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HOWARD SHEVRIN AND THE SHEVRIN LAB

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Summary: Prof. Howard Shevrin is both a renowned psychoanalyst and a distinguished scientist with hundreds of scientific publications covering both (neuro-) scientific and psychoanalytic journals. He received the Sigourney Award in recognition of his achievements in applied psychoanalysis and research (2003) and the Pfeffer Prize for the best paper in the field of neuropsychanalysis (2004). He has founded the *Ormond and Hazel Hunt Laboratory* for the study of Conscious and Unconscious Processes at the University of Michigan. His research has led to empirical support for two fundamental propositions: the existence of (1) a psychological unconscious having cognitive, affective, and motivational properties (see also Snodgrass' "non-monotonic model" of unconscious processing) and of (2) a qualitatively different organization of these properties from most conscious mental processes, namely following the logic of the primary process (see also Brakel's empirical test, called *GeoCat* for "Geometrical Categorization").

Key words: Shevrin – psychoanalysis – (cognitive) neurosciences – neuropsychanalysis – empirical research

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Professor Howard Shevrin received his Bachelor of Science degree from the City College of New York in 1948 and his Master of Arts and PhD degrees from Cornell University in 1951 and 1954, respectively. He received postdoctoral training at the Menninger Foundation and completed psychoanalytic training at the Topeka Institute for Psychoanalysis. He joined the University of Michigan faculty in 1973 as a professor and chief clinical psychologist at the Department of Psychiatry in the Medical School, and received a joint appointment as professor of psychology in the College of Literature, Science, and the Arts in 1975. Currently, Prof. Shevrin is an emeritus professor of psychology in the University of Michigan Medical School's Department of Psychiatry and in the University of Michigan

College of Literature, Science and the Arts. He directs the University of Michigan Research Program in Neuro-psychoanalysis and the *Ormond and Hazel Hunt* Laboratory for the study of Conscious and Unconscious Processes. Prof. Shevrin is a member of the Michigan Psychoanalytical Society and also takes part in the University of Michigan Department of Psychiatry's long-term psychodynamic psychotherapy clinic, a joint effort with the Michigan Psychoanalytic Institute.

Prof. Shevrin has given over 200 invited presentations to various psychoanalytic societies, including programs of the American Psychoanalytic Association, the American Psychological Association, the International Psychoanalytic Society, the American Psychiatric Association and to various life science societies, including the American Psychophysiological Society, the International Society for Neuro-Psychoanalysis, the American Association for the Advances of Science, the International Psychophysiological Association and the National Institute of Mental Health. Howard Shevrin is the author of over 150 scientific publications, covering among others both internationally high quality (neuro-) scientific journals (such as e.g. *Nature*) and psychoanalytic journals (such as e.g. the *International Journal of Psychoanalysis*).¹ In 2003, he received the prestigious *Mary S. Sigourney* Award in recognition of his outstanding achievements in applied psychoanalysis and research. The award is given by the Mary S. Sigourney Award Trust, an independent foundation named for a California publisher who seeks to reward new activity in psychoanalysis. In 2004, his contributions to the field of "neuro-psychoanalysis" were awarded the *Arnold Pfeffer* Prize for the best paper in this field. Since more than 40 years, Shevrin is indeed pioneering research at the interface of psychoanalysis and neurosciences. In 2006, Prof. Shevrin contributed a chapter on psychodynamic diagnosis in the *Psychodynamic Diagnostic Manual* (Shevrin, 2006). In 2008, he was invited to contribute the article on the unconscious to the *Macmillan Encyclopedia of Cognitive Science*, a standard reference work in the field and recognition of his contributions to cognitive science. Howard Shevrin also wrote a psychoanalytic novel in verse form, *The Dream Interpreters* (Shevrin, 2003), a story of seven interrelated analyses. In 2005, this novel was

1. See this issue pages ///-///.

awarded the Gradiva Award, given by the National Association for the Advancement of Psychoanalysis.

The Shevrin Lab

The history of the research program in the Ormond and Hazel Hunt Laboratory at the University of Michigan begins before there was any substantial interest in the relationship between psychoanalysis and what would eventually be called cognitive neuroscience, or more recently, "neuro-psychoanalysis". The Shevrin lab is the only neuro-psychoanalytic program that addresses *basic scientific questions with experimental methods informed by clinical experience*. Using *experimental* methods is crucial because it enables strong tests for psychoanalytically inspired hypotheses, something that other methods can only suggest. The group seeks a true interdisciplinary integration of cognitive psychology, neuroscience, biosignal analysis, philosophy and psychoanalysis. A vital ingredient is that the director and co-directors of the program are practicing *clinicians*: Howard Shevrin and Linda A.W. Brakel are psychoanalysts and on the faculty of the Michigan Psychoanalytic Institute and Michael Snodgrass is a psychodynamically oriented psychotherapist. Their clinical experience with patients informs all aspects of their research giving it a depth of human understanding and empathy not often found in experimental research. Their overriding aim is to get at the underlying causes of what makes people tick in illness and in health, and in this way to contribute to establishing a solid basic science foundation to psychodynamic theory and practice while drawing upon neuroscience methods and findings.

The research program is "theory driven" rather than "finding driven", as is true of much cognitive and neuroscience research. This theory is psychoanalysis: on the basis of the prior theoretical thinking of Freud, Rapaport², and Rubinstein³ among others, are two

2. David Rapaport (1911-1960) was a Hungarian researcher in psychology with a PhD in philosophy. In 1940 he joined the Menninger Clinic. His *Emotions and Psychology*, which appeared in 1942, is a record of his early research, as is *Diagnostic Psychological Testing* (1945-1946), published in collaboration with Roy Schafer and Merton Gill. Although he never worked as a psychoanalyst, Rapaport was interested in treating schizophrenics and borderline cases, and soon became an eminent theoretician of psychoanalysis. His classes and conferences on affects, activity-passivity, and memory, his comments on chapter 7 of Sigmund Freud's *The Interpretation of Dreams* (1900a), his translations of Otto Fenichel, Paul Schilder, and Heinz Hartmann, provided him with many students and material for several books, including *Organization and Pathology of Thought* (1951), and many articles, which were collected after

fundamental propositions that need empirical support independent of clinical observations:

- 1) *the existence of a psychological unconscious having cognitive, affective, and motivational properties;*
- 2) *the existence of a qualitatively different organization of these properties from most conscious mental processes.*

The existence of a psychological unconscious

In 1968, Howard Shevrin and colleagues published the first report of brain responses to unconscious visual stimuli, thus providing strong, objective evidence for the existence of the unconscious at a time when most scientists were skeptical (Shevrin & Fritzier, 1968). The Shevrin team has since then conducted many series of subliminal studies employing brain responses as objective markers of unconscious perception.⁴ Remarkably, Shevrin and colleagues have found brain markers for the role of unconscious emotional conflict in producing social phobias, demonstrating the existence of dynamic, conflictual unconscious processes (Shevrin, Bond, Brakel, Hertel, & Williams, 1996). Shevrin, Ghannam, and Libet (2002a, 2002b) have also shown that subjects with a repressive personality trait have a longer-than-average delay between the application of a stimulus and the conscious awareness of that stimulus.

This axis of the Shevrin research is particularly carried by *Michael Snodgrass*, PhD and one of two co-directors of the program.

his death and are often cited. A member of the Western New England Psychoanalytical Society, he was an at-large member of the International Psychoanalytical Association and, shortly before his death, in September 1960, received a prize from the American Psychological Association's division of clinical psychology. His close collaborator Merton Gill said of Rapaport that "he spoke of metapsychological abstraction with the fervor of a political orator and the thunder of a Hebrew prophet." Gill also recalled Rapaport's desire to create a general psychology that would include ego psychology and social psychology while retaining Freud's revolutionary intuitions about the id.

3. Benjamin Rubinstein (1905-1989) was a psychiatrist and psychoanalytical theorist. He was born in Finland and fought in the Russo-Finnish War of 1940, was educated in Finland and England and came to the United States in 1947. He was a research fellow at the Menninger Foundation, before entering private practice in New York. Dr. Rubinstein, a student of the philosophy of science, published several papers applying scientific principles to the critical evaluation of psychoanalytic theory.

4. The term subliminal means "beneath a limen or sensory threshold." Subliminal research is research with stimuli below the detection threshold. For visual stimuli, this is obtained by shortening the presentation time. Although stimuli are not consciously detected, subliminal research shows that they are nevertheless processed. In this sense, subliminal research can function as an experimental paradigm to study unconscious processes

Snodgrass and Shevrin (2006) have shown how the subliminal priming paradigm at the objective threshold is a valid method for the experimental study of deep unconscious processes. The Shevrin lab is unique in the world to do subliminal priming at the stringent condition of the *objective* detection threshold, i.e. at a value of the detectability parameter d' equal to zero.⁵ Other research teams work at subjective thresholds of detection, i.e. at d' values slightly above zero. The difference between the subjective and the objective threshold is that at the subjective threshold people report verbally not being able to detect anything, but still score slightly above chance to the question "have you seen something or nothing?" in forced choice situations. At the objective threshold, however, people score *at chance* level in this task. Snodgrass has developed the so-called "non-monotonic model" of unconscious processing (Snodgrass, Bernat, & Shevrin, 2004): this model implies that only in experimental conditions where conscious influences are totally excluded – i.e. at the objective detection threshold – are typically unconscious dynamics, such as inhibition phenomena (Snodgrass, Shevrin, & Kopka, 1993a, 1993b), uncovered. Snodgrass has received growing recognition in the last years from the cognitive neuroscience world: in 2006, he delivered an invited plenary address to the *Association for the Scientific Study of Consciousness* conference in Oxford in which he presented his theory of levels of consciousness. He has also contributed the article on unconscious perception to the *Oxford Companion to Consciousness* (Snodgrass & Winer, 2009). It is now generally accepted in cognitive psychology and neuroscience that unconscious processes exist, although little thought is given to the theoretical implications of this for the understanding of mind and brain.

The existence of a qualitatively different organization in the unconscious

5. In "Signal Detection Theory" a parameter is calculated which indicates the so-called detectability of the stimulus or sensitivity named d' (*d-prime*), a measure for how well the stimulus is detected. To calculate d' , one needs to know a person's hit (H) and false alarm (FA) rates: d' then is the standardized difference between the means of the False Alarms (FA) and Hits (H) distributions: $d' = z(\text{FA}) - z(\text{H})$. Larger absolute values of d' mean that a person is more sensitive to the difference between the Signal Present and Signal Absent (or "noise") distributions. In subliminal priming, it is crucial that the d' of the direct task for the conscious perception is not significantly different from zero, i.e. that the subject cannot make a distinction between signal and noise, resulting in an at chance performance.

The second main thrust of the Shevrin research program deals with the qualitative differences between conscious and unconscious processes, with the so-called "primary processes" being more predominant unconsciously, while "secondary process" thinking is characteristic for conscious dynamics.⁶

This axis is particularly carried by *Linda A.W. Brakel*, MD and Master in Philosophy and the other co-director of the program. Brakel is also associate (adjunct) Professor in Psychiatry and associated scholar in the Department of Philosophy, both at the University of Michigan. Brakel has designed simple pictorial stimulus material – named *GeoCat* for "*Geometrical Categorization*" – which enables to probe empirically for primary and secondary process mentation.⁷ This remarkable test can detect primary process thinking characteristic for the unconscious. The research results, drawing on psychoanalytic theory, show that primary process dynamics are found in the conscious thinking of pre-school children (Brakel, Shevrin, & Villa, 2002), in the unconscious thinking of adults (Brakel, Kleinsorge, Snodgrass, & Shevrin, 2000), and in the conscious thinking of adults when anxious and under stress (Brakel & Shevrin, 2005). There is broad interest in using this test from a number of laboratories in Belgium, France, and the United States. Moreover, an adaptation of the test is used in experiments with pigeons at the University of California in Los Angeles. It turns out that the test has important implications for understanding the evolution of cognition in other species. Brakel has received growing recognition these last years from the philosophy and psychoanalysis world: in 2002 she published the lead article in *The Australasian Journal of Philosophy*, an internationally recognized journal in philosophy (Brakel, 2002). In 2003, the New York Psychoanalytic Institute invited her to give the coveted *Fisher lecture* on her work (Brakel, 2004). The lecture

6. The primary process reflects the primary function of the nervous system: the flight for incoming excitations by the shortest pathway possible by means of free flowing quantities which follow directly connected or contiguous neural pathways. At the level of the psyche, this neuronal dynamic organization is reflected in associative thinking, including metonymy or displacement and condensation, ruled by the pleasure principle; the overall outcome is a search for identity of perception. The secondary process reflects a more developed functioning of the nervous system: the search for an adequate act as a response to the actual situation of distress or lack in the organism by means of a refrained flow of quantities under the inhibitory influence of the ego. At the level of the psyche, this neuronal dynamic organization is reflected in "rational" thinking ruled by the reality principle; the overall outcome is a search for identity of thought (freely summarized from Freud, 1950c [1895]; Freud 1900a). See also p. ///.

7. Test material can be emailed by simple request at brakel@umich.edu; copyright by Linda A.W. Brakel and the University of Michigan.

honored Charles Fisher who pioneered the scientific exploration of the unconscious.⁸ In 2008 she was asked to be the guest editor of a special issue on philosophy and psychoanalysis of *American Imago*, one of the oldest journals in the humanities and psychoanalysis (Brakel, 2008). Recently, in 2009, she published *Philosophy, Psychoanalysis and the A-rational Mind* (Brakel, 2009) a book on the philosophical foundations of psychoanalysis. A second Oxford University Press book was published, *Unconscious Knowing and Other Essays in Psycho-Philosophical Analysis* (Brakel, 2010).

Other team members

Ramesh Kushwaha, PhD, has a doctorate in electrical engineering and biosignal analysis. He has developed a method for analyzing brain waves so that the flow of information from one part of the brain to another can be mapped. This method is used to track the flow of unconscious processing in the brain (Kushwaha, Williams, Shevrin, & Sackellares, 1989; Kushwaha, Williams, & Shevrin, 1992; Aviyente, Brakel, Kushwaha, Snodgrass, Shevrin, & Williams, 2004).

Selin Aviyente, PhD, is an assistant professor with the Electrical and Computer Engineering Department at Michigan State University. Her research focuses on the theory and applications of statistical signal processing, in particular non-stationary signal analysis. She has developed a state of the art method for detecting shifts in brain frequencies occurring unconsciously in response to emotionally meaningful stimuli. With her method she has shown how the brain responds differently when phobic patients are presented unconsciously with the object of their phobia (Aviyente et al., 2004).

Some former collaborators

Edward Bernat obtained his PhD from the University of Michigan in 1997 and remained at that institution to complete two postdoctoral fellowships in the Shevrin lab (Wong, Bernat, Bunce, & Shevrin, 1997; Bunce, Bernat, Wong, & Shevrin, 1999; Bernat, Shevrin, & Snodgrass, 2001; Bernat, Bunce, & Shevrin, 2001; Wong, Bernat,

8. Charles Fisher (1908-1988), a psychoanalyst noted for his research in the field of sleep and dreaming. In his laboratory at Mount Sinai Hospital, Fisher investigated the physiological and psychological manifestations of dreams during sleep and was credited with illuminating the significance of REM, or rapid eye movement, periods of light sleep when most dreams occur.

Snodgrass, & Shevrin, 2004; Snodgrass et al., 2004). Since then he has held the position of Research Associate at the University of Minnesota. In the fall of 2009, Bernat has joined the Clinical Psychology area of the Florida State University. His research focuses on the cognitive and affective processes that underlie impulse control problems such as substance use and abuse and antisocial behavior. Using advanced methodological tools, like EEG/MEG, Bernat attempts to delineate the role of the brain in impulse control problems.

Philip Wong received his PhD in Clinical Psychology from the University of Michigan, and his postdoctoral training from the Psychiatry Department at the University of Michigan. He collaborated with the Shevrin team on studies on emotional-associative learning (Wong, Shevrin, & Williams, 1994; Wong et al., 1997; Wong et al., 2004). In 2003, he joined the faculty of Long Island University (Brooklyn Campus) as Associate Professor in the PhD Program in Clinical Psychology. Wong's research interests are centered on the emotional and motivational dimensions of implicit cognition in a variety of normal and pathological conditions. Wong uses a blend of cognitive, social-cognitive, and psychophysiological laboratory techniques in this research.⁹

Scott Bunce earned his BA in Biology and Philosophy at Wheaton College, his MA in Personality Psychology at the University of Michigan, and his PhD in Clinical & Personality Psychology at the University of Michigan (Wong et al., 1997; Bunce et al., 1999; Bernat et al., 2001). Bunce is Assistant Professor of Psychiatry, Clinical Neuroscience Research Unit, Drexel University College of Medicine.

Karen Klein Villa, PhD, was at Spring Arbor University and has a clinical practice at Brighton in Michigan. She worked as a Post-doctoral Fellow with the Shevrin lab and completed a study on the subliminal priming with palindrome words (Villa, Shevrin, Snodgrass, Bazan, & Brakel, 2006).

Shasha Kleinsorge, PhD holds a Michigan License in Clinical Psychology. She earned her doctoral degree from Michigan State University. She worked as a Post-doctoral Fellow in research and psychotherapy at the University of Michigan's Department of

9. See myweb.brooklyn.liu.edu/pwong: "Often, people cannot report accurately on how or why they behave the way they do. One understanding of this phenomenon is that implicit mental processes shape behavior, but work 'behind the scenes' in the sense that one does not have introspective access to them. Experimental techniques in psychology can provide ways of assessing these implicit, 'behind the scenes' processes."

Psychiatry for three years. Her research interests were in unconscious processes, and her therapy training focused on short and long-term psychoanalytic psychotherapy for adults suffering with depression, anxiety, abuse issues, grief and mourning. Kleinsorge is also an Instructor at Spring Arbor University. She teaches in the Master's Counseling Program and Family Life Programs.

Ariane Bazan holds both a PhD in biochemistry from the University of Ghent in Belgium and a PhD in clinical psychology and psychopathology from University of Lyon 2 in France (Prof. René Roussillon). She also has advanced training in cognitive neuroscience and in psychoanalysis. She was a visiting scholar at the University of Michigan from 2003 till 2005 and completed a joint study on the brain processes involved in the unconscious processing of language, demonstrating that phonemes and meaning go different ways unconsciously and are associated with distinctive brain processes (Bazan, Shevrin, Brakel, & Snodgrass, 2007; Bazan, 2006). The study throws light on the pathology of language and thought in such disorders as schizophrenia. Bazan has continued active collaboration with the Shevrin Lab till now. In 2006, she was invited to give a paper at the annual conference on *Attention and Performance* considered the bellwether organization in cognitive psychology (Bazan, 2007b). Since 2007, she is a professor in psychology at the Université Libre de Bruxelles (ULB) in Belgium. She is also a psychodynamic psychotherapist working in private practice. Her theoretical work is published in a book called *Des fantômes dans la voix. Une hypothèse neuropsychanalytique sur la structure de l'inconscient* (Bazan, 2007a). In 2008, she was awarded the Clifford Yorke Prize by the International Neuropsychanalysis Society for "her early career contributions relevant to the field of neuropsychanalysis and for a series of publications in neuropsychanalysis."

Nederlandse titel Howard Shevrin en het Shevrin Lab

Samenvatting: in het nederlands Prof. Howard is zowel een gereputeerd analyst als een erkend wetenschapper met honderden wetenschappelijke publicaties in zowel (neuro-)wetenschappelijke als psychoanalytische tijdschriften. Hij ontving the *Sigourney Award* voor zijn verdiensten in het domein van de toegepaste psychoanalyse en onderzoek (2003) en de *Pfeffer Prize* voor de beste publicatie in het veld van de neuropsychanalyse (2004). Hij stichtte het *Ormond and Hazel Hunt Laboratory* voor de studie van bewuste en onbewuste processen aan de universiteit van Michigan. Zijn onderzoek verleende empirisch bewijsmateriaal voor twee fundamentele stellingen: het bestaan van (1) een

psychologisch onbewuste met cognitieve, affectieve en motivationele eigenschappen (zie ook Snodgrass' "non-monotisch model" van de onbewuste prikkelverwerking) en van (2) een organisatie van deze eigenschappen die kwalitatief verschillend is van de meeste bewuste mentale processen en met name de logica van het primair proces volgt (zie ook Brakel's empirische test, de *GeoCat*, afkorting van "Geometrical Categorization").

Sleutelwoorden: Shevrin – psychoanalyse – (cognitieve) neurowetenschappen – neuropsychoanalyse – empirisch onderzoek

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