclopedia, and has previously written or edited fifteen books, including *Freud Reappraised* (1989) and two other *Psychological Issues* monographs: *Motives and Thought* (1967), and *Psychoanalysis and the Philosophy of Science* (1997).