AN EMPIRICAL-PHENOMENOLOGICAL APPROACH FOR MAPPING CONSCIOUSNESS AND ITS VARIOUS "STATES"

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ABSTRACT

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Although there are several theories of consciousness and its various "states", there is little research that attempts to operationalize the concept of "state" of consciousness and "altered" states of consciousness, in particular. For this purpose a questionnaire, the Phenomenology of Consciousness Questionnaire (PCQ), was developed to retrospectively assess the nature and dimensions of subjective conscious experience (phenomenological experience) and to compare that experience in differing conditions, so as to determine the particular phenomenological "state" associated with these conditions.

Two hundred and forty-nine Ss, averaging about 35 Ss to a group, participated in two sessions spaced a week apart. In each session the Ss experienced two four-minute conditions, and then completed the PCQ immediately afterwards, in reference to these conditions. Conditions for the first session consisted of sitting quietly with eyes opened (first baseline) and reading mildly-arousing erotic material. Conditions for the second session consisted of sitting quietly with eyes opened (second baseline) followed by progressive relaxation to which a four minute meditational

interlude had been added. A personality inventory was also given at the end of the first session.

It was hypothesized that (1) subjective conscious experience can be accurately and reliably assessed via nomothetically-procured self-report data, (2) such experience is composed of certain dimensions or structures that are stable over time, and (3) identical conditions (the baseline conditions) are characterized by the same intensities of phenomenological experience, while the treatment conditions (erotica and relaxation) are characterized by intensities of subjective experience significantly different from that of baseline. It was also hypothesized that (4) the baseline conditions would not differ from each other in regard to the pattern of the dimensions of consciousness, while the two treatment conditions would differ from baseline in regard to pattern, and (5) personality variables would correlate with specific dimensions of consciousness.

The reliability results indicated that Ss could be adequately reliable and accurate at retrospection into their subjective experience. Such retrospection yielded nine dimensions of consciousness that were found to be stable according to several criteria across all four conditions. These included: internal dialogue, awareness, imagery, positive affect, control, altered experience, attention, negative affect, and memory.

Unexpectedly, small but significant differences between

the two baseline conditions were found for several of the dimensions of consciousness. However, a lack of pattern differences, as measured by correlation coefficients between the dimensions that was statistically supported by the Box test, was evident between the two baseline conditions. These results suggested that the two baseline conditions were associated with a particular "state" of consciousness, similar, although not identical, to each other, that may serve as an adequate baseline for assessing waking conscious experience.

As hypothesized, significant intensity differences were found for the dimensions of consciousness between the baseline and treatment conditions, almost all in the expected direction. Significant pattern differences, as measured by very large differences in the correlation coefficients between the dimensions of consciousness, were also found between each of the treatment conditions and their respective baselines, that was corroborated by the Box test.

The relaxation condition was also associated with the perception of being in an altered state, while the erotica condition was not. According to the theorizing of Tart[1], the previous results suggested that the relaxation condition was associated with an "altered" state, and the erotica condition, an "identity" state of consciousness.

Few and low correlations between the personality measures and the dimensions implied that the personality

traits assessed had little moderating effect upon phenomenological experience.

In summary, the results indicated that a "state" of consciousness can be operationally defined by phenomenological parameters that appear reliable, valid, and stable under several conditions. "Baseline", "identity", and "altered" states of consciousness that are associated with specific stimulus conditions appear capable of phenomenological definition in terms of intensity variations within, and pattern effects amongst, the dimensions of conscious experience.

[1]Tart, C.T. States of Consciousness. New York: E.P. Dutton and Company, Inc., 1975.

Dedicated

To Mom and Dad,

whose past and present love suggests
that much better parents there
may not be;

And to Michelle or Michael,

for whom our love beckons Deb and I
as good as parents
us to be.

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INTRODUCTION[1]

The last twenty years have seen a tremendous growth in the theorizing and research on the nature of consciousness and its various "altered states" as induced by meditation (Naranjo and Ornstein, 1972), drugs (Pahnke, 1972; Harman, et. al., 1972), hypnosis (Weitzenhoffer, 1978), biofeedback (Brown, 1974), and many other induction procedures. There are now books on the nature of human consciousness (Ornstein, 1973); the psychology of consciousness (Ornstein, 1972); states (Tart, 1975), altered states (Tart, 1972), and alternate states (Zinberg, 1977) of consciousness; the highest state of consciousness (White, 1972); the spectrum of consciousness (Wilber, 1977); expanding dimensions of consciousness (Sugerman and Tarter, 1978); the stream of consciousness (Pope and Singer, 1978); and the science of consciousness (Pelletier, 1978).

This resurgence of interest in consciousness within the last two decades is in stark contrast to the "behavioristic" years of American psychology, during which even mention of the word consciousness was, at least, tacitly forbidden (Boring, 1953). Nevertheless, this current interest

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[1]For a more in-depth introduction to early twentieth century and contemporary approaches to introspection and consciousness, see Appendix I (page 191).

in consciousness is a return to the beliefs of the founding fathers of psychology, who, at the turn of the twentieth century, asserted that psychology was, first and foremost, the study of mental processes. It was the father of experimental psychology and the founder of the first psychological laboratory, Wilhelm Wundt, who defined the problem of psychology as the problem of consciousness: determining the nature of the elements that made up conscious experience and how these elements were connected (Boring, 1929/50).

Introspection

Introspection, the process of engaging in and examining ones own thought processes and stream of consciousness was the method *par excellence* of these psychologists for ferreting the nature of subjective experience. Yet due to differences in methods of introspection (Boring, 1953), controversies such as that concerning imageless thought (Titchener, 1912), and the seemingly pedantic and sterile results that such introspection was yielding (Watson, 1913), the interest in consciousness and its methodology of introspection faded from the scenes of American psychology.

In 1913 J.B. Watson proclaimed that psychology's goal was the "prediction and control of behavior (of which) introspection forms no essential part" (p.158). With these words introspection began to be banished from the American scene of psychology, although under the guise of *phenomenological observation*, it continued to survive in Europe

(Husserl, 1913/72; Kohler, 1929).

Despite the return of interest in consciousness during the past twenty years, spawned, in part, by studies in perception and attention (Kahneman, 1973), the emergence of cognitive psychology (Holt, 1964), and the tremendous strides in neuropsychology and psychophysiology (Lindsley, 1960; John and Schwartz, 1978), the use of introspection and phenomenological observation has been slow to gain acceptance (Lieberman, 1979).

This is due, in part, to introspection's failure at the turn of the century to provide for a functional psychology of behavior. But it has also been due to behaviorism's hegemony during the twentieth century (Robinson, 1979); a hegemony that has eschewed introspection and the examination of subjective processes. Even though contemporary psychology has largely abandoned the language of the classical behaviorists, behaviorism continues to exert its influence through the acceptance by psychologists of its philosophical and methodological assumptions.

According to these assumptions, the mind is, at least, of dubious epistemological status and introspection is seen as an inherently flawed tool for the investigation of mind (Lieberman, 1979). Added to this are the modern behaviorist's polemics against introspection (Skinner, 1974; Rachlin, 1974) and much ego strength is needed to go against fifty years of American psychology and argue that introspection

can be useful and reliable.

But such a stance has already been taken. D.A. Lieberman (1979) has argued for a limited return to introspection for the simple reason that introspective data can help us understand behavior. In his article, Lieberman showed the inadequacies of the arguments of methodological and radical behaviorists against introspection. He also cited evidence that introspection can, at times, be very accurate (Kroll and Kellicut, 1972). He summarized by suggesting:

> Instead of trying to force our behavior into the procrustean bed prescribed by (behavior) theory, I believe it would be far less taxing, as well as more honest, to accept overtly what we so clearly believe in covertly (p.330).

Consciousness

This tendency to deny the use of introspection in psychology has clearly hurt the development of theories and research on consciousness, development that should be tied to empirical, phenomenological data. After all, if consciousness is "awareness, especially of something within oneself" (Webster, 1970, p.177), how else can one determine the nature of awareness and consciousness, except by introspection or phenomenological observation upon that awareness?

It has been suggested that neurophysiology can help map the nature of consciousness (Hilgard, 1969; Kamiya, 1968). But recent evidence on the lack of a relationship between the occurrence of the "alpha experience" (Kamiya, 1972), and

the strength or density of the EEG alpha activity, "calls into question the entire enterprise of 'mapping consciousness' neurophysiologically" (Plotkin, 1979). If these findings replicate in other areas of consciousness research, this can only mean that phenomenological approaches to consciousness must be the fundamental means for exploring and mapping subjective experience. But phenomenological approaches to assessing consciousness have been slow to materialize, although they have been increasing.

Current Phenomenological Approaches to the Study of Consciousness

There are currently two general approaches to consciousness for which introspection can be, and is being, used. These approaches parallel the two approaches to consciousness exploration evident at the turn of the century, i.e. functionalism and structuralism.

Functionalism, in the tradition of W. James (1890/1950) and J. Angell (1907), sought to "discern and portray the typical operations of consciousness under actual life conditions" (Angell, 1907, p.63). A similar approach to consciousness is found in the research and theorizing of Singer (1966, 1974, 1977, 1978), Klinger (1978), Pope (1978), and their colleagues on daydreaming, imagination, and the stream of consciousness experience. Here the stream of consciousness and its operations are being assessed by retrospective self-report inventories (Singer and Antrobus, 1963, 1972),

thought-sampling procedures (Klinger, 1978), and thinking out loud (Pope, 1978).

Paralleling the structuralists, who, in the tradition of Wundt (1897) and Titchener (1898), sought to determine the structure of consciousness by reducing it to its elemental units, are those scientists concerned with theorizing and research into "states" and "altered states" of consciousness. These theories of consciousness hypothesize that the intensities or patterning of the different elements, structures, or subsystems of consciousness are thought to be different in differing altered (Tart, 1972, 1975, 1977) or alternate (Zinberg, 1977) states of consciousness.

"Altered" States of Consciousness

In spite of a great deal of theorizing on the enumeration (Krippner, 1972; Ludwig, 1972), nature (Zinberg, 1977b; Marsh, 1978; Singer, 1977), and organization of altered states of consciousness (Tart, 1972, 1975, 1977; Fischer, 1971, 1978; Silverman, 1968; Fishkin and Jones, 1978), with the exception of a few studies (Vogel, et. al., 1972; Hunt and Chefurka, 1976), there has been relatively little empirical, phenomenological investigation into the nature of altered states of consciousness as they compare with ordinary states.

Such ordinary states must serve as a baseline against which to compare altered or alternate states of consciousness. The phenomenological work done on those states of

awareness produced by meditation (Maupin, 1972; Deikman, 1966; Greenfield, Note 1), drugs (Pahnke, 1972), EEG biofeedback (Kamiya, 1972; Plotkin, 1979), any many other means, hypothesize these procedures to produce "altered" states of consciousness. Yet without an adequate and empirical baseline with which to compare them, their "altered" or "alternate" status is questionable.

This is even more salient since a relatively simple task such as sitting immobily for ten minutes can evoke significant alterations in subjective experience that resemble altered states produced by drugs, meditation, etc. (Hunt and Chefurka, 1976). Hunt and Chefurka's results call into question the uniqueness of the "altered state" effects of meditation, biofeedback, etc., and the extent to which their results depend on the purported agents or are caused by nonspecific variables.

In short, meditation, biofeedback, and many other altered state induction procedures are espoused to cause alternate states of consciousness. But this presupposes a baseline with which to compare these altered states, and also presupposes that this baseline state is significantly different from these altered states. Moreover, since a "state of consciousness" is something subjectively experienced, such evaluation of differences in state of consciousness should be subjectively or phenomenologically based. Since there is little hard, empirical, phenomenological research

to substantiate the above presuppositions, the statement that meditation, biofeedback, etc. produce altered states of consciousness (from a baseline state) is without scientific validation. Indeed, the same objections and controversies that, for decades, have surrounded the question of hypnosis as a trance state (Barber, 1969; Sarbin and Coe, 1972) are applicable to the notion of "altered" states of consciousness, in general.

The Question of "States" of Consciousness

Besides the question of the validity of the notion of altered or alternate states of consciousness for certain induced alterations in phenomenological experience, there is a more fundamental question. This concerns the question as to whether the concept of "states" of consciousness is a legitimate and valid one, and one that can be operationalized. This is a question that goes back, at least, to the beginning of the twentieth century.

One of the several controversies that erupted between the structuralists and the functionalists at the turn of the 1900's concerned the structuralist's use of the term "states of consciousness." According to Angell (1907), the "more extreme and ingenuous conceptions of structural psychology . . . (grew) out of an unchastened indulgence in what we may call the 'state of consciousness' doctrine" (p.64). Angell argued that when the structuralists used the "moment of consciousness" as their unit of analysis, not only was the

particular state of consciousness assessed, arbitrary and stimulus-dependent, since it was "dependent upon the particular exigencies and conditions which call(ed) them forth" (p.67), but this analysis destroyed the most fundamental property of consciousness, its evanescent and fleeting quality. Since consciousness is never the same but always in flux, the "state of consciousness" doctrine, was, according to Angell, an artificial and basically erroneous perception of the nature of consciousness that could only lead to confusion and controversy.

Even though modern researchers are using the term "state of consciousness" in a different sense from that of the structuralists, Angell's argument still holds. If consciousness is in continual flux and never the same, it may make no sense to talk about a particular "state" of consciousness, for the simple reason that the nature of the stream of consciousness may preclude that term having any useful meaning. As an example, one may pass through different states of consciousness so quickly, that every moment is a new state of consciousness, making it impossible to assess a particular state of consciousness with any degree of reliability. Or a state of consciousness may be so nebulous and hard to observe, that the mere act of observing it, alters it, just as in quantum mechanics, the act of determining the precise position of an electron will change its momentum and hence, its position (Heisenberg, 1962).

Nevertheless, the term "state of consciousness" is currently used with the implied meaning that a particular state of consciousness has a certain recognizable pattern or form to it that is somewhat durable over time (Tart, 1975; Zinberg, 1977; Singer, 1977). But the statement that consciousness has a pattern or form to it, such that the concept of "state of consciousness" applies, is not a fact, but only an assumption that needs to be empirically investigated and confirmed or refuted. Thus the notion of consciousness having "states" that can be empirically verified, is only an assumption that depends on (1) ones definition of "state" and (2) evidence that "states" of consciousness, so defined, can be operationalized such that it is a valid and useful scientific concept.

Webster (1970) defines the concept of "state" as "a mode or condition of being" (p.855) in which water in its solid, liquid, and gaseous states are prime examples. But surely, states of consciousness are not like states of water? A more precise definition of "state", drawn from a field quite appropriate for our inquiry, cybernetics, is that a state is "any well-defined condition or property that can be recognized if it occurs again" (Ashby, 1963, p.17). If the stream and structure of consciousness is so fluid so as to preclude definition, or so nebulous or changeable that its parameters in one condition cannot be assessed to be the same or similar in a later, but identical

condition, the phrase "state of consciousness", as applied to a given condition, has no operational meaning.

The only profitable way of testing this notion of "states" of consciousness, and the validity of the "altered" state of consciousness concept, must be via introspection, during which the phenomenological parameters of consciousness are observed and assessed. As mentioned, since consciousness is the subjective awareness of the objects within and without the observer (Webster, 1970), and the mapping of consciousness by a neurophysiological approach has been called into question (Plotkin, 1979), only by introspection or phenomenological observation, can the subjective nature of consciousness be known and hence communicated. In essence then, any science of consciousness and its various "states" must be grounded in an empirical phenomenology of consciousness, although it can and should be supported by psychological, electrophysiological, and neurochemical data.

Such an empirical phenomenology would then allow for an adequate testing of the validity of the "states" of consciousness notion and particular current theories of (states of) consciousness. Although there have been several theories of consciousness put forward, there has been less than adequate data to validate or refute them.

Theories of Consciousness

R. Fischer (1971, 1978) has developed a cartography of conscious states based upon the arousal level of the

organism. According to Fischer's paradigm, conscious states vary from hypo- to hyperaroused states, depending on the trophotropic or ergotropic activation of the nervous system. Whereas meditative states are due to trophotropic arousal, hyperphrenic and cataleptic states are due to ergotropic activation of the nervous system.

In contrast to arousal, J. Silverman (1968) has hypothesized a system for explaining states of consciousness based upon attention. For Silverman, the deployment of attention and the degree to which it is intensive, extensive, and selective, will determine the degree to which an altered state of consciousness is experienced.

Another model for understanding consciousness and its various states that puts attention in a prominent position is that proposed by Fishkin and Jones (1978). They suggest that a particular state of consciousness (SC) can be characterized by a set of eight parameters, four of which deal with attentional control, and two each with those phenomena "potentially available to consciousness" (PAC) and the energy status of the system.

In contradistinction to the previous models, the "psychedelic model of altered states" asserts that in the formal sense there are no altered states of consciousness, rather there are only "states of consciousness typically subordinated within conduct and consciousness atypically manifested" (Hunt and Chefurka, 1976, p.876). In their approach, altered states reduce to "subjective reflections"

or "by-products of general mental activity" due to consciousness becoming aware of its own subjective processes.

Tart's systems approach to consciousness

By far the most rigorous and systematic theory of consciousness is the "systems approach" to consciousness as espoused by C.T. Tart (1972, 1975, 1977). For Tart, ordinary consciousness is a semi-arbitrary construction due to the physiological, psychological, and cultural needs of the organism. It, and any other states of consciousness, are made up of "awareness/attention", the basic theoretical and experiential given of consciousness, and ten subsystems or structures, which include: exteroceptors, interoceptors, input processing, memory, sense of identity, evaluation and decision making, motor output, subconscious, emotion, and the space/time sense (Tart, 1975).

These subsystems combine to form a "discrete state of consciousness" (d-SoC):

> a unique configuration or system of psychological structures or subsystems, a configuration that maintains its integrity or identity as a recognizable system in spite of variations in input from the environment and it spite of various (small) changes in the subsystems (1975, p.62).

For Tart, it is the pattern or organization between these different elements that determines the particular discrete state of consciousness experienced, and not the intensity of the particular psychological subsystems evident.

In Tart's system, and that of others (Ludwig, 1972;

Krippner, 1972), the recognition of being in an altered state of consciousness is a phenomenological one: the observer notes

> a qualitative alteration in the overall pattern of mental functioning, such that the experiencer feels his consciousness is radically different from the 'normal' way it functions (Tart, 1972, p.95).

Because of individual differences between people, Tart also believes that the mapping of discrete states of consciousness must first be done on an individual basis. Only then, and only if great similarities are found to exist across individuals, can common names be applied across individuals for those states of consciousness that are found to be similar in similar individuals.

The elegance of Tart's systems approach makes it especially amendable to empirical testing, provided, of course, there are structures or subsystems of consciousness that tend to remain stable in a variety of conditions. In that case, altered states of consciousness should be distinguishable from a normal, baseline state, by an alteration in pattern among the structures of consciousness, concomitant with the perception that one is in a qualitatively different state of consciousness than normally.

If there are only alterations in intensities among the subsystems of consciousness, instead of changes in patterning, one might then help resolve one of the controversies over states of consciousness theory, i.e. whether

altered states of consciousness are merely differences in degree over baseline and other states of consciousness, as Singer suggests (Zinberg, 1977b), or are discrete states, states formed by a patterning of subsystems, whose patterns are different in different states, as Tart (1975, 1977) insists.

The Purpose of the Present Investigation

The following study will determine whether it makes any sense to talk about "states" and "altered states" of consciousness, i.e. whether these terms have meaning that can be operationally defined and empirically investigated via a phenomenological methodology. This will be done by determining:

(1) if consciousness can be accurately and reliably assessed via a phenomenological, retrospective approach.

If subjective data cannot be accurately and reliably assessed, a phenomenological exploration of consciousness can go no further. Such an introspective approach has been suggested by Lieberman (1979) as credible, although behaviorists like Skinner (1974) and Rachlin (1974) have argued that introspection is inaccurate and superfluous.

Although Tart (1975) insists that the mapping of consciousness must first be done on an individual basis, since there is consensual validation for such states as dreaming, sleeping, and daydreaming, etc. (Zinberg, 1977b), this

suggests

(2) that the phenomenological mapping of consciousness can be nomothetic instead of idiographic.

If each of these propositions turns out to be empirically supported, then such an approach can be used to

(3) determine the possible structures, subsystems, or dimensions of consciousness, and

(4) determine if these dimensions of consciousness are stable in a variety of differing or altered conditions.

Positive results would support Tart's (1975) theorizing on the stability of the subsystems of consciousness and suggest that altered states of consciousness may be composed of the same dimensions of consciousness as ordinary states, although possibly intensified or organized in different ways.

With stable dimensions of consciousness, then a comparison of these various dimensions in two successive, identical conditions will be able to determine

(5) if the intensities and/or the patterns amongst the dimensions remain the same or vary significantly in identical, yet successive conditions.

If it turns out that identical conditions are associated with phenomenological experiences that are the same or very similar, one can then talk about a particular condition as being associated with a particular "state of

consciousness", since such a state can now be operationally defined in terms of phenomenological parameters, and is found to be the same or similar in identical stimulus conditions.

By comparing such a "baseline" condition with conditions hypothesized to produce alterations in consciousness, it will be possible to determine

(6) if such conditions are characterized by dimensions of consciousness different in intensity from the same dimensions in the baseline state, and/or

(7) if such conditions are characterized by differences in pattern among the dimensions of consciousness.

This would then help to determine if altered states are characterized by intensity changes, or rather, by pattern changes, or both.

Also, because of possibly large individual and personality differences among the subjects, by means of personality inventories, one could determine if

(8) different personality characteristics are associated with differing subjective experiences across the various dimensions of consciousness for the Ss.

ASSESSMENT, DESIGN, AND HYPOTHESES

Assessment of Phenomenological Experience

In order to determine an assessment procedure adequate for mapping phenomenological consciousness, such a procedure would have to be able to assess the great variety of subjective experiences. Tart (1977) has mentioned ten different psychological subsystems excluding awareness/attention that comprise what we call conscious experience and Krippner (1972) has described twenty different altered states of consciousness worthy of study. In order to comprehensively determine the nature of consciousness, any phenomenological mapping of subjective experience would have to include these categories of subjective experience, provided they can be phenomenologically assessed, and any other pertinent areas of subjective experience.

Possible methodologies

Klinger (1978) suggests that there are roughly five procedures currently in use for assessing the phenomenology of experience. A self-report questionnaire, like the Imaginal Process Inventory (IPI) (Singer and Antrobus, 1972), in which the subject assesses his inner experience via retrospection, is an example of the first. Several modern imagery questionnaires, such as the modified Betts QMI (Sheehan, 1972, 1974), and the Richardson Vividness of Visual Imagery Questionnaire (VVIQ) (Richardson, 1977) are also examples of

approaches to map subjective experience of imagery via introspective self-report that use a questionnaire.

Another method consists of the subject thinking out loud and reporting via speech what he is experiencing. It requires the subject to speak continuously as he is thinking and has been used since the 1950's (Bloom and Brider, 1950; DeGroot, 1965; Klinger, 1971). This approach, however, may be obtrusive and influence or distort the nature of the phenomenological experience, especially since thinking out loud is not the same as thinking to oneself. Moreover, it may tend to "fit" phenomenological experience into the semantic-syntactic language of verbal discourse.

A third method consists of the participant going about his everyday business and then being interrupted intermittently and asked of his subjective experience just before the interruption. This procedure is called thought sampling and can be epitomized by the work of Aserinsky and Kleitman (1953) in which Ss were awakened during periods of rapid eye movements (REMs) and non-rapid eye movements (NREMs) and asked for their subjective experience. This procedure has the virtue of being a highly flexible procedure that is relatively unobtrusive (Klinger, 1978).

A fourth method consists of thought sampling, but instead of being asked to narrate their experience, Ss are to rate their experience according to particular agreed-upon scales. This procedure allows for flexibility and

and unobtrusiveness of the previous method and yet allows as many aspects of subjective experience to be assessed as there are items.

The fifth method consists of having the subject report the number of times subjective events occur during a particular time period. Studies done at the University of Minnesota (Klinger, 1978) have utilized the last four methodologies in the study of the stream of consciousness with a good deal of success.

Other methods for assessing phenomenological experience less directly include the use of drawings to tap the nature of ones phenomenological experience, as with Achterberg and Lawlis's (1977) work on the use of imagery with cancer patients, and Kagen's interpersonal process recall (Kagan and Krathwohl, 1967).

In attempting to directly map the phenomenology of subjective experience, a content analysis of the subject's verbalizations of his stream of consciousness either during thinking out loud or verbalized thought sampling, may not yield data comprehensive enough to cover the many dimensions of phenomenological experience. As mentioned, it may also exclude those areas of experience that cannot be adequately put into semantic-syntactic speech. Having the Ss report the number of times a given subjective event occurred may be tedious, especially if there are many subjective events of which to keep track. This leaves only the

self-report questionnaire and thought sampling using ratings as viable alternatives for directly mapping the nature of subjective experience.

Retrospective phenomenological observation

Since the Imaginal Process Inventory (Singer and Antrobus, 1972) has been found to be reliable and valid, as were the various imagery questionnaires previously mentioned, it was thought that a self-report inventory could yield an uncumbersome and possibly reliable assessment of phenomenological experience. If one could combine a questionnaire on consciousness with the thought sampling method using ratings, such a questionnaire would allow the observer to rate his subjective experience of consciousness according to the items listed. The questionnaire could be given immediately after the period of time during which consciousness is to be assessed.

Such a procedure would then involved retrospection by the observer upon the period of time for which consciousness is to be rated. This would mean, for an accurate assessment of subjective experience, that the S must remember the nature of his experience during the criterion time interval and accurately rate it according to the items of the questionnaire. Klinger (1978) reported that most Ss are very accurate at remembering their stream of consciousness if they are asked immediately afterwards about it.

If retrospection upon a criterion time period is used,

in order for any "state" properties of consciousness to demonstrate themselves without interference from the fluidity of the stream of thought, it was thought that a period of time of approximately several minutes would be long enough to demonstrate such "state" properties without being greatly influenced by the randomness of thought at any particular moment. This procedure, however, means that the S would have to remember the nature of the immediately preceding several minute period. Although probably not difficult, memory loss may somewhat preclude an accurate remembering of this experience, especially for the beginning or middle section of this short period of time.

Nevertheless, if it can be shown that Ss can do such retrospection reliably, this would mean that such a procedure has merit, and its possible lack of high accuracy would be more than compensated by its benefits. These would include (1) the fact that such a time period would not disrupt or "freeze" one stream of consciousness. This was one of the big arguments that the functionalists (Angell, 1907) leveled against the structuralists, i.e. that an assessment period of several seconds, as used by the structuralists, was so short that it eliminated the most essential nature of consciousness, its process nature.

As mentioned, a several minute period of time would also (2) tend to eliminate assessment of transient and random events and thus make it easier for any "state" properties of consciousness to become evident. And finally, (3)

such a short period of time should not be severely affected by memory decrements, although some memory loss would probably occur.

A questionnaire, completed in reference to the period of subjective experience to be assessed, if reliable, should be able to determine if consciousness can be defined in terms of the state concept, i.e. having a "well-defined condition or property that can be recognized if it occurs again" (Ashby, 1963, p.17). This would then allow for an empirical testing of the validity of those theories of consciousness, hotly discussed in the literature (Zinberg, 1977), that have little empirical, phenomenological data to support them.

Design

Since the initial mapping of subjective experience via such a questionnaire should be representative of a usual, ordinary "state" of consciousness, a baseline period of time was needed that would be similar to ones ordinary waking state of consciousness. Ones ordinary waking state has been described as that in which a person is alert and conscious, engaged in the perception of external or internal events, involved in some verbal thinking, and maintaining a satisfactory self-image (Fishkin and Jones, 1978). In deciding upon a baseline measure, a time period was needed which would be similar to the above definition of ordinary waking consciousness.

Baseline conditions

Sitting quietly with ones eyes opened (the SQ or baseline condition) was chosen as the baseline activity to be assessed. Ordinary experience usually consists of having ones eyes opened in which one is interacting with the surround or others or is engaged in some type of self-activity (be this daydreaming, talking to oneself, problem solving, etc.). Sitting quietly with eyes opened seemed to tap such ordinary experience yet it also was compatible with Fishkin and Jones's definition.

Since it was decided that structuring the session to engage in some specific type of activity would bias the state of consciousness assessed in terms of that activity, only a more open-ended setting would allow for a less biased and possibly more general assessment of conscious experience. For this reason, sitting quietly with eyes closed was not chosen as the baseline measure. It was thought such an assessment procedure might bias the nature of phenomenological experience towards more imagery, increased inward attention, and possibly alterations in conscious experience due to sensory deprivation.

An initial pilot study also indicated that sitting quietly with ones eyes opened was a simple procedure that everyone could do without arousing anxiety or concern that did not involve a lot of instructions that also might bias the setting of the experiment. It allowed for a setting in

which individual differences in phenomenological experience might more easily show themselves, as opposed to a structured activity which would surely have cut down on the variance amongst Ss. Several following pilot studies indicated that this open-ended stimulus situation did allow for a lot of individual variation, yet was structured enough so that a constant, stimulus environment was present to all Ss.

The use of such unstructured, ongoing thought as a baseline from which to compare altered states of consciousness also has the support of J.L. Singer. As mentioned, he has done a great deal of experimentation on daydreaming (Singer, 1966, 1974) and the stream of consciousness (Singer, 1978). Singer (1977) suggests using the "stream of consciousness" as a baseline for altered states of consciousness research. Eyes opened sitting quietly is thus a baseline measure that is in the mainstream of contemporary consciousness research.

By having the Ss return a week later and experience the same, identical condition with an identical assessment procedure, one can assess for differences in intensity and patterning of subjective experience between the two baseline conditions and also determine test-retest reliability for the assessment instrument.

Treatment condition: relaxation/meditation

Besides mapping the parameters of phenomenological experience in an ordinary, waking state of consciousness, the author also wanted to determine if procedures which would be thought to induce subjective experiences different from sitting quietly, would yield significant differences on one or more of the possible parameters of phenomenological experience that characterize the baseline condition. Silverman (1968) has mentioned that an alteration in conscious state is produced by a change in attentional intensiveness, extensiveness, and selectivity. Both meditation and progressive relaxation involve such changes in attentional activity.

Meditation usually involves a closing of the eyes, an erect yet rigid but relaxed, body posture, and the deployment of attention so as to concentrate attention upon a single object or impression (Naranjo and Ornstein, 1972). Progressive relaxation, likewise, involves a closing of the eyes, a nonmoving body posture that becomes very relaxed, and the deployment of attention upon the body so as to produce deep muscle relaxation throughout the body (Bernstein and Borkovec, 1973). Both states also involve a lowering of arousal or level of consciousness (Goleman, 1971) over more ordinary, nonaltered states of consciousness.

By combining progressive relaxation with a short meditational procedure one has a condition that would be

purported to produce an alteration in conscious experience. By comparing such a relaxation/meditation (RM) condition with a baseline condition, one could then assess for significant differences in intensity and patterning of subjective experience between the two conditions.

Treatment condition: reading erotica

Whereas relaxation/meditation would supposedly involve a lowering of arousal, an inward turning of attention, and a decrease in cognitive and imagoic processes over the sitting quietly condition, a condition was also wanted that would involve an increase in arousal, a greater absorption of attention, and an increase in rational and imagoic processes. In order to tap such a state of awareness, it was decided that the reading of some mildly arousing erotic material should evince a more aroused, excited state of awareness, with increased cognitive and imagoic activity than either the RM or the SQ conditions.

All three conditions seemed eminently suitable for tapping dimensions of consciousness that one would expect to be different from each other in such parameters as arousal, awareness, attention, imagery, cognition, rationality, and affect. Thus the three conditions compared in this study were: eyes opened sitting quietly (the SQ or baseline condition), relaxation/meditation (RM), and reading erotica (RE).

Assessment of personality differences

With possible large individual differences between Ss for the different parameters of phenomenological experience (Tart, 1975), one might hypothesize that such individual differences will be related to differing personality characteristics among the Ss. Such personality traits like introversion/extraversion (Eysenck, 1953) or absorption, a trait highly correlated with hypnotic susceptibility (r=.38) (Tellegen and Atkinson, 1974), may be related to the intensity of a person's awareness and attention levels, imagery vividness, etc. Just as meditators differ on the intensity of their phenomenological experience during meditation (Greenfield, Note 1), introverts and extraverts, or those of low or high absorption, may differ as to their experience of consciousness. Personality measures to map individual differences on these two traits were thus included to determine if the nature of subjective experience might be moderated by such individual differences.

Experimental paradigm

The experimental design for this experiment included, in an initial session, four minutes of sitting quietly with eyes opened, followed by four minutes of reading erotic material. Immediately after each of these two conditions, the Ss completed an instrument that assessed their subjective experience during that time period (the Phenomenology

of Consciousness Questionnaire (PCQ)). The first session ended with the Ss completing a personality inventory (a shortened version of the Differential Personality Questionnaire (DPQ)).

During a second session, held a week later, the Ss again experienced four minutes of eyes opened sitting quietly, followed by progressive relaxation instructions and four minutes of relaxation/meditation with eyes closed. Each of these two conditions were also immediately followed by completion of the consciousness inventory in reference to that condition. Table 1 on the following page illustrates this design graphically.

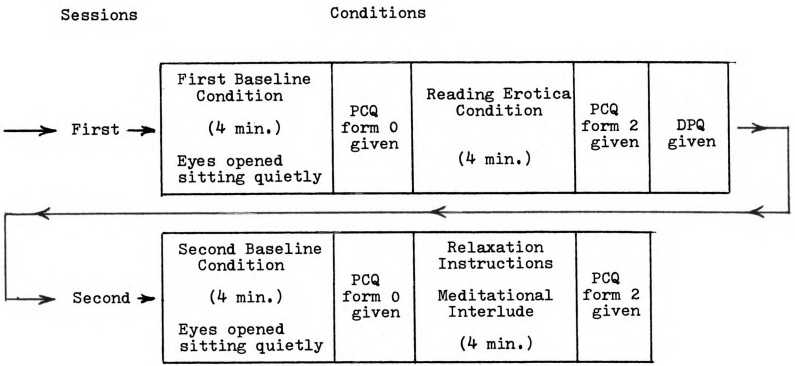
By means of this design one is able to determine if consciousness can be accurately and reliably assessed via a retrospective questionnaire, the possible dimensions of consciousness found to be stable in a variety of conditions, and the changes in intensity and patterning among these dimensions in two identical "baseline" conditions and two conditions thought to produce alterations in consciousness from this baseline condition. Selected personality characteristics as they relate to differences in phenomenological experience among the Ss for the different dimensions of consciousness can also be monitored.

Hypotheses

Based upon the material reviewed in the introduction and the design characteristics of this investigation that

Table 1

Graph of the Experimental Design



have just been reviewed, the following hypotheses are presented:

Hypothesis 1: Judgments regarding the phenomenology of consciousness can be reliably and accurately assessed via nomothetically-procured, retrospective, self-report data.

Hypothesis 2: The subjective experience of consciousness is characterized by specific structures or dimensions of consciousness that are stable over time. These dimensions will include: body integrity (image), time, altered awareness, attention, control (volition), ego (self) awareness, perception, affect, imagery, internal dialogue, rationality, memory, meaning, and alertness (arousal).

Hypothesis 3A: A baseline condition, characterized by certain intensities of phenomenal experience, is associated with the same intensities of phenomenal experience when repeated.

Hypothesis 3B: Alternatively, conditions purported to produce alterations in consciousness from the above baseline, are characterized by intensities of phenomenal experience significantly different from that of baseline.

(1) Specifically, a condition in which Ss read mildly arousing erotica is associated with significantly greater alertness

(arousal), absorbed attention, control, affect, imagery amount and vividness, rationality, and less internal dialogue than the corresponding baseline condition of sitting quietly with eyes closed.

(2) A condition, characterized by deep muscle relaxation and attention to ones breathing, is associated with significantly greater altered awareness, inward and absorbed attention, and imagery vividness, but lesser alertness (arousal), ego (self) awareness, body integrity, control, affect, imagery, rationality, and internal dialogue than the baseline condition.

Hypothesis 4A: A baseline condition, characterized by certain patterns or relationships amongst the dimensions of consciousness that compose it, is associated with the same patterns when this baseline session is repeated under identical conditions.

Hypothesis 4B: Conversely, conditions, characterized to produce alterations in phenomenological consciousness from the baseline period, are associated with patterns of subjective experience significantly different in organization from that of the baseline condition.

Hypothesis 5: There will be much individual differences amongst the Ss for intensity of phenomenological experience for the various dimensions of consciousness, and the intensities of these experiences will be associated with certain personality traits.

(1) Specifically, the trait of absorption (increased absorption) will correlate positively with altered awareness; inward and absorbed attention; loss of body integrity, self awareness, and control; and decreases in rationality.

(2) Extraversion (greater extraversion) will correlate positively with an outward, distractible attention; little experience of imagery; yet a great deal of control, body integrity, and self awareness.

METHOD

Subjects, Experimenter, and Experimental Setting

Two hundred and seventy Ss took part in the first of two sessions of an experiment entitled "You and Your Mind". All Ss were introductory psychology students recruited according to the Human Subjects Pool procedures and they were given credits towards their final grade for participation. Twenty-one Ss either failed to return for the second session or had incomplete data. Two hundred and forty-nine Ss made up the final data pool. Of these, one hundred and seventy-nine were females, and seventy, males. Their mean age was 18.6 years.

The experimenter was the author, a fourth year graduate student, who knew of the experimental hypotheses.

All Ss were run from 6 to 8 PM in October of 1979 in a classroom containing 65 regular classroom seats. These seats were arranged in nine rows, approximately seven seats to a row. All seats faced towards the front of the room. Besides the seats, the room contained a large desk, at the front of the room, a door, seven large windows, and a blackboard, also at the front of the room. The blackboard was blank except for information on the study that the Ss needed in order to complete the consent forms.

Materials

The Phenomenology of Consciousness Questionnaire (PCQ)

Construction of the questionnaire

A questionnaire, used to assess the S's phenomenological experience, was constructed. The author first determined the dimensions or content areas of subjective, conscious experience upon which consciousness might vary. Based upon Battista's (1978) eight elements of phenomenological experience, Tart's (1972, 1977) eleven subsystems of consciousness, Ludwig's (1972) and Krippner's (1972) altered states of consciousness, Silverman's (1968) dimensions of attention, and the author's own knowledge of the phenomenology and psychology of consciousness, possible content areas of conscious experience were enumerated, differentiated, and integrated.

The following dimensions of consciousness were thought relatively distinct, yet comprehensive enough, to map the nature of subjective experience: ego awareness, body integrity, state of awareness, arousal, attention, control or volition, time, perception, affect or emotion, imagery, cognition, rationality, meaning and paranormal experience, and a general information category.

Items dealing with consciousness, according to the above content areas, were then constructed. These items were patterned after the Post-Session Questionnaire (PSQ) developed by Osis, et. al. (1973) to assess the phenomenological

experience of meditation. The items were bipolar, each consisting of extreme statements between which lay a seven-point Likert scale. They were randomly arranged to produce an initial questionnaire, called the Phenomenology of Consciousness Questionnaire (PCQ), consisting of sixty items. Several pilot studies were completed on this initial questionnaire before it reached its final format.

First pilot study

During the first pilot study, the PCQ was given to a group of about twenty Ss and these Ss were queried about the way they completed the PCQ and were asked to give suggestions to improve the questionnaire. Based on their feedback, many of the items were modified to make them more understandable and the questionnaire was expanded to seventy items to more adequately tap all possible dimensions of consciousness.

Second pilot study

A second pilot study was then done on about fifteen Ss. After this second pilot study it was decided that the Ss needed some initial practice in learning how to introspect (since that's what the completion of the PCQ entailed). The first two pilot studies did not tell the Ss what to expect while they sat quietly. Several Ss feared the E would not return or got mad at not being told exactly what was happening. Both pilot studies gave no initial practice at introspecting. Because of the above and the inconsistent

responses some of the Ss seemed to be giving, a third pilot study was run which instituted a short practice period at the beginning of the experiment.

Third pilot study

For this pilot study the Ss sat for one minute with their eyes closed and then completed a short ten-item questionnaire just like the seventy-item PCQ. This gave them practice at what they were expected to do, seemed to alleviate alot of their anxiety, and did not seem to affect or bias the subsequent sitting quietly period.

In order to assess how accurate and consistent the Ss were at completing the PCQ, five items of the PCQ (those dealing with awareness, attention, affect, internal cognitions, and imagery) were duplicated with synonyms substituted for a few of the words in each of the items. Thus there were two sets of items with nearly identical wording. Five items of the previous seventy-item questionnaire were eliminated. One of the items of each of the five pairs was randomly placed near the beginning of the questionnaire and the second item of each pair, near the end. These items would allow for a check of the reliability and accuracy of the Ss at completing the questionnaire.

Twenty-seven Ss were run through this pilot study using the modified PCQ. Reliabilities were computed between the five pairs of items, summing across two periods of sitting quietly and one period of relaxation/meditation that

each S experienced. Reliabilities, as computed by the Pearson product moment correlation, were: .47, .62, .68, .83, and .87, which were deemed quite satisfactory except for the pair with the correlation of .47. Inspection of this pair revealed it was diffuse and vague and so another pair of items was substituted to replace it.

Since a relaxation/meditation condition was run along with the two sitting quietly conditions, analysis of the data revealed that many of the items differentiated significantly between the two conditions of sitting quietly and relaxation/meditation. This pilot study indicated that Ss could be consistent at introspecting while also revealing that their subjective experience was different in these two differing conditions.

Fourth pilot study

A fourth pilot study was run. The Ss experienced three conditions during this pilot study: eyes opened, sitting quietly, a condition in which the Ss read mildly arousing erotica, and the relaxation/meditation condition. The results indicated that most Ss could become somewhat sexually aroused to the mildly erotic material and yet no one objected to this material.

Development of the final questionnaire

A cluster analysis of the items of the 70-item PCQ for the third pilot study was undertaken to determine the

final composition of the questionnaire. Certain items were a priori hypothesized to load highest on a particular dimension or content area, and a multiple groups oblique cluster analysis using Hunter's PACKAGE (Hunter, Note 2) was employed to determine those items that did in fact have their highest loadings in a given content area. Items that loaded higher on a different cluster from what they were assigned, were eliminated and reassigned to the cluster on which they loaded higher, or were put in a residual cluster. Reclustering then occurred until the items making up the final clusters all had their highest cluster loadings on their assigned cluster.

Based on the initial a priori categories that were hypothesized to accurately map the phenomenology of consciousness, and the previous multiple groups cluster analysis to purify those clusters of nonhomogeneous items, the PCQ in its final form consisted of sixty items, drawn from fifteen different content areas or dimensions. The content areas and the number of items in each content area were the following: (1) state of awareness (3 items); (2) time (3 items); (3) body image (or integrity) (3 items); (4) attention (6 items, 2 each for direction, absorption, and selectivity); (5) control (or volition) (5 items, three for attention and two for volition); (6) ego (or self) awareness (3 for awareness and 3 for integrity); (7) perception (3 items); (8) affect (7 items, 4 for positive and 3 for

negative affect); (9) imagery (4 items, 2 for amount and 2 for vividness); (10) internal dialogue (3 items); (11) rationality (3 items); (12) memory (2 items); (13) meaning (3 items); (14) alertness (or arousal) (4 items); and (15) other (6 items).

These were the items used in the final form of the PCQ. Two forms, labeled Form 0 and Form 2, were constructed. Both forms had the same items, although the items were arranged differently, by random selection, in each form. (See Appendix A, p. 158.) These final forms also included the five pair of duplicate items previously mentioned.

Differential Personality Questionnaire (DPQ)

In order to determine and assess for possible individual personality differences, a portion of the Differential Personality Questionnaire (DPQ) (Tellegan, Note 3) was used. The DPQ is a 300-item personality inventory developed to possess a discriminant multidimensional structure. The DPQ scales represent a number of distinct and major personality dimensions that include the traits of introversion/extraversion, absorption, and other dimensions represented by the taxanomies of Eysenck, Cattell, and Guilford.

For the purpose of this study only four of the scales of the DPQ were used, these being: social closeness, social potency, impulsiveness, and absorption. All have coefficient alphas of between .86 and .89 and adequate

test-retest reliabilities. The scales of social closeness, social potency, and impulsiveness were collapsed to produce a scale that tapped introversion/entraversion (Eysenck, 1953), while the absorption scale tapped "openness to absorbing and self-altering experiences" (Tellegan and Atkinson, 1974). These four scales were combined into a personality questionnaire consisting of one hundred and six items. (See Appendix B, p. 170.)

Other Materials

The progressive relaxation/meditation instructions consisted of standard progressive relaxation instructions to which a short four minute meditational interlude had been added. This short interlude, enacted after the progressive relaxation instructions, consisted of having the Ss become aware of their breathing while they let themselves become more and more relaxed with each breath that they took. During this four minute period the experimenter did not talk and at the end of that time, the Ss were told to open their eyes. (See Appendix C, p. 178.)

The mildly erotic material which the Ss read consisted of a short passage of about 1000 words that took the average reader about four minutes to read. The passage was a slightly modified version of an exerpt from a short story called "The Veiled Woman" which was taken from Delta of Venus, Erotica by Anasis Nin (1977). (See Appendix D, p. 183.)

Two debriefing questionnaires were completed by each S at the end of each session. These questionnaires asked the Ss to summarize their subjective experience during each of the conditions. (See Appendix E, p. 186.)

A Consent Form, which explained the S's rights, was completed by each S at the beginning of each session. (See Appendix F, p. 188.)

A state of Consciousness Instruction Sheet was used to acquaint the Ss with the nature of their task (See Appendix G, p. 189.) and a Practice Questionnaire was used by the Ss in the beginning of the first session to acquaint them with the task of introspection. (See Appendix H, p. 190.)

Procedure

Ss were run in groups of about 30 to 40 Ss per group. At the beginning of the session the E greeted the Ss and told them the following:

> In this study I am interested in learning about your stream of consciousness, your subjective experience of yourself and the world around you. During this study I will be asking you to engage in different short activities and then will ask you to write about your experience.
>
> I will ask about the sensations, perceptions, emotions, thoughts, images, and awareness levels that you experience during these short time intervals. In order for you to have some idea of what you will be asked about, I want to pass out a sheet of instructions that will tell you what you will be asked to do.

The E then passed out the State of Consciousness Instruction Sheet and read it to the Ss. The E asked if there were any questions and then said the following:

> Now that you know a little about the study I'd like you to complete this consent form which is the department consent form for everyone participating in research.

The E passed out the consent form. After the Ss had completed it, the E said the following:

> Before we begin I'd like you to practice a little so you have an idea of what I will be asking you to do. So for the next minute I'd like you to sit quietly with your eyes closed and think about anything you like. Then after the minute is over I'll ask you to open your eyes and write about your experience. Any questions? O.K. Please close your eyes and think about whatever you like. In a minute I'll tell you to open your eyes.

After the minute was over the E had the Ss open their eyes and they then completed the Practice Questionnaire. This questionnaire consisted of ten dipole items, with three item pairs of approximately similar content. The E then reviewed the practice questionnaire with the Ss and called their attention to the three item pairs, telling them that by comparing their responses to the three item pairs, they could determine how consistent they were at completing the questionnaire. The E then said the following:

> For this experiment I'll be asking you to introspect into your experience, just like you did with this short questionnaire. Since introspection is not something you normally do, it may be difficult. Please take your time and try to be as consistent as you can when asked to do this

> again. For those of you who were very consistent on the practice questionnaire, please try to continue to do so, and for those of you who were not very consistent, please take your time and try to do your best. Any questions?

After this the E said the following:

> O.K. For the next few minutes I'd like you to sit quietly and think about whatever you like. However, I'd like you not to read, write, talk, or close your eyes, and this includes putting your head down on the desk, like this. (E mimics the behavior.) I'Il be sitting outside the room during this time and after it passes, I'll be back in and ask you to write about your experience just like you did for the practice session. Any questions?

The E repeated the instructions and left the room. After four minutes the E returned and had the Ss complete the PCQ, form 0, in reference to the four minute period during which the E was outside the room. After the Ss were finished and the questionnaire and answer sheets were collected, the E said the following:

> During the next part of the experiment I have some reading material I would like you to read. I'm going to pass out the material and I'd like you to read it over, but please do not start to read it until I tell you to do so.

The E passed out the material face down so the Ss could not see the material. The E then said:

> In a moment I want you to turn over the material and start reading. When you are done, please turn the material over like it is now, so I know you have finished reading it. Are there any questions? O.K. Please begin reading the material.

The E left the room. After four minutes, he returned and had the Ss stop reading. The PCQ, form 2, was passed out and the Ss were told to complete it in reference to the

period of time in which they sat reading the erotic material. After completing this they were given the personality questionnaire, the DPQ, to complete. When finished, they completed a short debriefing form and were told to return in a week at the same time and place to take part in an experiment called "Relaxation and You".

At the beginning of the second session, the Ss again completed the consent form. They were then given the same identical instructions as they received for the first half of the first session, i.e. they were told to sit quietly and not read, write, talk, or close their eyes. The E left the room and after four minutes, returned. He gave the Ss the PCQ, form 0 to complete, telling the Ss to complete it reference to the period of time during which they were sitting quietly.

After completing and collecting all questionnaires, the Ss experienced the relaxation/meditation condition. It began with the E telling the Ss that he would like to teach them progressive relaxation. The E asked if anyone had heard of this method before and then said the following:

> Progressive relaxation is a procedure by which you learn to relax deeply and fully. It is done by having you tense and then relax deeply and fully each of your different muscle groups of the body. During the next few minutes I would like to run through this procedure with you. The actual instructions for the procedure will be read to you by me. But before you actually experience it, I would like to run through the different muscle groups of the body with you to give you some idea of what to expect.

The E turned off the lights in the back of the room but left on the lights in the front of the room. He then had the Ss tense and relax the muscles of their fists, arms, face, neck, shoulders, back, chest, abdomen, thighs, and feet. He then said the following:

> Since you will be asked to close your eyes at the beginning of the relaxation instructions, if anyone is wearing contacts and cannot keep them in for approximately twenty minutes, you'd probably be best to take them out. Does anyone have to do this?
>
> I will now go through each of the different muscle groups of the body with you. After you have relaxed all the muscles of your body, I will stop talking for a few minutes and you will be able to practice relaxing on your own. I will then start talking and ask you to open your eyes. Do you have any questions?

The E then read the progressive relaxation instructions to the Ss, and paused for four minutes near the end, during which time the Ss were to relax on their own while being aware of their breathing. After this was over, the E had the Ss complete the PCQ, form 2, in reference to the time period in which they sat quietly, relaxing to their breathing.

After the Ss had completed the PCQ, they were given a short debriefing form to complete that asked them about their subjective experience. The Ss were thanked for their participation, the general nature of the study was explained to them, and their phone number was taken if they wanted to be notified as to their results. They were also given their extra credit points for participation in the study.

RESULTS

Reliability and Accuracy of Introspection

Hypothesis #1 suggested that consciousness can be reliably and accurately assessed via nomothetically-procured, self-report data. The reliability results supported this hypothesis.

Pearson r product-moment correlations were computed for the five pairs of duplicate items for each condition. (See Table 2, page 113.) Correlations ranged from a low of .39 to a high of .84. The average correlation across all five item pairs for the two baseline conditions was .70, and across all four conditions, .65. Only one of the item pairs had items that were exactly the same (internal dialogue) and here correlations averaged .76. These reliability results, although not extremely high, suggest that Ss can be reliable at retrospective introspection, especially when assessed in reference to items of exactly the same content.

The accuracy of the S's responses was also assessed. By taking the absolute difference between the S's responses to the two items of each duplicate pair, one has a measure of how accurate the Ss were at retrospection, at least as measured by these five item pairs. Table 3 (page 114) lists the percentages of Ss having a given deviation score for each of the item pairs when collapsing across all four

conditions. Whereas a deviation score of zero indicates a direct hit, a deviation score of three or more indicates an inaccurate response, since the S missed checking the same space for both items by three or more units. (The maximum deviation score possible was 6 for the 7-point Likert scale.)

Fifty-two percent of all responses were direct hits, 81% of all responses were within one unit and only 10% of the responses were off by three or more units. The average deviation score across all item pairs was less than one unit ($\bar{X}$=.84).

By averaging the five item pairs for each S in each condition, one has a measure of how accurate each S was at retrospecting in that condition. As before, a zero score represents perfect accuracy, while a deviation score of 3, a chance response. Over all four conditions, the mean deviation score was .46. Fifty-nine percent of all Ss were within one half of a unit deviation, 95% were within one and one half unit deviations, and only 5 out of 996 cases, or approximately .5%, averaged a score of around chance. (See Table 4, page 115.)

These and the previous results strongly suggest that Ss can be both consistent and accurate when retrospecting, at least as assessed by the five item pairs of the PCQ.

The Possible Dimensions of Consciousness

Initial a priori cluster analysis

In order to determine the possible structures or

dimensions of consciousness, the 60 item PCQ was submitted to an oblique multiple groups cluster analysis, based on the a priori analysis previously discussed in the methods section. Cluster analysis is a synthesis of the theories of factor analysis and reliability, and is the "most appropriate technique in almost every substantive area in which construct validity and error of measurement are primary considerations" (Hunter, Note 2, p.1). As an efficient way to do multitrait, multimethod analysis, it is "the preferred form of factor analysis in almost all situations" (Hunter, Note 2, p.1).

Since the number of clusters and the composition of the clusters was specified in advance, an oblique multiple groups cluster analysis was eminently suitable for confirming or disproving the parameters of this model, while factor analysis was not. For these reasons the cluster analysis method was used, instead of factor analysis, although exploratory factor analysis was used afterwards to double check on the results of the cluster analysis.

To do the cluster analysis Hunter's PACKAGE program (Hunter and Cohen, Note 4) was utilized. This program enacted an oblique multiple groups analysis on the matrix of correlations between each pair of items on the questionnaire. It allowed for an estimation of the cluster score or the "trait" associated with a given group of items and the correlations between the traits.

Communalities were used in the diagonals of the correlation matrix. The use of communalities corrected for attenuation and eliminated the effects of error measurement for the estimated correlations between the items and the clusters. The resulting cluster loadings and the correlations between the items of the questionnaire and the clusters were then based on the cluster "true" scores, or the underlying traits or dimensions of consciousness that the questionnaire purports to measure, instead of merely the correlations between the items and the observed cluster scores.

An oblique multiple groups analysis with communalities was executed, using the 15 a priori dimensions of consciousness that formed the final categories of the PCQ. As mentioned, these were the dimensions of consciousness arrived at by inductive reasoning and checked for homogeneity of content by a cluster analysis on the data of the third pilot study. These a priori dimensions included: body integrity, state of awareness, attention, control, self awareness, time, perception, positive and negative affect, imagery, alertness, memory, meaning, internal dialogue, and rationality.

This analysis was done for the data of the PCQ for the first baseline condition using all 270 Ss. It was also completed for the first baseline condition for only those Ss whom data was available for all four conditions (N=249).

Since there were negligible differences between the results, the results reported for this and all subsequent cluster analyses were based on the data from Ss who experienced all four conditions.

Tables 5 and 6 (pages 116-117) list the coefficient alphas (a measure of internal consistency or reliability) for each of the hypothesized dimensions and the individual item's cluster loading for that dimension (using form O of the PCQ). The analyses indicated that most of the dimensions were fairly reliable, but contained items that were heterogenous and loaded higher on a dimension other than that assigned to them. Because of this, each cluster was tested for unidimensionality, the extent to which the items of which it was composed "share a common core - the attribute which is to be measured" (Nunnally, 1978).

Confirmatory cluster analysis

This was done by an analysis of the items of each cluster for (1) homogeneity of content, the extent to which the items of a given cluster had the same meaning; (2) internal consistency, the degree to which the cluster loadings of the items within each cluster had the same general pattern, and (3) parallelism, or external consistency, the extent to which items within each cluster paralleled, in terms of cluster loadings, the items outside that particular cluster (Hunter, Note 2).

Those items that loaded higher on a dimension other

than their assigned dimension were visually checked to see if they did not meet the above three criteria. If so, they were put in a residual cluster, and the remaining items of that cluster were reclustered with another multiple groups analysis. If coefficient alpha increased for the reclustered cluster, this was evidence that the deleted item(s) was heterogeneous and the new cluster, more homogeneous in content. Almost invariably, this is what happened.

In some cases, a given cluster was found to be composed of two smaller clusters. Such was the case for the imagery cluster, which was composed of an imagery vividness and an imagery amount cluster. In these cases, the two smaller clusters were analyzed separately, yet were also subsets of a larger cluster than was also analyzed.

Similarly, since several of the resulting clusters or dimensions of consciousness were highly correlated with one another, those clusters correlating highly were also combined with each other to see if the resulting supracluster was internally consistent, i.e. had an equal or higher coefficient alpha. This resulted in several clusters being subclusters of more general and inclusive clusters or dimensions of consciousness.

Thus the initial model of fifteen dimensions of consciousness was

> modified by rearranging and deleting items and repeating the process (of multiple groups cluster analysis) until a set of unidimensional scales (were) obtained (Hunter and Gerbing, 1979, p.8).

As a check on this process, the resulting coefficient alphas had to be equal or higher, for the resulting clusters to be considered valid and homogeneous.[2]

Final cluster analysis

This process of confirmatory cluster analysis (Hunter, Note 2) resulted in ten major clusters or dimensions of consciousness. Of these ten, four clusters were composed of two or more subclusters. Of the fifteen previously hypothesized dimensions of consciousness, only the rationality dimension failed to find empirical support as a cluster or subcluster of phenomenological experience, and was dropped from all subsequent analyses.

Table 7 (page 118) lists the resulting dimensions of consciousness, their corresponding subdimensions, the number of items in each (sub)dimension, and their coefficient alphas. Nine major dimensions had coefficient alphas of .61 or above, for an average alpha of .76. These included: internal dialogue, awareness, imagery, positive affect, control, altered experience, attention, negative affect,

---

[2]This was true for all the resulting clusters and supraclusters except one. The attention cluster had a coefficient alpha (.72) less than one of its subclusters, direction of attention (.76). Since this seemed to be the result of a much lower alpha for the absorption subcluster (.58), both subclusters were still combined, especially since the correlation between subclusters was very high (r=.63) and both clusters had similar content.

and memory. Only one major dimension, alertness, had an alpha below .60 (alpha=.50). Table 8 (page 119) lists the item number (based on form 0 of the PCQ) belonging to each dimension and its corresponding cluster loading.

Check on the a priori approach: exploratory factor analysis

As a check upon the above dimensions, that were arrived at by a basically a priori approach, and confirmed by confirmatory cluster analysis, an exploratory factor analysis was also performed on the data. The exploratory factor analysis consisted of a principal components factor analysis that was followed by Varimax rotations. Orthogonal factors were extracted for factors with eigenvalues of greater than one. The last Varimax rotation was then subject to a cluster analysis, with "each cluster consisting of the set of variables which have their largest factor loading on a given Varimax factor" (Hunter, Note 2, p.1-2). Although this type of analysis tends to blur the distinctions between clusters arrived at via the multiple groups cluster analysis approach, it "will usually find those dimensions which are completely outside the investigator's frame of reference" (Hunter and Gerbing, 1979, p.35).

This exploratory factor analysis was done on all the items of the PCQ for the first baseline condition and is shown in Table 9 (page 120). Nine factors were generated, accounting for 44% of the variance. Based on the content of

the items in each of these factors, the nine factors were the following: altered experience, awareness, imagery, attention/memory, negative affect, alertness, positive affect, control, and internal dialogue. Except for the collapsing of the attention and memory clusters, the clusters arrived at by this blind empirical approach mirror the clusters arrived at by the a priori approach. This suggests that there are probably no other dimensions of consciousness tapped by the PCQ besides those previously enumerated.

The Stability of the Dimensions of Consciousness

The a priori cluster analytic approach

Hypothesis #2 suggested that consciousness would be characterized by specific dimensions of consciousness that were stable over time. To check this hypothesis, the 39 items of the PCQ that made up the ten dimensions of consciousness in the final cluster analysis of the first baseline condition, were subjected to an oblique multiple groups analysis for each of the three subsequent conditions: the second baseline condition, the reading erotica condition, and the relaxation/meditation condition.

Coefficient alphas for each of the ten dimensions of consciousness and their subdimensions were computed for each of the conditions. Table 10 (page 122) lists these coefficients and their averages. It was hypothesized that the stable dimensions would include: body integrity, time, state of awareness, attention, control, self awareness,

perception, positive and negative affect, imagery, internal dialogue, rationality, memory, meaning, and alertness. This was supported for all of the above, except rationality, which, as mentioned, failed to qualify as a legitimate dimension (or subdimension) of consciousness.

Although two dimensions or subdimensions had average alphas of below .55, indicating some lack of internal consistency or stability, all of the major dimensions except alertness and negative affect had coefficient alphas of .64 or higher. Coefficient alphas for six of the ten dimensions averaged .75 or higher and nine of the ten (except for alertness) had an overall mean alpha of .74. Internal dialogue, imagery, and awareness were found to be most stable and internally consistent; followed by positive affect, control, altered experience, and attention. Memory and negative affect were moderately reliable and consistent, and only alertness had an average reliability of below .50.

Coefficient alphas for the dimensions and subdimensions of consciousness for the second baseline condition tended to be slightly higher than those in the first baseline condition. Although the alphas in the erotica and relaxation conditions tended to be lower than the baseline conditions, the drop across these two sets of conditions was only slight, i.e. about six hundreds of a point.

Cluster loadings for each item of its given dimension across all four conditions also indicated the relative

stability and consistency of these dimensions. As Table 11 (page 123) shows, almost all of the items making up a given dimension continued to load highest on its assigned dimension, even though the loadings tended to be a little lower in the erotica and relaxation conditions.

Exploratory factor analytic approach

The previous results were also supported by exploratory factor analyses. Principal component analyses using the 39 items of the ten dimensions of consciousness, followed by Varimax rotations, were done for each of the four conditions and are listed in Tables 12 through 15 (pages 125-128). Although the items tended to cluster together somewhat differently in each of these four conditions, especially the erotica and relaxation conditions, most of the time, those items making up a given cluster were located in empirically-derived clusters composed of the items of the a priori clusters to which they belonged.

All the previous results tend to strongly support the conclusion that the ten major dimensions of consciousness, as mapped by the PCQ, with the possible exception of alertness, are dimensions or structures of phenomenological experience that tend to be relatively stable and coherent structures in several differing conditions. These a priori dimensions, and their subdimensions, were the dimensions used in all subsequent analyses.

Interdimensional correlation matrices for the different conditions

Because cluster analysis does not force orthogonality like factor analysis does (Levine, Note 5), the resulting dimensions of consciousness, corrected for attenuation, represent the dimensions of consciousness thought to underlie the nature of phenomenological consciousness as mapped by the PCQ. The correlations between these dimensions, then represent the degree of relationship between the different dimensions of consciousness.

Tables 16 through 19 (pages 129-130) list the interdimensional correlation matrices, corrected for attenuation. for each of the four conditions. A perusal of these tables indicates the relationships between the various dimensions of consciousness and the extent to which the baseline conditions are more similar to each other than they are to the two treatment (erotica and relaxation) conditions. (Statistical tests to evaluate the degree of similarity/dissimilarity between the patterns of correlations between the different conditions will be presented later.)

An Analysis of Subjective Experience in Identical Conditions

Computation of cluster or dimension intensity scores

By having the Ss enact the same behavior, i.e. sitting quietly with eyes opened, in an identical stimulus environment on two different occasions, it was thought possible to determine the extent to which their subjective

experiences would be the same or similar. To determine this, cluster or dimension scores were computed for each S in each condition for each of the dimensions and subdimensions of consciousness arrived at by the previous analyses. Scores for each dimension and subdimension for each S were computed by averaging the S's responses to those items that made up a particular dimension, as per the recommendations of Hunter and Gerbing (1979).

Since each item consisted of dipoles separated by a 7-point Likert scale, a S received a score of 0 to 6 per item depending on the nature of his response to that item. A zero score always represented a response that was nonaltered and thought to be common with eyes opened, while a 6 score indicated great alteration in normal experience or unusual experience. By averaging the S's responses to items of a particular dimension, one has a score that indicates his level of response in reference to that dimension. As an example, the internal dialogue dimension was made up of two items, #24 and #64. A S's internal dialogue score was simply the average of the two responses to these items, and could range from a zero score, indicating a great deal of verbal thought, to a score of six, which indicated little or no internal dialogue.

Test-retest reliability

Scores of each S were computed for all ten dimensions and their subdimensions in each of the four conditions. By

comparing each S's dimension score across the two baseline conditions, by means of the Pearson r correlation coefficient, one has a measure of the test-retest reliabilities for each of the dimensions of consciousness. Table 20 (page 131) lists these reliabilities for the two baseline conditions and also compares reliabilities between the first baseline condition and the erotica condition, both experienced during the first experimental session, and the second baseline condition and the relaxation condition, both experienced during the second experimental session.

Test-retest reliabilities between the two baseline conditions ranged from .56 for altered experience to .16 for alertness. Except for alertness, all reliabilities for the major dimensions of consciousness for the two baseline conditions were .34 or higher. In comparing the reliabilities between the two baseline conditions against those between the two conditions experienced the same session (first baseline and erotica conditions, and second baseline and relaxation conditions), reliabilities for all but two major dimensions (alertness and negative affect) were higher in the baseline conditions than the others.

Because of the much lower test-retest reliability for alertness as compared to the other dimensions, its consistently lower coefficient alphas across all conditions, and possible differences in meaning between its two items, it, as a dimension of consciousness, was dropped from

subsequent analyses. This left nine dimensions of consciousness, with their corresponding subdimensions, and these were the dimensions used in all the following analyses.

Dimensional intensity differences between the baseline conditions

Hypothesis #3 suggested that there would be no intensity differences for the hypothesized dimensions of consciousness between the two baseline conditions.

Paired t-tests were computed between the two baseline conditions for the nine dimensions of consciousness and their subdimensions. Table 21 (page 132) lists the computed means and standard deviations for the dimensions of consciousness across the two baseline conditions, along with corresponding differences scores, t-values, and omega squared, the concept denoting the percentage of variance accounted for by the differences in treatment conditions.

Significant, and unexpected, differences were found for the dimensions of awareness, imagery, positive affect, and altered experience, and their subdimensions. A mean omega squared of about 4% indicated that these were very small effects. Figure 1 (page 133) gives a graph of the nature of the subjective experience across all dimensions and subdimensions of consciousness for the two baseline conditions.

All the significant differences were in the direction of lesser alteration in awareness or experience and less imagery, vivid imagery, and positive affect, in the second,

as opposed to the first, baseline condition. In collapsing across both baseline conditions, the average phenomenological experience associated with this condition can be characterized by the following intensity parameters:

> a moderate predominance of internal dialogue; a moderate amount of vivid, visual imagery; a perception of having a good deal of control over ones thought processes; an attention span midway between distracted and absorbed that is attentive to both inner and outer events equally; little negative affect and some positive affect; a relatively intact memory; mild alterations in ones state of consciousness; mild loss of self-awareness; a slight alteration in perception and meaning or significance; and mild distortions in time and body image.

Dimensional Intensity Differences Across Treatment and Baseline Conditions

The erotica and first baseline conditions compared

Hypothesis #3 suggested that the erotica condition would be characterized by intensities of subjective experience different from that of the baseline condition for specific dimensions of consciousness.

Paired t-tests were computed between the first baseline condition and the erotica condition, testing for significant differences between the means. The results are shown in Table 22 (page 134). As hypothesized, the erotica condition was associated with greater imagery vividness and more imagery, more absorbed attention, more positive affect, and lesser internal dialogue than the baseline condition, but was associated with less control, instead of more, as

hypothesized. (See Figure 2 (page 135).)

It was also associated with significantly greater inward attention and a slight loss in self-awareness over the baseline condition. Omega squared ranged to a high of .4 for internal dialogue and averaged about .11, which are considered moderate treatment effects. There were no significant alterations in state of awareness, altered experience, and negative affect or memory, over the baseline condition.

The nature of this condition can be characterized by the following average phenomenological intensities:

> a small amount of internal dialogue; a lot of imagery that tends to be fairly vivid; moderate perceived control over ones stream of thought; moderate inward, absorbed focusing of attention; very little negative affect and a moderate amount of positive affect; a relatively good memory; mild alteration in ones state of awareness; mild loss of self-awareness; a slight alteration in perception and memory; and mild distortions in time and body image.

The relaxation and second baseline conditions compared

It was also hypothesized that the relaxation/meditation condition would be associated with greater alteration in state of awareness, more inward and absorbed attention, and more vivid imagery; but less self-awareness and body integrity, less imagery and internal dialogue, and less affect that the baseline condition.

Paired t-tests were computed between the relaxation

condition and the second baseline condition. All comparisons between all dimensions and subdimensions were significant, as Table 23 (page 136) shows. As hypothesized, all comparisons between conditions were in the expected direction except for imagery vividness (imagery in the relaxation condition was less vivid than that of baseline). (See Figure 3 (page 137).)

One of the most amazing outcomes of these comparisons concerned the huge values of omega squared obtained. Omega squared ranged from a high of .67 for the state of awareness subdimension to a low of .02 for positive affect, and averaged a huge 28% across all dimensions and subdimensions of consciousness.

The phenomenological nature of the relaxation/meditation condition, averaged across all Ss, can be characterized by the following:

> only a modest amount of internal dialogue; a small amount of imagery that is not very vivid; little control over ones stream of consciousness; attention that is very much inwardly-directed and concentrated; very little negative affect and little positive affect; strong decrements in memory; a very strong perception of being in an altered state of awareness; moderate alterations in meaning and perception; fairly strong alterations in the perception of time; and a very noticeable loss of body image.

The erotica and relaxation conditions compared

In order to determine if the two treatment conditions may have been significantly different from the baseline conditions, yet similar to each other on many of the

dimensions of consciousness, paired t-tests were also computed comparing the dimension means between the relaxation and the erotica conditions. As Table 24 (page 138) indicates, all comparisons were extremely significant. Omega squared ranged from one percent to 56% and averaged 26.5% across all dimensions, indicating very large treatment effects between conditions. Figure 4 (page 139) compares the intensity means of all nine dimensions of consciousness across all four conditions.

Euclidean distances between conditions

Another means of assessing the intensity differences between the conditions is to compute the Euclidean distance, in 9-space (based on the nine dimensions of consciousness), between the four conditions, as if each condition is associated with a particular location in this hyperspace. This was done by computing the square root of the sum of the squared differences between the means of each of the dimensions of the two conditions being compared, according to the formula:

$$Z=((X_1-Y_1)^2+(X_2-Y_2)^2+ \ . \ . \ . \ +(X_9-Y_9)^2)^{\frac{1}{2}}$$

where Z is equal to the Euclidean distance in 9-space, X_1 through X_9, the means of the dimensions of consciousness in one condition, and Y_1 through Y_9, the means of the dimensions of consciousness in the other condition. As Table 25 (page 140) demonstrates, the relaxation condition was the most different from the others, followed by the

erotica condition, while the two baseline conditions were the most similar.

Pattern Differences Between the Conditions

Comparisons between the baseline conditions

Hypothesis #4 suggested that there would be no differences in the patterns between the dimensions of consciousness for the two baseline conditions. This hypothesis was supported.

Correlational matrices were computed between the nine dimensions of consciousness for the two baseline conditions. These, and all subsequent correlational matrices, were not corrected for attenuation, since such correction may have lead to possible violations of statistical assumptions (Levine, Note 5). (The subdimensions of consciousness were not included since they were subsumed under the more inclusive major dimensions.)

Tables 26 and 27 (page 141) show the correlations between the dimensions, and Table 28 (page 142), the matrix expressing the differences between the correlational matrices. Since the correlational matrices represent the pattern of relationships between the two baseline conditions, the difference matrix represents differences in patterns between the dimensions. Of the 36 difference correlations, only four were significant, and only at the .05 level. This suggests only small differences, if any, between the patterns of dimensions in the two baseline conditions.

In order to arrive at a more precise test for differences between the patterns of consciousness for the two conditions, the Box (1950) test was used. The Box test is a multivariate analog of Bartlett's test of the homogeneity of variance for a univariate case (Winer, 1971). It is a statistical procedure to test the hypothesis that two covariance matrices are random samples from a population whose covariance matrices are the same.

By converting the above correlational matrices into covariance matrices, one has a statistical procedure to determine if the two correlational matrices are random samples from the same population, i.e. are not significantly different from each other.

To do this the determinants of the covariance matrices were computed for each condition and the $\log_e$ of the determinants calculated. The $\log_e$ of the determinants of the covariance matrices was then subtracted from the $\log_e$ of the determinant of the pooled covariance matrix (Winer, 1971) to arrive at M_i, i.e. $M_i = N\ln(S_{pooled}) - \Sigma n_i \ln(S_i)$. Since the X^2 statistic is equal to $(1-C_i)M_i$ (where C_i is an algorithm that is a function of the number of groups and measures), it is "approximated by a Chi-square distribution having f_i degrees of freedom" (Winer, 1971).

The use of these formulas allowed one to determine if the covariance matrices were significantly different from each other. This would then allow one to infer if the

patterns of correlations between the different dimensions of consciousness between the two conditions were significantly different.[3] Table 29 (page 143) lists the covariance matrices for the two baseline conditions, and Table 30 (page 144), X^2 comparisons between the different conditions. As can be seen from the table, the logs of the determinants of the two baseline conditions were very similar, i.e. 4.0 as compared to 4.13. These values yielded a X^2 value of

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[3]The Box test was devised for two independent groups for which there were repeated measures on a given factor. Although the covariance matrices used herein are from correlational matrices from Ss on two different days, the Ss from which the matrices were computed are the same. Thus the two groups are not independent of each other. Using the Box test in this situation then means, that if significant differences between the matrices are found, the results are truly significant, for differences found between conditions which are somewhat correlated are statistically harder to find than between conditions assumed to be independent. However, if significant differences between matrices are not found, this does not mean that the matrices are not significantly different, but only that they may not be (Schmitt, Note 6). They may still be significantly different, although the greater the significance value, i.e. greater than .05, the less chance there is that the matrices are significantly different. Also, by comparing omega squared between matrices found to be different from those not found different, one has a means of evaluating for similarity or differences between the matrices. (The author knows of no test like the Box test devised specifically for repeated measures, and thus the Box test was used as the next best statistical procedure.)

37.1 with 45 degrees of freedom. This was not significant and had a corresponding omega squared of zero.

These statistical results strongly suggest that the patterns of the correlations between the dimensions of consciousness in the two baseline conditions were very similar to each other.

Comparisons between the treatment and baseline conditions

In contrast to the lack of significant differences between the two baseline conditions, hypothesis #4 suggested that there would be significant pattern differences between the baseline conditions and the other two conditions, i.e. the erotica and relaxation conditions.

The correlational matrices indicating the patterns amongst the nine dimensions of consciousness for the erotica and relaxation conditions are shown in Tables 31 and 32 (page 145), respectively. Table 33 (page 146) shows the differences matrix between the erotica condition and the first baseline condition, and Table 34 (page 146), the differences matrix between the relaxation condition and the second baseline condition.

Whereas the differences correlation matrix between the two baseline conditions had only five correlations significantly different at only the .05 level, the correlation matrix between the erotica and the first baseline condition had fourteen significant difference correlations, nine of

which were significant at least at the .001 level. The differences correlation matrix between the relaxation and second baseline condition had 15 out of 36 correlations that were significantly different at least at the .001 level and 6 others significant at .05 or .01.

These results strongly suggest that the patterns between the dimensions of consciousness in the erotica and relaxation conditions were much different from their corresponding baseline conditions, and much more different than the baseline conditions were from each other.

To further substantiate this, the correlational matrices of the erotica and relaxation conditions were converted to covariance matrices (See Table 29 (page 143).) and these covariance matrices were compared to their corresponding baseline covariance matrices, testing for significant differences in pattern between the dimensions of consciousness via the Box test. (See Table 30 (page 144).)

The comparison between the first baseline condition and the erotica condition yielded a X^2 of 146.4 with 45 df, significant at less than .000. Ten percent of the variance between conditions was attributable to the differences in treatment effects between these conditions. In comparing the relaxation and second baseline conditions, a X^2 of 355.7 with 45 df was found. With a significance level of less than .000, omega squared was 37%, indicating huge treatment effect differences between conditions.

To test the question of whether the erotica and relaxation conditions, although significantly different from baseline, were yet similar to each other, the Box test was also performed, comparing their covariance matrices to each other. A X^2 of 313 with 45 df, significant at .000 and accounting for 33% of the variance was found.

These results indicated very significant pattern differences between the erotica and relaxation conditions and their respective baselines, and also significant pattern differences between the erotica and relaxation conditions. Comparatively, the two baseline conditions were very similar in pattern, the erotica and first baseline conditions were moderately different, and the relaxation and baseline conditions and the erotica and relaxation conditions, hugely different in structure.

Individual, Personality, and Sex Differences

Individual differences

Hypothesis #5 suggested that there would be large individual differences across Ss for the various dimensions of consciousness. This was supported.

The graphs of Figure 5 (pages 147-150) illustrate the large variances and the skewed distributions for the dimensions and subdimensions of consciousness across each of the four conditions. Individuals do differ greatly in response to their phenomenological experience of consciousness.

Personality differences

It was also hypothesized that individual differences in response to the intensity of subjective experience for specific dimensions of consciousness would correlate with the personality traits of absorption and extraversion.

Specifically, absorption (increased absorption) was hypothesized to correlate positively with alteration in awareness, increased and absorbed attention, and losses in body integrity, self awareness, and control. Table 35 (page 151) lists the correlations between absorption and each of the dimensions and subdimensions of consciousness across each of the four conditions.

Of the hypothesized correlations, only awareness, and its subdimension, state of awareness, showed positive correlations across three of the four conditions, and these correlations were small, i.e. .15 to .21. This suggests that ones states of awareness in a given situation may be a function of that person's ability to enter into "absorbed" engagement with the environment or himself, although only a small portion of the variance is accountable by such a trait.

Significant, but low, correlations were also found for all the altered experience subdimensions in the first baseline condition and the relaxation condition, but not the other two conditions. No other consistent correlations were found.

It was also hypothesized that increased extraversion would positively correlate with an outward, distractible attention; little experience of vivid imagery; control; and an intact body integrity and self awareness. As Table 36 (page 152) indicates, none of these hypotheses held up consistently across two or more of the four conditions.

Sex differences

In order to determine if there might be sex differences, t-tests (for independent groups) were computed for all the dimensions and subdimensions of consciousness across all four conditions for males and females and are shown in Tables 37 through 40 (pages 153-156). Only with the perception subdimension of altered experience were significant differences between males and females found for three of the four conditions.

Sex differences were also assessed for the absorption and extraversion personality dimensions for each of the four conditions. (See Table 41 (page 157).) Although the males were slightly more extraverted than the females, all other comparisons were nonsignificant.

DISCUSSION

Retrospective Introspection

Any methodology attempting to map phenomenological experience must be found reliable and accurate. The reliability results obtained from the five item pairs demonstrated that Ss can be fairly reliable at retrospection. An average Pearson r of .65 across all five pairs, although at the lower criterion level for adequate reliability, was felt sufficient, especially since only one of the pairs was identical (and this pair averaged a Pearson r of .76). The other measure of reliability used in the study, coefficient alpha, averaged .74 for the nine major dimensions of consciousness, and five of these dimensions were composed of only two or three items. This showed that Ss were fairly consistent at responding to the items within each dimension in the same general way.

The accuracy results, as measured by the deviation scores, also demonstrated that most Ss were accurate at responding to the item pairs. Eighty-one percent of all responses were direct hits or within one unit of a direct hit (on a 7-point scale) and Ss averaged a deviation score of only .46 across all five item pairs for a given condition (in which zero indicated perfect accuracy, and three, complete randomness).

These results strongly suggest that Ss can be accurate

and consistent at retrospection into their subjective experience, provided it follows upon the period to be assessed and that period is of relatively short duration. The extent to which these reliabilities may increase with trained observers or decrease if done in response to a longer period of subjective experience, can only be determined accurately with future research. Nevertheless, the reliabilities found in this study and the very significant results obtained, strongly indicate that retrospection of ones subjective experience, via a questionnaire using ratings, may be an effective technique at mapping phenomenological experience.

Reactive effects of introspection

The debriefing questionnaires administered at the end of each session also indicated that this retrospection did not seem to be very reactive. Even though the Ss thought they would have to retrospect upon the assessment period, no S indicated that this knowledge interferred with their experience of the assessment period. Nevertheless, Ss were sensitized to the fact that they would be involved in introspection into their stream of consciousness and such self-observation may have altered the nature of their subjective experience more than if they had not been sensitized to it. If so, one might hypothesize that such sensitization would lead to greater alteration in experience than might otherwise have been the case.

The dimensional intensity results for the first baseline condition did indicate mild alterations in self awareness, state of awareness, imagery, time, body image, and perception and meaning. Moreso, several Ss reported great alterations in the above dimensions for the first baseline condition. These results agree with the findings of Hunt and Chefurka (1976) who found that merely having Ss sit immobily for ten minutes, while they observed their subjective experience, led to greater anomalous subjective experiences to the extent to which they were "sensitized" to that experience. Although Hunt and Chefurka did not take their Ss through a second identical session, to see if their results would replicate, the present study did.

The second baseline condition found significantly less alterations in awareness, imagery, and experience than the first condition, although there were several Ss who still reported great alterations in these dimensions. These results suggest, that for most Ss, it may not be sensitization to subjective experience but the novelty of the situation, or both, that led to alterations in awareness, imagery, and experience. More research is needed to determine the proportion of variance attributable to both.

Mapping the Dimensions of Consciousness

The items of the PCQ were based on an exhaustive search of the literature for possible dimensions of consciousness that could be operationalized via a questionnaire.

Nevertheless, there were only 60 items, and these 60 items could not possibly tap all the nuances of subjective experience. Thus the nine major dimensions of consciousness, and their subdimensions, as arrived at by this study, are not the only dimensions of consciousness, but rather possible dimensions of consciousness and dimensions found reliable for the items of this questionnaire.

Since, when using factor or cluster analysis, one only receives what one gives, a different questionnaire could well have come up with different dimensions of consciousness, especially if items of different content were used. Although the nine dimensions of consciousness found reliable in this study were arrived at and replicated by both an a priori and an empirical approach, this is not to say that another experimenter might have come up with similar, but not identical, dimensions, given the same data.

The criteria for the admission of any particular dimension was unidimensionality, i.e. the extent to which the items of a particular cluster shared a common core - "the attribute which is to be measured" (Nunnally, 1978, p.274). This was operationalized by making sure that the items composing a given cluster had homogeneity of content, internal consistency, and parallelism (Hunter and Gerbing, 1979), and was checked by making sure that the measure of internal consistency (coefficient alpha) for a given dimension, increased with a deletion or admission of additional

items. Although this procedure allowed the items of a given dimension to be unidimensional, several dimensions were nevertheless collapsed because of very high correlations between the dimensions and a common meaning, to arrive at major dimensions of consciousness, which, except for one case, had higher coefficient alphas than their subdimensions. The previous strongly suggests that although the dimensions arrived at by this study were not absolute, they were dimensions that seemed to fit best with both the a priori and empirical analyses.

Regardless of the final dimensions used, as long as these are the same dimensions assessed across all the conditions, the conditions can be compared amongst themselves, as to changes in phenomenological intensity and patterning. Since the major question that this experiment hoped to answer was not "What are the fundamental dimensions of consciousness?", but rather "Can the concept of 'state of consciousness' be operationalized?", and "Are the parameters of such states different in differing conditions?", the nonabsolute nature of the dimensions is not critical.

Dimension stability

To operationalize the 'state of consciousness' concept, the dimensions of consciousness utilized would have to be stable and reliable. The nine major dimensions that made up the final model were dimensions that were fairly stable and reasonably consistent across a variety of

conditions. The stability of these dimensions is even more striking considering the huge individual differences that were reported across Ss. This can only mean that regardless of whether the Ss expressed having very vivid imagery or none at all; or had huge alterations in awareness or very little; the constructs being measured by these items seem to be relatively stable structures of phenomenological experience.

These results are supportive of Tart's (1975, 1977) theorizing on the nature of consciousness. In his "systems approach" he suggests that consciousness is composed of certain structures that are dynamic and interacting structures whose stability is necessary for these structures to be arranged in configurations necessary for the organism to function properly. Consciousness, as phenomenologically assessed, does appear to be composed of such structures. Although several of the major dimensions of consciousness used in this study do not correspond with the dimensions hypothesized by Tart, this was more a function of being unable to operationalize such psychological systems as subconsciousness, or input processing, via a self-report questionnaire, than their nonexistence as psychological structures.

Individual differences

Contrary to Tart's (1975, 1977) belief that the mapping of consciousness must first be done on an individual

basis first, before being done across groups of people, the stability of the dimensions of consciousness across great individual differences, along with the results of intensity and pattern similarities and differences in similar and dissimilar conditions, strongly suggests that consciousness can be mapped nomothetically, i.e. across groups of people.

Individuals can vary greatly in terms of the intensity of their phenomenological experience and "state of consciousness" and yet comparisons can be made across individuals as to the reliability, stability, and nature of phenomenological experience and state of consciousness in different conditions. Just as individual differences do not preclude research in personality, or psychophysiology, it need not impede phenomenological research on the nature of consciousness.

Quantifying a "state of consciousness"

Since the dimensions were relatively stable, cluster or dimension scores were computed for each condition for each S. The dimension scores allowed for the dimensions of consciousness to be quantified as to intensity; whereas the correlation coefficients amongst the dimensions allowed for quantification of the relationships of patterning amongst the dimensions. These two parameters were then eminently suitable for quantifying the "state of consciousness" that was associated with a particular set of stimulus

conditions via a phenomenological perspective.

Thus this research has shown that phenomenological consciousness can be empirically quantified and that an average "state of consciousness" for a group of Ss, can be defined and hence "recognized if it occurs again" in terms of the mean cluster or dimension scores and their correlations amongst each other.

Test-retest reliabilities for the dimensions

For the nine major dimensions of consciousness, test-retest reliabilities for the two baseline conditions, ranged from a high of .56 to a low of .34, and averaged .43. This indicates that ones subjective experience varies a great deal, even when experiencing the same stimulus conditions, although a possible novelty effect for the first baseline condition may have reduced these correlations somewhat. Even with slightly higher correlations, however, these results suggest that replication of the stimulus environment and specific instructions, does not dictate that the intensity of ones subjective experience will be identical in identical stimulus environments.

Skinner (1957, 1974) and Rachlin (1974) notwithstanding, an understanding of mental events is not superfluous, and an understanding of only environmental variables cannot lead to an accurate prediction of behavior, at least the motor behavior associated with the covert events tapped by the PCQ. But this, of course, is consistent with common

sense. The same environmental variables can generate different subjective experiences in the same individual, that does not seem predictable from environmental variables alone.

Although the test-retest reliabilities were not as high as one would expect in assessing traits like extraversion or absorption, nevertheless, one would not expect the reliabilities to be this high, since, in the present situation, states and not traits were being assessed. When considering this, an average correlation of .43 is still impressive, especially since the correlations between the baseline conditions and the erotica and relaxation conditions, averaged, .26 and .18, respectively.

The Baseline Conditions and "States" of Consciousness

Several of the dimensions of consciousness were found to consistently vary within the two baseline conditions, with the second baseline condition having less alterations of consciousness and experience and less imagery and positive affect. Although unexpected, these differences are explainable in terms of the first session involving a novelty effect, or the second, a practice or boredom effect, as suggested earlier in this discussion.

This interpretation is supported by the Ss's responses to the debriefing form at the end of the session. Many Ss indicated that they were more bored and less enthusiastic during the seoond baseline condition than the first.

Future research is needed to determine if these differences were due to such an effect, or were caused by other means.

"States" of consciousness

Although there were mild intensity changes for several of the dimensions of consciousness in the baseline conditions, the patterns between these dimensions, as measured by the correlation coefficients, remained very, very similar in the two conditions. This is strong support for the conclusion that the subjective experience of consciousness in these two identical conditions, is characterized by similar patterns of subjective experience, in spite of the above intensity differences.

The intensity results preclude any final decision as to whether the two baseline conditions were associated with an identical "state" of consciousness. But the intensity and patterning differences between the two baseline conditions, were, relatively speaking, very much less than the huge intensity and patterning effects found between the baseline and treatment conditions.

This, in turn, allows one to talk about this particular stimulus condition as being associated with a state of consciousness having similar intensity and pattern quantifiers when repeated. It suggests that a particular state of consciousness may be replicated, given the requisite stimulus conditions, at least as concerns the "average" state across a group of individuals. This finding is

crucial, since only if a particular stimulus condition, when repeated, is associated with identical or similar phenomenological parameters, can elusive states of consciousness be tied to observable, environmental and organismic stimuli.

The results that the two baseline conditions were associated with very similar states of consciousness, also suggests the use of eyes opened sitting quietly as an ideal baseline condition. Such a condition allows for a lot of individual variation and is based on the unstructured ongoing stream of thought advocated by Singer (1978) as the baseline from which to compare altered states.

The Treatment Conditions and Differing States of Consciousness

Both the erotica and relaxation/meditation conditions were found to be characterized by changes in intensity from the baseline conditions for certain of the dimensions of consciousness. These hypothesized changes were based on a priori reasoning and previous research done during the pilot studies. The fact that, by and large, these changes did occur, suggests that the questionnaire has construct validity, i.e. it appears to be able to validly discriminate between conditions according to certain constructs or dimensions of consciousness hypothesized to be different in these conditions.

Differing states of consciousness

Besides the predicted changes in intensity between the baseline and treatment conditions, there were also very significant differences in pattern between dimensions for the erotica and relaxation conditions from that of baseline and also each other. The relaxation condition was also found to be much more different from baseline than the erotica condition, based on omega squared. The states of consciousness associated with the erotica and relaxation conditions can be characterized as states of consciousness different from that of baseline qualitatively and quantitatively, i.e. differences in pattern and intensities.

The phenomenological experience associated with both experimental conditions does not, however, fit the definition of altered or alternate states of consciousness as espoused by Krippner (1972), Ludwig (1972), or Tart (1972, 1975, 1977). These authors defined an altered state as a state characterized as being subjectivity and radically different from ones ordinary or normal state of consciousness.

Of all the dimensions and subdimensions of consciousness, that dimension that was the most significantly different between the relaxation and the baseline condition, i.e. evinced the greatest proportion of variance attributable to the treatment differences between conditions, was the state of awareness subdimension. Here omega squared was a huge

67%. No significant differences were found between the first baseline and erotica conditions for this subdimension. The two baseline conditions, however, did have significant differences in intensity for this subdimension, for omega squared equalled 6%. There were no significant pattern differences in phenomenological state, as measured by the Box test, between these conditions.

Relaxation/meditation as an "altered" state of consciousness

The previous results suggest that the relaxation condition, but not the erotica or baseline conditions, can be characterized as being associated with an altered state of consciousness if one uses the two criteria hypothesized by Tart (1977) to differentiate altered states of consciousness from other states, i.e. (1) changes in patterning among the structures of consciousness, and (2) the subjective sense of (being in) an altered state (SSAS).

The relaxation/meditation condition was associated with not only a significant pattern change between the dimensions of consciousness, but a very significant perceived alteration of consciousness. The erotica condition, on the other hand, was associated with patterning changes, but no SSAS, whereas the first baseline condition, in comparison to the second, was associated with a mild SSAS but no patterning differences.

The relaxation/meditation condition, but not the others

as being associated with an altered state of consciousness, is also consistent with common sense. Although the relaxation condition would be looked upon as fostering significant alterations in consciousness, neither the erotica nor the baseline conditions would.

Remarks on altered states of consciousness

The use of the PCQ and its method of administration thus gives the researcher a means to operationalize the concept of "altered states of consciousness" that is in accordance with common sense and theoretical conceptualizations. This then allows for a vehicle by which to compare the state of consciousness produced by such means as hypnosis, biofeedback, meditation, etc. to determine the extent to which these procedures do indeed produce such phenomena as a "trance state" (Weitzenhoffer, 1978) or an "alpha high" (Kamiya, 1972) that are significantly different from that of states of consciousness not associated with such induction procedures.

The use of Tart's formulation does not, however, mean that differing states of consciousness are characterized mainly by changes in patterning and that changes in intensities for the dimensions of consciousness are not important. Since it cannot be determined if the changes in patterning between the experimental and baseline conditions were a function of changes in intensities, vice versa, or neither, the extent to which states of consciousness are

characterized by changes in patterning as opposed to changes in intensity of subjective experience, is moot. This controversy must wait for future research to be fully explored.

However, it may be that patterning generally determines the state of consciousness, and intensity values, the "depth" or intensity of the state. But since patterning and intensity do not appear to be uncorrelated, the relationships between them and corresponding states of awareness, are probably much more complex.

Reading erotica as an "identity" state of consciousness

If the relaxation/meditation condition is associated with phenomenological experience that can be labeled an altered state of consciousness, the phenomenological experience associated with the second baseline condition may be characterized as a less intense but similar state of consciousness as the first baseline condition, and the subjective experience of the erotica condition can be labeled an "identity" state of consciousness.

An identity state of consciousness is Tart's (1975, 1977) term for a specialized version of an ordinary state of consciousness that has an overall pattern of functioning that distinguishes it from other identity states. It is composed of psychological structures that possess unique properties not present in other identity states, but it is not perceived as a radically different state of consciousness

subjectively.

The structure of phenomenological experience during the erotica condition was much different from the baseline state, but there was no significant differences in SSAS, subjective sense of altered state. This would tend to implicate the subjective experience associated with the erotica condition with what Tart has labeled as an identity state, since the overall pattern of phenomenological experience is different from that of baseline, yet the person does not experience himself in an altered state of consciousness.

Further remarks

The previous methodology strongly suggests that "states" of consciousness are phenomena that can be empirically assessed via a phenomenological approach, although the replicability of altered states in identical stimulus conditions has yet to be ascertained. The extent to which such differing states are a function of qualitative or quantitative differences and are discrete, to use Tart's (1975) terminology, or continuous, has yet to be decided, although the initial results suggest that both quantitative changes in the intensities of subjective experience, and qualitative changes amongst the dimensions of that experience, are both involved.

The previous discussed results can be seen in opposition to the conclusions of Hunt and Chefurka (1976). They

concluded that "there is no such thing as 'altered states of consciousness'" (p.876) since consciousness is made up of "microgenetically early stages of normal functioning" (p.876) that is normally masked by the intentional nature of consciousness. They based their conclusions on the finding that introspective sensitization leads to alterations in awareness.

However, just because introspective sensitization can lead to altered states, does not mean that altered states are just a function of introspective sensitization, for the converse of a true statement is not necessarily true. The fact that the relaxation/meditation condition was associated with huge intensity and pattern differences over the baseline conditions, may be traced, not only to introspective sensitization, but to several possibilities which may include the effects of deep muscle relaxation, a restriction and absorption of attention during the meditational interlude, sensory isolation, and/or demand characteristics.

Although more in-depth research is needed to determine the extent to which each of these variables was operating, the present research does not support Hunt and Chefurka's conclusion that there are no "altered states" of consciousness. The results obtained suggest that the dimensions of phenomenal experience in these conditions were organized in significantly different ways that do not seem to be the mere operation of microgenetically prior modes of

consciousness, but seemed to be related to specific manipulations, i.e. reading erotica, relaxation and absorption in ones breathing, that did much more than just sensitize the S to his immediate subjective experience.

The success of the PCQ at mapping phenomenological experience and differentiating that experience in terms of intensity and pattern changes in reference to specific stimulus conditions, also strongly implies that other (yet to be developed) phenomenological questionnaires may be equally effective at mapping different or more specific nuances of subjective experience. That is, provided, of course, such questionnaires employ duplicate and similar items to tap the particular aspects of subjective experience to be monitored; and are utilized in a retrospective procedure similar to that delineated here.

The fact that such a procedure allows phenomenological consciousness to be quantified does not, however, justify the indiscriminant construction of such questionnaires, nor their indiscriminant use, for much research yet needs to be done to replicate and support the results reported here, and determine the generalizability of such a procedure with Ss besides college students, conditions besides relaxation and reading, etc.

Another word of caution is also in order. Not all Ss experienced the same intensities of subjective experience in each of the conditions, and the patterning of

of phenomenological experience was arrived at by correlation coefficients computed across all Ss. Although a given condition may be associated with a certain average phenomenological experience, there is yet much individual variation among Ss for a given condition, and one S's individual subjective experience may be extremely different from that of another. This is where individual and personality differences may express themselves.

Personality and Sex Differences

Only a few of the hypothesized correlations between the traits of absorption and extraversion and the dimensions of consciousness were found, and these were quite modest. The strongest and most consistent correlation was between the trait of absorption and the (altered) state of awareness subdimension of consciousness. It was hypothesized that absorption, defined as the "openness to absorbing and self-altering experiences" (Tellegan and Atkinson, 1974, p.268) would be related to the state of awareness subdimension of consciousness.

Just as Greenfield (Note 1) found that individuals who scored high on absorption, were found to experience greater alteration and change in consciousness during meditation, high absorption Ss were also found to experience greater alteration in SSAS as measured by the state of awareness subdimension of the PCQ. This suggests that Ss scoring high or low on the absorption scale may be

characterized as experiencing different intensities and possibly, states of consciousness, in differing conditions. The relatively low correlations, however, suggest that the extent of this relationship is very small.

All four subdimensions of the altered experience dimension also correlated positively with the absorption trait, but only during the first baseline and the relaxation conditions. These results may relate to the fact that both of these conditions were subjectively felt to produce more alteration in consciousness than the second baseline or the erotica conditions, and so were more likely to differentiate between persons having higher or lower absorption scores.

The low absorption correlations, the lack of more salient correlations, and few significant correlations between the trait of extraversion and the dimensions may relate to several reasons. There may have been a lack of correspondence between trait scores and covert behavior in the specific conditions, which is always a problem when using paper and pencil measures of traits or attitudes to determine actual behavior (McGuire, 1969). The trait measures may also have been tapping different constructs than what the dimensions of consciousness were. This seems to have been the case for the extraversion trait, which assessed, in contrast to the absorption trait, more behavioral, as opposed to, phenomenological experiences.

Another reason may have concerned the fact that a four minute period was too short of a time for trait characteristics to demonstrate themselves consistently. Finally, since only a few items made up most of the dimensions of consciousness, random error may have reduced differences that might have been (more) significant if more items per dimension had been used. (Adding more items to each of the dimensions of the PCQ should help to reduce the salience of this shortcoming.)

Most likely, however, the low and nonexistent correlations between the traits and the dimensions of consciousness may simply be related to the fact that these traits and dimensions are little correlated with each other, especially since correlating traits and states may not allow for high correlations to show themselves.

No sex differences were hypothesized and except for significant altered perception differences between males and females for three out of the four conditions, no consistent sex differences were found. These results suggest that sex does not appear to be a moderating variable for any of the dimensions of consciousness, with the possible exception of the subdimension perception.

Demand Characteristics

An issue that always arises, especially in this type of research, is the extent to which demand characteristics, subtle stimuli that give Ss information about how they are

to behave, are responsible for the results obtained (Orne, 1970). This is closely associated with experimenter expectancy effects, the situation in which the experimenter gets what he expects to find, by expecting to find it and conveying this, in covert ways, to the Ss.

Since the experimenter for this study was the author, who knew of the hypotheses, there were most likely some experimenter expectancy effects and subtle demand characteristics working. But the experiment was set up to offset these characteristics. During both baseline conditions the Ss were given a bare minimum of information, i.e. "sit quietly and think about whatever you like . . . " Any of the S's questions were answered as noncommittantly as possible in these and the other conditions.

If any of the hypotheses were nonverbally communicated to the Ss, the Ss may have had a hard time giving the E what he expected. This was because the instrument used to assess their subjective experience was a 60-item inventory. The number of items may have made it extremely hard for the Ss to remember exactly how they responded to the items of the same questionnaire (unless they actually compared items), let alone items from the different conditions, in order for them to skew their responses appropriately.

For example, if the Ss "perceived" that the E expected them to answer the PCQ exactly the same way for the two baseline conditions, it would be extremely hard, if not

impossible, for the Ss to remember how they responded to each of the items of the questionnaire a week earlier and answer appropriately. Since much of the data analysis involved comparisons between items and dimensions across conditions, such long-term retrospection would tend to preclude responses between conditions being based on demand characteristics.

Nevertheless, with a condition like relaxation/meditation, which is patently different from the baseline conditions, the Ss probably thought that the experimenter expected differences and could have skewed their responses accordingly. This is very possible and likely. However, the comparisons made concerning the relaxation condition involved different predictions for the different dimensions of consciousness, i.e. less imagery and internal dialogue, more altered awareness and distorted body image but less self awareness, etc. in comparison to the second baseline condition.

Thus instead of trying to guess which dimensions might be expected to be different, the Ss were probably more likely to complete the questionnaire based on their perception of what they experienced, although a general bias towards more unusual or different experiences from baseline could be expected for those dimensions in the relaxation and erotica conditions patently and obviously related to the dimensions such experiences would be expected to alter.

If the Ss were responding in terms of such demand

characteristics, a debriefing afterwards may be able to indicate the extent to which the Ss were trying to please the experimenter and the extent to which the experiences that the Ss had were due to the actual experimental procedures. The Ss were not briefed beforehand as to what the relaxation/meditation session would subjectively feel like. Since the relaxation instructions consisted of only standard progressive relaxation instructions, during which the muscles were tensed and relaxed, and a meditational interlude, during which the Ss were told to relax to their breathing, the Ss's written responses reflect only what they experienced, what they thought they experienced, and/or what they expected the experimenter wanted to hear.

The following verbatim responses were <u>typical</u> of the Ss who felt alterations and changes in their experience during the relaxation/meditation condition; a condition in which demand characteristics would be most prominent, due to the patently obvious nature of the relaxation instructions for suggesting a deeply relaxed and nontense state. (The numbers in parentheses refer to the month and day of the session.)

(10/8) No thoughts at all, I was very sleepy.

(10/8) It was like being in limbo . . . like floating . . . like being in the womb.

(10/9) I'm not sure what I was experiencing. I was extremely relaxed. . . . I felt like my mind and my body were separate.

(10/9) I felt really weird . . . like I was really out of it.

(10/10) I was totally gone . . . my mind would jump back into consciousness and I'd vaguely think what happened.

(10/10) At this time, I wasn't aware of my presence . . . I didn't know where I was when we were awakened . . . I was very relaxed and off in a dream world.

(10/11) I was extremely relaxed . . . like in the stage of limbo right before you fall asleep. I couldn't believe how relaxed I was.

(10/11) A state of suspended animation.

(10/22) Light-headedness, a floating sensation. . . No physical body, just as active mind.

(10/22) I loved it. I have never felt so totally relaxed.

(10/23) It was like being asleep. For a while there I lost all perception of where I was at or what I was doing.

(10/23) I was very relaxed and almost fell asleep. . . . In a dream-like state.

(10/24) I felt very elevated - kind of a natural high . . . My head frequently would droop toward my chest.

(10/24) It was really something . . . It was like my body and mind were completely separated.

(10/25) I was aware of a tingling throughout my body.

(10/25) That was very strange, because I didn't fall asleep, but I can hardly remember what I was thinking about . . . My thoughts were dream-like.

As the previous verbatim responses demonstrated, many Ss experienced phenomena which were not mentioned in the experimenter's introductory comments. Thus there were comments about dissociation, amnesia, tingling throughout the S's body, the head drooping towards the chest, etc. Such responses, common during the experience of a hypnotic trance state, would be highly unlikely for Ss, who were mostly college freshman and probably not familiar with the effects of hypnosis or deep muscle relaxation, to "think up" in order to please the experimenter. Mention of being confused and feeling very strange are also not comments that a S might make if trying to please the experimenter.

The extent to which the Ss's comments were based upon the physical sensations produced by the experimental procedures or were "contaminated" with the Ss's cognitive evaluation of the experience is impossible to determine from these data. But the previous data seemed to indicate that the Ss really and actually experienced what they wrote about. The subjective experiences did not seem contrived or written just to please the experimenter.

Rather, the comments of the Ss tended to indicate that the experiences they had were subjectively genuine, veridical, and, at times, confusing and strange. Regardless of the extent to which their expectations of relaxation may have added to their experience of relaxation, their

experiences were subjectively felt, per their comments, to be based upon their experience of relaxation and their evaluation of that experience, and did not seem to be written, to any great extent, to please the experimenter. Moreso, Ss who were little affected by the relaxation instructions, commented likewise, i.e. they wrote it was a bore, they were not relaxed, etc.

In summary, then, although more research is needed to tease out the extent of demand characteristics, the major experimental results do not seem to be the result of extensive demand characteristics.

Summary and Conclusions

The results of this study suggest that the following conclusions are warranted:

1. Phenomenological or subjective experience can be fairly accurately and reliably assessed via a self-report questionnaire. This is true if the questionnaire is given after the period of subjective experience to be assessed and is completed via retrospection in reference to that subjective experience. Ss can learn to do this with a minimum of practice.
2. Phenomenological consciousness, as mapped by the PCQ, can be characterized by the following dimensions (and subdimensions): internal dialogue; awareness (self awareness, state of awareness);

imagery (imagery amount, imagery vividness); positive affect; control or volition; altered experience (alterations in meaning, perception, time, and body integrity); attention (direction of attention, absorption); negative affect; and memory. These dimensions are not all the possible, nor the only, dimensions of consciousness, but those dimensions found to be reliably assessed and relatively stable in three differing types of conditions: sitting quietly with eyes opened, reading mildly arousing erotica, and relaxation/meditation.

3. In comparing the two conditions of sitting quietly with eyes opened (spaced one week apart), the nine major dimensions of consciousness have test-retest reliabilities ranging from a high of .56 to a low of .34, with an average reliability of .43. These figures indicate only a moderate test-retest reliability in identical conditions.
4. Although the baseline conditions were found to differ significantly in intensity for the dimensions of awareness, imagery, positive affect, and altered experience, the patterns or correlations amongst the dimensions were not significantly different (as measured by the Box test). This suggests that changes in intensity among several

dimensions of consciousness does not necessarily affect the patterning or correlations of these dimensions amongst themselves. These results also suggest that the "state of consciousness" concept may be operationalized by being based on the patterning of dimensions of consciousness with each other and the intensities of these dimensions.

5. The nature of conscious experience associated with sitting quietly with ones eyes opened may be labeled a state of consciousness that is associated with particular correlational parameters and intensities of phenomenological experience that are similarly reproduced, when the stimulus condition is repeated. Moreso, it may serve as an effective baseline condition from which to compare alterations in subjective experience associated with other conditions.
6. The condition of reading mildly arousing erotica was found to differ from the first baseline condition in terms of: increased and more vivid imagery, inward and absorbed attention, decreases in control and internal dialogue, and greater positive affect. The dimensions of consciousness in the erotica condition were also found to be characterized by a significantly different pattern of organization from that of the first baseline

condition. This, along with the fact that there was no subjective sense of being in an altered state, suggests that this state may be characterized as an "identity" state of consciousness.

7. The condition of relaxation/meditation was found to differ from the baseline condition in terms of all the dimensions of consciousness. It included decreases in internal dialogue, imagery, control, self awareness, positive and negative affect, and memory; and increases in inward, absorbed attention, sense of altered state, and increases in altered meaning, perception, time, and body integrity. It was also found to be characterized by very significant pattern differences from the baseline condition. The pattern differences and the huge differences for the state of awareness subdimension between this condition and baseline, suggest that the relaxation/meditation condition may be characterized as an "alternate" or "altered" state of consciousness.
8. Significant positive correlations found between the trait of absorption and the dimensions of altered state of awareness and altered experience suggest that this trait moderates the extent to which Ss will perceive an alteration in their awareness and phenomenological experience of themselves, but only slightly. No consistent

differences for extraversion or sex suggest that these variables do not moderate the nature of phenomenological experience.

9. The previous conclusions indicate that retrospective introspection may be an important methodological tool for empirically mapping and exploring the nature and structure of phenomenological consciousness during such subjective experiences as daydreaming, meditation, relaxation, hypnosis, guided imagery, drug intoxication, and any other conditions whose phenomenological parameters may be worth exploring.
10. Other phenomenological questionnaires, employing similar types of items, and utilized in a procedure similar to that described here, may be developed to map specific nuances of subjective experience not mapped by the PCQ. Such questionnaires may be found reliable and valid instruments for mapping such experience.
11. The study of the "black box" of the mind need not be ignored for it can yield intriguing and provocative, empirical data on the nature of consciousness. Such information may be useful for understanding, and possibly predicting, behavior that is correlated with such psychological systems as attention, imagery, emotion, memory, etc.

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APPENDIX OF TABLES

Table 2

Pearson r Correlations for the Five Reliability Pairs Across All Four Conditions

Item-pairs (and item #'s from Form 0)	Conditions					
	1st Base.	2nd Base.	1st & 2nd Base. Ave.	Erot.	Relx./ Med.	Ave.
1. State of Awareness (#17 & #57)	.47	.60	.54	.57	.60	.56
2. Direction of Attention (#18 & #65)	.61	.67	.64	.51	.39	.55
3. Positive Affect (Sex) (#22 & #72)	.79	.84	.82	.68	.66	.74
4. Imagery Amount (#23 & #63)	.64	.71	.68	.66	.61	.66
5. Internal Dialogue (#24 & #64)	.83	.83	.83	.69	.67	.76
Average	.67	.73	.70	.62	.59	.65

Note: All correlations are significant at $p < .0001$.

N = 996

Table 3

Percentage of Ss Having a Given Deviation Score for the Five Reliability Pairs Across All Four Conditions (N=996)

Deviation Amount	Reliability Pairs					
	State. Aware.	Dir. Att.	Imag. Amt.	Pos. Aff.	Int. Dial.	Ave.
Zero (0) Deviation	45%	47%	46%	67%	56%	52%
Within ±1 Unit Deviation	75%	81%	77%	88%	84%	81%
Within ±2 Unit Deviations	87%	91%	88%	94%	92%	90%
3 or More Unit Deviations	13%	9%	12%	6%	8%	10%
Mean Unit Deviation	1.02	.90	.98	.58	.74	.84
Standard Deviation	1.26	1.20	1.29	1.10	1.14	

Table 4

Percentage of Ss Having a Given Average Deviation Score Summed Across All Five Item Pairs for All Four Conditions

	Average Unit Deviations			
	0-.5	0-1.5	0-2.5	2.5 & up
%Ss	59%	95%	99.5%	0.5%

Note: N = 996

Table 5

Dimensions of Consciousness and Corresponding Alphas for the First Cluster Analysis on the First Baseline Condition

Dimensions	Coefficient Alphas
1. Body Integrity	.53
2. Time	.29
3. State of Awareness	.79
4. Attention	.70
5. Control (Volition)	.74
6. Ego (Self) Awareness	.71
7. Perception	.53
8. Positive Affect	.77
9. Negative Affect	.65
10. Imagery	.84
11. Internal Dialogue	.80
12. Rationality	.39
13. Memory	.61
14. Meaning	.63
15. Arousal (Alertness)	.47

Table 6

Dimensions of Consciousness and Corresponding Cluster Loadings for the First Cluster Analysis for the First Baseline Condition

Dimensions	Cluster Load.	Dimensions	Cluster Load.
1. Body Integrity		8. Positive Affect	
#15	.59*	#22	.81*
#29	.39*	#47	.65*
#54	.23	#62	.44
#55	.35	#72	.81*
#67	.61	9. Negative Affect	
2. Time		#31	.68*
#16	.37	#38	.78*
#53	.00	#69	.43*
#61	.87*	10. Imagery	
3. State of Awareness		#23	.73*
#17	.63	#36	.69*
#52	.85*	#46	.80*
#57	.77*	#63	.79*
4. Attention		11. Internal Dialogue	
#18	.62*	#24	.86*
#25	.28	#45	.51
#44	.43	#64	.94*
#51	.56*	12. Rationality	
#58	.64*	#26	.57*
#65	.67*	#43	.21
5. Control		#56	.35
#19	.60	#73	.39
#28	.53*	13. Memory	
#42	.76*	#27	.67*
#50	.72*	#41	.67*
6. Self (Ego) Awareness		14. Meaning	
#20	.46	#30	.66*
#40	.46*	#39	.49
#49	.82*	#68	.68*
#60	.74*	15. Alertness	
7. Perception		#32	.69*
#21	.52*	#37	.47*
#48	.38	#70	.30
#66	.69*		

Note: An asterisk (*) means the item (#) loaded highest on its assigned dimension.

Table 7

Dimensions of Consciousness and Corresponding Alphas for the Final Cluster Analysis on the First Baseline Condition

Dimensions	Number of Items	Coefficient Alphas
1. Internal Dialogue	(2)	.91
2. Awareness	(4)	.86
a. Self Awareness	(2)	.81
b. State of Awareness	(2)	.79
3. Imagery	(4)	.84
a. Imagery Amount	(2)	.78
b. Imagery Vividness	(2)	.77
4. Positive Affect	(3)	.77
5. Control (Volition)	(4)	.74
6. Altered Experience	(9)	.73
a. Meaning	(3)	.63
b. Perception	(2)	.54
c. Time	(2)	.53
d. Body Integrity	(2)	.49
7. Attention	(4)	.72
a. Dir. of Attention	(2)	.76
b. Absorption	(2)	.58
8. Negative Affect	(3)	.65
9. Memory	(2)	.61
10. Alertness (Arousal)	(2)	.50
Average coefficient alpha for all ten major dimensions		.73
Average coefficient alpha for nine major dimensions (excluding alertness)		.76

Table 8

Dimensions of Consciousness and Corresponding Cluster Loadings for the Final Cluster Analysis for the First Baseline Condition

Dimensions	Cluster Load.	Dimensions	Cluster Load.
1. Altered Experience		a. Self Awareness	
#30	.50	#49	.83
#39	.49	#60	.83
#68	.54	b. State of Awareness	
#21	.55	#17	.63
#66	.41	#52	.85
#16	.48	#57	.77
#61	.47	4. Imagery	
#15	.45	#23	.73
#29	.44	#63	.79
a. Body Integrity		#36	.69
#15	.59	#46	.80
#29	.59	a. Imagery Vividness	
b. Time		#36	.80
#16	.62	#46	.80
#61	.62	b. Imagery Amount	
c. Perception		#23	.81
#21	.62	#63	.81
#66	.62	5. Control (Volition)	
d. Meaning		#19	.60
#30	.66	#28	.53
#39	.49	#42	.76
#68	.68	#50	.72
2. Attention		6. Internal Dialogue	
#18	.68	#24	.92
#65	.72	#64	.92
#51	.49	7. Positive Affect	
#58	.60	#22	.81
a. Dir. of Attention		#47	.65
#18	.79	#62	.44
#65	.79	#72	.81
b. Absorption		8. Negative Affect	
#51	.65	#31	.68
#58	.65	#38	.78
3. Awareness		#69	.43
#49	.71	9. Memory	
#60	.60	#27	.60
#17	.52	#41	.60
#52	.82	10. Alertness	
#57	.75	#32	.67
		#37	.67

Note: Item numbers (#'s) are from Form O of the PCQ.

Table 9

Exploratory Factor Analysis for the First Baseline Condition Across All Items

Item Number	Content	Factor Load.	Cluster Load.
Factor 1. Altered Experience (alpha=.80; Variance=7%)			
#30	religious, spiritual experience	.55	.51
#55	change in body perspective	.52	.48
#67	dizzy and disoriented	.51	.56
#70	strange and dream-like state	.50	.67
#68	sacredness or deep meaning	.49	.53
#56	ineffability	.47	.47
#66	objects in world change	.44	.43
#39	profound and enlightening ideas	.44	.43
#61	change in perception of time	.43	.50
#48	change in perception of space	.39	.48
#15	body expanded into world	.39	.42
#21	extraordinary sensory changes	.37	.44
#29	separation between self/environ.	.35	.38
#73	transcendence of opposites	.35	.38
#33	fantastic thoughts and images	.29	.29
#74	questionnaire easy to complete	.24	.25
Factor 2. Awareness (alpha=.80; Variance=7%)			
#60	self-awareness	.73	.71
#49	conscious and aware of self	.72	.77
#52	certain of unus. state of conscio.	.67	.76
#57	unusual state of consciousness	.60	.71
#54	aware of body sensations	.54	.54
#17	nonordinary state of awareness	.47	.48
#40	aware of ego and personality	.36	.34
#53	change in passage of time	.34	.31
Factor 3. Imagery (alpha=.80; Variance=7%)			
#23	amount of imagery	.73	.77
#63	amount of imagery	.72	.81
#46	vividness of imagery	.70	.75
#36	distinctness of imagery	.67	.70
#45	imagery versus thought	.55	.56
#34	mind and extent of thoughts	-.42	.38
#25	attention to field of conscious.	.24	.25

Table 9 (cont'd.)

Item Number	Content	Factor Load.	Cluster Load.
Factor			
4. Attention/Memory (alpha=.76; Variance=5%)			
#44	focus of attention	.70	.65
#43	thoughts: logical or illogical	-.68	.58
#51	distraction/absorption	.50	.55
#58	involved/detached in experience	.46	.57
#65	attention's direction	.46	.42
#27	remembering experience	-.44	.52
#19	control over attention	-.36	.36
#41	memory	-.36	.47
#26	understanding experience	-.34	.46
5. Negative Affect (alpha=.70; Variance=4%)			
#38	feelings of irritation	.69	.77
#31	anger	.62	.60
#71	pleasure/unpleasure	.58	.62
#69	shame and guilt	.54	.48
#59	peacefulness/excitement	.44	.38
6. Alertness (Arousal) (alpha=.57; Variance=3%)			
#32	awareness intensity	.55	.73
#37	perceptual sensitivity/intensity	.53	.43
#18	direction of attention	.49	.44
#29	alertness/drowsiness	.43	.42
7. Positive Affect (alpha=.75; Variance=4%)			
#22	sexual feelings	.82	.79
#72	sexual feelings	.81	.77
#47	feelings of love	.56	.68
#62	feelings of joy and bliss	.34	.46
#35	suggestibility	.34	.37
8. Control (Volition) (alpha=.56; Variance=3%)			
#42	control	.56	.73
#28	actively involved/letting go	.50	.61
#50	control of thoughts and images	.47	.66
#16	sense of time	-.41	.06
9. Internal Dialogue (alpha=.91; Variance=4%)			
#24	silently talking to oneself	.89	.92
#64	silently talking to oneself	.89	.92

Table 10

Dimensions of Consciousness and Corresponding Alphas for Each of the Four Conditions

Dimensions	Conditions				
	1st Base.	2nd Base.	Erot.	Relx.	Ave.
1. Internal Dialogue	.91	.90	.81	.80	.86
2. Awareness	.86	.86	.81	.75	.82
a. Self Awareness	.81	.81	.68	.56	.76
b. State of Awareness	.79	.83	.80	.77	.80
3. Imagery	.84	.85	.86	.79	.84
a. Imagery Amount	.78	.83	.80	.76	.79
b. Imagery Vividness	.77	.84	.76	.73	.78
4. Positive Affect	.77	.81	.80	.74	.78
5. Control (Volition)	.74	.86	.67	.72	.75
6. Altered Experience	.73	.80	.76	.72	.78
a. Meaning	.63	.68	.66	.73	.68
b. Perception	.54	.45	.37	.54	.48
c. Time	.53	.73	.61	.61	.62
d. Body Integrity	.49	.66	.45	.64	.56
7. Attention	.72	.80	.64	.57	.68
a. Dir. of Attention	.76	.81	.68	.56	.70
b. Absorption	.58	.69	.36	.43	.52
8. Negative Affect	.65	.62	.50	.46	.56
9. Memory	.61	.57	.64	.75	.64
10. Alertness (Arousal)	.50	.47	.40	.49	.47
Average (across all ten dimensions)	.73	.75	.69	.68	.72
Average (for nine dimensions exc. alertness)	.76	.79	.72	.70	.74

Table 11

Dimensions of Consciousness and Corresponding Cluster Loadings Across All Four Conditions

Dimensions (item #'s from Form 0)	Cluster Loadings 1st Base.	2nd Base.	Erot.	Relx.
1. Internal Dialogue				
#24	.92*	.91*	.84*	.82*
#64	.92*	.91*	.84*	.82*
2. Awareness				
#49	.71*	.75*	.69*	.73*
#60	.60*	.69*	.59	.37
#17	.52*	.65	.81*	.76*
#52	.82*	.83*	.71*	.63*
#57	.75*	.79*	.62*	.60*
a. Self Awareness				
#49	.83*	.83*	.76*	.74*
#60	.83*	.83*	.76*	.74*
b. State of Awareness				
#17	.63*	.72	.88*	.90*
#52	.85*	.82*	.74*	.63*
#57	.77*	.84*	.64*	.65*
3. Imagery				
#23	.73*	.74*	.82*	.66*
#63	.79*	.78*	.77*	.75*
#36	.69*	.75*	.75*	.63*
#46	.80*	.79*	.76*	.75*
a. Imagery Amount				
#23	.81*	.85*	.82*	.79*
#63	.81*	.85*	.82*	.79*
b. Imagery Vividness				
#36	.80*	.86*	.79*	.77*
#46	.80*	.86*	.79*	.77*
4. Positive Affect				
#22	.81*	.81*	.84*	.81*
#47	.65*	.58*	.63*	.65*
#62	.44*	.59*	.69*	.40
#72	.81*	.90*	.68*	.75*
5. Control (Volition)				
#19	.60*	.76*	.39	.71*
#28	.53*	.79*	.74*	.61*
#42	.76*	.87*	.57	.54*
#50	.72*	.72*	.64*	.67*

Note: An asterisk (*) means the item loaded highest on its assigned dimension.

Table 11 (cont'd.)

Dimensions	1st Base.	2nd Base.	Erot.	Relx.
6. Altered Experience				
#30	.50*	.52	.50	.58*
#39	.49*	.50*	.60	.52*
#68	.54*	.61*	.55	.59*
#21	.55*	.62*	.56	.43
#66	.41*	.38	.47	.49*
#16	.48*	.60*	.43	.44*
#61	.47	.50*	.57	.36
#15	.45*	.70*	.52	.51*
#29	.44*	.58	.69*	.35
a. Meaning				
#30	.66*	.62*	.59	.66*
#39	.49*	.62*	.60	.60*
#68	.68*	.71*	.69*	.80*
b. Perception				
#21	.62*	.56	.50	.62*
#66	.62*	.56	.50*	.62*
c. Time				
#16	.62*	.77*	.68*	.68*
#61	.62*	.77*	.68*	.68*
d. Body Integrity				
#15	.59*	.71*	.56	.70*
#29	.59*	.71*	.56*	.70*
7. Attention				
#18	.68*	.67*	.67*	.56*
#65	.72*	.85*	.67*	.55*
#51	.49*	.63*	.31*	.54*
#58	.60*	.67*	.56*	.35*
a. Direct. of Attention				
#18	.79*	.83*	.73*	.64*
#65	.79*	.83*	.73*	.64*
b. Absorption				
#51	.65*	.73*	.49*	.54*
#58	.65*	.73*	.49	.54*
8. Negative Affect				
#31	.68*	.83*	.67*	.49*
#38	.78*	.67*	.64*	.62*
#69	.43*	.33*	.24	.33*
9. Memory				
#27	.60*	.65*	.70*	.78*
#41	.60*	.65*	.70*	.78*
10. Alertness (Arousal)				
#32	.67*	.57*	.52*	.59*
#37	.67*	.57*	.52*	.59*

Table 12

Exploratory Factor Analysis for the First Baseline Condition Using Only 39 Items

Factor Variance	Item	A Priori Dimension	Factor Load.	Cluster Load.	Coeff. Alpha
1. (10%)	#57	state of awareness	.72	.66	.81
	#52	state of awareness	.72	.67	
	#17	state of awareness	.64	.57	
	#61	time	.51	.52	
	#21	perception	.50	.54	
	#16	time	.49	.49	
	#68	meaning	.45	.52	
	#30	meaning	.41	.46	
	#29	body integrity	.38	.42	
	#66	perception	.37	.37	
	#15	body integrity	.36	.45	
	#39	meaning	.35	.44	
2. (10%)	#46	imagery vividness	.72	.73	.82
	#36	imagery vividness	.72	.70	
	#63	imagery amount	.65	.65	
	#23	imagery amount	.63	.65	
	#58	absorption	.62	.67	
	#65	dir. of attention	.49	.43	
	#27	memory	-.42	.39	
	#51	absorption	.42	.47	
	#41	memory	-.40	.40	
	#62	positive affect	.39	.48	
3. (7%)	#50	control	.71	.61	.79
	#42	control	.70	.70	
	#19	control	.56	.58	
	#28	control	.55	.50	
	#49	self awareness	.50	.69	
	#60	self awareness	.48	.62	
4. (4%)	#18	dir. of attention	.56	.43	.53
	#32	alertness	.54	.54	
	#37	alertness	.45	.44	
5. (6%)	#22	positive affect	.85	.88	.80
	#72	positive affect	.84	.88	
	#47	positive affect	.55	.53	
6. (4%)	#38	negative affect	.70	.78	.65
	#31	negative affect	.69	.68	
	#69	negative affect	.45	.43	
7. (5%)	#24	internal dialogue	.90	.92	.91
	#64	internal dialogue	.90	.92	

Table 13

Exploratory Factor Analysis for the Second Baseline Condition Using Only 39 Items

Factor Variance	Item	A Priori Dimension	Factor Load.	Cluster Load.	Coeff. Alpha
1. (14%)	#57	state of awareness	.75	.82	.87
	#17	state of awareness	.72	.76	
	#52	state of awareness	.67	.72	
	#15	body integrity	.66	.68	
	#21	perception	.63	.63	
	#29	body integrity	.58	.61	
	#16	time	.57	.57	
	#68	meaning	.53	.56	
	#61	time	.52	.52	
	#49	self awareness	.49	.53	
	#30	meaning	.47	.46	
	#39	meaning	.44	.43	
	#66	perception	.43	.41	
2. (9%)	#42	control	.72	.71	.79
	#28	control	.71	.74	
	#19	control	.71	.69	
	#50	control	.68	.68	
	#60	self awareness	.52	.57	
	#32	alertness	.49	.47	
	#27	memory	.36	.40	
	#37	alertness	.34	.31	
	#41	memory	.34	.34	
3. (7%)	#46	imagery vividness	.78	.79	.85
	#36	imagery vividness	.72	.75	
	#63	imagery amount	.70	.78	
	#23	imagery amount	.64	.74	
4. (6%)	#65	dir. of attention	.73	.85	.80
	#18	dir. of attention	.64	.67	
	#51	absorption	.56	.63	
	#58	absorption	.48	.67	
5. (6%)	#72	positive affect	.86	.90	.81
	#22	positive affect	.83	.81	
	#47	positive affect	.55	.58	
	#62	positive affect	.48	.59	
6. (4%)	#38	negative affect	.68	.67	.62
	#31	negative affect	.67	.83	
	#69	negative affect	.36	.33	
7. (4%)	#64	internal dialogue	.88	.91	.90
	#24	internal dialogue	.88	.91	

Table 14

Exploratory Factor Analysis for the Erotica Condition Using Only 39 Items

Factor Variance	Item	A Priori Dimension	Factor Load.	Cluster Load.	Coeff. Alpha
1. (12%)	#49	self awareness	.72	.73	.84
	#60	self awareness	.70	.61	
	#17	state of awareness	.64	.75	
	#42	control	.60	.57	
	#52	state of awareness	.60	.68	
	#28	control	.59	.60	
	#57	state of awareness	.53	.60	
	#16	time	.49	.53	
	#19	oontrol	.48	.52	
	#50	control	.43	.49	
	#29	body integrity	.36	.41	
	#66	perception	.31	.37	
	#69	negative affect	-.16	.17	
2. (10%)	#47	positive affect	.69	.69	.81
	#39	meaning	.61	.62	
	#62	positive affect	.59	.68	
	#68	meaning	.57	.57	
	#22	positive affect	.55	.69	
	#21	perception	.54	.58	
	#61	time	.46	.57	
	#72	positive affect	.46	.58	
	#30	meaning	.40	.36	
	#15	body integrity	.35	.43	
	#37	alertness	.31	.23	
	#32	alertness	.26	.21	
3. (6%)	#41	memory	.60	.63	.68
	#38	negative affect	.50	.56	
	#27	memory	.47	.51	
	#65	dir. of attention	-.41	.47	
	#58	absorption	-.40	.50	
	#31	negative affect	.40	.34	
	#51	absorption	-.36	.38	
4. (7%)	#23	imagery amount	.77	.80	.82
	#63	imagery amount	.76	.78	
	#36	imagery vividness	.71	.76	
	#46	imagery vividness	.69	.77	
	#18	dir. of attention	.37	.39	
5. (4%)	#24	internal dialogue	.83	.84	.81
	#64	internal dialogue	.80	.84	

Table 15

Exploratory Factor Analysis for the Relaxation Condition Using 39 Items

Factor Variance	Item	A Priori Dimensions	Factor Load.	Cluster Load.	Coeff. Alpha
1. (12%)	#49	self awareness	.70	.71	.86
	#19	control	.68	.64	
	#60	self awareness	.63	.54	
	#28	control	.57	.61	
	#50	control	.56	.54	
	#27	memory	.56	.49	
	#52	state of awareness	.48	.60	
	#17	state of awareness	.48	.62	
	#37	alertness	.46	.40	
	#57	state of awareness	.44	.59	
	#32	alertness	.44	.38	
	#41	memory	.43	.35	
	#42	control	.43	.50	
	#61	time	.40	.44	
	#16	time	.38	.39	
	#15	body integrity	.33	.41	
2. (6%)	#51	absorption	.48	.57	.63
	#38	negative affect	-.47	.55	
	#18	dir. of attention	.44	.50	
	#65	dir. of attention	.42	.39	
	#29	body integrity	.40	.33	
	#58	absorption	.38	.33	
	#31	negative affect	-.33	.41	
	#69	negative affect	-.31	.26	
3. (7%)	#30	meaning	.63	.64	.73
	#39	meaning	.63	.68	
	#68	meaning	.63	.72	
	#21	perception	.51	.51	
	#66	perception	.44	.39	
	#62	positive affect	.38	.41	
4. (6%)	#63	imagery amount	.75	.75	.79
	#23	imagery amount	.70	.66	
	#46	imagery vividness	.67	.75	
	#36	imagery vividness	.63	.63	
5. (5%)	#22	positive affect	.75	.86	.78
	#72	positive affect	.71	.75	
	#47	positive affect	.55	.60	
6. (4%)	#24	internal dialogue	.65	.82	.80
	#64	internal dialogue	.60	.82	

Table 16

Correlation Matrix for the First Baseline Condition Corrected for Attenuation*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial.	1.00	-.05	,05	.08	.03	-.18	-.07	-.11	-.01
Awar.		1.00	.13	.27	.49	.68	.29	.02	.29
Imag.			1.00	.52	.03	.25	.65	-.21	-.41
Pos. Aff.				1.00	.06	.34	.40	-.08	-.14
Cont.					1.00	.34	-.03	.07	.37
Alt. Exp.						1.00	.33	.15	.00
Att.							1.00	-.12	-.43
Neg. Aff.								1.00	.13
Mem.									1.00

Table 17

Correlation Matrix for the Second Baseline Condition Corrected for Attenuation*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial	1.00	-.01	.01	-.06	.13	-.10	-.15	-.19	.20
Awar.		1.00	.22	.39	.56	.80	.28	.05	.19
Imag.			1.00	.41	.12	.30	.63	-.20	-.31
Pos. Aff.				1.00	.08	.48	.43	.06	-.26
Cont.					1.00	.36	.07	-.14	.43
Alt Exp.						1.00	.21	.27	.00
Att.							1.00	-.17	-.39
Neg. Aff.								1.00	.06
Mem.									1.00

*Note: Because Alertness was later excluded as a dimension of consciousness, it is not listed here.

Table 18

Correlation Matrix for the Erotica Condition Corrected for Attenuation*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial.	1.00	-.19	-.03	.00	-.20	-.14	.29	-.12	-.06
Awar.		1.00	.26	.53	.89	.80	.45	.06	.02
Imag.			1.00	.47	.23	.34	.66	-.29	-.40
Pos. Aff.				1.00	.53	.72	.60	-.26	-.31
Cont.					1.00	.67	.44	-.02	.00
Alt Exp.						1.00	.34	.06	-.06
Att.							1.00	-.34	-.59
Neg. Aff.								1.00	.41
Mem.									1.00

Table 19

Correlation Matrix for the Relaxation Condition Corrected for Attenuation*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial.	1.00	.26	-.19	-.32	.33	-.04	.24	-.35	.27
Awar.		1.00	-.16	.02	.84	.55	.36	-.36	.43
Imag.			1.00	.44	-.01	.04	-.18	.17	-.12
Pos. Aff.				1.00	.02	.35	-.06	.37	-.09
Cont.					1.00	.48	.19	-.30	.56
Alt Exp.						1.00	.27	-.15	.11
Att.							1.00	-.60	-.07
Neg. Aff.								1.00	.00
Mem.									1.00

*Note: Because Alertness was later excluded as a dimension of consciousness, it is not listed here.

Table 20

Test-Retest Reliabilities for the Dimensions of Consciousness

Dimensions	Comparisons		
	1st & 2nd Baseline	1st Base. & Erot. Conditions	2nd Base. & Relx. Conditions
1. Internal Dialogue	.50	.26	.17
2. Awareness	.44	.40	.19
a. Self Awareness	.43	.34	.13
b. State of Awareness	.43	.35	.15
3. Imagery	.41	.21	.02*
a. Imagery Amount	.38	.21	.04*
b. Imagery Vividness	.40	.23	.08*
4. Positive Affect	.43	.27	.31
5. Control (Volition)	.44	.18	.17
6. Altered Experience	.56	.41	.38
a. Meaning	.58	.40	.41
b. Perception	.29	.30	.16
c. Time	.38	.24	.23
d. Body Integrity	.44	.24	.23
7. Attention	.39	-.05*	.03*
a. Dir. of Attention	.28	-.01*	.04*
b. Absorption	.39	.02*	.02*
8. Negative Affect	.34	.38	.32
9. Memory	.34	.18	.06*
10. Alertness (Arousal)	.16	.22	.07*
Average (across all ten dimensions)	.40	.26	.17
Average (across all dimensions exc. Alert.)	.42	.26	.18

Note: All correlations are significant at $p < .05$ except those marked with an asterisk (*).

Table 21

Comparisons for the Dimensions of Consciousness Between the Baseline Conditions

Dimensions	Statistics						
	Conditions						
	1st Base.		2nd Base.				
	Mean	S.D.	Mean	S.D.	Diff.	t* Value	Omega Squ.
1. Int. Dial.	2.13	1.95	2.38	2.12	-0.25	-1.94	-
2. Aware.	2.02	1.29	1.60	1.33	0.43	4.89[c]	.04
Self Aware.	1.97	1.55	1.71	1.52	0.26	2.51[a]	.01
State Aware.	2.07	1.45	1.52	1.44	0.54	5.52[c]	.06
3. Imagery	3.47	1.57	3.08	1.70	0.40	3.51[b]	.02
Imag. Amt.	3.30	1.75	2.98	1.90	0.32	2.49[a]	.01
Imag. Viv.	3.65	1.71	3.18	1.90	0.47	3.75[c]	.03
4. Pos. Affect	2.60	1.56	1.81	1.50	0.79	7.63[c]	.10
5. Control	2.29	1.39	2.25	1.60	0.04	0.42	-
6. Alt. Exp.	1.91	1.00	1.47	1.07	0.44	7.13[c]	.09
Meaning	1.46	1.32	1.22	1.33	0.24	3.17[b]	.02
Percept.	1.44	1.44	0.90	1.16	0.53	5.38[c]	.05
Time	2.50	1.58	1.90	1.66	0.60	5.22[c]	.05
Body Int.	2.45	1.41	1.98	1.37	0.47	4.72[c]	.04
7. Attention	3.74	1.28	3.65	1.38	0.08	0.88	-
Dir. of Att.	3.65	1.61	3.58	1.67	0.04	0.34	-
Absorption	3.85	1.42	3.75	1.46	0.12	1.21	-
8. Neg. Affect	0.99	1.24	0.89	1.17	0.11	1.22	-
9. Memory	1.33	1.15	1.35	1.05	-0.02	-0.25	-
							.04

[a] $p < .05$
[b] $p < .01$
[c] $p < .001$

*df = 248

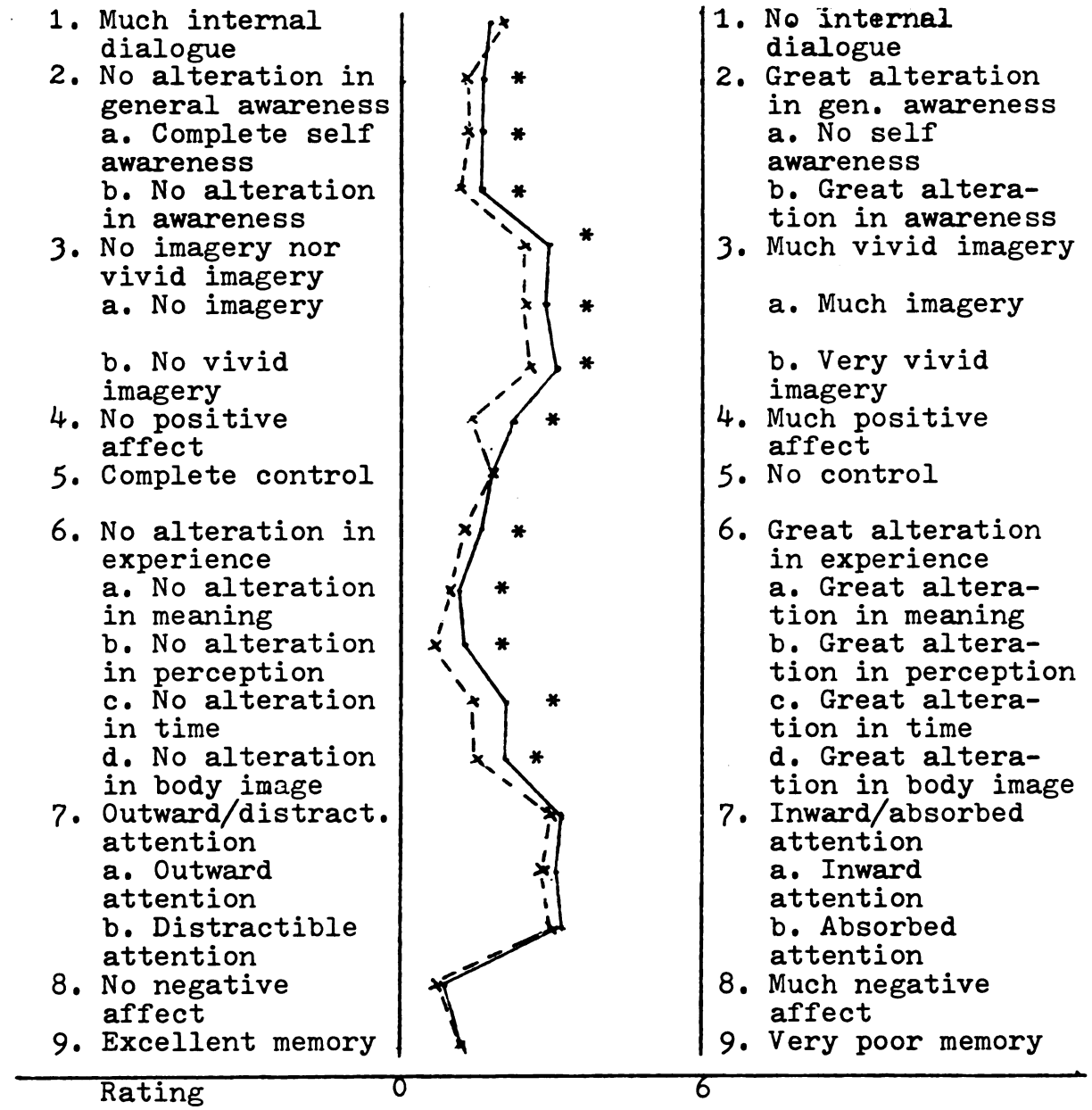

Figure 1

Comparisons Between the Phenomenological Nature of the Two Baseline Conditions

Table 22

Comparisons for the Dimensions of Consciousness Between the First Baseline and the Erotica Conditions

Dimensions	Statistics						
	Conditions						
	1st Base.		Erot.				
	Mean	S.D.	Mean	S.D.	Diff.	t* Value	Omega Squ.
1. Int. Dial.	2.13	1.95	4.63	1.61	-2.50	-18.11[c]	.40
2. Awareness	2.02	1.29	2.18	1.38	-0.16	-1.68	-
Self. Aware.	1.97	1.55	2.24	1.63	-0.27	-2.32[a]	.009
State Aware.	2.07	1.45	2.14	1.53	-0.08	-0.76	-
3. Imagery	3.47	1.57	4.59	1.27	-1.11	-9.71[c]	.16
Imag. Amt.	3.30	1.75	4.64	1.48	-1.34	-10.41[c]	.18
Imag. Viv.	3.65	1.71	4.53	1.27	-0.88	7.36[c]	.10
4. Pos. Affect	2.60	1.56	3.27	1.49	-0.68	-5.82[c]	.06
5. Control	2.29	1.39	2.76	1.35	-0.48	-4.29[c]	.03
6. Alt. Exp.	1.91	1.00	1.96	1.02	-0.05	-0.78	-
Meaning	1.46	1.32	1.52	1.29	-0.06	-0.68	-
Percept.	1.43	1.44	1.57	1.28	-0.14	-1.36	-
Time	2.50	1.58	2.35	1.66	0.15	1.15	-
Body Int.	2.45	1.41	2.61	1.37	-0.16	-1.48	-
7. Attention	3.74	1.28	4.43	1.02	-0.70	-6.54[c]	.08
Dir. of Att.	3.63	1.61	4.37	1.26	-0.74	-5.69[c]	.06
Absorption	3.85	1.42	4.49	1.17	-0.65	-5.62[c]	.06
8. Neg Affect	0.99	1.24	0.92	1.08	0.07	0.85	-
9. Memory	1.33	1.15	1.33	1.07	0.00	-0.04	-
							.11

[a] $p < .05$
[b] $p < .01$
[c] $p < .001$

*df = 248

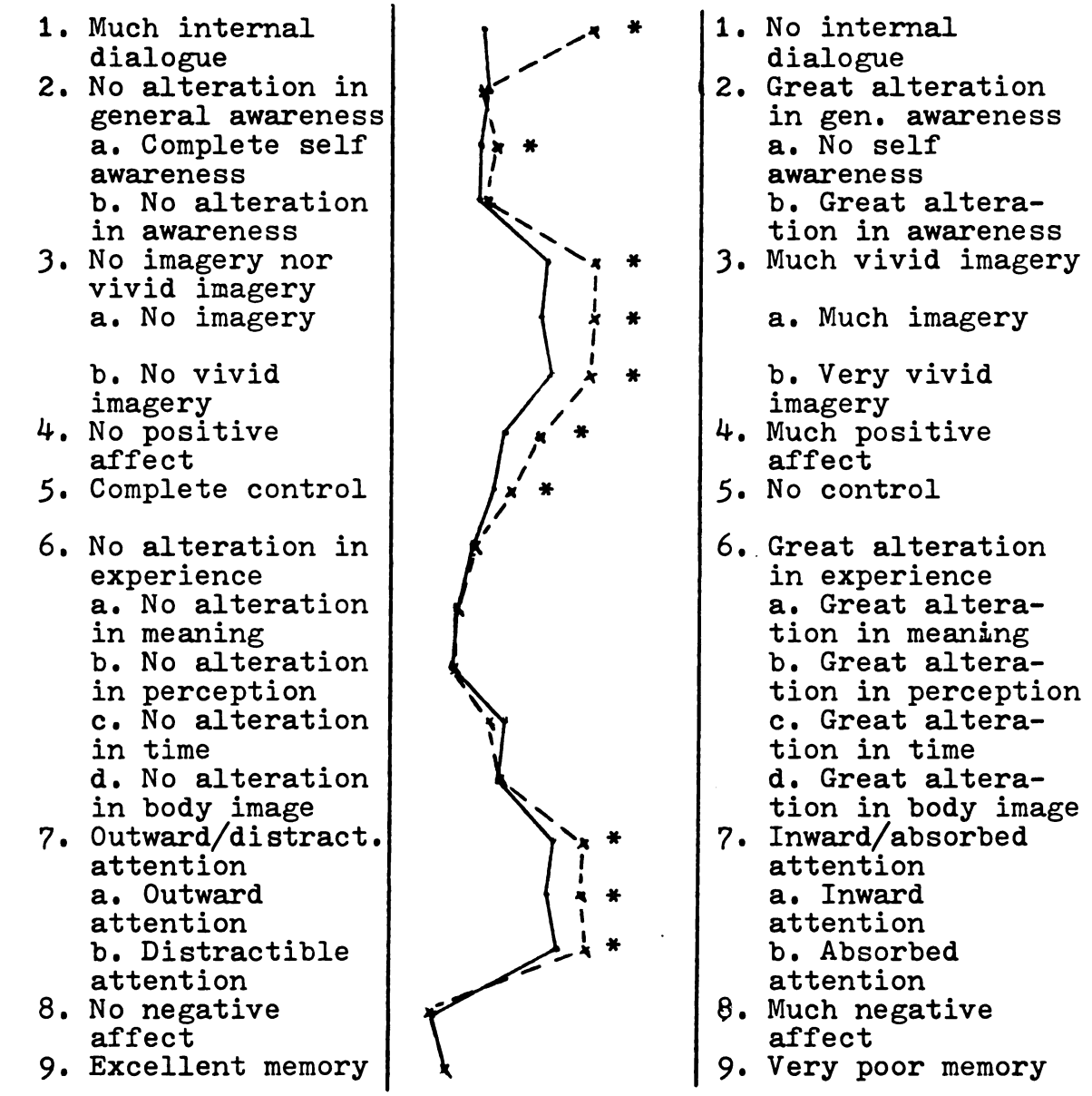

Figure 2

Comparisons Between the Phenomenological Nature of the First Baseline and the Erotica Conditions

Table 23

Comparisons for the Dimensions of Consciousness Between the Second Baseline and the Relaxation Conditions

Dimensions	Statistics						
	Conditions						
	2nd Base.		Relaxation				
	Mean	S.D.	Mean	S.D.	Diff.	t* Value	Omega Squ.
1. Int. Dial.	2.38	2.11	4.30	1.65	-1.92	-12.38[c]	.23
2. Awareness	1.60	1.33	4.56	1/10	-2.97	-30.15[c]	.65
Self Aware.	1.71	1.52	4.09	1.65	-2.38	-17.94[c]	.39
State Aware.	1.52	1.44	4.88	1.11	-3.36	-31.49[c]	.67
3. Imagery	3.08	1.70	2.03	1.49	1.05	7.41[c]	.10
Imag. Amt.	2.98	1.90	2.28	1.83	0.69	4.23[c]	.03
Imag. Viv.	3.18	1.91	1.77	1.56	1.41	9.39[c]	.15
4. Pos. Affect	1.81	1.50	1.47	1.24	0.34	3.27[c]	.02
5. Control	2.25	1.61	4.35	1.27	-2.09	-17.94[c]	.39
6. Alt. Exp.	1.47	1.07	3.10	1.08	-1.63	-21.46[c]	.48
Meaning	1.22	1.33	2.21	1.63	0.99	-9.69[c]	.16
Percept.	0.90	1.16	2.39	1.64	-1.49	-12.67[c]	.24
Time	1.90	1.66	4.07	1.59	-2.17	-17.01[c]	.37
Body Int.	1.98	1.37	4.16	1.58	-2.19	-17.68[c]	.39
7. Attention	3.65	1.38	5.04	0.86	-1.39	-13.66[c]	.27
Dir. of Att.	3.58	1.67	5.12	1.07	-1.54	-12.45[c]	.24
Absorption	3.75	1.46	4.97	1.08	-1.24	-10.83[c]	.19
8. Neg. Affect	0.89	1.17	0.41	0.75	0.47	6.34[c]	.07
9. Memory	1.35	1.06	3.16	1.73	-1.81	-14.47[c]	.30
							.28

[a]p = < .05
[b]p = < .01
[c]p = < .001

*df = 248

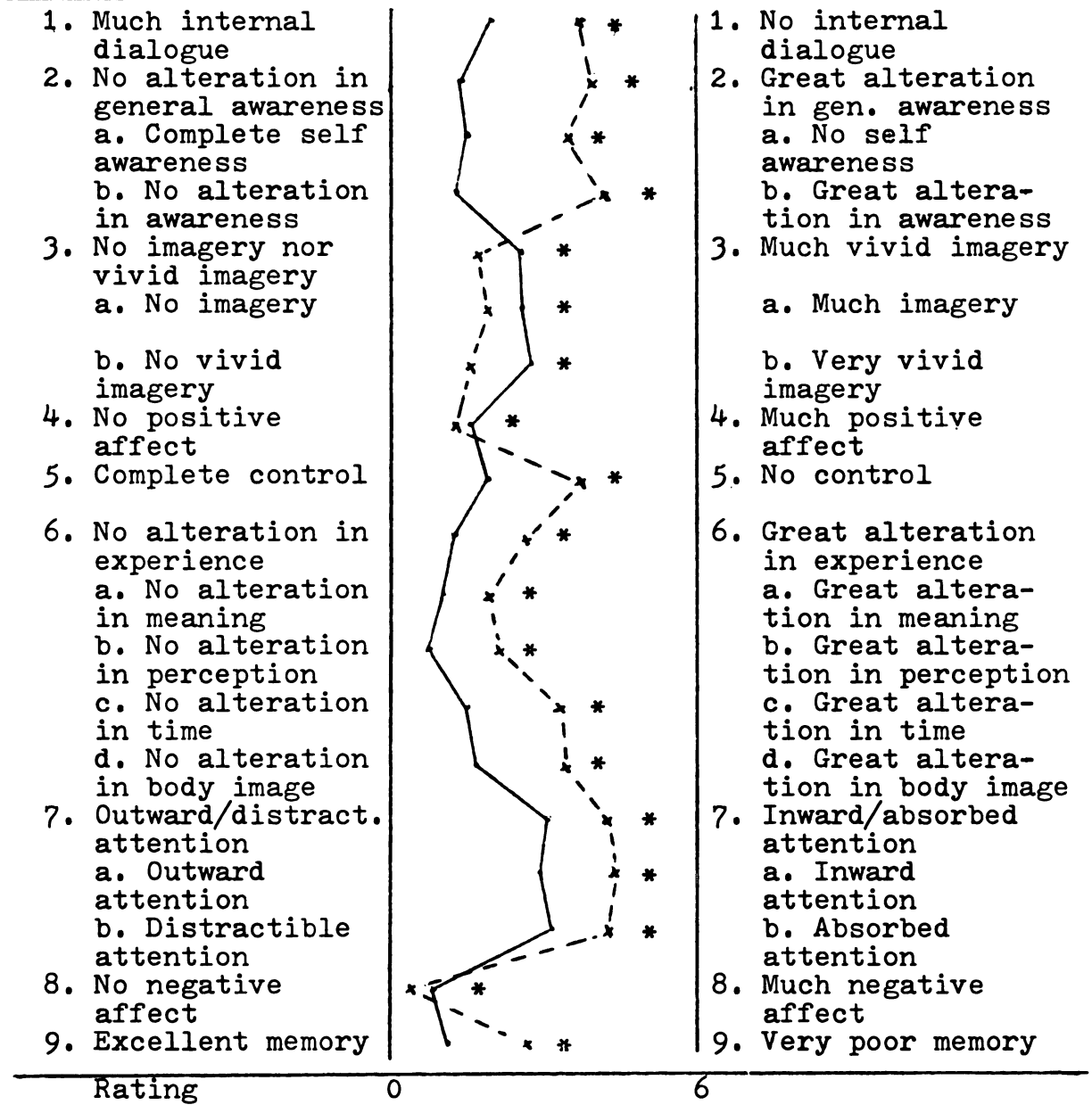

Figure 3

Comparisons Between the Phenomenological Nature of the Second Baseline and the Relaxation Conditions

Table 24

Comparisons for the Dimensions of Consciousness Between the Erotica and the Relaxation Conditions

Dimensions	Statistics						
	Conditions						
	Erotica		Relaxation				
	Mean	S.D.	Mean	S.D.	Diff.	t* Value	Omega Squ.
1. Int. Dial.	4.63	1.61	4.30	1.65	0.33	2.74[b]	.01
2. Aware.	2.18	1.38	4.56	1.10	-2.38	-22.95[c]	.51
Self Aware.	2.24	1.63	4.69	1.65	-1.85	-13.43[c]	.27
State Aware.	2.14	1.53	4.88	1.11	-2.74	-24.75[c]	.56
3. Imagery	4.59	1.27	2.03	1.49	2.56	20.87[c]	.47
Imag. Amt.	4.64	1.48	2.29	1.83	2.36	16.20[c]	.34
Imag. Viv.	4.53	1.27	1.77	1.56	2.76	21.78[c]	.49
4. Pos. Affect	3.27	1.49	1.47	1.24	1.80	15.92[c]	.34
5. Control	2.77	1.35	4.34	1.27	-1.58	-14.06[c]	.28
6. Alt. Exp.	1.96	1.02	3.10	1.08	-1.14	-15.57[c]	.33
Meaning	1.52	1.29	2.21	1.63	-0.69	-6.85[c]	.08
Percept.	1.57	1.28	2.39	1.64	-0.82	-7.18[c]	.09
Time	2.35	1.66	4.07	1.59	-1.72	-13.34[c]	.26
Body Int.	2.61	1.37	4.16	1.58	-1.56	-13.62[c]	.27
7. Attention	4.43	1.02	5.04	0.86	-0.61	-8.27[c]	.12
Dir. of Att.	4.37	1.26	5.12	1.07	-0.75	-7.74[c]	.11
Absorption	4.50	1.17	4.96	1.08	-0.47	-5.10[c]	.05
8. Neg. Affect	0.92	1.08	0.41	0.75	0.51	6.37[c]	.07
9. Memory	1.33	1.07	3.16	1.73	-1.83	-15.14[c]	.38
							.26

[b] $p = < .01$

[c] $p = < .001$

*df = 248

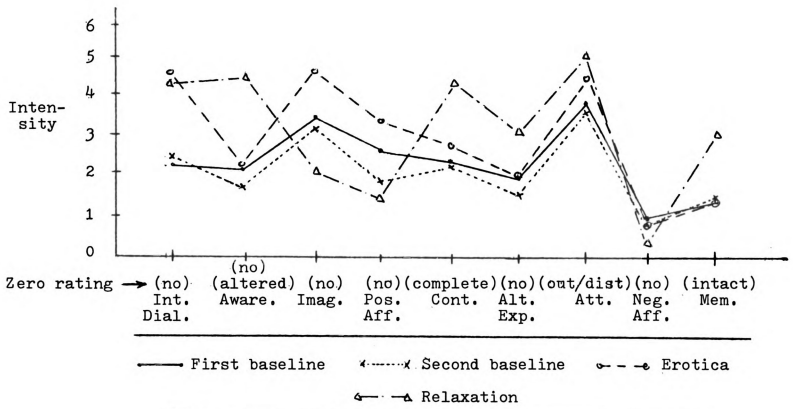

Figure 4

Comparisons Between the Phenomenological Nature of Consciousness for All Four Conditions

Table 25

Comparative Distances in Euclidean Nine-Space Between the Differing Conditions

	Conditions			
	First Baseline	Second Baseline	Reading Erotica	Relaxation/ Meditation
First Baseline	0.00	1.12	2.95	5.08
Second Baseline		0.00	3.31	5.17
Reading Erotica			0.00	4.83
Relaxation/ Meditation				0.00

Table 26

Correlation Matrix for the First Baseline Condition*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial.	1.00	-.04	.04	.06	.06	-.15[a]	-.06	-.10	.00
Awar.		1.00	.11	.22[c]	.38[c]	.53[c]	.22[c]	.01	.13[a]
Imag.			1.00	.42[c]	.02	.20[c]	.50[c]	-.17[b]	-.30[c]
Pos. Aff.				1.00	.02	.26[c]	.30[c]	-.08	-.10
Cont.					1.00	.24[c]	-.02	.04	.26[c]
Alt. Exp.						1.00	.24[c]	.10	.00
Att.							1.00	-.09	-.28[c]
Neg. Aff.								1.00	.08
Mem.									1.00

[a] $p = < .05$
[b] $p = < .01$
[c] $p = < .001$

Table 27

Correlation Matrix for the Second Baseline Condition*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial.	1.00	-.01	.01	-.05	.12	-.09	-.13[a]	-.14[a]	.15[a]
Awar.		1.00	.19[b]	.32[c]	.49[c]	.66[c]	.23[c]	.02	.13
Imag.			1.00	.34[c]	.11	.26[c]	.51[c]	-.16[a]	-.22[c]
Pos. Aff.				1.00	.07	.39[c]	.35[c]	.03	-.18[b]
Cont.					1.00	.31[c]	.06	-.11	.22[c]
Alt. Exp.						1.00	.17[b]	.17[b]	-.01
Att.							1.00	-.14[a]	-.26[c]
Neg. Aff.								1.00	.04
Mem.									1.00

[a] $p = < .05$
[b] $p = < .01$
[c] $p = < .001$

* Note: Matrices were not corrected for attenuation.

Table 28

Difference Correlation Matrix Between the First and Second Baseline Conditions*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial.	.00	.03	.03	.11	.06	.06	.07	.04	.15[a]
Awar.		.00	.08	.10	.11	.13[a]	.01	.01	.00
Imag.			.00	.08	.09	.06	.01	.01	.08
Pos. Aff.				.00	.05	.13[a]	.05	.11	.08
Cont.					.00	.07	.08	.15[a]	.04
Alt. Exp.						.00	.07	.07	.01
Att.							.00	.05	.02
Neg. Aff.								.00	.04
Mem.									.00

[a] $p < .05$

*Note: Matrix was not corrected for attenuation.

Table 29

Covariance Matrices for the Four Conditions

First Baseline Condition

1.00								
.31	1.64							
.69	.37	1.66						
.34	-.04	.68	1.92					
.32	1.01	.22	.05	2.48				
-.30	-.15	-.11	.15	.13	3.80			
.41	.59	.40	.04	1.03	.19	2.43		
.12	-.14	.00	.06	-.32	-.23	-.15	1.51	
.00	-.42	.20	.41	-.54	-.01	-.18	.12	1.32

Second Baseline Condition

1.14								
.25	1.90							
.94	.43	1.77						
.53	.14	1.04	2.58					
.47	1.20	.43	.29	2.89				
-.19	-.37	-.04	.39	.05	4.47			
.62	.72	.64	.16	.86	-.16	2.23		
.22	-.22	.04	-.20	-.32	-.36	.06	1.38	
-.02	-.38	.19	.37	-.40	.34	-.29	.06	1.11

Erotica Condition

1.04								
.28	1.05							
.89	.48	1.91						
.67	.43	1.22	1.82					
.36	.65	.38	.30	1.61				
-.16	.12	-.34	-.32	-.04	2.59			
.88	.68	.87	.78	.72	-.01	2.21		
.02	-.24	.00	-.04	-.28	-.14	-.29	1.16	
-.07	-.43	.02	-.01	-.40	-.08	-.36	.29	1.15

Relaxation Condition

1.17								
.17	.74							
.53	.16	1.21						
.47	.10	.87	1.60					
.06	-.15	-.15	.02	2.22				
-.06	.21	.38	.52	-.37	2.72			
.38	.00	.04	.04	.62	-.52	1.55		
-.08	-.19	-.18	-.17	.12	-.27	.20	.57	
.17	-.09	.67	.94	-.21	.62	-.15	-.01	2.98

Table 30

Box Test Comparisons Between the Covariance Matrices for the Different Conditions

Conditions	Det.	ln Det.	M_1	f	X^2	p	ω^2
First Baseline	54.64	4.00	37.82	45	37.1	> .40	-
Second Baseline	61.96	4.13					
First Baseline	54.64	4.00	149.20	45	146.4	< .000	.10
Reading Erotica	3.69	1.31					
Second Baseline	61.96	4.13	362.57	45	355.7	< .000	.37
Relax./ Meditat.	5.06	1.62					
Reading Erotica	3.69	1.31	319.07	45	313.0	< .000	.33
Relax./ Meditat.	5.06	1.62					

Table 31

Correlation Matrix for the Erotica Condition*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial.	1.00	-.15[a]	-.02	.00	-.15[a]	-.10	.27[c]	-.08	-.06
Awar.		1.00	.22[c]	.42[c]	.66[c]	.64[c]	.34[c]	.00	.01
Imag.			1.00	.38[c]	.18[b]	.28[c]	.50[c]	-.20[c]	-.29[c]
Pos. Aff.				1.00	.39[c]	.58[c]	.44[c]	-.18[b]	-.23[c]
Cont.					1.00	.49[c]	.31[c]	-.03	.00
Alt. Exp.						1.00	.27[c]	.01	-.06
Att.							1.00	-.22[c]	-.39[c]
Neg. Aff.								1.00	.25[c]
Mem.									1.00

[a] $p = < .05$
[b] $p = < .01$
[c] $p = < .001$

Table 32

Correlation Matrix for the Relaxation Condition*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial.	1.00	.21[c]	-.15[a]	-.25[c]	.25[c]	-.03	.15[a]	-.22[c]	.22[c]
Awar.		1.00	-.09	.03	.62[c]	.45[c]	.17[b]	-.22[c]	.35[c]
Imag.			1.00	.34[c]	.01	.04	-.12	.10	-.08
Pos. Aff.				1.00	.02	.28[c]	.00	.22[c]	-.07
Cont.					1.00	.34[c]	.09	-.17[c]	.43[c]
Alt. Exp.						1.00	.18[b]	-.09	.09
Att.							1.00	-.30[c]	-.06
Neg. Aff.								1.00	.00
Mem.									1.00

[a] $p = < .05$
[b] $p = < .01$
[c] $p = < .001$

* Note: Matrices were not corrected for attenuation.

Table 33

Difference Correlation Matrix Between the First Baseline and the Erotica Conditions*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial.	.00	.11	.06	.06	.21[c]	.05	.33[c]	.02	.05
Awar.		.00	.11	.20[c]	.28[c]	.11	.12	.01	.12
Imag.			.00	.04	.16[a]	.08	.00	.03	.01
Pos. Aff.				.00	.37[c]	.32[c]	.14[a]	.10	.13[a]
Cont.					.00	.25[c]	.33[c]	.07	.26[c]
Alt. Exp.						.00	.03	.09	.06
Att.							.00	.13[a]	.11
Neg. Aff.								.00	.17[b]
Mem.									.00

[a] $p = < .05$
[b] $p = < .01$
[c] $p = < .001$

Table 34

Difference Correlation Matrix Between the Second Baseline and the Relaxation Conditions*

	Int. Dial.	Awar.	Imag.	Pos. Aff.	Cont.	Alt. Exp.	Att.	Neg. Aff.	Mem.
Int. Dial.	.00	.22[c]	.16[a]	.20[c]	.13[a]	.06	.28[c]	.08	.07
Awar.		.00	.28[c]	.29[c]	.13[a]	.21[c]	.06	.24[c]	.22[c]
Imag.			.00	.00	.10	.22[c]	.63[c]	.26[c]	.14[a]
Pos. Aff.				.00	.05	.11	.35[c]	.19[b]	.11
Cont.					.00	.03	.03	.06	.21[c]
Alt. Exp.						.00	.01	.26[c]	.10
Att.							.00	.16[a]	.20[c]
Neg. Aff.								.00	.04
Mem.									.00

[a] $p = < .05$
[b] $p = < .01$
[c] $p = < .001$

* Note: Matrices were not corrected for attenuation.

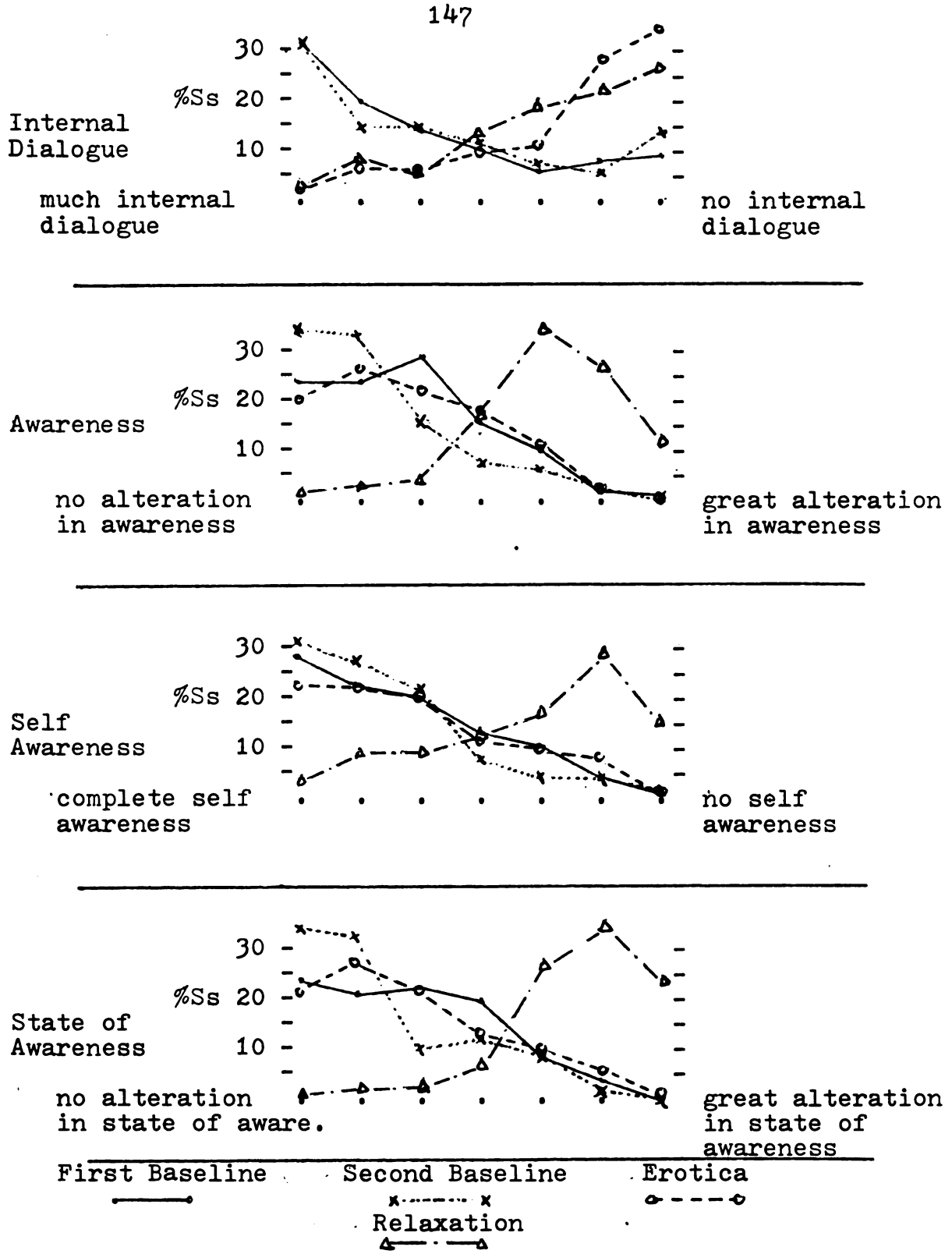

Figure 5

Percentage of Ss Having a Given Phenomenological Intensity Score for the Various Dimensions of Consciousness as a Function of Conditions

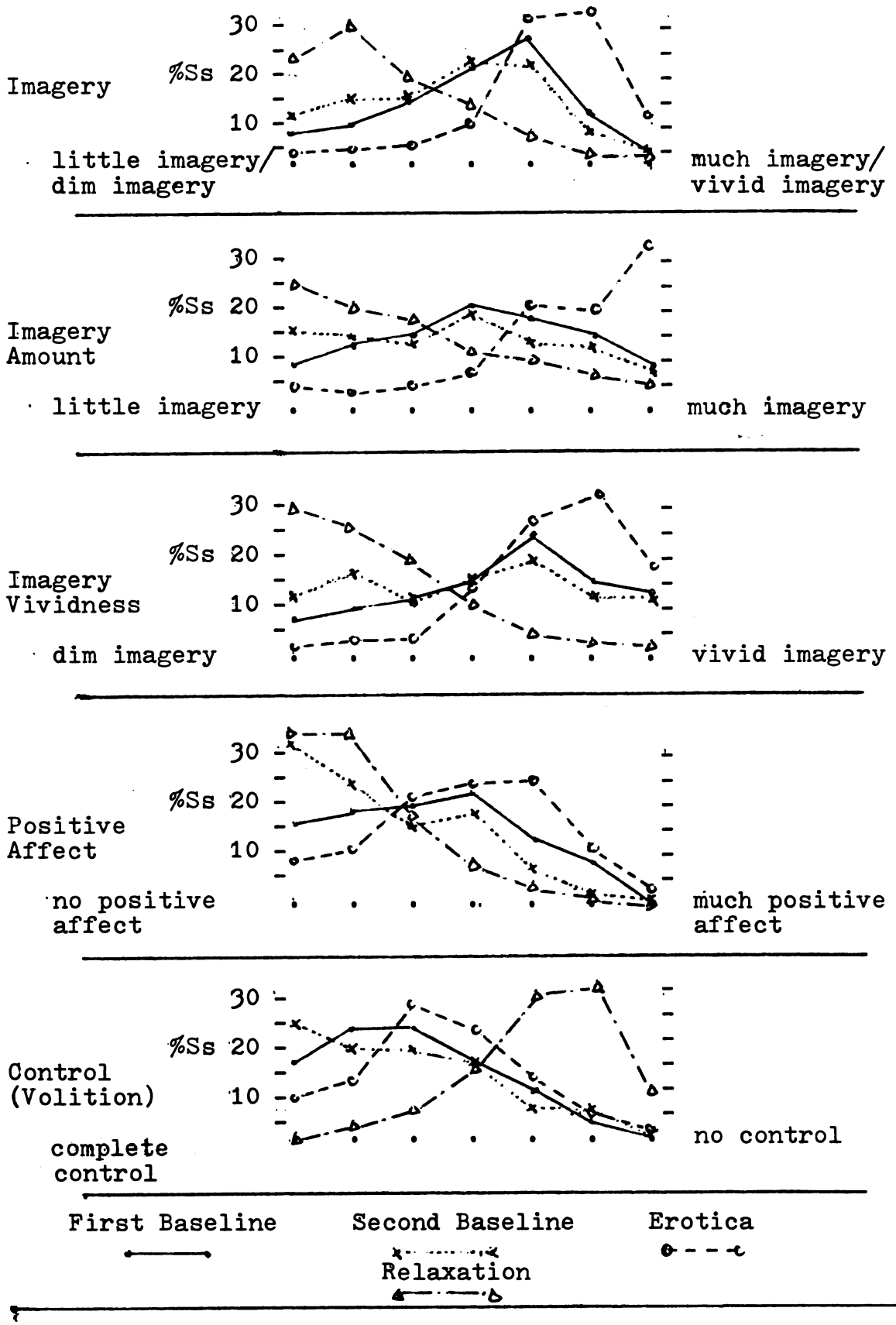

Figure 5 (cont'd.)

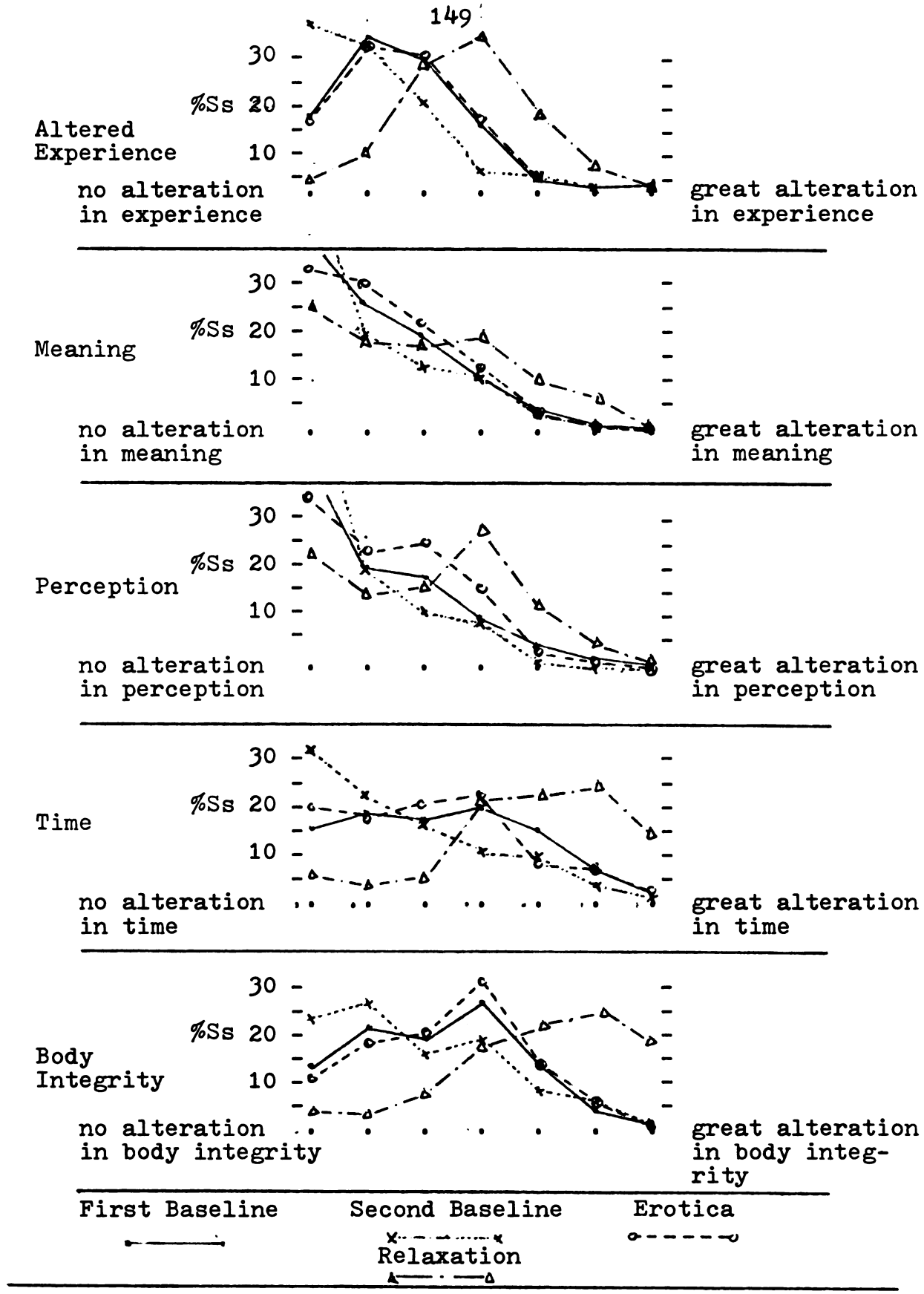

Figure 5 (cont'd.)

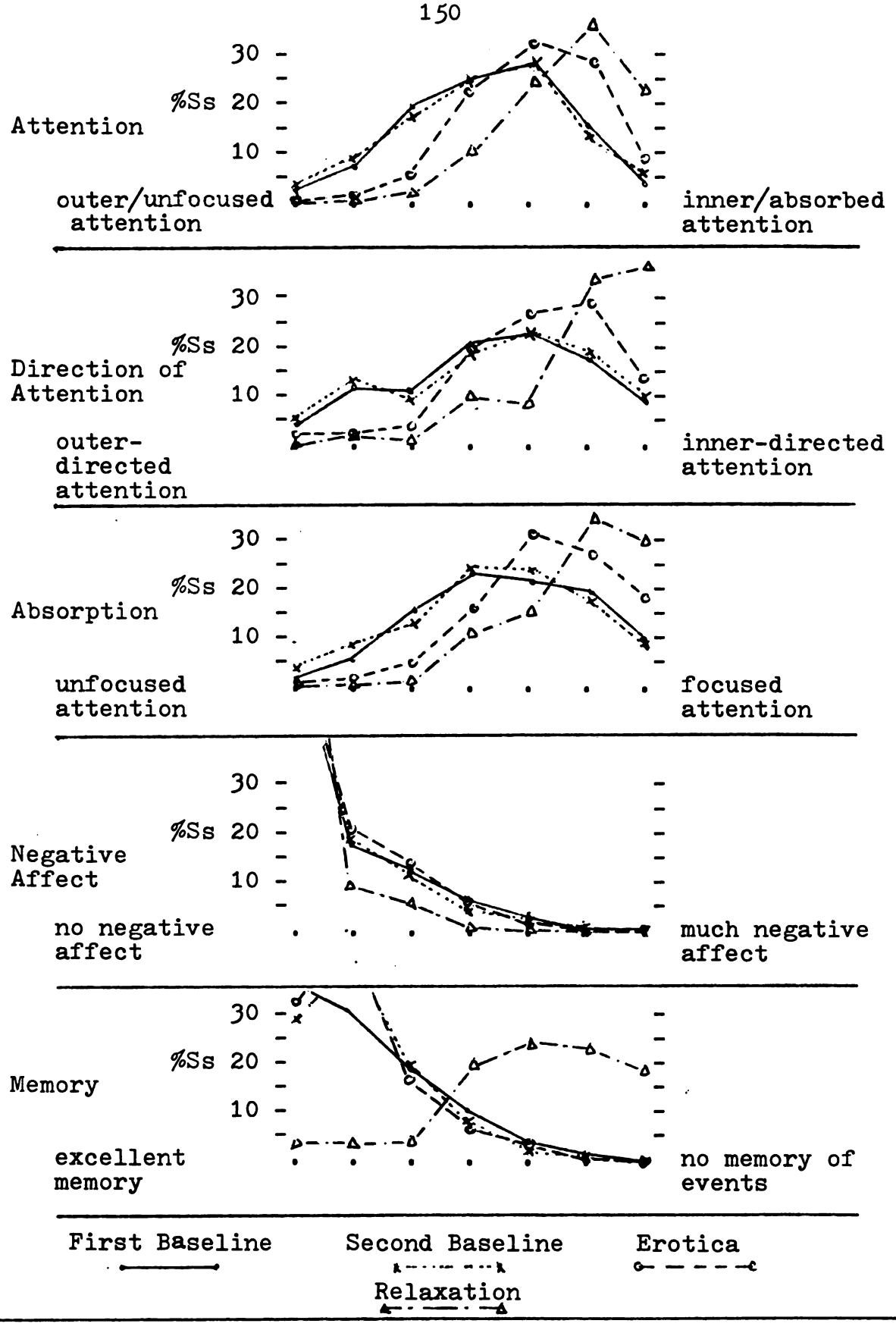

Figure 5 (cont'd.)

Table 35

Correlation of Absorption with the Dimensions of Consciousness Across All Four Conditions

Dimensions	Conditions			
	1st Base.	2nd Base.	Erot.	Relx.
1. Internal Dialogue	-.07	-.02	-.06	.09
2. Awareness	.16[a]	.15[a]	.09	.15[a]
a. Self Awareness	.09[b]	.10[a]	.05	.04[c]
b. State of Awareness	.17[b]	.16[a]	.09	.21[c]
3. Imagery	.23[c]	.15[a]	.04	-.11
a. Imagery Amount	.21[c]	.18[b]	.10	-.01
b. Imagery Vividness	.16[a]	.07	-.02	-.07
4. Positive Affect	.09	.12	.10	-.02
5. Control (Volition)	.04	.09	.03	.11
6. Altered Experience	.26[c]	.10	.10	.21[c]
a. Meaning	.23[c]	.10	.11	.16[a]
b. Perception	.13[a]	.08	.09	.13[a]
c. Time	.16[a]	.04	.02	.15[a]
d. Body Integrity	.19[b]	.08	.05	.13[a]
7. Attention	.14[a]	.11	.04	.15[a]
a. Direction of Attention	.14[a]	.12	.04	.12
b. Absorption	.08	.07	.04	.11
8. Negative Affect	.01	-.06	.09	-.12
9. Memory	.08	.01	.01	.05

[a] $p < .05$
[b] $p < .01$
[c] $p < .001$

Table 36

Correlation of Extraversion with the Dimensions of Consciousness Across All Four Conditions

Dimensions	Conditions			
	1st Base.	2nd Base.	Erot.	Relx.
1. Internal Dialogue	.06	.05	-.09	-.03
2. Awareness	.03	.03	.03	.02
a. Self Awareness	-.01	-.01	.04	.02
b. State of Awareness	.05	.04	-.06	.11
3. Imagery	-.04	.06	-.03	.00
a. Imagery Amount	-.05	-.04	.14[a]	.04
b. Imagery Vividness	-.11	-.03	-.01	-.06
4. Positive Affect	.03	.14[a]	.00	-.01
5. Control (Volition)	.13[a]	.08	.03	.07
6. Altered Experience	.03	.12	.05	.02
a. Meaning	.13[a]	.15[a]	.02	.05
b. Perception	-.12	.08	-.05	-.02
c. Time	.01	.05	.08	.03
d. Body Integrity	.05	.06	.09	-.04
7. Attention	.08	.15[a]	.03	.05
a. Direction of Attention	.05	.16[a]	.00	.07
b. Absorption	.09	.11	.05	.01
8. Negative Affect	-.11	-.07	-.05	-.06
9. Memory	.08	-.01	-.04	.05

[a] $p < .05$

Table 37

Sex Differences in the Dimensions of Consciousness for the First Baseline Condition

Dimensions	Females		Males		t
	Mean	S.D.	Mean	S.D.	Value
1. Internal Dialogue	2.21	2.0	1.92	1.7	1.05
2. Awareness	2.01	1.3	2.06	1.2	-.30
a. Self Awareness	1.98	1.6	1.93	1.5	.21
b. State of Awareness	2.03	1.5	2.15	1.4	-.59
3. Imagery	3.45	1.6	3.54	1.5	-.38
a. Imagery Amount	3.28	1.8	3.36	1.7	-.31
b. Imagery Vividness	3.63	1.8	3.72	1.6	-.38
4. Positive Affect	2.55	1.6	2.70	1.5	-.67
5. Control (Volition)	2.30	1.4	2.25	1.4	.27
6. Alt. Experience	1.82	1.0	2.13	1.0	-2.15[a]
a. Meaning	1.42	1.3	1.57	1.3	-.84
b. Perception	1.30	1.3	1.80	1.7	-2.49[a]
c. Time	2.39	1.6	2.79	1.5	-1.79
d. Body Integrity	2.38	1.3	2.62	1.6	-1.16
7. Attention	3.82	1.3	3.53	1.2	1.56
a. Direction of Attention	3.74	1.6	3.34	1.7	1.74
b. Absorption	3.89	1.4	3.74	1.3	.85
8. Negative Affect	.98	1.3	1.02	1.2	-.24
9. Memory	1.27	1.1	1.49	1.3	-1.37

N = 179 females, 70 males, df=247

[a] $p < .05$

Table 38

Sex Differences in the Dimensions of Consciousness for the Second Baseline Condition

Dimensions	Females		Males		t
	Mean	S.D.	Mean	S.D.	Value
1. Internal Dialogue	2.46	2.2	2.12	2.0	.88
2. Awareness	1.47	1.3	1.91	1.4	-2.32[a]
a. Self Awareness	1.59	1.5	1.99	1.6	-1.86[a]
b. State of Awareness	1.39	1.4	1.84	1.4	-2.25[a]
3. Imagery	2.93	1.8	3.35	1.5	-2.15[a]
a. Imagery Amount	2.83	2.0	3.34	1.7	-1.91
b. Imagery Vividness	3.06	2.0	3.49	1.7	-1.62
4. Positive Affect	1.69	1.4	2.13	1.6	-2.12[a]
5. Control (Volition)	2.19	1.6	2.39	1.6	-.88
6. Alt. Experience	1.40	1.1	1.65	1.1	-1.70
a. Meaning	1.22	1.4	1.21	1.3	.03
b. Perception	.79	1.1	1.18	1.3	-2.42[a]
c. Time	1.74	1.6	2.33	1.8	-2.56[a]
d. Body Integrity	1.93	1.6	2.10	1.5	-.78
7. Attention	3.63	1.4	3.72	1.2	-.45
a. Direction of Attention	3.56	1.7	3.64	1.5	-.35
b. Absorption	3.70	1.5	3.79	1.4	-.46
8. Negative Affect	.86	1.2	.96	1.1	-.59
9. Memory	1.37	1.0	1.29	1.1	.55

N = 179 females, 70 males, df=247

[a] $p < .05$

Table 39

Sex Differences in the Dimensions of Consciousness for the Erotica Condition

Dimensions	Females		Males		t
	Mean	S.D.	Mean	S.D.	Value
1. Internal Dialogue	4.71	1.6	4.42	1.7	1.30
2. Awareness	2.13	1.4	2.31	1.4	-.91
a. Self Awareness	2.21	1.7	2.30	1.6	-.38
b. State of Awareness	2.08	1.5	2.31	1.6	-1.11
3. Imagery	4.49	1.4	4.83	0.8	-1.88
a. Imagery Amount	4.56	1.6	4.88	1.0	-1.54
b. Imagery Vividness	4.43	1.4	4.78	1.0	-1.90
4. Positive Affect	3.01	1.5	3.94	1.3	-4.63[b]
5. Control (Volition)	2.69	1.4	2.95	1.3	-1.38
6. Alt. Experience	1.88	1.0	2.16	1.0	-1.98
a. Meaning	1.51	1.3	1.57	1.2	-.33
b. Perception	1.47	1.2	1.84	1.4	-2.09[a]
c. Time	2.18	1.6	2.79	1.7	-2.64[a]
d. Body Integrity	2.55	1.3	2.75	1.5	-1.02
7. Attention	4.39	1.1	4.55	0.9	-1.10
a. Direction of Attention	4.36	1.3	4.39	1.2	-.13
b. Absorption	4.41	1.2	4.70	1.1	-1.79
8. Negative Affect	.97	1.1	.81	1.0	1.00
9. Memory	1.37	1.0	1.26	1.3	.72

N = 179 females, 70 males, df=247

[a] $p < .05$

[b] $p < .01$

Table 40

Sex Differences in the Dimensions of Consciousness for the Relaxation Condition

Dimensions	Females		Males		t
	Mean	S.D.	Mean	S.D.	Value
1. Internal Dialogue	4.42	1.6	3.96	1.8	1.97
2. Awareness	4.59	1.0	4.48	1.2	.73
a. Self Awareness	4.13	1.6	3.96	1.7	.71
b. State of Awareness	4.90	1.0	4.83	1.3	.49
3. Imagery	1.94	1.5	2.25	1.5	-1.46
a. Imagery Amount	2.15	1.8	2.64	1.8	-1.89
b. Imagery Vividness	1.71	1.6	1.91	1.5	-.89
4. Positive Affect	1.40	1.2	1.68	1.3	-1.56
5. Control (Volition)	4.41	1.7	4.21	1.5	1.08
6. Alt. Experience	3.15	1.0	2.98	1.2	1.10
a. Meaning	2.34	1.6	2.18	1.6	.26
b. Perception	2.47	1.6	2.22	1.6	1.06
c. Time	4.09	1.6	4.04	1.6	.22
d. Body Integrity	4.27	1.5	3.89	1.7	.69
7. Attention	5.09	.9	4.93	.8	1.31
a. Direction of Attention	5.16	1.1	5.00	1.1	1.04
b. Absorption	5.01	1.1	4.85	1.0	1.06
8. Negative Affect	.34	.7	.62	.7	-2.66[a]
9. Memory	3.12	1.7	3.25	1.9	-.53

N = 179 females, 70 males, df=247

[a] $p = < .05$

Table 41

Sex Differences for the Personality Measures and the Deviation Scores

Personality Measures	Females		Males		t
	Mean	S.D.	Mean	S.D.	Value
Absorption	21.31	6.06	20.48	6.54	.95
Extraversion	38.68	10.80	41.90	11.10	-2.09[a]

Conditions	Deviation Scores				
	Females		Males		t
	Mean	S.D.	Mean	S.D.	Value
First Baseline	.80	.5	.79	.6	.20
Second Baseline	.76	.6	.76	.6	-.04
Erotica	.91	.5	1.05	.7	-1.62
Relaxation	.89	.6	.85	.6	.48

[a] $p = < .05$

APPENDICES

APPENDIX A

PHENOMENOLOGY OF CONSCIOUSNESS QUESTIONNAIRE

1-6. Student number 7. Form: 0 8. Sex: (0) female (1) male

9.-10. Your age 11-12. Today's date 13-14. Today's code

PLEASE READ EACH STATEMENT SLOWLY AND CAREFULLY AND ANSWER AS ACCURATELY AS YOU CAN BY PUTTING THE NUMBER THAT BEST CORRESPONDS TO YOUR STATE OF CONSCIOUSNESS (DURING THE TIME IN QUESTION) ON THE ANSWER SHEET. DO THIS FOR EACH STATEMENT.

15. My body ended at the boundary between my skin and the world.	'0'1'2'3'4'5'6'	I felt my body greatly expanded beyond the boundaries of my skin.
16. I felt no sense of timelessness; time flowed as I usually experience it.	'0'1'2'3'4'5'6'	Time stood still; there was no movement of time at all.
17. My state of awareness was not unusual or different from what it ordinarily is.	'0'1'2'3'4'5'6'	I felt in an extraordinary unusual and nonordinary state of awareness.
18. My attention was totally directed toward the environment around me.	'0'1'2'3'4'5'6'	My attention was totally directed towards my own internal subjective experience.
19. I had complete control over what I was paying attention to.	'0'1'2'3'4'5'6'	I had no control over what I was paying attention to.
20. I was alert and wide awake.	'0'1'2'3'4'5'6'	I was very, very drowsy and sleepy.
21. Objects appeared to take on extraordinary sensory qualities, such as unusual brilliance, vibrancy, clarity, etc.	'0'1'2'3'4'5'6'	My experience did not involve any changes in my sensory perception.
22. I was not aware of any strong sexual feelings.	'0'1'2'3'4'5'6'	I experienced very strong sexual feelings.

23. I experienced very little or no imagery.	'0'1'2'3'4'5'6'	My experience consisted almost completely of imagery.
24. I did not engage in any silent talking to myself.	'0'1'2'3'4'5'6'	I was silently talking to myself a great deal.
25. I was equally attentive to everything in my field of consciousness.	'0'1'2'3'4'5'6'	My attention was focused upon a very restricted set of impressions in my field of consciousness.
26. I could not understand what I was experiencing.	'0'1'2'3'4'5'6'	I could completely understand what I was experiencing.
27. I cannot remember what I experienced.	'0'1'2'3'4'5'6'	I can remember just about everything that I experienced.
28. I was actively involved in determining what was happening to me.	'0'1'2'3'4'5'6'	I was able to "let go" and passively experience what was happening to me.
29. I continually maintained a very strong sense of separation between myself and the environment.	'0'1'2'3'4'5'6'	I experienced an intense unity with the world: the boundaries between me and the environment dissolved away.
30. I had an experience which I would label as very religious, spiritual, or transcendental.	'0'1'2'3'4'5'6'	I did not have any experience which I would label as religious, spiritual, or transcendental.
31. I experienced no strong feelings of anger.	'0'1'2'3'4'5'6'	I experienced very strong feelings of anger.
32. My awareness was very greatly reduced or diminished.	'0'1'2'3'4'5'6'	My awareness was very greatly enhanced or increased.
33. My thoughts or images were very fantastic and quite unrealistic.	'0'1'2'3'4'5'6'	My thoughts or images were not fantastic nor were they unrealistic.

34. My mind was entirely free of any and all thoughts, feelings, sensations, images, and perceptions.	'0'1'2'3'4'5'6'	My mind was continually occupied with thoughts, feelings, sensations, images, and perceptions.
35. I felt in a very suggestible mood.	'0'1'2'3'4'5'6'	I did not feel in a suggestible mood.
36. The imagery I experienced was very detailed and quite distinct.	'0'1'2'3'4'5'6'	The imagery I experienced was not very detailed, nor was it very distinct.
37. I experienced a greatly heightened sense of perceptual sensitivity.	'0'1'2'3'4'5'6'	My perception of the world was greatly diminished.
38. I experienced very strong feelings of irritation or annoyance.	'0'1'2'3'4'5'6'	I was not aware of any feelings of irritation or annoyance.
39. I experienced very profound and enlightening insights of certain ideas or issues.	'0'1'2'3'4'5'6'	I experienced no profound insights besides my usual cognitive understanding of things.
40. I was very aware of myself as having an ego or personality.	'0'1'2'3'4'5'6'	I felt depersonalized: I no longer had an ego or sense of personality.
41. My memory of what I experienced was greatly impaired.	'0'1'2'3'4'5'6'	My memory of what I experienced was greatly enhanced.
42. I relinquished control and became receptive and passive to what I was experiencing.	'0'1'2'3'4'5'6'	I was willfully controlling what I was experiencing.
43. My thoughts were logically and coherently related.	'0'1'2'3'4'5'6'	My thoughts were randomly connected.
44. My attention jumped from one impression to another.	'0'1'2'3'4'5'6'	I was able to keep my attention completely focused upon a single impression.

45. I experienced almost all imagery with very little verbal thoughts.	'0'1'2'3'4'5'6'	I experienced almost all verbal thought with very little imagery.
46. My imagery was very vague and dim.	'0'1'2'3'4'5'6'	My imagery was as clear and vivid as objects in the real world.
47. I experienced very strong feelings of love.	'0'1'2'3'4'5'6'	I experienced no strong feelings of love.
48. My perception of space was normal and three-dimensional.	'0'1'2'3'4'5'6'	My perception of space was distorted.
49. I was continually conscious and well aware of myself.	'0'1'2'3'4'5'6'	I lost consciousness of myself.
50. Images and thoughts popped into my mind without my control.	'0'1'2'3'4'5'6'	The thoughts and images I had were under my control: I decided what I imaged or thought.
51. I was continually distracted by extraneous impressions or events.	'0'1'2'3'4'5'6'	I was not distracted, but was able to become completely absorbed in what I was experiencing.
52. I am reasonably certain I was in my usual state of consciousness.	'0'1'2'3'4'5'6'	I am reasonably certain I was in an extremely altered state of consciousness.
53. Time passed very much slower than it normally does.	'0'1'2'3'4'5'6'	Time passed very much faster than it normally does.
54. I was extremely aware of my body and its sensations.	'0'1'2'3'4'5'6'	I lost all awareness of my body and its sensations.
55. My body appeared to change in size, shape, or weight.	'0'1'2'3'4'5'6'	My body did not appear to change in size, shape, or weight.

56. Words cannot begin to express what I experienced.	'0'1'2'3'4'5'6'	I can express what I experienced quite adequately in words.
57. I felt in an extremely different and unusual state of consciousness.	'0'1'2'3'4'5'6'	My state of consciousness was not any different or unusual from what it ordinarily is.
58. I felt very involved and immersed in my experience.	'0'1'2'3'4'5'6'	I felt very detached and distant from what I was experiencing.
59. I felt in an extraordinarily relaxed and peaceful state.	'0'1'2'3'4'5'6'	I felt extremely excited and aroused.
60. I maintained a very strong sense of self-awareness the whole time.	'0'1'2'3'4'5'6'	I did not maintain a very strong sense of self-awareness at all.
61. My perception of the flow of time changed drastically.	'0'1'2'3'4'5'6'	I noticed no changes in my perception of the flow of time.
62. I felt extreme joy and bliss.	'0'1'2'3'4'5'6'	I experienced no joy or bliss beyond my usual feelings.
63. I experienced no or very few images.	'0'1'2'3'4'5'6'	My experience was made up almost completely of images.
64. I did not engage in any silent talking to myself.	'0'1'2'3'4'5'6'	I was silently talking to myself a great deal.
65. My attention was completely directed towards my own internal subjective experience.	'0'1'2'3'4'5'6'	My attention was completely directed towards the world around me.
66. Objects in the world around me changed in size, shape, or perspective.	'0'1'2'3'4'5'6'	I noticed no changes in the size, shape, or persepctive of the objects in the world around me.

67. I felt dizzy or disoriented.	'0'1'2'3'4'5'6'	I did not feel dizzy nor did I feel disoriented.
68. I experienced no sense of sacredness or deep meaning in existence beyond my usual feelings.	'0'1'2'3'4'5'6'	Existence became deeply sacred or meaningful.
69. I felt ashamed or guilty.	'0'1'2'3'4'5'6'	I felt no feelings of shame or guilt.
70. I felt in a very strange and dream-like state.	'0'1'2'3'4'5'6'	I did not feel in a very strange and dream-like state.
71. My experience was very pleasurable.	'0'1'2'3'4'5'6'	My experience was very unpleasant.
72. I became aware of very intense sexual feelings.	'0'1'2'3'4'5'6'	I experienced no intense sexual feelings.
73. I experienced a complete transcendence of opposites: contrary ideas or qualities (like good or bad, high or low) became equivalent.	'0'1'2'3'4'5'6'	I did not experience a transcendence of opposites: contrary ideas or qualities (like good or bad, high or low) remained contraries.
74. I found this questionnaire very easy to do.	'0'1'2'3'4'5'6'	I found this questionnaire very difficult to do.

Note: The Phenomenology of Consciousness Questionnaire (PCQ) has since been expanded and revised into the Phenomenology of Consciousness Inventory (PCI) which has excellent psychometric properties and both a long and short form. Research with it has replicated the results reported within this dissertation.

- author - 8/12/80

PHENOMENOLOGY OF CONSCIOUSNESS QUESTIONNAIRE

1-6. Student number 7. Form: 2 8. Sex: (0) female (1) male

9.-10. Your age 11-12. Today's date 13-14. Today's code

PLEASE READ EACH STATEMENT SLOWLY AND CAREFULLY AND ANSWER AS ACCURATELY AS YOU CAN BY PUTTING THE NUMBER THAT BEST CORRESPONDS TO YOUR STATE OF CONSCIOUSNESS (DURING THE TIME IN QUESTION) ON THE ANSWER SHEET. DO THIS FOR EACH STATEMENT.

15. My awareness was very greatly reduced or diminished.	'0'1'2'3'4'5'6'	My awareness was very greatly enhanced or increased.
16. My thoughts were logically and coherently related.	'0'1'2'3'4'5'6'	My thoughts were randomly connected.
17. I felt in an extremely different and unusual state of consciousness.	'0'1'2'3'4'5'6'	My state of consciousness was not any different or unusual from what it ordinarily is.
18. My attention was completely directed towards my own internal subjective experience.	'0'1'2'3'4'5'6'	My attention was completely directed towards the world around me.
19. My body ended at the boundary between my skin and the world.	'0'1'2'3'4'5'6'	I felt my body greatly expanded beyond the boundaries of my skin.
20. My experience was very pleasurable.	'0'1'2'3'4'5'6'	My experience was very unpleasant.
21. My perception of space was normal and three-dimensional.	'0'1'2'3'4'5'6'	My perception of space was distorted.
22. I became aware of very intense sexual feelings.	'0'1'2'3'4'5'6'	I experienced no intense sexual feelings.
23. I experienced no or very few images.	'0'1'2'3'4'5'6'	My experience was made up almost completely of images.

24. I did not engage in any silent talking to myself.	'0'1'2'3'4'5'6'	I was silently talking to myself a great deal.
25. I cannot remember what I experienced.	'0'1'2'3'4'5'6'	I can remember just about everything that I experienced.
26. Time passed very much slower than it normally does.	'0'1'2'3'4'5'6'	Time passed very much faster than it normally does.
27. I experienced no sense of sacredness or deep meaning in existence beyond my usual feelings.	'0'1'2'3'4'5'6'	Existence became deeply sacred or meaningful.
28. I relinguished control and became receptive and passive to what I was experiencing.	'0'1'2'3'4'5'6'	I was willfully controlling what I was experiencing.
29. The imagery I experienced was very detailed and quite distinct.	'0'1'2'3'4'5'6'	The imagery I experienced was not very detailed, nor was it very distinct.
30. I maintained a very strong sense of self-awareness the whole time.	'0'1'2'3'4'5'6'	I did not maintain a very strong sense of self-awareness at all.
31. I was alert and wide awake.	'0'1'2'3'4'5'6'	I was very, very drowsy and sleepy.
32. I experienced a complete transcendence of opposites: contrary ideas or qualities (like good or bad, high or low) became equivalent.	'0'1'2'3'4'5'6'	I did not experience a transcendence of opposites: contrary ideas or qualities (like good or bad, high or low) remained contraries.
33. I was continually distracted by extraneous impressions or events.	'0'1'2'3'4'5'6'	I was not distracted, but was able to become completely absorbed in what I was experiencing.
34. My thoughts or images were very fantastic and quite unrealistic.	'0'1'2'3'4'5'6'	My thoughts or images were not fantastic nor were they unrealistic.

35. I experienced almost all imagery with very little verbal thought.	'0'1'2'3'4'5'6'	I experienced almost all verbal thought with very little imagery.
36. I felt dizzy and disoriented.	'0'1'2'3'4'5'6'	I did not feel dizzy nor did I feel disoriented.
37. I had an experience which I would label as very religious, spiritual, or transcendental.	'0'1'2'3'4'5'6'	I did not have any experience which I would label as religious, spiritual, or transcendental.
38. I experienced very profound and enlightening insights of certain ideas or issues.	'0'1'2'3'4'5'6'	I experienced no profound insights besides my usual cognitive understanding of things.
39. I experienced very strong feelings of love.	'0'1'2'3'4'5'6'	I experienced no strong feelings of love.
40. I was equally attentive to everything in my field of consciousness.	'0'1'2'3'4'5'6'	My attention was focused upon a very restricted set of impressions in my field of consciousness.
41. I felt no sense of timelessness; time flowed as I usually experience it.	'0'1'2'3'4'5'6'	Time stood still; there was no movement of time at all.
42. I felt in a very strange and dream-like state.	'0'1'2'3'4'5'6'	I did not feel in a very strange and dream-like state.
43. My body appeared to change in size, shape, or weight.	'0'1'2'3'4'5'6'	My body did not appear to change in size, shape, or weight.
44. I felt in an extraordinarily relaxed and peaceful state.	'0'1'2'3'4'5'6'	I felt extremely aroused and excited.

45. I continually maintained a very strong sense of separation between myself and the environment.	'0'1'2'3'4'5'6'	I experienced an intense unity with the world; the boundaries between me and the environment dissolved away.
46. I felt in a very suggestible mood.	'0'1'2'3'4'5'6'	I did not feel in a suggestible mood.
47. I was extremely aware of my body and its sensations.	'0'1'2'3'4'5'6'	I lost all awareness of my body and its sensations.
48. I felt extreme joy and bliss.	'0'1'2'3'4'5'6'	I experienced no joy or bliss beyond my usual feelings.
49. I experienced no strong feelings of anger.	'0'1'2'3'4'5'6'	I experienced very strong feelings of anger.
50. I am reasonably certain I was in my usual state of consciousness.	'0'1'2'3'4'5'6'	I am reasonably certain I was in an extremely altered state of consciousness.
51. My memory of what I experienced was greatly impaired.	'0'1'2'3'4'5'6'	My memory of what I experienced was greatly enhanced.
52. Images and thoughts popped into my mind without my control.	'0'1'2'3'4'5'6'	The thoughts and images I had were under my control; I decided what I thought or imaged.
53. My perception of the flow of time changed drastically.	'0'1'2'3'4'5'6'	I noticed no changes in my perception of the flow of time.
54. I experienced a greatly heightened sense of perceptual sensitivity.	'0'1'2'3'4'5'6'	My perception of the world was greatly diminished.
55. I felt ashamed or guilty.	'0'1'2'3'4'5'6'	I felt no feelings of shame or guilt.

56. I was continually conscious and well aware of myself.	0 1 2 3 4 5 6	I lost consciousness of myself.
57. My state of awareness was not unusual or different from what it ordinarily is.	0 1 2 3 4 5 6	I felt in an extraordinarily unusual and nonordinary state of awareness.
58. Words cannot begin to express what I experienced.	0 1 2 3 4 5 6	I can express what I experienced quite accurately in words.
59. I was very aware of myself as having an ego or personality.	0 1 2 3 4 5 6	I felt depersonalized: I no longer had an ego or sense of personality.
60. My attention jumped from one impression to another.	0 1 2 3 4 5 6	I was able to keep my attention continually focused upon a single impression.
61. I felt very involved and immersed in my experience.	0 1 2 3 4 5 6	I felt very detached and distant from what I was experiencing.
62. Objects in the world around me changed in size, shape, or perspective.	0 1 2 3 4 5 6	I noticed no changes in the size, shape, or perspective of the objects in the world around me.
63. I experienced very little or no imagery.	0 1 2 3 4 5 6	My experience consisted almost completely of imagery.
64. I did not engage in any silent talking to myself.	0 1 2 3 4 5 6	I was silently talking to myself a great deal.
65. My attention was totally directed towards the environment around me.	0 1 2 3 4 5 6	My attention was totally directed towards my own internal subjective experience.
66. I had complete control over what I was paying attention to.	0 1 2 3 4 5 6	I had no control over what I was paying attention to.

67. My imagery was very vague and dim.	'0 '1 '2 '3 '4 '5 '6	My imagery was as clear and vivid as objects in the real world.
68. Objects appeared to take on extraordinary sensory qualities, such as unusual brilliance, vibrancy, clarity, etc.	'0 '1 '2 '3 '4 '5 '6	My experience did not involve any changes in my sensory perception.
69. My mind was entirely free of any and all thoughts, feelings, sensations, images, and perceptions.	'0 '1 '2 '3 '4 '5 '6	My mind was continually occupied with thoughts, feelings, sensations, images, and perceptions.
70. I could not understand what I was experiencing.	'0 '1 '2 '3 '4 '5 '6	I could completely understand what I was experiencing.
71. I was actively involved in determining what was happening to me.	'0 '1 '2 '3 '4 '5 '6	I was able to "let go" and passively experience what was happening to me.
72. I was not aware of any strong sexual feelings.	'0 '1 '2 '3 '4 '5 '6	I experienced very strong sexual feelings.
73. I experienced very strong feelings of irritation or annoyance.	'0 '1 '2 '3 '4 '5 '6	I was not aware of any feelings of irritation or annoyance.
74. I found this questionnaire very easy to do.	'0 '1 '2 '3 '4 '5 '6	I found this questionnaire very difficult to do.

APPENDIX B

PERSONALITY QUESTIONNAIRE*

In this booklet you will find a series of statements a person might use to describe her/his attitudes, opinions, interests, and other characteristics.

Each statement is followed by two choices, numbered (0) and (1) in the booklet. Please read the statement and decide which choice best describes you. Then mark your answer on the answer sheet.

In marking your answers on the answer sheet, be sure that the number of the statement in the booklet is the same as the number on the answer sheet.

Please answer <u>every</u> <u>statement</u>, even if you are not completely sure of the answer.

Read each statement carefully, but don't spend too much time deciding on the answer.

In spaces numbered one through six of the answer sheet darken in the numbers that correspond to your student number, darkening the number of line one that corresponds to the first digit of your student number, darkening the number of line two that corresponds to the second digit of your student number, etc.

If you have any questions when going through the questionnaire, please feel free to ask about them. Thank-you.

PLEASE DO NOT WRITE IN THIS BOOKLET!

*Note: Taken with permission from Tellegan, Note 3.

1.-6. Your student number.

7. When I work on a committee, I like to take charge of things. (0) True, (1) False.

8. I keep close track of where my money goes. (0) True, (1) False.

9. I usually prefer to spend my leisure time with friends rather than alone. (0) True, (1) False.

10. Sometimes I feel and experience things as I did when I was a child. (0) True, (1) False.

11. I often stop in the middle of one activity to start something else. (0) True, (1) False.

12. I can be greatly moved by eloquent or poetic language. (0) True, (1) False.

13. I don't like having to tell people what to do. (0) True, (1) False.

14. I could be happy living all alone in a cabin in the woods or mountains. (0) True, (1) False.

15. While watching a movie, a T.V. show, or a play, I may become so involved that I forget about myself and my surroundings and experience the story as if it were real and as if I were taking part in it. (0) True, (1) False.

16. I like to be in the spotlight. (0) True, (1) False.

17. When faced with a decision, I usually take time to consider and weigh all aspects. (0) True, (1) False.

18. When I am unhappy about something, (0) I tend to seek the company of a friend, (1) I prefer to be alone.

19. If I stare at a picture and then look away from it, I can sometimes "see" an image of the picture, almost as if I were still looking at it. (0) True, (1) False.

20. I perform in public whenever I have the opportunity. (0) True, (1) False.

21. Sometimes I feel as if my mind could envelop the whole world. (0) True, (1) False.

22. I often act without thinking. (0) True, (1) False.

23. I prefer not to "open up" too much, not even to friends. (0) True, (1) False.

24. I usually prefer to let someone else take the lead on social occasions. (0) True, (1) False.

25. I like to watch cloud shapes change in the sky. (0) True, (1) False.

26. I like to stop and think things over before I do them. (0) True, (1) False.

27. If I wish, I can imagine (or daydream) some things so vividly that they hold my attention as a good movie or story does. (0) True, (1) False.

28. I often monopolize a conversation. (0) True, (1) False.

29. I am a warm person rather than cool and detached. (0) True, (1) False.

30. I often prefer to "play things by ear" rather than to plan ahead. (0) True, (1) False.

31. I think I really know what some people mean when they talk about mystical experiences. (0) True, (1) False.

32. I am (or could be) a very effective sales person. (0) True, (1) False.

33. I am usually happier when I am alone. (0) True, (1) False.

34. I sometimes "step outside" my usual self and experience an entirely different state of being. (0) True, (1) False.

35. I don't like to start a project until I know exactly how to proceed. (0) True, (1) False.

36. I would not enjoy being a politician. (0) True, (1) False.

37. Textures - such as wool, sand, wood - sometimes remind me of colors or music. (0) True, (1) False.

38. I prefer working with people to working with things. (0) True, (1) False.

39. I am very level-headed and always like to keep my feet on the ground. (0) True, (1) False.

40. Sometimes I experience things as if they were doubly real. (0) True, (1) False.

41. I am quite effective at talking people into things. (0) True, (1) False.

42. I have few or no close friends. (0) True, (1) False.

43. When I listen to music, I can get so caught up in it that I don't notice anything else. (0) True, (1) False.

44. I am more likely to be fast and careless than to be slow and plodding. (0) True, (1) False.

45. I have a natural talent for influencing people. (0) True, (1) False.

46. If I wish, I can imagine that my body is so heavy that I could not move it if I wanted to. (0) True, (1) False.

47. I am more of a "loner" than most people. (0) True, (1) False.

48. Rarely, if ever, do I do anything reckless. (0) True, (1) False.

49. I am not interested in obtaining positions of leadership. (0) True, (1) False.

50. I can often somehow sense the presence of another person before I actually see or hear her/him. (0) True, (1) False.

51. It is very important to me that some people are concerned about me. (0) True, (1) False.

52. When I need one thing at the store, I get it without thinking about what else I may need soon. (0) True, (1) False.

53. People consider me forceful. (0) True, (1) False.

54. The crackle and flames of a wood fire stimulate my imagination. (0) True, (1) False.

55. It is sometimes possible for me to be completely immersed in nature or in art and to feel as if my whole state of consciousness has somehow been temporarily altered. (0) True, (1) False.

56. I tend to value and follow a rational, "sensible" approach to things. (0) True, (1) False.

57. I can often go a whole morning without wanting to speak to anyone. (0) True, (1) False.

58. With a little effort, I can "wrap most people around my little finger." (0) True, (1) False.

59. Different colors have distinctive and special meanings for me. (0) True, (1) False.

60. I do not like to be the center of attention on a social occasion. (0) True, (1) False.

61. I often do things on the spur of the moment. (0) True, (1) False.

62. For me one of the most satisfying experiences is the warm feeling of being in a group of good friends. (0) True, (1) False.

63. I am able to wander off into my own thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later that I have completed it. (0) True, (1) False.

64. I generally rely on careful reasoning when making up my mind. (0) True, (1) False.

65. I usually do not like to be a "follower." (0) True, (1) False.

66. I can sometimes recollect certain past experiences in my life with such clarity and vividness that it is like living them again or almost so. (0) True, (1) False.

67. I prefer to work alone. (0) True, (1) False.

68. Things that might seem meaningless to others often make sense to me. (0) True, (1) False.

69. When I am with someone else, I do most of the decision making. (0) True, (1) False.

70. I am often not as cautious as I should be. (0) True, (1) False.

71. I would rather have a house (0) in a friendly suburb, (1) alone in a deep woods.

72. While acting in a play, I think I could really feel the emotions of the character and "become" her/him for the time being, forgetting both myself and the audience. (0) True, (1) False.

73. I do not like to organize other people's activities. (0) True, (1) False.

74. My work is planned and organized in detail before it is begun. (0) True, (1) False.

75. My thoughts often don't occur as words but as visual images. (0) True, (1) False.

76. If I have a problem, I like to work it out alone. (0) True, (1) False.

77. I am a better talker than a listener. (0) True, (1) False.

78. I often take delight in small things (like the five-pointed star shape that appears when you cut an apple across the core or the colors in soap bubbles). (0) True, (1) False.

79. I often start projects with only a vague idea of what the end result will be. (0) True, (1) False.

80. I often take it upon myself to liven up a dull party. (0) True, (1) False.

81. When listening to organ music or other powerful music, I sometimes feel as if I am being lifted into the air. (0) True, (1) False.

82. It is easy for me to feel affection for a person. (0) True, (1) False.

83. People say that I am methodical (that I do things in a systematic manner). (0) True, (1) False.

84. Sometimes I can change noise into music by the way I listen to it. (0) True, (1) False.

85. On social occasions I usually allow others to dominate the conversation. (0) True, (1) False.

86. I am rather aloof and maintain distance between myself and others. (0) True, (1) False.

87. Some of my most vivid memories are called up by scents and smells. (0) True, (1) False.

88. I am a cautious person. (0) True, (1) False.

89. I am quite good at convincing others to see things my way. (0) True, (1) False.

90. Certain pieces of music remind me of pictures or moving patterns of color. (0) True, (1) False.

91. I am happiest when I see people most of the time. (0) True, (1) False.

92. I generally do not like to have detailed plans. (0) True, (1) False.

93. I often know what someone is going to say before he or she says it. (0) True, (1) False.

94. I would enjoy being a powerful executive or politician. (0) True, (1) False.

95. I tend to keep my problems to myself. (0) True, (1) False.

96. I often have "physical memories," for example, after I've been swimming I may still feel as if I'm in the water. (0) True, (1) False.

97. Whenever I go out to have fun, I like to have a pretty good idea of what I'm going to do. (0) True, (1) False.

98. I don't enjoy trying to convince people of something. (0) True, (1) False.

99. The sound of a voice can be so fascinating to me that I can just go on listening to it. (0) True, (1) False.

100. I often prefer not to have people around me. (0) True, (1) False.

101. People consider me a rather freewheeling and spontaneous person. (0) True, (1) False.

102. I would describe myself as a pretty "strong" personality. (0) True, (1) False.

103. At times I somehow feel the presence of someone who is not physically there. (0) True, (1) False.

104. Before I get into a new situation, I like to find out what I can expect from it. (0) True, (1) False.

105. Without close relationships with others my life would not be nearly as enjoyable. (0), True, (1) False.

106. People seem naturally to turn to me when decisions have to be made. (0) True, (1) False.

107. Sometimes thoughts and images come to me without the slightest effort on my part. (0) True, (1) False.

108. On social occasions I don't particularly care to "run the show." (0) True, (1) False.

109. I find that different odors have different colors. (0) True, (1) False.

110. I often like to do the first thing that comes to my mind. (0) True, (1) False.

111. I could pull up my roots, leave my home, my parents, and my friends without suffering great regrets. (0) True, (1) False.

112. I can get lost in looking at a sunset. (0) True, (1) False.

113. I am a (0) female, (1) male.

114.-115. Darken in the two digits, one on each line, that corresponds to your age in years now.

APPENDIX C

Progressive Relaxation/Meditation Instructions

Settle back as comfortably as you can. Please close your eyes and keep them closed until I tell you to open them. Let yourself relax to the best of your ability. Now, as you relax like that, clench your right fist. Just clench your fist tighter and tighter and study the tension as you do so. Keep it clenched and feel the tension in your right fist, hand, and forearm . . . and now relax. Let the fingers of your right hand become loose, and observe the contrast in your feelings. Let all the tension and tightness just fade and vanish away as the muscles of your right hand become more and more relaxed, more and more deeply relaxed. Once more now, clench your right fist really tight . . . hold it, and notice the tension again . . . Now let go and relax, let your fingers straighten out and notice the difference once again. Notice the relaxation spreading fully and deeply throughout your right hand.

Now repeat that with your left fist. Clench your left fist while the rest of your body relaxes; clench that fist tighter and tighter and feel the tension, feel how tense and tight it is, and now relax. Feel the relaxation spreading fully and deeply throughout your left hand as the muscles there become more and more deeply relaxed, very deeply relaxed. Let go and feel the relaxation spreading more and more. Clench both fists now. Clench both fists tighter and tighter and feel the tension in the forearms and hands. Study the tension . . . and now relax. Straighten out your fingers and feel the relaxation spreading fully and completely throughout your arms. Continue relaxing your hands and forearms more and more deeply, more and more fully with every word that I say.

Now bend your elbows slightly and tense the muscles of your upper arms. Bend both your elbows slightly and tense the muscles of your upper arms. Feel the tension and tightness . . . and now relax. Straighten out your arms, let them relax and feel the difference again. Let all the tension and tightness just fade and vanish away as the muscles of both your arms are relaxing more and more deeply and fully. Just let go and feel the relaxation as it envelops your muscles of your arms. Once more now, bend your arms slightly and feel the tension and tightness in the muscles of your upper arms, and now relax. Relax to the best of your ability. Get your arms in a comfortable position and let the relaxation proceed on its own. Let all the tension and tightness just fade and vanish away as the muscles of your hands and arms are now very deeply and fully relaxed. Continue relaxing your arms even further. Even when your arms seem fully relaxed, try to go that extra bit

further; try to achieve deeper and deeper levels of relaxation.

Let all your muscles go loose and heavy. Just settle back quietly and comfortably. Wrinkle up your forehead now; wrinkle it tighter and tighter and feel the tension and tightness there . . . and now relax. Stop wrinkling your forehead muscles and let them relax. Let them relax fully and completely. Feel the relaxation spread throughout the muscles of your forehead and scalp and let the tension fade and vanish away.

Now frown and crease your brows and study the tension and tightness. Study the tension and tightness there . . . and now relax. Let go of all tension and tightness and just relax, relaxing more and more deeply with every word that I say. With your eyes closed, make the muscles around your eyes very tight and tense and study the tension and tightness . . . feel the tension and tightness and now relax. Let all the tension and tightness around the muscles of your eyes just fade and vanish away as the muscles around your eyes and cheeks become very fully and deeply relaxed. Let all tension and tightness just fade and vanish away as the muscles around your eyes become deeply and fully relaxed. Please keep your eyes closed and just let your eyes become fully and completely relaxed so there is no trace of tension and tightness there at all.

Now clench your jaws, bite your teeth together, study the tension and tightness throughout your jaws and notice the difference . . . and now relax. Relax your jaws and let all tension and tightness just fade and vanish away as the muscles of your teeth and jaws become more and more fully and deeply relaxed, more deeply and fully relaxed than they've ever been before. Let your lips part slightly. Appreciate the relaxation and let all tension and tightness just fade and vanish away. Now press your tongue hard against the roof of your mouth. Look for the tension and tightness and now relax. Let the muscles of your mouth and tongue become fully and deeply relaxed, very fully and deeply relaxed with every word that I say. Just let the tension and tightness fade and vanish away as the muscles of your face and head become fully and deeply relaxed, deeply and fully relaxed.

Now attend to the muscles of your neck. Press your head back as far as it can go and feel the tension in the neck; roll it to the right and feel the tension shift; now roll it to the left. Straighten you head now and bring it forward, press your chin against your chest. Let your head return to a comfortable position now and study the relaxation. Let the relaxation develop and let all tension and tightness just fade and vanish away as the muscles of your

neck become fully and deeply relaxed. Shrug your shoulders forward now. Shrug your shoulders forward and feel the tension in your shoulders and upper back. Feel the tension and tightness there and now relax. Let the muscles of your shoulders and upper back just relax fully and deeply and feel the tensions fade and vanish away. Let all the tension and tightness just fade and vanish away as the muscles of the shoulders and upper back become more and more deeply relaxed.

Now attend to the muscles of your lower back. Tense the muscles of your lower back and feel the tension and tightness there. And now relax and let that tension and tightness just fade and vanish away as all the muscles of your back become fully and deeply relaxed, more and more fully and deeply relaxed with every word that I say. Let the relaxation spread throughout the muscles of your back as they become more and more fully relaxed with every word that I say. Relax your entire body to the best of your ability. Feel the comfortableness that accompanies the relaxation. Feel how deeply and fully relaxed you are.

Breathe easily and freely in and out. Notice how the relaxation increases as you exhale . . . as you breathe out just feel the relaxation and how much more deeply relaxed you feel. Now breathe right in and fill your lungs; inhale deeply and hold your breath. Study the tension and tightness, and now exhale and relax. Let the walls of your chest grow loose and push the air out automatically. Continue relaxing and breathe freely and gently. Feel the relaxation and enjoy it. With the rest of your body as relaxed as possible,,fill your lungs again. Breathe in deeply and hold it again. That's fine, breathe out and appreciate the relief. Just breathe normally now. Continue relaxing your chest and let the relaxation spread to your entire body. Continue to breathe normally now and with each breath that you take, let the relaxation spread throughout your body.

Now I'd like you to pay attention to the muscles of your abdomen, your stomach muscles. Tighten your stomach muscles and make your abdomen hard. Notice the tension and tightness there and now relax. Let all the tension and tightness in the muscles of your stomach and abdomen just fade and vanish away as the muscles of your stomach and abdomen become more and more fully and deeply relaxed with every word that I say. Let all the tension and tightness just fade and vanish away as the muscles of your stomach and abdomen become more and more fully and deeply relaxed with every word that I say, letting all the tension and tightness just fade and vanish away. Let go of all tensions and tightness and just relax.

Now I'd like you to tense the muscles of your buttocks and thighs. Tense the muscles of your buttocks and thighs and feel the tension and tightness there. Study it. And now relax. Let all the tension in the muscles of your buttocks and thighs just fade and vanish away as the muscles there become more and more fully and deeply relaxed. Fully and deeply relaxed. More and more deeply relaxed. Now tense the muscles of your lower legs and feet by bending your toes and straightening your legs slightly and feel the tension and tightness that develops. Feel the tension and tightness in the muscles of your lower legs and feet . . . and now relax. Let all that tension and tightness just fade and vanish away as the muscles there become more and more fully and deeply relaxed. Feel the relaxation all over. Let the relaxation spread throughout your entire body. Let it proceed to your thighs and abdomen, your lower and upper back, your stomach and chest, your shoulders, neck, and face. Let the relaxation envelop your body. Make sure that no tension has crept in anywhere. Just let your body relax fully and deeply, fully and deeply.

Now you can become twice as relaxed as you are now by merely taking in a really deep breath and slowly exhaling. That's right, take in a really slow and deep breath and then exhale, breathing out slowly and deeply and feel how deeply and fully relaxed you are becoming. More and more deeply and fully relaxed than you've ever been before. Just feel the relaxation becoming more and more deeper as you continue to relax more and more. More and more deeply.

You are now very relaxed, but you are going to relax more, much more. I'm going to count from three to one, and with each number that I say you will become ten times more relaxed than you are now. I'm going to count from three to one and with each number that I say you will become ten times more relaxed than you are now. Here we go. Three. You are becoming more and more deeply and fully relaxed. More and more deeply relaxed. Fully and deeply relaxed. Two. You are relaxing more and more deeply and fully with every word that I say. Your whole body is now deeply and fully relaxed and yet you will relax more, much more, becoming more and more deeply and fully relaxed. Very, very relaxed. One. You are now deeply and fully relaxed.

Just go on relaxing more and more deeply on your own. For the next few minutes I'd like you to relax on your own, becoming more and more deeply relaxed with each breath that you take. I'm going to stop talking and for the next few minutes I'd like you to see how relaxed you can become on your own. That's right, for the next several minutes I want you to relax on your own. I want you to become aware of

your breathing and become more and more deeply relaxed with every breath that you take. I will stop talking and I want you to relax as deeply as you can on your own. I want you to do this by being aware of your breathing, and becoming more and more deeply relaxed with every breath that you take. Do this on your own now and after several minutes I will interrupt you and start talking again and then we will stop. Please begin now and with each breath that you take become more and more deeply and fully relaxed. In several minutes I will start talking again. (PAUSE 4 MINUTES.)

O.K. I want you to stop relaxing. I'm going to count from one to five and as I do you will open your eyes. I'm going to count from one to five and as I do you will open your eyes. By the time I say five, your eyes will be completely opened, and you will feel alert, refreshed, and relaxed. Here we go. One . . . two . . . you're starting to open your eyes slightly. Three . . . four . . . your eyes are more and more open and you will open your eyes at five and feel refreshed, alert, and relaxed. Five. Your eyes are now opened and you are awake, alert, and relaxed.

APPENDIX D

"But everybody likes the unknown," said George, thinking immediately of voyages, unexpected encounters, novel situations.

"No, not in the way she does. She is interested only in a man she has never seen before and never will see again. And for this man she will do anything."

George flushed with pleasure. They left the bar together. The man hailed a taxi. In the taxi he gave George fifty dollars. Then he said he was obliged to blindfold him, that George must not see the house he was going to, nor the street, as he was never to repeat this experience.

The ride was not very long. He submitted amiably to all the mystery. The blindfold was taken off his eyes before he came out of the taxi so as not to attract the attention of the taxi driver or doorman, but the stranger had counted wisely on the glare of the entrance lights to blind George completely. He could see nothing but brilliant lights and mirrors.

He was ushered into one of the most sumptuous interiors he had ever seen - all white and mirrored, with exotic plants, exquisite furniture covered in damask and such a soft rug that their footsteps were not heard. He was lead through one room after another, each in different shades, all mirrored, so that he lost all sense of perspective. Finally, they came to the last. He gasped slightly.

He was in a bedroom with a canopied bed set on a dais. There were furs on the floor and vaporous white curtains at the windows, and mirrors, more mirrors. He was glad that he could bear these repetitions himself, infinite reproductions of a handsome man, to whom the mystery of the situation had given a glow of expectation and alertness he had never known. What could this mean? He did not have time to ask himself.

The woman who had been at the bar entered the room, and just as she entered, the man who had brought him to the place vanished.

She had changed her dress. She wore a striking satin gown that left her shoulders bare and was held in place by a ruffle. George had the feeling that the dress would fall from her at one gesture, strip from her like a glistening sheath, and that underneath would appear her glistening

skin, which shone like satin and was equally smooth to the fingers.

He had to hold himself in check. He could not believe that this beautiful woman was offering herself to him, a complete stranger.

He felt shy, too. What did she expect of him? What was her quest? Did she have an unfulfilled desire?

He had only one night to give all his lover's gifts. He was never to see her again. Could it be he might find the secret of her nature and possess her more than once? He wondered how many men had come to this room.

She was extraordinarily lovely, with something of both satin and velvet in her. Her eyes were dark and moist, her mouth glowed, her skin reflected the light. Her body was perfectly balanced. She had the incisive lines of a slender woman together with a provocative ripeness.

Her waist was very slim, which gave her breasts even greater prominence. Her back was like a dancer's, and every undulation set off the richness of her hips. She smiled at him. Her mouth was soft and full and half-open. George approached her and laid his mouth on her bare shoulders. Nothing could be softer than her skin. What a temptation to push the fragile dress from her shoulders and expose the breasts that distended the satin. What a temptation to undress her immediately.

But George felt that this woman could not be treated so summarily, that she required subtlety and adroitness. Never had he given to his every gesture so much thought and artistry. He seemed determined to make a long seige of it, and as she gave no sign of hurry, he lingered over her bare shoulders, inhaling the faint and marvelous odor that came from her body.

He could have taken her then and there, so potent was the charm she cast, but first he wanted her to make a sign, he wanted her to be stirred, not soft and pliant like wax under his fingers.

She seemed amazingly cool, obedient but without feeling. Never a ripple on her skin, and though her mouth was parted for kissing, it was not responsive.

They stood near the bed, without speaking. He passed his hands along the satin curves of her body, as if to become familiar with it. She was unmoved. He slipped slowly to his knees and caressed her body. His fingers felt that under her dress she was naked. He lead her to the edge of

the bed and she sat down. He took off her slippers. He held her feet in his hands.

She smiled at him, gently and invitingly. He kissed her feet, and his hands ran under the folds of the long dress, feeling the smooth legs up to the thighs.

She abandoned her feet to his hands, held them pressed against his chest now, while his hands ran up and down her legs under her dress. If her skin was so soft along the legs, what would it be where it was always the softest? Her thighs were pressed together so he could not continue to explore. He stood and leaned over her to kiss her into a reclining position. As she lay back, her legs opened slightly.

APPENDIX E

DEBRIEFING QUESTIONNAIRE

Your student number:_____ Today's date:_____

Today's code:_____

PLEASE WRITE A SHORT SUMMARY OF WHAT YOU EXPERIENCED IN EACH OF THE FOLLOWING SESSIONS:

1. The short time period in which you sat quietly with your eyes opened.

2. The short time period after the relaxation instructions in which you sat quietly while being aware of your breathing:

3. IF YOU WOULD LIKE TO MAKE ANY COMMENTS ABOUT THE STUDY YOU JUST EXPERIENCED, PLEASE MAKE THEM HERE:

APPENDIX F

MICHIGAN STATE UNIVERSITY
Department of Psychology

DEPARTMENTAL RESEARCH CONSENT FORM

1. I have freely consented to take part in a scientific study being conducted by: _____

   under the supervision of: _____

   Academic Title: _____

2. The study has been explained to me and I understand the explanation that has been given and what my participation will involve.

3. I understand that I am free to discontinue my participation in the study at any time without penalty.

4. I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request.

5. I understand that my participation in the study does not guarantee any beneficial results to me.

6. I understand that at my request, I can receive additional explanation of the study after my participation in completed.

Signed: _____

Dated: _____

APPENDIX G

STATE OF CONSCIOUSNESS INSTRUCTION SHEET

During this study you will be asked to rate your experience of yourself and the environment during certain short time periods by means of statements like the one shown below. You will be asked to evaluate your state of consciousness by rating your subjective experience of yourself to statements listed like the one below.

You are to do this by marking the number on the answer sheet that best corresponds to your subjective feeling during the time mentioned to you by the examiner. As an example, if during the time period in question, you would rate your mood as "very calm and tranquil" and not at all "very anxious" you would darken in the number "0" on the answer sheet that corresponds to statement number ten.

10. I felt very '0' 1 '2' 3 '4' 5 '6' I felt very anxious.
calm and tranquil.

Thus you are to choose the number of the answer on the answer sheet for each question that best corresponds to your state of consciousness at the time mentioned by the examiner. Please do this for each of the following dipole statements, trying to be as accurate as you can.

In order to best determine your mood or state of consciousness, some definitions have been provided for some of the key words used in the questionnaire you will complete.

1. SENSATIONS: are internal bodily impressions that you become aware of. Itches, pressure, pain, warmth, and coldness are examples of such sensations.

2. PERCEPTIONS: are impressions that you feel you receive from the external world. Perceptions come from the environment through sights, sounds, smells, etc.

3. FEELINGS OR EMOTIONS: are those internal impressions or moods such as happiness, joy, anger, excitement, etc.

4. THOUGHTS: are internal words, statements, and verbalizations that you are saying to yourself.

5. IMAGES OR IMAGERY: are internal visual (sights), auditory (sounds), kinesthetic (bodily), olfactory (smells), tactual (touch), or gustatory (tastes) impressions or pictures which pass before your mind, no matter how vague or dim they may be. They originate within you instead of coming from the environment.

6. IMPRESSIONS OR EVENTS: are any of the above, i.e. sensations, perceptions, feelings, thoughts, or images.

APPENDIX H

PRACTICE SESSION QUESTIONNAIRE

Your student number:_____ Today's date:_____

Please evaluate your subjective experience of the previous time period by checking the line between the two statements of the following items that best corresponds to how you felt during that time period.

1. My mind was continually occupied with random thoughts.	'__'__'__'__'__'__'__'	My mind was free of any and all thoughts.
2. The imagery I had was very vivid.	'__'__'__'__'__'__'__'	The imagery I had was not vivid at all.
3. I experienced very pleasant emotions.	'__'__'__'__'__'__'__'	I experienced very unpleasant emotions.
4. I was astutely aware of everything around me.	'__'__'__'__'__'__'__'	I was unaware of everything around me.
5. My body felt very light.	'__'__'__'__'__'__'__'	My body felt very heavy.
6. I do not remember anything of what I experienced.	'__'__'__'__'__'__'__'	I remember everything of what I experienced.
7. I had no thoughts running through my mind.	'__'__'__'__'__'__'__'	Different thoughts repeatedly popped into my mind.
8. The images I had were not in the least bit vivid.	'__'__'__'__'__'__'__'	The images I experienced were as vivid as real objects in the world.
9. I felt I was out of control.	'__'__'__'__'__'__'__'	I felt in control of my experience.
10. The feelings I had were very unpleasurable.	'__'__'__'__'__'__'__'	The feelings I had were very pleasurable.

APPENDIX I

Early Twentieth Century and Contemporary Approaches to Introspection and Consciousness: A Review

by

Ronald J. Pekala

OUTLINE

I. Early Viewpoints Upon Consciousness

A. Consciousness and philosophy

B. Consciousness and psychology

1. Structural psychology
2. Functional psychology
3. Phenomenological approaches
4. The rise of behaviorism

II. A Modern Return to Consciousness

A. For and against introspection

B. Interim summary

III. Contemporary Perspectives Upon Consciousness

A. The phenomenology of consciousness

B. The nature of the stream of consciousness

C. States of consciousness

1. An Eastern enumeration of states of consciousness
2. A Western enumeration of states of consciousness
3. Theories (of states) of consciousness
4. Tart's theoretical approach to states of consciousness

D. Experimental studies in the phenomenology of states of consciousness

E. Interim conclusions

In 1879 the father of experimental psychology, Wilhelm Wundt (1832-1920), founded the first psychological laboratory of the world. This laboratory was established to investigate Erfahrungswissenschaften, the science of experience. Since the data of such a science were anschaulich, or phenomenal, the methodology of psychology was introspection, the process of engaging in and examining ones own thought processes and sensory experience. Such a methodology sought, in short, to understand consciousness and its component processes.

As outlined by Wundt, the problems of psychology as the science of experience were

> (1) the analysis of conscious processes into elements, (2) the determination of the manner of connection of these elements, and (3) the determination of their laws of connection (In Boring, 1929/50, p.333).

It is now over a century since the founding of Wundt's psychological laboratory, dedicated to exploring the structure and nature of consciousness. One hundred years later, it can justifiably be said that the scientists of the 1980's are not much further ahead than Wilhelm Wundt was at the turn of the century in explaining and understanding the nature and operations of consciousness.

The number of neurons in the brain, over ten billion, is similar to the number of stars in the Milky Way, our

home galaxy (Wilson, 1978), and yet the science of consciousness is at about the same place as astronomy was in the sixteenth century before Galileo turned his telescope on the moons of Jupiter.

Whereas modern psychology began its existence with the study of consciousness under such brilliant scientists as Wundt, Titchener, and James, after a few short decades, the interest in consciousness waned. By 1930 it was hard to find even a reference to the word consciousness in the popular textbooks and journals of America, for consciousness and introspection had been exorcized from the mainstream of American psychology. But just as what has been repressed continues to haunt the repressor, ever remaining beneath the surface ready to erupt when the defenses have weakened, consciousness and the study of its processes are beginning to gain in scientific importance, as the bulwarks of behaviorism and its tacit presuppositions, are being dissolved in the light of scientific evidence.

It will be the purpose of this paper to explore the rise and fall and resurrection of consciousness as a legitimate area of psychological research. The emergence of psychology from philosophy as a separate scientific discipline in the late 1800's, its rise to prominence as the science of consciousness, and its slide into oblivion only a few short decades later will form the first half of the following paper.

The second half of this exposition will then focus upon the resurrection of the study of consciousness that began in the second half of the twentieth century, and will explore what modern and contemporary psychologists have to say about consciousness and its nature and functions from a phenomenological perspective. We will begin with a definition of consciousness and then follow its development from the beginnings of modern philosophy to the present.

EARLY VIEWPOINTS UPON CONSCIOUSNESS

Consciousness and Philosophy

The word consciousness comes from the Latin compound con-scius, which means to know with, or know together (Webster, 1970). It was first used in the English-speaking world by Francis Bacon (1561-1629) in the early seventeenth century (Marsh, 1978), although its primacy in experience can be traced back at least to Descartes's (1596-1650) Cogito, ergo sum, I think, therefore, I am.

In attempting to break away from medieval scholasticism, Descartes wanted to find something of which he would be indubitably certain. Such a certainty would serve as a foundation for erecting a theory of knowledge divorced from theological speculations. In attempting to doubt everything conceivable, in hopes of finding something of which he could not doubt, Descartes realized that his awareness of himself was indubitable. Even if God were an evil genius deceiving him, this evil genius could not deceive Descartes as to his

existence.

Descartes realized that awareness is necessarily experienced as part of the experience of existence, and being deceived, presupposes an existent being who is aware of the possibility of deception. Hence one is aware of his own existence, since the possibility of the experience of deception presupposes an awareness of that possibility, which, in turn, presupposes a being who is aware of that awareness:

> Doubtless then, I exist, since I am deceived; and let him deceive me as he may, he can never bring it about that I am nothing, so long as I shall be conscious that I am something. So that it must, in fine, be maintained, all things being maturely and carefully considered, that this proposition, I am, I exist, is necessarily true each time it is expressed by me, or conceived in my mind (Descartes, 1641-1959, p.126-127).

Descartes's I think, therefore, I am, implicates thinking, however, and not consciousness, as the indubitable basis of knowledge. But he later defines thought as

> all that we are conscious as operating in us. And that is why not only understanding, willing, and imagining, but also feeling are here the same thing as thought (Descartes, 1644, In Copleston, 1963, p.102).

Thus thinking for Descartes corresponds to what we would today characterize as consciousness. The cogito thus brought thinking, and hence consciousness, to the center of philosophy and it was to remain there ever since.

Descartes's Meditations (1641/1959) marks a turning point in Western philosophy and science. Besides finding

an indubitable basis for man's knowledge, Descartes went on in his Meditations to separate the spiritual and mental domains from that of the material. Since Descartes defined mind in terms of an immaterial, unextended substance, and body, in terms of a material, extended thing, each substance now had its own characteristics and separate domains; one amendable to the spiritual/religious, and one to the empirical, spheres of influence. Philosophy and science were now free to explore and understand the nature of material reality without irking the wrath of religious dignitaries in the process. This, in turn, helped set the stage for the split between man's mind and his body, and his science and his religion, for the coming centuries.

The British empiricists of Locke (1632-1704), Berkeley (1685-1753), and Hume (1711-1776) took up where Descartes left off. They continued the dualism advocated by Descartes but they also became interested in how the mind attempts to bridge the gulf between mind and body when coming to know the external world.

Locke, the father of British empiricism, held that all ideas, which he defined as "whatever is meant by phantasm, notion, species, or whatever it is which the mind can be employed about in thinking" (Locke, 1660/1968, p.8), were either simple or complex and were grounded in experience. In his system, the mind was a tableau rosa or blank tablet upon which the ideas were impressed. He defined consciousness as "the perception of what passes in a man's own mind"

(Locke, 1660/1968, p.138) and it included the changing panorama of ideas of the mind.

Hume, like Locke, derived all mental events from experience, but did so by using the word "perceptions" for Locke's "ideas." He also divided perceptions into impressions and ideas. Impressions were the immediate data of experience, or what we would today call sensations, while ideas were the faint images of impressions used in thinking and reasoning. Ideas came from impressions and were less vivid and lively.

Another Englishman, David Hartley (1705-1755) took Locke's ideas on association and came up with the doctrine or principle of association. Hartley hypothesized that man's complex mental life is constructed by simple ideas becoming associated, via contiguity, with other ideas, so that complex mental ideas were produced from and ultimately traceable to, simpler ideas.

Consciousness and Psychology

Structural psychology

The work of these Englishmen was used by Wilhelm Wundt (1832-1920) to inaugerate scientific psychology in Germany. Drawing upon the British empiricist's ideas on sensation, thinking, and association, Wundt attempted to make psychology as scientific as physics. Physics, for Wundt, dealt with experience mediately, for its elements, i.e. force, gravity, etc., were inferred and not given

immediately in experience. Psychology, on the other hand, dealt with experience immediately, as subjectively perceived. For Wundt, then, both physics and psychology dealt with experience. But the difference between them lay in the point of view with which experience was to be regarded.

To inaugerate psychology as a scientific discipline dealing with immediate experience, Wundt turned to chemistry for his model. Wundt looked for the psychological atoms of experience and used the principle of association to build up the molecules, compounds, and higher order levels of mental activity. Sensations, and perhaps feelings and images, were the psychological atoms that could be combined to form perceptions, ideas, and higher mental processes. To deal with the fact that the mind is in constant flux, Wundt emphasixed that an element, such as a sensation, was a "mental process", that was not substantial and thus not an "element" in the traditional sense of chemistry.

The fact that later psychological introspectionists tended to treat mental processes, such as sensations, images, and feelings, as static bits of consciousness, was a perversion of the meaning intended by Wundt. Nevertheless, Wundt is not completely innocent for to hold that an element is also a process is to invite ambiguity as to exactly what meaning is to be attached to the <u>structural approach</u>

to consciousness that Wundt advocated.

At the heart of Wundt's structural approach to psychology was his methodology, now termed classical introspection. Wundt distinguished between inner perception and introspection. Inner perception was basically introspection by untrained observers. In contrast, introspection, per se, was introspection by trained observers. These observers were so trained that it is said that an introspector had to perform 10,000 introspective judgments before he could provide data for a publishable report from Wundt's laboratory (Boring, 1953). This introspection consisted, after having been trained as to the nature of the elements and their sensory nature, of being aware of what was occurring in consciousness during a given interval of time, and then retrospectively reporting upon that awareness.

A student of Wundt's, E.B. Titchener (1867-1927), brought the structural approach of introspection to America. Titchener regarded structural psychology as analogous to the discipline of anatomy in biology. Just as an anatomical description of the structures of the organism are necessary before an adequate understanding of the functioning of the organism can be grasped; so likewise, an analysis of the structure or morphology of consciousness was necessary before one could truly begin to understand its nature and operations.

In his classic paper of 1898, Titchener defined the

"structural elements of mind," their number, and their nature. Sensations were designated the elementary mental processes, as were the affective processes, and they only, were the elemental processes of mind:

> It seems safe, then, to conclude that the ultimate processes are two, and two only, sensation and affections, though we must not forget that the first class, that of sensations, includes the two well-defined subspecies, 'sensation' and 'idea' (p.459).

Whereas sensation referred to percepts from the external world, ideas referred to internal processes less clear and vivid than that derived from sensations.

Any mental element for Titchener had at least two attributes or determinants, these being: quality and intensity. Quality made an element specific and individual, as a red or yellow, sweet or sour, or pleasant or unpleasant sensation; whereas intensity referred to the gradient of intenseness with which the sensation or affection was experienced. Along with these attributes affective elements also had a duration, and sense elements, duration, clearness, and in some instances, extent.

Titchener came to these conclusions, as did Wundt, via introspection on himself, and as done by others who worked as students in his laboratory. However, Titchener placed much greater restraints upon introspection than did Wundt or other introspectionists. Titchener maintained the requirement that the description of conscious experience should exclude statements of meaning. Titchener originally

coined the concept of stimulus-error as the reporting of meanings about the independent existence of stimulus objects, something an introspectionist should not do. When Kulpe claimed to find imageless thought in "the consciousness of judgment, action, and other thought processes" (Boring, 1953, p.173), Titchener broadened his definition to include any meanings at all in the data of introspection. He felt that such stimulus-error inferences about conscious data did not exist in the same way as did the elemental processes of sensation and affection.

Titchener's methodology, although purporting to exclude meaning, yet seemed to let it in by the back door, for introspection, as practiced under Titchener, was greatly dependent upon retrospection. As an example, an observation that took only a second or two to complete might take twenty minutes to describe completely, during which time "the introspector racked his brain to recall what happened 1000 seconds ago" (Boring, 1953, p.174). Such retrospection would seem to undoubtedly have to rely heavily on the role of memory and inference.

As a reaction against such rigid and pedantic constraints upon introspection, Kulpe (1862-1915) develped systematic experimental introspection, also known as the Wurzburg school of introspection. Whereas Wundt had said that thoughts could not be studied experimentally, Kulpe thought they could and set out to do just that. He had

observers think under specific controlled conditions and then let the observers introspect about the thought processes taking place. He and his student's results indicated that observers could not determine how a particular solution to a cognitive problem was found, i.e. how thought was directed towards a particular goal. To address the question of what the observers were experiencing when problem solving that were not images or sensations, one of Kulpe's students, Ach, coined the term, unanschauliche Bewusstheiten, or impalpable awarenesses, to describe the vague and evanescent contents of consciousness evident during problem solving.

Whereas the Wurzburgers thought they had discovered a new kind of mental element, Titchener suggested that this was nothing but "vague evanescent patterns of sensations and images, and in part, meanings and inferences which ought to be kept out of psychology" (Boring, 1953, p.174). Thus began the controversy over imageless thought, that helped to initiate the downfall of structuralism.

Functional psychology

Besides this controversy and others, another reason why structuralism never really caught on in America was due to the practical nature of Americans, who looked for practical and functional solutions to problems. Those Americans, besides Titchener, who were interested in introspection, espoused a functional, instead of a structural approach, to consciousness.

The two most famous proponents of functionalism in America were William James (1842-1910) and James Angell (1869-1949). William James, the father of American psychology, can be said to be the main American proponent of functionalism. He enunciated his position in his momentous tour de force, The Principles of Psychology (1890/1950).

James began his book by defining the scope of psychology:

> Psychology is the Science of Mental Life, both of its phenomena and their connections. The phenomena are such things as we call feelings, desires, cognitions, reasonings, decisions, and the like (p.1).

Like the Wundtians, psychology, for James, was concerned with the nature of mental life or subjective experience. But whereas the structuralists attempted to "freeze" a single moment of consciousness and then analyze that moment for its elemental structures and contents, James conceived the study of consciousness in terms of process. It is he who is credited with popularizing the term, the stream of consciousness (or the stream of thought), to refer to the fleeting and changing character of consciousness over time.

James characterized consciousness by five attribues, these being that consciousness is personal, always in flux, continuous, intentional, and selectional. Every thought is part of a personal consciousness and thought is always changing and never the same. As with Heraclitus's stream,

one cannot step into the stream of thought twice, for each moment it changes and varies. Similarly, like a stream or river, the stream of consciousness is continuous, and "without breach, crack, or division." The fourth characteristic of thought, its intentionality, refers to the fact that consciousness deals with objects independent of itself, consciousness is always consciousness of something. Lastly, consciousness

> is always interested in more than one part of its object than in another, and welcomes and rejects, or chooses, all the while it thinks (p.284).

These last two characteristics of thought deal with attention, the fact that attention is always an aspect of consciousness that is directed towards something, and that attention is selectional, choosing a particular object to be aware of at a particular moment.

These five characteristics of consciousness, as espoused by James, epitomize the functionalistic approach to consciousness and are contrasted with the elementary processes of sensations and affections and their corresponding attributes of intensity, quality, etc. of the structuralists.

In a paper by the other major American functionalist, James Angell (1907), the opposition between structuralism and functionalism was more fully delineated. Angell wrote that functional psychology was concerned

> with the effect to discern and portray the typical <u>operations</u> of consciousness under actual life conditions, as over against the

> attempt to analyze and describe its elementary and complex contents (p.63).

Whereas a structural psychology of sensation would undertake to determine the number and attributes of the elements of the various sensory modalities, a functional psychology of sensation would concentrate on determining the characteristics of the various sensory capabilities and how they differ from one another.

Angell suggested that because mental events are so evanescent, fleeting, and at times, vague, to characterize them as elements, as an anatomist would the organs of a body, is to give to such mental contents a durability which they do not possess. According to Angell,

> In the measure in which consciousness is immanently unstable and variable, one might anticipate that a functional classification would be more significant and penetrating than one based upon any supposedly structural foundation . . . (1907, p.75).

Angell also objected to the structuralist's use of the "state of consciousness" concept. When analyzing any particular "state of consciousness" for the elements which make it up, what the observer notices depends upon the particular stimulus setting and conditions that call them forth. Since one cannot get a fixed and specific color sensation without keeping constant the internal and external conditions in which it appears, the particular sensation experienced is a function of the multitude of variables which may have influenced consciousness at the particular moment of observation. Thus the structural approach, in

analyzing the elements of consciousness, may yield different results in different environments, and moreso, whatever it does find may be more a function of the method used than the actual state of consciousness experienced.

Angell argued that functionalism, on the other hand, is not liable to the above criticism when investigating the psychology of mental operations, since the function and not the content of consciousness is being investigated. A functionalistic approach also addresses itself to how the mind mediates between the environment and the needs of the organism. This allows for the determination of the functional utility of consciousness. Angell suggested that it is thus more appropriate to the process nature of consciousness and can yield much more reliable and useful results than the structural approach.

Phenomenological approaches

Besides the structuralist and functionalist approaches to consciousness, another approach to consciousness, much more evident in Europe than America, was the phenomenological approach as taken up and espoused by the Gestalt psychologists. When Wundt in 1874 was busy completing his handbook, Brentano wrote his Psychologie vom Empirischen Standpunkt (1874/1925). Thus while Wundt was busy analyzing consciousness in terms of content, Brentano was busy defining consciousness in terms of acts.

Brentano thought that psychical acts, in contrast to

physical phenomena, possess, immanent objectivity. Psychical acts are directed towards an object and "have that object 'inexisting intentionally' within them" (Boring, 1929/1950, p.360). An act of consciousness always implies an object or refers to a content, whereas physical phenomena are self-contained, and do not refer beyond themselves. This doctrine of intentionality was taken up by Brentano's pupil, Husserl, and became the foundation for his philosophical system of pure phenomenology.

For Husserl, consciousness is "consciousness of something" (1913/72, p.223) and phenomenology is the methodology used to elucidate consciousness. Through the epoche, a suspension of judgment, the existence of the external world is "bracketed" or suspended, and the phenomenologist is now free to describe the basic data of experience as they present themselves. By means of the epoche and the phenomenological method the psychologist now has at his disposal "the only secure basis upon which a strong empirical psychology can be built" (1913/72, p.62).

It is from this phenomenological foundation that the Gestaltists came to speak of the data of direct experience as phenomena. According to Boring (1929/50) "this Magna Carta of phenomenology presently released a great deal of good research" (p.177) via Gestalt approaches to perception. Gestalt psychology became a legitimate school of psychology with the works of Katz, Wertheimer, and Kohler.

In contrast to the elementalism of the structuralists, the Gestaltists asserted that the whole is greater than the sum of its parts and protested against the analysis of an experience into a predetermined list of elements. They argued that since a person can see a whole object without knowing what conscious elements it is composed of, or can see movement without being able to specify the "quality" of the movement, such enumeration of elements is futile and not necessary for an understanding of the phenomena being studied. They were also not afraid to include meanings in their analyses, something that a classical introspectionist like Titchener, would never do. In 1929 Kohler published his Gestalt Psychology and with the death of Titchener two years earlier, "phenomenological observation had won out over classical introspection" (Boring, 1929/50, p.177).

The rise of behaviorism

In America, however, it was behaviorism that dealt the final blow to classical introspection, and with it, the study of consciousness. The beginning of the end was foreshadowed in J.B. Watson's (1878-1958) classic paper of 1913, entitled "Psychology as the behaviorist views it." With this paper, not only did Watson derogate introspection and its disciplines of structuralism and functionalism, but Watson also founded behaviorism as the new psychology, a psychological paradigm that is still much in influence

today. The first paragraph of this seminal paper sums up Watson's attitude and approach to psychology:

> Psychology as the behaviorist views it is a purely objective, experimental branch of natural science. Its theoretical goal is the prediction and control of behavior. Introspection forms no essential part of its method, nor is the scientific value of its data dependent upon the readiness with which they lend themselves to interpretation in terms of consciousness (p.158).

Watson suggested that by making consciousness the primary subject matter of psychology, behavioral data were reduced to having no value. Since 50 years of experimental introspection had failed to make psychology an undisputed natural science, it was time for psychology to discard all references to consciousness. Watson argued that the presence or absence of consciousness anywhere in the phylogenetic scale had made no effect upon the problems of behavior. He suggested that neither structural nor functional psychology had allowed for adequate experimental treatment of the facts. These disciplines had rather enmeshed themselves in a series of speculative questions not amendable to experimental verification.

Behaviorism, on the other hand, allowed for the adequate testing of psychological problems. In support, Watson reviewed those fields of psychological endeavor where the behavioristic approach was already yielding promising results. In such an approach, introspection had no place, except perhaps to the extent of using verbal report to assess "thought processes (that) are really motor habits in the

larnyx" (Watson, 1913, p.174).

Watson's protest against consciousness fit well with America's Zeitgeist. America's practical spirit was well suited for a functional and practical approach to psychology and behaviorism offered the American psychologist a paradigm that was both functional and extremely practical. According to Boring (1929/50), by "the 1920's it seemed as if all America had gone behaviorist" (p.645). During the behavioristic hegemony, Watson was not the only proponent of behaviorism, although he was probably the most polemic. Between 1915 and 1950, many psychologists carried on the torch of behaviorism, lighting the way for a functional and behavioristic psychology that shunned consciousness.

With men like E.B. Holt (1873-1946), A.P. Weiss (1879-1931), E.C. Tolman (1886-1961), and B.F. Skinner (1904-), behaviorism retained its hold over American experimental psychology, and did not deviate much from Watson's initial ostracism of consciousness. Although Tolman was one of the few behaviorists to even attempt a definition of consciousness (Tolman, 1927), his behavioristic approach gave consciousness little more than nominal status. He did, nevertheless, espouse a system called purposive behaviorism, in which purpose, if not consciousness, was given a prominent place in his theoretical account of behavior.

By far the current leader and philosopher of behaviorism is B.F. Skinner. In clarifying his current views about the relationship between behaviorism and consciousness,

Skinner (1974) neither denies the existence of mental events (as Watson did at one time), nor does he hold to their inaccessibility to scientific analysis, because they are private:

> Radical behaviorism . . . does not call these (private) events unobservable, and it does not dismiss them as subjective (p.116)

Rather, Skinner regards mental events, such as seeing an apple, as just another form of behavior, i.e. a particular class of responses governed by the same behavioral principles as overt events. He does not, however, hold to the view that they should be used in explaining other behavior. According to him, mental events are not necessary for a functional analysis of behavior and can, for all practical purposes, be ignored.

Fifty years of behaviorism, in contrast to the previous fifty years of introspection, have allowed psychology to make tremendous strides in becoming a scientific and legitimate science with voluminous applications. Behaviorism was a necessary and needed change to the pedantic and controversial researches of the introspectionists. It has also produced much of the desired results that Watson so prophesized. However, just as introspection was superceded after 50 years by behaviorism, so behaviorism is now being superceded by cognitive psychology.

A MODERN RETURN TO CONSCIOUSNESS

An already classic paper published just 51 years after Watson's paper on behaviorism, was the essay by R.R. Holt (1964) entitled "Imagery: The return of the ostracized." In this paper Holt explored the banishment of imagery by psychology at the hands of the behaviorists and its return via interest in sensory deprivation, attention, dreaming, etc. to the laboratories of psychologists. Whereas the

> controversy over imageless thought became a death struggle of introspectionism, and imagery was one of the main foci of Watson's attack in the polemic that founded behaviorism (1964, p.263)

it was the recent interest in imagery that brought consciousness, introspection, and subjective experience back to the scientific forum. Holt suggested that the study of imagery could help psychologists understand behavior. Besides helping to construct a "detailed working model of the behaving organism," such an approach could take into account the operations inside the famous black box of the mind.

Whereas Holt's article reviewed how imagery was making a comeback since the turn of the century, a contemporary theoretical article that defends the use of introspection in psychology has appeared in the granddaddy of psychological publications, the American Psychologist. Entitled "Behaviorism and the mind: A (limited) call for a return to introspection" by D.A. Lieberman (1979), this brilliant

article cites evidence for the return of introspection as a legitimate adjunctive methodology for use with behavioral observation.

Lieberman argues that although many experimental psychologists have abandoned the language of behaviorism, many still continue to be influenced by its methodological and philosophical assumptions and constraints. Yet the dangers of introspection are not nearly quite so detrimental as has been painted by the behaviorists. Lieberman systematically explores these dangers and then determines why they are somewhat, although not completely, unfounded, provided the requisite restraints are used. The following several paragraphs will review Lieberman's polemics.

For and Against Introspection

Three general arguments have been advanced by the behaviorists against the use of introspection as a scientific technique. The first concerns the argument that mental events do not exist, an argument that was once used by Watson himself (Watson and McDougall, 1929). Lieberman dismisses this argument without discussion since virtually no contemporary psychologist, in his right mind, has chosen to attack mental events by denying their existence.

A more subtle argument consists in saying that the mind exists but denies that it is involved in the causality of behavior. Such an epiphenomenal version of mind suggests that consciousness is but an "incidental by-product" of

the electrical activity of the neural elements and so does not play a causal role in influencing behavior. Besides suggesting that such an epiphenomenalist position is empirically untestable and hence no scientific position at all, Lieberman argues that since mental events and neural states are correlated, an analysis of mental events can lead to an understanding, and possibly prediction, of neural events.

The ultimate argument of whether or not introspective data are useful in psychology is the extent to which such data can help lead to the "prediction and control of behavior" (Watson, 1913). Whether the mind is or is not causal for behavior is not a valid argument against introspection, especially since the evidence suggests "that mental and neural states are, at least, correlated" (Lieberman, 1979, p.321).

A third argument, the most persuasive, is that introspection, by its very nature, is the observation of internal events that are not accessible to outside observation. Without a means of confirming observations, arguments over the reliability and validity of such observation will doom introspective accounts to futile and needless controversy, just as it did to the early structural and functional introspectionists.

Lieberman acknowledges that there is some validity to this argument, but also suggests that reports from

others are not the only means of validating introspective data. The repeatability or reliability of an observation is one measure of its validity and the methods and data of modern psychophysics show that scientific, empirical data can be procured from introspective reports that are reliable and valid. Moreover, subjective events reported by introspection can be correlated with other data, such as neurological events like EEG potentials, etc., to check on the validity of the self-report. Although there is room for error while confirming subjective reports, the lack of perfect accuracy must be weighed against the empirical usefulness of such reports in predicting and controlling behavior.

Lieberman then addresses the objections of the behaviorist B.F. Skinner (1974) against using introspection. Skinner's main objection is that introspective reports are "inherently inaccurate." Lieberman admits that

> much of our internal world is inaccessible and the correlation between verbal reports and these states that are accessible is unlikely to be perfect (p.323).

Nevertheless, as long as some correlation exists, introspective reports can be useful, especially when the correlations are very high, as is the case in some experiments (Kroll and Kellicut, 1972).

A second objection of Skinner is that mental events are not necessary in a functional analysis of behavior. Lieberman argues that if behavior were fully predictable from observable environmental events, there would be no

need to bother with the murkiness of mental events. But all behavior cannot be predicted by behaviorists by the current conditions of the environment and the individual's past behavior.

Moreover, sometimes merely asking the S his intentions can yield better results than an exhaustive analysis of environmental and history variables. As an example, public opinion polls can now usually predict election results to within one to two percent by merely asking voters of their intentions. Would a knowledge of environmental conditions and historical variables that presumably lead to voter behavior do the same?

A final main objection raised by Skinner is that introspection can too easily lead to such a preoccupation of mind so as to ultimately neglect environmental factors that control behavior. But Lieberman contends that just because a methodology may lead to dangers is not sufficient reason for not studying and using it.

Lieberman summarizes by suggesting that instead of trying to force behavior and methodology into the

> procrustean bed prescribed by (behavior) theory, . . . it would be far less taxing, as well as more honest, to accept what we so clearly believe in covertly (p.330).

The arguments of the behaviorists against introspection, although somewhat valid, are not valid enough so as to preclude introspection as a viable methodology in helping to understand behavior.

Interim Summary

The previous pages have reviewed the rise and fall of introspection in the beginnings of psychology, and its gradual reemergence in the sixties and seventies. Scientists are now looking more closely at the nature of imagery and cognition and their theoretical models underlying their approaches to behavior, introspection, and consciousness. These approaches, along with the great strides being made (and having been made) in attention (Kahneman, 1973) and neuropsychology (Lindsley, 1961; John and Schwartz, 1978), are allowing the study of consciousness to again become a legitimate area of research for psychologists. The following pages will review the modern phenomenological approaches to consciousness that are currently being theorized and researched.

CONTEMPORARY PERSPECTIVES UPON CONSCIOUSNESS

The contemporary literature reflects two general trends in the study of consciousness; trends that parallel the structuralist-functionalist camps of introspection during the early twentieth century. Like the functionalists, one approach to consciousness attempts to investigate the stream of consciousness and its relationship to personality measures and related variables. The other approach, paralleling that of the structuralists, attempts to investigate the structure of states of consciousness; states that are hypothesized to be of different intensities or patterns

than other states of consciousness.

The following paragraphs will review the theorizing and empirical research into each of these two major approaches to studying the phenomenological nature of human consciousness; but first, a contemporary introduction to the phenomenology of consciousness.

The Phenomenology of Consciousness

According to Battista (1978) phenomenological observation about the nature of human consciousness is fraught with difficulty, owing to the nature of consciousness and the problems in observing it. Nevertheless, there are three essential points of agreement that tend to show up again and again across a variety of investigations on consciousness. These three points consist of the facts that conscious experience is primary, it is a field, and it is a stream in continuous flux.

The observation that conscious experience is primary refers to the fact that consciousness forms the basis of all knowledge by transcending the split between knower and known and uniting both in the experience of consciousness. It is consciousness's intentional nature that allows this unity of experience to take place.

Battista's second point of agreement, that consciousness is a field, refers to the fact that consciousness is a Gestalt experience. The field of consciousness consists of a multitude of perceptions, emotions, thoughts, etc.

which are unified into the fabric of experience such that the contents of consciousness are continuous and nondisjunctive with each other. Battista's third point, that consciousness is in continuous flux, refers to the fluid and changeable nature of consciousness, whose flow can be analogized to the flow of a stream.

Battista also distinguishes eight main content areas of conscious experience. These include "sensation, perception, emotion, affect, cognition, intuition, self-awareness, and unition - 'the experience of oneness or unification with everything'" (1978, p.59). These content areas are defined as the following:

Sensations are the physiological reactions to stimuli that impinge upon the nervous system. They are the "raw, physical" experiences that form the foundation for perceptions. Perceptions, in turn, are our experiences of sensations, and can occur as sights, sounds, touches, smells, etc.

Emotions, for Battista, are the internal experiences that arise in response to sensations and consist of such experiences as hunger, grief, sexual feelings, etc. Affects are the positive and negative reactions that are experienced in reference to emotions and refer to the pleasant and unpleasant nature of emotions. Cognition, on the other hand, is that complex "state of consciousness" that is the conceptualization, abstraction, and reflection upon experience in a logical, sequential manner.

Intuition is that means of understanding experience that is holistic and simultaneous and may correspond to the "aha" experience as when multifarious data are seen as a whole or organized unity. Self-awareness is that unique property of consciousness that allows it to reflect upon itself. Finally, unition is the term used to denote a transcendence of subject-object dichotomies in which one is merged with the universe or surround. According to Battista, ones phenomenological experience is composed of these contents in a unity that is ever-flowing and continuous.

In a somewhat different perspective for describing the phenomenological attributes of consciousness, Marsh (1978) talks about understanding consciousness in terms of four categories, these being: focus, structure, attributes, and flow. Focus, for Marsh, means the direction of attention, whether inward or outward, its intensity, and its breadth. All three can be thought of as the different aspects of attention.

Structure refers to the field of awareness as foreground, backround, and aerial. The foreground of awareness is the current ideas, memories, impressions, etc. that capture ones attention at a particular moment. The backround of awareness refers to the "more general, persistent awareness of time, place, social reality, and personal identity" (p.126) that forms the basis for the foreground of awareness.

And finally, the aerial or overview perspective refers to ones self-awareness, that quality of being aware that one is aware.

Marsh's third category, attributes, are the qualities or characteristics that describe and delimit images, perceptions, feelings, etc. as to their quality, form, and structure. Some attributes are clear/blurred, real/imagined, and like/dislike. The last of Marsh's categories, that of flow, refers to the fact that the experience of consciousness is subjectively felt as in flux and never the same.

Marsh's perspective thus describes the framework of consciousness in which the contents of consciousness, as enumerated by Battista, are organized. Both Marsh and Battista characterize consciousness as always in flux, or an unending stream of thought. One of the two major contemporary perspectives for understanding phenomenological consciousness consists of tapping and assessing ones ongoing stream of thought.

The Nature of the Stream of Consciousness

Investigations into the stream of consciousness as phenomenologically experienced can be traced, in a large part, to the work of Jerome Singer and his colleagues. Singer's approach to studying the stream of consciousness has been through daydreaming. Since

> daydreaming is one manifestation of an ongoing stream of relatively self-activated cognitive responses which characterize consciousness,

> further knowledge of its dimensions and functional implications for personality seems desirable (Singer and Antrobus, 1963, p.187).

Thus began an exploration into the stream of consciousness that has yielded a tremendous amount of data on the nature of daydreaming (Singer, 1966, 1975); its relationship to the ongoing stream of thought (Singer, 1977); a variety of personality variables (Singer and Schonbar, 1961; Rabinowitz, 1975); psychopathology (Starker and Singer, 1975; Giabra and Traynor, 1977); affect and stress (Singer and Rowe, 1964); fantasy (Singer and Singer, 1966); and many, many other areas.

Singer's approach to the study of daydreaming has been primarily through the use of a retrospective self-report questionnaire, that in its final form consists of 400 self-descriptions. It is called the Singer-Antrobus Imaginal Process Inventory (IPI) (Singer and Antrobus, 1972) and has been shown to be a reliable and valid questionnaire for assessing subjective daydreaming experience. This questionnaire has succeeded in showing that daydreaming patterns can be understood as an assortment of independent factors. Three major factors have been found to characterize ongoing thought during daydreaming. These include a Positive-Vivid daydreaming scale, a Guilty-Dysphoric daydreaming scale, and a Mindwandering-Distractible scale characterized "by fleeting thoughts and an inability to focus on extended fantasy" (Singer, 1978, p.196).

One of the many results that the IPI has uncovered that has been supported by interview data is the discovery that most, if not all, of us carry on

> complex processing of imagery sequences and fairly elaborate chains of thought that are often unrelated to some specific task or social situation in which we find ourselves (Singer, 1974, p.182).

In other words, ones stream of thought is continually occupied with looking into the future and the past, and planning and fantasizing possible outcomes of events, all the while with concomitant imagery and affect. Indeed, Singer (1978) suggests that the function of the stream of consciousness may be to provide us with the possibilities of action that we can choose from, so as to determine the most appropriate short and long-term goals and behaviors to enact.

Another approach to studying the stream of thought that utilizes direct assessment, is the research being done by E. Klinger at the University of Minnesota. In one particular experiment Ss were trained to become aware of their inner experience and then participated in in-the-laboratory and out-of-the-laboratory assessment sessions. During these sessions, at each sound of a buzzer, the Ss completed a thought-sampling questionnaire on the nature of their stream of consciousness. The questionnaire measured such phenomenological contents as duration of thought, vagueness of imagery, amount of direct thought, visualness

of imagery, etc.

Among the many results that were found, some of the following were:

> The five dimensions of thought: operant (directed) versus respondent (nondirected), stimulus-independent versus stimulus-bound, fancifulness, degenerateness, and relation of ego to imagery - are functionally separate even though they may be statistically related . . . Most thought in college student participants is specific, detailed, predominantly visual, unfanciful, controlled, present tense, related to the immediate situation, and recallable within a few seconds with at least moderate confidence (Klinger, 1978, p.255-56).

These results indicate that the thought-sampling method can yield intriguing and valuable data about the nature of the stream of consciousness.

In a different, but related, type of study (Pope, 1978) the effects of gender, solitude, and posture upon the stream of consciousness were assessed. Subjects reported on their stream of consciousness by thinking aloud into a cassette recorder. The results indicated that although the flow of consciousness is exceedingly rich and varied, it can be reliably categorized and varies with the type of stimulus condition. Pope suggested that to the extent that his particular study tapped "normal thinking," "people seem to spend a great deal of time in fantasy and long-term memory" (1978, p.288).

States of Consciousness

In contrast to the above studies which attempt to investigate the nature of the stream of consciousness, are those studies and theories which investigate the nature of "states" of consciousness. In recent times there has been an increased interest in trying to experience, categorize, and understand "states" of consciousness and "altered" (Tart, 1972, 1975, 1977) or "alternate" (Zinberg, 1978) states of consciousness in particular.

These terms refer to the belief that besides waking consciousness, there are also other, altered or alternate states of consciousness which people experience. Altered states of consciousness have received much more attention than ones ordinary, waking state of consciousness, for obvious reasons.

An interest in the scientific study and exploration of altered states of consciousness is not new to American psychology, however. William James, the father of American psychology, wrote in 1902:

> Some years ago I myself made some observations on this aspect of nitrous oxide intoxication. . . . One conclusion was forced upon my mind at that time and my impression of its truth has ever since remained unshaken. It is that our normal waking consciousness, rational consciousness, as we call it, is but one special type of consciousness, whilst all about it, parted from it by the filmiest of screens, there lie potential forms of consciousness entirely different. We may go through life without suspecting their existence, but apply the requisite stimulus, and at a touch they are there in all completeness, definite types

> of mentality which probably somewhere have their field of application and adaptation. No account of the universe in its totality can be final which leaves these other forms of consciousness quite disregarded. How to regard them is the question - for they are so discontinuous with ordinary consciousness. Yet they may determine attitudes though they cannot furnish formulas and open a region though they fail to give a map (1902/58, p.298).

By definition, altered states of consciousness would be experienced differently from a waking, baseline state. Several slightly different definitions have been provided to clarify exactly what an altered state of consciousness is. According to Krippner (1972)

> an altered conscious state can be defined as a mental state which can be subjectively recognized by an individual (or by an objective observer of the individual) as representing a difference in psychological functioning from that individual's 'normal, alert, waking state' (p.1).

Ludwig (1972) in a slightly different definition defines an altered state of consciousness as

> any mental state(s), induced by various physiological, psychological, or pharmacological maneuvers or agents, which can be recognized subjectively by the individual himself (or by an objective observer of the individual) as representing a sufficient deviation in subjective experience or psychological functioning from certain general norms for that individual during alert, waking consciousness (p.11).

And finally, the father of altered states of consciousness (ASC) theorizing, C.T. Tart (1972c), defines an ASC as

> a qualitative alteration in the overall pattern of of mental functioning, such that the experiencer feels his consciousness is radically different from the 'normal' way it functions (p.95).

An Eastern enumeration of states of consciousness

Although we in the West are just beginning to define and map states of consciousness and theorize about them, some of the Eastern philosophies and religions have very elaborate maps and theories about consciousness and its multifarious states (Tart, 1977). According to Goleman (1977), the Buddhist classic entitled the Abhidhamma, "is probably the broadest and most detailed traditional psychology of states of consciousness" (p.1) in written existence.

The Abhidhamma represents an encyclopedic compilation of the discourses of the Buddha. In the fifth century A.D. that portion of the Abhidhamma dealing with meditation was summarized by Buddhaghosa and entitled, the Visuddhimagga, or "the path of purification." The Visuddhimagga is really a recipe book for meditation, and lists, among other things, the states of consciousness attainable by meditation. These states of consciousness are enumerated according to two general classification systems, one based on concentration, and the other, based on insight.

The path of concentration lists the states of consciousness the mind can experience based on the degree to which one-pointed concentration or absorption are developed. When there is full absorption, or jhana, upon the object of meditation, there is a total break with normal consciousness and here begins the first of eight different jhanas, each concerned with specific, yet higher levels of

consciousness.

The following are the main characteristics of the first through eighth jhanas: (1) cessation of hindering thoughts, sustained attention to the object of concentration, and feelings of rapture and bliss; (2) no primary object of concentration, feelings of rapture, bliss, and one-pointedness; (3) cessation of rapture, feelings of bliss, one-pointedness, and equanimity; (4) cessation of bodily pleasures; feelings of equanimity, one-pointedness, and bliss; (5) consciousness of infinite space, equanimity, and one-pointedness; (6) objectless infinite consciousness, equanimity, and one-pointedness; (7) awareness of nothingness, equanimity, and one-pointedness, and (8) neither perception nor nonperception, equanimity, and one-pointedness.

Paralleling the path of concentration is the path of insight. The Visuddhimagga enumerates the different levels of mindfulness (of consciousness) attainable, based on the degree of insight, or the ability to "see things as they are." These stages include, from the least to the greatest insight: bare insight, mindfulness, the stage of reflections, pseudonirvana, realization, effortless insight, nirvana, and nirodh. Like the stages of concentration, each stage of insight has corresponding cognitive, affective, and noetic concomitants.

According to Goleman, at the higher stages, the paths of concentration and insight tend to merge, although subtle

differences remain, based on the fact that each path uses a different methodology to achieve alteration of state. Whereas the concentration method uses absorption in the object of meditation, the insight method uses attention to, yet detachment from, the object of meditation, which may be the meditator's own stream of consciousness.

A Western enumeration of states of consciousness

The West has also come up with several articles reviewing and delineating states of consciousness distinct enough from each other so as to merit enumeration. Two such reviews are those of Krippner (1972) and Ludwig (1972).

Krippner lists twenty states of consciousness that need to be further mapped. These include the states of dreaming and sleeping, the hypnagogic and hypnapompic states, states of hyperalertness and lethergy, states of rapture, hysteria, fragmentation, and regression, meditative and trance states, reverie, the daydreaming state, internal scanning, stupor, coma, stored memory, "expanded" conscious states, and last, but not least, the normal, everyday state of consciousness.

Ludwig, in a seminal article on altered states, has conceptualized altered states of consciousness as having several common denominations and dimensions in contrast to ordinary, everyday waking consciousness. Most of the following features, according to Ludwig, to a greater or lesser extent, tend to characterize most ASCs: alterations in

thinking, disturbed time sense, loss of control, changes in emotional expression, body image changes, perceptual distortions, changes in meaning or significance, a sense of the ineffable, feelings of rejuvenation, and hypersuggestibility.

Besides merely enumerating states of consciousness is a Western interest in how they come about. Several theories have been presented that attempt to determine the theoretical foundations and functions that make altered states of consciousness possible. The following paragraphs will review the contemporary major Western theories that attempt to account for the ability of consciousness to change and yet stabilize itself in various and sundry states.

Theories of states of consciousness

R. Fischer (1978) has developed a cartography of conscious states based upon the level of arousal of the organism. According to his mapping of consciousness, levels of arousal can be mapped along a continuum that extends from ordinary perception to hyperaroused states, and in the opposite direction, from perception to hypoaroused activity levels. According to him, one half of the consciousness continuum

> is along the perception-hallucination continuum of increasing ergotropic arousal - an inner excitation, called sympathetic or hyperarousal; and the second along the perception-meditation continuum of increasing trophotropic arousal.- a tranquil relaxation, or central hypoarousal. A voyage along the path of hyperarousal is

> experienced by Western travelers as normal, creative, hyperphrenic (including manic and schizophrenic as well as cataleptic and ecstatic states); the voyage along the path of hypoarousal is a succession of meditative experiences referred by Eastern travelers as zazen, dharna, dhyan, savichar and nirvichar samadhi (Fischer, 1978, p.25).

In accordance with Fischer's paradigm, the "perception hallucination continuum of increasing ergotropic arousal is characterized by diffuse cortical excitation, as in awakening (Gellhorn and Liely, 1972); EEG-desynchronization-hypersynchronization (Winters, et. al., 1972)" (Fischer, 1978, p.30), and an augmentation in sympathetic discharge that originates from the locus coerulus. High levels of arousal lead to hallucinatory experience, high S/M ratios (of inner sensation versus motor actions), and a (usually) desynchronized EEG. The perception-meditation continuum of increasing trophotropic arousal is characterized by an activation of the parasympathetic nervous system, a synchronized EEG, and deep, non-active meditational states, such as are achieved from Zen, vipassana or insight meditation, or any number of other meditational disciplines.

Fischer's cartography is a blend of Eastern and Western psychology that is based on a neurophysiological analysis of arousal and concomitant phenomenological experiences. States of consciousness are defined and divided according to the arousal level of the organism. This arousal level seems, in turn, to be based upon neurophysiological interactions between the reticular activating system of the

brain (Lindsley, 1960), the thalamus (Andersen and Andersson, 1968), limbic structures (Thatcher and John, 1978), and cortical structures (Diamond, 1976; Pribram and McGuiness, 1975). Fischer does not discuss the exact nature of the phenomenology of these states of consciousness, but rather uses the Eastern and Western labels (such as zazen, dhrana, etc.) and correlates such labels with neurological substrates.

A somewhat different paradigm has been put forward by J. Silverman (1968) for understanding altered states of consciousness that is based upon attention instead of arousal. According to Silverman, individuals in altered states evince behaviors which have the following characteristics:

> (1) Subjective disturbances in concentration, attention and also memory and judgment, (2) disturbed time sense, (3) difficulty in control, (4) changes in emotional tone, (5) bodily image changes, 96) perceptual distortions, (7) and changes in meaning or significance (pp. 1201-1202).

Such altered states are typically preceded, according to Silverman, by sensory overload or sensory underload, hyper- or hypoattentiveness to sensory or ideational stimuli, and changes in the biochemistry or neurophysiology of the body. Silverman suggests that recent advances in attention and perceptual behavior have suggested a new framework for understanding altered states of consciousness. This framework is based on the analysis of attention and its three related component factors, derived from factor analytic studies, which regulate and monitor the "reception

and utilization of environmental and internal stimuli" (Silverman, 1968, p.1202-1203). These three factors are: attention intensiveness, extensiveness (scanning) and selectiveness (field-articulation).

Attention intensiveness refers to the S's sensitivity to stimuli and how absorbed or involved he becomes in those stimuli. Whereas an ordinary state of consciousness involves a "midrange" sensitivity to stimuli, according to Silverman, "unusual hypersensitivity appears to be a precondition for an altered state of consciousness experience" (Silverman, 1968, p.1208). Extensiveness of attention refers to the degree of sampling of the elements in the stimulus field. Whereas a person in an ordinary waking state is in a balanced state of scanning the environment, in an altered state of consciousness there is restricted scanning of the environment for the person is preoccupied with a very narrow circle of internal or external stimuli.

Silverman's third variable, the selectiveness of attention, "refers to responses which determine which elements in a stimulus field exert a dominant influence on the perceiver" (p.1203). Thus whether the subject responds to the discrete elements of the field, or takes a more holistic and global perspective represent differences in selectivity of attention. A person in a normal waking state of consciousness generally has articulative control that is active, analytical and segmentalizing, whereas a person in an altered state has a passive, global-relational set of attention

selectivity. Silverman cites Deikman (1966) in support:

> The active, intellectual style is replaced by a receptive, perceptual mode . . , the undoing of automatic, perceptual and cognitive structures permits a gain in sensory intensity and richness at the expense of abstract categorization and differentiation (pp.329-331).

Thus the deployment of attention and the degree to which it is intensive, extensive, and selective will help determine the degree to which an altered state of consciousness is experienced.

Fishkin and Jones (1978) also present a model for the understanding of consciousness and altered states that likewise has attention in a very prominent position. In their approach the contents of consciousness at any moment are determined by what is being attended to and how it is being attended to. Certain phenomena are <u>potentially available to consciousness</u> (PAC) and attention towards the PAC determines what will gain access to consciousness.

According to their model attention is represented as a movable "window" between the potentially conscious and what gets into consciousness. The size of the window determines the breadth of attention, the rate of window movement determines the rate of shifts in attention, and the pattern of window movement determines the temporal sequence of attentional shifts.

Besides these parameters, four other parameters are necessary to determine a particular state of consciousness. The fluidity of the PAC and its structure determine the

amount of material to enter into consciousness and the specifics of that material, respectively. The last two parameters deal with the energy state of the organism. The distribution of available energy will help to determine the intensity of consciousness, the rate of attention shifts, and the rigidity of the PAC contents; while the amount of available energy determines the total energy accessible for trade-offs in distribution of available energy.

According to Fishkin and Jones "on the basis of these parameters a state of consciousness (SC) may be defined. Each SC is characterized by a particular set of values and/or attitudes of the eight parameters" (1978, p.278). In terms of this conceptualization, they define the ordinary state of consciousness into the following values of the previous parameters: The location of the window tends to be located upon perception of external or body events or verbal thinking. The rate of window movement is fast while the pattern of window movement is sufficient to maintain contact with the external environment and maintain a satisfactory self-concept. Talking to oneself (or others) and shifts between internal verbal thinking and the perception of external events and bodily events also characterize the pattern of window movement. The size of the window tends to fluctuate about midpoint. The fluidity of the PAC tends to be low to moderate while its structure is such that new associations form at a moderate rate. Both the distribution

and amount of available energy tends to be low to moderate.

Altered states of consciousness involve modulations in these eight parameters. Drug-induced altered states are characterized as involving the following characteristics: shifts from external to internal focus, alterations of moods or feelings, changes in breadth of attention and intensity of experience, time distortions, occurrences of strengthening of new associations, persistent or enhanced internal imagery, loss of memory, shifts from verbal to nonverbal thinking, increased availability of deep-lying memories or unconscious material, alteration of complex psychological phenomena, loss of self-concept, and the experience of unity, oneness, or connectedness.

A much different perspective upon the nature of altered states is the "psychedelic model of altered states of consciousness" (Hunt and Chefurka, 1976). Hunt and Chefurka argue that since the nature of consciousness is intentional, i.e. pointing "beyond itself (into the world of everyday conduct)" (p.867) then any direct awareness of experience of ones immediate subjectivity "could be experienced as anomalous, and would be dysfunctional in terms of adaptation" (p.867). They suggest that a psychedelic model of altered states

> would view altered states as the subjective reflections or by-products of general mental activity, resulting when the 'known object' of focal awareness is replaced by features of the 'knowing medium' (1976, p.867).

In order to test this hypothesis, Ss, after being placed in one of four groups, sat immobily for ten minutes in a bare well-lit room. Different instructions were given to each group. Group 1 was a baseline group who were given instructions that were not to sensitize them to their subjective experience. Group 2 received instructions to pay attention to their "subjective experience." Group 3 received instructions similar to that given observers of the classic introspectionists in the tradition of Titchener (1924), James (1890/1950), and Cattell (1930). Group 4 received instructions in imaginative role-playing.

The results, according to the authors, confirmed the psychedelic model for the different conditions evoken differing degrees of unusual experiences. The main results indicated that the sensitization instruction group was associated with greater altered state reports than the baseline or subjective experience groups. Unexpectedly, however, were the findings that the group instructed to just sit (the baseline group) reported greater alterations in experience than the group told to be aware of their subjective experience.

These and other results suggested that spontaneous altered state reports can be elicited in very short periods of time without recourse to elaborate experimental manipulations. The authors concluded by suggesting that altered states are always present, but "backwardly masked" because

they are microgenetically primitive processes prior to the conscious experience of perceptions, feelings, cognitions, etc. As such they suggest that

> in a formal sense, there is no such thing as 'altered states of consciousness,' rather we find states of consciousness typically subordinated within conduct and consciousness, atypically manifested (1976, p.876).

In contrast to Hunt and Chefurka, a consciousness theorist who firmly believes in the existence of altered states of consciousness and who was the original popularizer of the concept with his classic, Altered States of Consciousness (1972) is C.T. Tart. He is, by far, the most rigorous and systematic researcher and theorist to approach the study of altered states of consciousness, and his approach will be discussed in detail.

Tart's theoretical approach to states of consciousness

For Tart, ones ordinary state of consciousness is a "semi-arbitray construction," dependent upon the belief systems of the culture and the personal psychological make-up of the person. As amply demonstrated by research, the act of perception is a "highly complex, automated construction" that is dependent upon the physiological, psychological, and cultural needs of the organism (Tart, 1975). The emotions a person feels and the thoughts he thinks are also dependent upon his enculturation by the society, the process by which a particular culture selects certain human potentialities for use. Such a viewpoint is also

supported by others.

The work of J. Bruner (1957) has emphasized how perception is conditioned by the categories of conceptualization that we employ, and G. Kelly (1955) has concluded that each person tends to create his own world by means of "personal constructs" or categories. From a completely different cultural perspective, an Islamic mystic organization, the Sufis, have always maintained that ordinary consciousness is but a construction:

> The Sufis emphasize the constantly changing biases that constitute our normal awareness. 'What a piece of bread looks like depends on whether you are hungry,' says a Sufi poet, Jallaudin Rami. (They) quite explicitly consider the effects of our limited category system on awareness. The Sufis and other traditions contend that the selective and restricted nature of awareness is an obstacle to be overcome and that the process of meditation, among other exercises, is a way of turning down the restrictions that normally limit our awareness (Ornstein, 1972, p.191).

This belief is also paralleled by the Eastern tradition of labeling ordinary consciousness as one of illusion or maya (Ram Dass, 1974; Singh, 1973). Thus Tart's contention that ordinary consciousness is a construction is supported by contemporary research and millenia of mystic tradition. But how then is it constructed?

Like Silverman and Fishkin and Jones, Tart makes awareness/attention the basic theoretical and experiential given in the construction of consciousness. Awareness, for Tart, "refers to the basic knowledge that something is happening to perceiving or feeling or cognizing in its simpliest

form" (Tart, 1975, p.27). Consciousness, on the other hand, is awareness as modulated and regulated by psychological structures which are those relatively stable organizations or component processes which perform one or more related psychological functions.

Whereas awareness/attention constitutes the major energy source of consciousness, the structures are the mechanisms by which consciousness is experienced. Permanent structures, such as the nervous system, are the "hardware" of the mental system, to analogize from computer programing, whereas structures created by learning, conditioning, and enculturation are software or less permanent structures.

The interaction of awareness/attention with psychological structures determines the discrete state of consciousness (d-SoC), to use Tart's terminology, of the individual at the moment. A d-SoC is defined as a specific pattern of functioning of consciousness, and although it may show a range of variations in its specifics, the pattern still retains the same overall pattern. Thus

> within a d-SoC, particular parts of the pattern, particular psychological functions, may function faster or slower, more or less efficiently, or show a change in a particular content they are working with, but the overall pattern remains the same (Tart, 1977, p.14).

In contrast, a discrete altered state of consciousness (d-ASC) is a radical modification of the overall patterning and functioning of consciousness, compared to a baseline

state, such as ones ordinary state of consciousness. In summary, the experiencer of the altered state "can tell that different laws are functioning and that a new, overall pattern is superimposed on this existence" (1977, p.14). The observer thus notices a qualitative difference in his state of consciousness in which it appears there are new patterns of functioning set up between the different psychological structures.

Ten subsystems are hypothesized to make up a particular state of consciousness, besides awareness/attention. These are: exteroceptors, interoceptors, input processing, memory, sense of identity, evaluation and decision making, motor output, subconscious, emotion, and space/time. An altered state of consciousness will demonstrate changes in these subsystems such that the patterning of activity between subsystems is different from that of ones ordinary state of consciousness. This is a point that Tart finds crucial for d-SoCs and d-ASCs, since

> pattern differences are the essential defining element of different d-SoCs. Particular psychological functions may be identical for several d-SoCs, but the overall system functioning is quite different (Tart, 1975, p.57).

In order to stabilize a particular state of consciousness, Tart hypothesized four stabilizing systems. These include: loading stabilization, negative and positive feedback stabilization, and limiting stabilization. These four stabilization processes keep a particular state of

consciousness generally in the same overall pattern, and thus maintain that state of consciousness.

Experimental Studies in the Phenomenology of States of Consciousness

As can be seen, there has been a great deal of theorizing on the nature of consciousness and the organization of its different subsystems to form particular states of consciousness. Research into the phenomenology of states of consciousness, although less than adequate, is increasing and has now been undertaken in such areas as psychedelic drugs (Pahnke, 1972); meditation (Deikman, 1972; Maupin, 1972; Osis, et. al., 1973; Greenfield, Note 1); alpha EEG biofeedback training (Kamiya, 1972; Plotkin, 1979); the smoking of cannabis (Tart, 1971); hypnosis (Aaronson, 1972; Tart, 1972b) and other areas. The following paragraphs will briefly review several of the more prominent studies.

In a drug study by Pahnke (1972), twenty theological students listened to a religious ceremony. Half of the students were given psilocybin one and one half hours before the ceremony, and the other half, received a placebo, nicotinic acid. A double-bind technique for the administration was employed. Data collection afterwards consisted of questionnaires and interviews.

The treatment and control groups were compared, among other things, on nine dimensions thought to be related to mystical experience, these being: unity, transcendence of

space and time, deeply felt positive mood, sacredness, objectivity and reality, paradoxicality, alleged ineffability, transiency, and persisting positive change in attitude and behavior. For seven of the nine categories, the Ss receiving the psilocybin evinced phenomenological experiences significantly different from the controls.

A study by Osis, et. al. (1973) investigated the phenomenological dimensions of the meditative experience. Self-selected meditators met once a week for a two-hour session over a period of six to eight months. After each meditation session they then completed a thirty-item post-session questionnaire. The items were then factor analyzed trying to determine the dimensions of the meditative experience that might emerge. Six factors were found. One referred to the pre-meditative state that the Ss brought to the meditative session while the others differentiated five different phenomenological dimensions of the meditative experience.

These included: self-transcendence and openness, intensification and change of consciousness, a meaning dimension, forceful exclusion of images, and general success in meditation. Five of these six factors were replicated thrice and were fairly stable, having core items that were the same over a period of a few years during which pilot studies were also done. The authors concluded that the dimensions that emerged did "seem not to express everyday

states of consciousness" and that meditation "leads to altered states of consciousness" (Osis, et. al., 1973, p.130). Their data collection, however, did not allow for an adequate defining nor mapping of the ordinary state of consciousness.

In a very involved and elegant study, Greenfield (Note 1) has investigated individual subjective responses to three types of meditation. Forty-five females experienced meditations involving the use of a mantra, visualization, and bare attention over a ten week period. Their subjective experiences were assessed by questionnaires and individual personality variables were also monitored.

The results indicated several significant differences in subjective experience across the three meditational techniques, although mystical experience as assessed by the mystical experience dimension of the post-meditational questionnaire was not significantly different across the three techniques. This mystical experience dimension indicated, however, that meditators were consistent in rating their experience along phenomenological domains that included high ratings for "unity, noetic feelings of reality and truth, sense of sacredness, deeply felt positive mood, paradoxicality, transcendence of time and space, transiency, and to a lesser extent, ineffability" (Greenfield, Note 1).

Individual differences across meditators were also monitored and related to depth of meditation and level of

mystical consciousness experienced. Individuals who scored high in a paper and pencil test of absorption, a measure empirically correlated with hypnotic susceptibility, were found to experience a greater alteration and change of consciousness than meditators who scored low on this measure. Ss who were highly tolerant of ambiguity were also better able to relax during meditation.

In two other meditation studies, Maupin (1972) demonstrated that strong subjective feelings could be evoked in Ss who had very little meditation training and a study by Deikman (1972) found that Ss who meditated on a blue vase experienced subjective changes in perception which Deikman traced to a "deautomatization" of cognitive and perceptual processes.

An area of research that may be tapping similar types of phenomenological experience as meditation is that of alpha electroencephalographic (EEG) biofeedback training. In such training the S is given feedback as to when he is experiencing rhythmic alpha activity in certain areas of his cerebral cortex. Ss who have undergone such training report a configuration of phenomenological experiences that have been labeled the "high alpha state" (Kamiya, 1972). Subjective experiences include such things as a general pleasantness, a relaxation of the mental apparatus, and a lack of criticalness or cognitive skepticism about the nature of the experience.

In a more recent review of the relationship between the alpha experience and EEG physiological activity (Plotkin, 1979), the alpha experience was characterized as a "pleasant, relaxed, and serene state, characterized by a loss of body and time awareness, an absense or diminuition of thought, and a feeling of egolessness" (p.1132).

Besides the above, the phenomenological experience during a profound hypnotic trance state (Tart, 1972b) has also been investigated, as has the subjective experience of the hypnagogic state just before sleep (Vogel, et. al., 1972), to yield intriguing information about phenomenal experience during such anomalous stimulus conditions.

Interim Conclusions

The previous are just some of the studies that are being done to explore and map the nature of altered states of consciousness from a phenomenological perspective. Although there has been a good deal of theorizing on the nature of consciousness and its various states, the research is just beginning to scratch the surface of uncovering the phenomenological workings of consciousness in ones ordinary and altered states.

Since the "consciousness revolution" has hit America the cultivation of altered states of consciousness via drugs, meditation, biofeedback, hypnosis, and many other methods is becoming big business. Yet the empirical research to support these induction procedures for producing

altered states of consciousness significantly different from nonaltered states is much less than adequate. A beginning has been made but future research is a must in order to understand the structure and functions of phenomenological consciousness in altered and nonaltered states and the extent to which nonspecific, placebo, and expectancy effects are involved in the production and maintainence of altered states of awareness.

The previous pages has hopefully reviewed for the reader how consciousness, once the basic interest of late nineteenth century psychologists, is again becoming an area to which many are turning. Studies on cognition, imagery, the stream of consciousness, and states of consciousness are increasing and becoming much more sophisticated. Just as behaviorism replaced introspective psychology, and cognitive psychology is now replacing behaviorism, it may be that the scientific study of consciousness and its various dimensions will be the new frontier to which many psychologists will turn when the approach of cognitive psychologists have been found wanting.

An empirical methodology which brings together <u>phenomenological</u> <u>observation</u> with <u>psychological</u> <u>research</u> and <u>theorizing</u> must form the basis for such an endeavor, since consciousness, as subjectively experienced, can be best known, not through neurophysiology, but through introspection or phenomenological observation that is

coupled with and related to a psychoneurophysiological data base.

Although electrophysiological, neurochemical, and neuroanatomical data can help, a science of consciousness must be grounded in an empirical psychophenomenology of consciousness by which the phenomenological attributes of subjective, conscious experience are empirically observed, assessed, and evaluated in conjunction with biological, psychological, and personological variables. Such a psychophenomenology, if found reliable and valid, would investigate consciousness through empirical, phenomenological methodologies and relate such observation to more traditional psychological, physiological, and biochemical approaches.

As such, the study of consciousness, of which the psychophenomenology of consciousness might play a crucial part, may then be understood to be the possible missing link between the environmental stimuli of the behaviorists and the unconscious motivations of the dynamic clinicians. Its future importance for a complete and comprehensive psychology of man may be impressive.

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