

# The phenomena of inner experience

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## Abstract

This study provides a survey of phenomena that present themselves during moments of naturally occurring inner experience. In our previous studies using Descriptive Experience Sampling (DES) we have discovered five frequently occurring phenomena—inner speech, inner seeing, unsymbolized thinking, feelings, and sensory awareness. Here we quantify the relative frequency of these phenomena. We used DES to describe 10 randomly identified moments of inner experience from each of 30 participants selected from a stratified sample of college students. We found that each of the five phenomena occurred in approximately one quarter of sampled moments, that the frequency of these phenomena varied widely across individuals, that there were no significant gender differences in the relative frequencies of these phenomena, and that higher frequencies of inner speech were associated with lower levels of psychological distress.

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## 1. Introduction

Understanding inner experience—thoughts, feelings, sensations, and so on—was the goal of psychology at its inception. For example, in 1873 Wundt defined psychology as the discipline where “the person looks upon himself as from within and tries to explain the interrelations of those processes that this internal observation discloses” (Diamond, 1980, p. 157). William James’ *Principles of Psychology*, arguably the most influential book in early psychology, begins with these words: “Psychology is the science of mental life, both of its phenomena and of their conditions. The phenomena are such things as we call feelings, desires, cognitions, reasonings, decisions, and the like” (James, 1890/1981, p. 1).

However, the study of inner experience proved difficult. James Watson famously argued early in the 20th century that the study of consciousness should be excluded from psychology: “The time seems to have come when psychology must discard all reference to consciousness; when it need no longer delude itself into thinking that it is making mental states the object of observation” (1913/1994, p. 249). As a result of the behaviorist critique and other forces (Danziger, 1980), the study of consciousness as a direct focus of inquiry receded

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for much of the 20th century, though explorations of inner experience continued in different forms and under different names (Boring, 1953).

Psychology's so-called cognitive revolution brought renewed focus on the characteristics and nature of conscious experience beginning in the 1960s. For example, Singer and his colleagues began a series of studies aimed at identifying features of ongoing consciousness (e.g., Antrobus, Singer, & Greenberg, 1966; Singer, 1966; Singer & Antrobus, 1963). Singer (1993) summarized that work; for example, his work with the Imaginal Processes Inventory (IPI; Singer & Antrobus, 1972) indicated that most people are aware of some daydreaming every day, that there is wide variability in the nature of these daydreams, and that there is substantial cultural variability in the frequency and patterning of daydreaming.

A number of researchers began exploring the characteristics of ongoing thinking in natural environments in the 1970s. For example, Pope (1978) found that posture (walking vs. reclining) and circumstances (alone vs. with others) were related to characteristics of thinking. The interest in ongoing thinking led to the use of beepers to trigger observations in natural environments. Klinger (1978) used beepers to find that current concerns, in interaction with external and internal cues, generate shifts in the flow of conscious thought. Klinger and Cox (1987–1988) beeped students at quasi-random intervals, asked them to characterize their most recent thought on 23 dimensions and further reduced those 23 to eight more global dimensions such as degree of visual intensity of thought, attentiveness to external stimulation, directedness of thought, and presence of auditory features. Hurlburt (1980) found that frequency and acceptance of daydreaming reported on the IPI was associated with more frequent daydreaming in moments of inner experience. Csikszentmihalyi and his colleagues developed the Experience Sampling Method (ESM; Csikszentmihalyi & Larson, 1987; Csikszentmihalyi, Larson, & Prescott, 1977, which uses beepers to explore thinking, moods, and their relations to social context in a variety of groups such as adolescents (Csikszentmihalyi & Larson, 1984; Larson, Raffaelli, Richards, Ham, & Jewell, 1990) and schizophrenics (Delespaul & deVries, 1987). Stone and Shiffman (1994) developed Ecological Momentary Assessment (EMA) and used it to explore experience in a variety of conditions such as stress (Stone, Neale, & Shiffman, 1993) and binge eating (le Grange, Gorin, Catley, & Stone, 2001).

Thus there has been, for the past 30 years or so, considerable effort to quantify aspects of naturally occurring conscious experience. The present study seeks to extend that effort by using Descriptive Experience Sampling (DES; Hurlburt, 1990, 1993) to perform a quantitative survey of phenomena that previous descriptive research has shown to occur frequently.

Like ESM and EMA, DES uses a random beeper that participants take into their natural environments. The participant's task is to pay attention to the experience that was ongoing at the moment of the beep, jot down notes about it, and describe it in a subsequent expositional interview (Hurlburt & Heavey, 2006). Unlike ESM and EMA, those using DES explicitly work to bracket presuppositions about the nature of inner experience. Beliefs and preconceptions about what one will find in another's inner experience are set aside so as not to blind, confirm, exaggerate, minimize, omit, or otherwise skew what is actually discovered. The DES expositional interview is not only intentionally open ended but is also "open beginninged" (Hurlburt & Akhter, 2006; Hurlburt & Heavey, 2006). No predetermined set of questions is used, as that would limit the possibilities of discovering unanticipated experiences. Care is taken to understand the details of the experience as they were apprehended by the participant. This necessitates careful questioning and attention to the details of the meanings expressed by the participant.

DES is fundamentally descriptive and idiographic. It aims at faithfully describing one single, randomly chosen moment of experience at a time. Those single-experience descriptions are then accumulated within a single individual, which allows an idiographic characterization of the frequently occurring phenomena of inner experience of that particular individual. Those particular-individual phenomena can then be accumulated across several or many individuals, allowing group-level characterization of the phenomena of experience. DES is capable of identifying already known phenomena of experience as well as discovering new phenomena; in fact it was designed specifically for that role.

Hurlburt (1993, 1997) discussed the idiographic validity of DES characterizations. Hurlburt and Heavey (1999) developed a codebook for frequently occurring phenomena of experience and showed that they could reliably characterize moments of experience using that codebook (Hurlburt & Heavey, 2002). Hurlburt and Schwitzgebel (2007) conducted an in-depth examination of the DES method from both philosophical and psychological perspectives and concluded at least tentatively that DES may be well suited to developing high-fidelity descriptions of moments of experience.

The present study asks what might be understood as fundamental questions in consciousness studies: What are the base rates of the common phenomena of inner experience? After all, it is only against such base rates that any phenomena (hallucinations, for example) might be said to be rare. Are those phenomena distributed similarly across individuals? These are basic questions that can help inform a science of consciousness, but they have rarely been asked, let alone answered, by psychological science. This study provides an initial answer to these questions.

## 2. Method

The study proceeded in two phases, Phase I (the Screening Phase) and Phase II (the Descriptive Experience Sampling Phase).

### 2.1. Phase I: Screening Phase

The aim of Phase I was to survey a large, heterogeneous sample of college students, stratify them on the basis of psychological distress, and take a random sample from each stratum so as to advance a representative sample ( $N = 30$ ) to Phase II.

#### 2.1.1. Participants

Participants were the 235 female and 172 male students taking introductory psychology courses at a large urban university. They were given credit toward their course research requirement for participating in this phase of the study. The average age of the students was 20.1 years ( $SD = 3.9$  years).

#### 2.1.2. Materials

The Symptom Checklist 90 Revised (SCL-90-R; Derogatis, 1994) is a questionnaire designed to assess the extent to which an individual is bothered by a broad list of 90 psychological symptoms; each symptom is rated on a 5-point scale that ranges from 0 (*not at all*) to 4 (*extremely*). Although responses can be divided into eight different subscales, for this study only the Global Severity Index (GSI) score was used. The GSI is the mean of all 90 items; it constitutes a broad-based measure of total psychological symptoms.

#### 2.1.3. Procedure

Participants gave consent, provided contact information, and then completed the SCL-90-R. Subsequently, they were divided into deciles based on their GSI scores; there were approximately 40 participants in each decile. We took random samples of  $N = 3$  from within each decile; these participants were contacted by telephone and invited to participate in Phase II. If a person declined to participate, he or she was replaced by another randomly selected participant from the same decile. This procedure resulted in 30 participants (3 from each decile) being advanced to Phase II.

### 2.2. Phase II: Descriptive Experience Sampling Phase

The aim of Phase II was to use the Descriptive Experience Sampling (DES) method to obtain 10 random samples of experience from each of the 30 participants advanced from Phase I so that the phenomena of inner experience could be ascertained.

#### 2.2.1. Participants

Participants for Phase II were the 16 females and 14 males randomly chosen, 3 from each decile, as described in Phase I. The aim of the Phase I procedure had been to obtain a sample for Phase II that matched the general psychological characteristics of the Phase I screening sample. That aim was accomplished: the Phase II sample closely matched the characteristics of the Phase I sample on SCL-90-R GSI scores (Phase II:  $M = .76$ ,  $SD = .51$ ; Phase I:  $M = .82$ ,  $SD = .56$ ;  $t = .57$ , *ns*), as well as gender breakdown (Phase II: 53% female; Phase I: 57% female). Females in Phase II ( $M = .85$ ,  $SD = .46$ ) had somewhat higher average SCL-90-R scores than did males in Phase II ( $M = .65$ ,  $SD = .57$ ), though this difference was not statistically

significant,  $t(28) = 1.07$ , *ns*. This Phase II pattern of female-higher GSI scores parallels the difference found in Phase I (female  $M = .89$ ,  $SD = .57$ ; male  $M = .72$ ,  $SD = .53$ ) as well as the normative samples reported by Derogatis (1994).

Participants were given additional credit toward their course research requirement for participating in Phase II. Phase II participants' average age was 19.0 years ( $SD = 3.3$  years); their racial/ethnic breakdown was 63% Caucasian, 17% Asian, 10% Hispanic, 7% African American, and 3% Native American. This is similar to the racial/ethnic breakdown of all students attending the university: 58% Caucasian, 12% Asian, 10% Hispanic, 7% African American, and 1% Native American.

### 2.2.2. Materials

Each participant in Phase II was given a portable, pocket-sized beeper (Hurlburt, 2007). The beeper emits a 700-Hz tone at random intervals ranging between 0 and 60 min with a mean of 30 min. The beeper has an on-off-volume switch that can be used to adjust the volume based on ambient noise levels. The tone is emitted through an earphone attached to the beeper. Each participant was also given a 3 in.  $\times$  5 in. notebook in which to record notes about their inner experiences at each sampled moment.

### 2.2.3. Procedure

Throughout the procedure, the researchers were kept blind to all participants' SCL-90-R score and decile. Each participant was telephoned and invited to participate in Phase II. A brief description of the sampling procedure was provided and an initial meeting scheduled. At this initial meeting, the process of DES was explained in detail and informed consent was obtained. A complete description of DES, including a sample transcript for the initial meeting, can be found in Hurlburt and Heavey (2006). What follows is a summary of the instructions given to participants.

Participants were asked to turn on the beeper during a time of their choosing and then to continue their everyday activities. They were to use the beeper until it had beeped six times. The participants were instructed to recall, immediately after each beep, the details of their experience that was ongoing at the exact onset of the beep and to jot down in the notebook whatever notes they might find useful to help them recall the details of their sampled inner experiences. The procedure for operating the beeper was explained and any questions were answered. A 1-h expositional interview was scheduled for a convenient time within 24 h of the use of the beeper.

During the expositional interview, the researcher (one of the two authors, randomly determined), interviewed the participant about the details of his or her experience at each sampled moment. The goal of this interview was (a) to develop a faithful understanding of the participant's inner experience at each of the sampled moments and (b) to train the participants in the DES skills so that subsequent sampling could be performed more expertly. After the researcher had developed an understanding of the ongoing experience at each moment, he used the codebook developed by Hurlburt and Heavey (1999) to determine which, if any, of the 16 forms of inner experience described in the codebook were present in the sampled experience. Note that more than one form of experience could be coded at any particular sample. Note also that because DES is a generative, exploratory, descriptive procedure, relatively unconstrained by prior studies, it was possible that none of the codebook forms would apply to some particular samples or that new phenomena would emerge.

Each participant was asked to participate in three days of sampling/interviewing with 6 samples per day. The first day was considered to be training and samples from this day were discarded. On the second and third sampling days, the first five samples were used unless one of those was unusable, in which case it was discarded and was replaced by the sixth sample. The most common reasons that samples were unusable were (1) the participant did not have the opportunity to jot down notes about the sample in close proximity to the beep and therefore could not recall the details of the experience at the moment and (2) the beep sounded when the participant was still writing notes about the previous beep, which we had decided a priori to discard. Five participants completed only two days of sampling. For these five participants, samples from the first day were used in place of those from the third sampling day. Each participant was to contribute 10 samples to the final data set. Four participants contributed fewer than 10 samples, with three completing 9 and one completing 8. Thus the final data set comprised 295 samples.

### 3. Results

The goal of this study was to describe the frequently occurring phenomena of inner experience within and across people. This study determined, at each beep, the presence or absence of 16 previously identified phenomena and would have created descriptions of additional phenomena had the investigations seemed to warrant it. However, no frequently occurring new phenomena were discovered, so these results focus on the 16 previously identified phenomena.

The magnitudes of these 16 frequencies had a clear dividing line, with five phenomena occurring quite frequently (22% or more) and the other 11 phenomena occurring quite infrequently (3% or less). Therefore, we narrow the focus of this report to the five most frequently occurring phenomena of experience: Inner speech, inner seeing (aka images), unsymbolized thinking, feelings, and sensory awareness. These phenomena are described in Table 1. The next most commonly occurring phenomena, inner hearing and just doing, occurred in 3% and 2% of the sampled moments, respectively.

As shown in Table 2, each of the five common phenomena of inner experience occurred in approximately one quarter of all samples. Note that several phenomena can and frequently do occur simultaneously. For example, a participant might be experiencing an inner seeing and a feeling at the same moment. Thus the sum of the frequencies of these phenomena exceeds 100%.

Additionally, Table 2 shows that there were no substantial gender differences in the relative frequency of these phenomena. The largest gender differences were for inner speech and feelings, where the percentage for males was greater than the percentage for females, 31–23% for both. Neither the difference for inner speech nor the difference for feelings was statistically significant,  $t(28) = 1.09$ , *ns*, and  $t(28) = .89$ , *ns*, respectively.

Table 2 also shows that there were large individual differences in the relative frequencies of these phenomena. The column headed *Within Participant Lowest Frequency* shows that each of the five most common phenomena was entirely absent from all the sampled moments of some participants. By contrast, the column headed *Within Participant Highest Frequency* shows that each of the five most common phenomena was always or almost always present in the sampled moments of other individuals. Thus, for example, the first row of Table 2 shows that 5 participants had no inner speech whatsoever, whereas, by contrast, 1 participant experienced inner speech in 75% of his samples. The highest frequencies are all substantially higher than would be expected by chance fluctuation. For example, if one assumes that inner speech occurs on 26% of all occa-

Table 1  
Frequently occurring phenomena of inner experience

Characteristic	Description	Example
Inner speech	Speaking words in your own voice, usually with the same vocal characteristics as your own external speech, but with no external (real) sound or motion	Susan was saying to herself mentally, "I've got to get to class." It seemed just like her voice, but she wasn't making any sound
Inner seeing (aka image)	Seeing something in imagination that is not actually present	Paul was imaginally seeing the face of his best friend. He could see her neck and her head and that she looked sad, but he could not see anything around her or what she was wearing
Unsymbolized thinking	Thinking a particular, definite thought without the awareness of that thought's being conveyed in words, images, or any other symbols	Adam was watching two men carry a load of bricks in a construction site. He was wondering whether the men would drop the bricks. This wondering did not involve any symbols, but it was an explicit cognitive process
Feeling	Affective experiences, such as sadness, happiness, humor, anxiety, joy, fear, nervousness, anger, embarrassment, etc.	Courtney was unequivocally angry, although it was difficult for her to describe how this anger presented itself to her. It seemed to be conveyed by or accompanied by a tight feeling in her chest and a little shakiness in her hands, but she could not be definite about those aspects
Sensory awareness	Paying attention to a particular sensory aspect of the environment where that sensory experience is itself a primary theme or focus apart from the object of perception	It was windy, and Harriet was feeling the cold breeze on her left cheek and her hair moving, tickling her forehead. She wasn't thinking about those aspects, but she was explicitly noticing the coldness and the moving hair

Table 2  
Frequency of common phenomena of inner experience

Form of inner experience	Overall frequency (%)	Female frequency (%)	Male frequency (%)	Within participant lowest frequency <sup>a</sup>	Within participant median (%)	Within participant highest frequency <sup>a</sup>
Inner speech	26	23	31	0% (5)	20	75% (1)
Inner seeing (aka images)	34	36	31	0% (4)	34	90% (1)
Unsymbolized thinking	22	22	23	0% (8)	25	80% (1)
Feeling	26	23	31	0% (5)	20	90% (1)
Sensory awareness	22	22	22	0% (9)	16	100% (1)

<sup>a</sup> The number in parentheses represents the number of individuals with the same frequency of the form of inner experience.

Table 3  
Correlations among five phenomena of inner experience and psychological distress

	Inner seeing	Unsymbolized thinking	Feeling	Sensory awareness	Psychological distress
Inner speech	-.28	-.42*	-.23	-.13	-.36*
Inner seeing (aka images)		-.34	-.06	-.29	.22
Unsymbolized thinking			.01	-.04	.19
Feeling				-.09	.18
Sensory awareness					.04

*N* = 30.

\* *p* < .05.

sions (as estimated in Table 2), the binomial distribution indicates that the probability that 10 randomly selected samples would have 75% or more inner speech is approximately .001.

Most participants had one form of inner experience predominate; 22 of the 30 participants had at least one of the five common phenomena occurring in 50% or more of their samples. Moreover, only 4 of these participants had another phenomenon occurring in 50% or more of their samples; in 3 of these instances one of the two common forms of inner experience was feeling. Thus, the majority of individuals exhibited a dominant inner experience phenomenon. The most common dominant phenomenon was inner seeing, followed by feelings, and then inner speech.

Finally, we examined the correlations among the within-person mean levels of the five phenomena as well as their correlation with self-reported psychological distress (SCL-90-R GSI score). These correlations are shown in Table 3. The intercorrelations among the five phenomena are generally small and negative, with only the (negative) correlation between inner speech and unsymbolized thinking reaching significance. The correlations between the five phenomena and psychological distress are also generally small, with only the (negative) correlation between inner speech and psychological distress reaching significance.

#### 4. Discussion

This study examined the phenomena of inner experience and discovered that inner speech, inner seeing (aka images), unsymbolized thinking, feelings, and sensory awareness each occurred in approximately one quarter of sampled moments. There were other phenomena of inner experience observed, but they were substantially less frequent, each occurring in less than 3% of the samples. Moreover, we found that there were large differences in the within-participant relative frequency of these phenomena across participants. When we examined the intercorrelations of these relative frequencies, we found them to be generally modest and negative, indicating that these phenomena are largely independent. The negative correlation between inner speech and unsymbolized thinking was significant, which was not surprising given the unworded nature of unsymbolized

thinking: when a person frequently experiences thinking in words, they experience unsymbolized thinking less frequently. Similarly, there was also a negative relationship between inner seeing and unsymbolized thinking, though that correlation did not reach significance.

Although we had no hypotheses about how characteristics of inner experience would relate to psychological symptoms, we did find that those with more frequent inner speech tended to report fewer distressing symptoms. The magnitude of this relationship was moderate. Much more work needs to be done before we can be confident about the nature of the relationships between inner experience and other aspects of functioning.

#### 4.1. Method considerations

This study can be said to be the third logical step in an investigation of the naturally occurring phenomena of inner experience. The first step (undertaken in a variety of DES studies including Hurlburt (1990, 1993), Hurlburt and Melancon (1987), Hurlburt, Happé, and Frith (1994), and Hurlburt, Koch, and Heavey (2002) was to describe as faithfully as possible the naturally occurring phenomena of inner experience. Those studies carefully observed the phenomena of inner experience in a variety of individuals (normal, depressed, anxious, borderline personality, bulimic, anxious, fast talkers) and in a variety of naturally occurring situations and were designed to allow the phenomena of inner experience to emerge as free of presuppositions as possible. There are many potential presuppositions about inner experience—that it always is in words (going back as far as Aristotle), that it always has images (as Titchener thought); etc. Those presuppositions are not consistent and sometimes entirely contradictory, so the first step in a modern phenomenological investigation must include the “bracketing” of those presuppositions—a concept discussed by Husserl (and described as it applies to DES in Hurlburt & Heavey, 2006). The object of bracketing presuppositions is to allow whatever phenomena exist to emerge, as untainted as possible by the investigator’s (or the subject’s) prior beliefs. In this first step there was no particular intention to discover common phenomena—those investigations (Hurlburt, 1990, 1993; Hurlburt & Melancon, 1987; Hurlburt et al., 1994; Hurlburt et al., 2002; etc.) would have been just as happy to discover unique phenomena as common phenomena. It happened, however, that at least some of the phenomena those studies discovered seemed to be similar across individuals and across studies.

The logical second step of a scientific phenomenological investigation was to determine whether the various phenomena identified in the first step could be discovered reliably in subjects and situations different from where they were first identified. Hurlburt and Heavey (2002) considered all the phenomena that had thus far been identified at least several times—there were 16 such phenomena—and determined their inter-rater reliabilities. They discovered that, indeed, there was very high inter-rater agreement about the phenomena that occurred frequently enough to perform such analyses.

A third (and the present) logical step of a scientific phenomenological investigation is the determination of the frequency with which these phenomena occur in the general population. If there are indeed specific phenomena that can be said reliably to occur across people but not within all people or all the time (as was found in the first two steps), then knowing the base rates of those phenomena is important in much the same way as knowing that the earth’s atmosphere is 80% nitrogen and 20% oxygen, or that the earth’s surface is 70% ocean and 12% desert, is important. Toward that end, in the present study we stratified a large group of students on a measure of psychological distress and randomly sampled from each stratum, thus ensuring at least a modestly representative sample, and investigated their phenomena of inner experience. As we have seen, five phenomena emerged frequently across our sample.

The fourth step, not yet undertaken, will be to assess the theoretical significance of these and other phenomena of inner experience. That will involve a broad series of studies in a wide variety of populations, all of which will refer at least indirectly to this or subsequently improved estimates of the base rates of phenomena.

There are limitations of all these studies, but we believe that the phenomena we are describing here are robust, real phenomena, as much characteristics of inner experience as oceans and deserts are of the real world. That is, we believe that any investigation of a variety of individuals performed using any adequate method will discover inner speech, sensory awareness, unsymbolized thinking, inner seeing, and feelings, just as any investigation of the surface of the earth will discover that about three quarters of that surface is oceans, about 12% is desert, and so on. Certainly the study needs to be replicated in other cultures and with popula-

tions other than university students before one can be confident of the overall base rates of these phenomena and the degree of within-person variability, but our sample was at least moderately diverse.

We note that the frequently occurring phenomena we have described are all characteristics of the *form* of experience, not its content—characteristics of the manner in which inner experience takes place, rather than the about what of it. That is an emergent characteristic of the phenomena: we did not set out to find characteristics of the form of experience, and would have been just as happy to have discovered content characteristics.

There are other studies that have examined aspects of naturally occurring inner experience. For example, Klinger (1987–1988) conducted random thought sampling and provided frequencies of characteristics of thought. Larson et al. (1990) used the Experience Sampling Method to randomly sample the thoughts and emotions of depressed and nondepressed adolescents. However, the present study differs from these and other studies in what we take to be two fundamentally important ways: (1) DES seeks to begin with naturally occurring phenomena (the emergent phenomena described in the first step above), whereas other methods begin with characteristics of experience that theory or casual observation determine a priori to be of interest and (2) DES values the careful observation of phenomena, whereas other methods rely on simpler but (we think) phenomenologically questionable rating scales or retrospective interviews.

To illustrate these two differences, we will use Klinger and Cox (1987–1988) as an example. We could just as easily have used other studies (e.g., Larson et al., 1990) including, for that matter, our own early studies (e.g., Hurlburt, Lech, & Saltman, 1984). First we show that Klinger and Cox (1987–1988), despite their intention to provide (among other things) the “descriptive statistics of thought flow” (p. 123), did not (1) begin with an investigation of the naturally occurring phenomena of thought flow. Klinger and Cox gave participants beepers and instructed them to fill out a Thought-Sampling Questionnaire at each beep. This Thought-Sampling Questionnaire was a modification of a questionnaire used by Klinger (1978–1979), which was itself “modified from a dream-sampling questionnaire by Allan Rechtschaffen” (Klinger, 1978–1979, p. 101). It is possible that Rechtschaffen had made a detailed phenomenological investigation of dreams, but that seems doubtful (Klinger did not provide his reference to Rechtschaffen, and the only Rechtschaffen dream questionnaire that we can find (Hauri, Sawyer, & Rechtschaffen, 1967) seems more psychoanalytically theoretical than phenomenological); but even if Rechtschaffen did perform a thorough phenomenological investigation of dreaming, it is a long step to assume that the same phenomena that emerged in dreaming would be important in waking experience. Thus Klinger and Cox did *not* first perform a careful phenomenological investigation of thoughts and then create a thought-sampling questionnaire on the basis of that investigation; instead, they adapted items already used. It is unlikely that items so chosen will faithfully reflect the actual lived phenomena of thinking—as one instance, there are no items on Klinger and Cox’s questionnaire that inquire about unsymbolized thinking, which our own work finds a frequent phenomenon.

Thus there is no assurance that the items Klinger and Cox chose to investigate rest lightly on the phenomena of experience. But even if they did begin with a thorough phenomenological investigation of experience, in our view, Klinger and Cox (1987–1988), like other studies, did not (2) pay careful enough attention to the observation of those phenomena. Here are two examples. Our studies have shown that if the intention is to investigate phenomena, it is essential to investigate very short moments, as close to instants as possible (Hurlburt & Akhter, 2006; Hurlburt & Heavey, 2004, 2006). Klinger and Cox, by contrast, instructed their subjects to “give a detailed, accurate report of what has been going through your head, from the most recent thought back to the earliest that you can remember well” (p. 110). We believe that that instruction opens the time window too wide, and too ill-defined, for faithful reports about the evanescent phenomena of experience. Second, their training of their participants was, in our view, inadequate. Klinger and Cox reported that their training sessions lasted from 30 to 60 min, much of which was focused on the use of the beeper and the mechanics of score reporting. That implies that they spent less than a minute each clarifying the 23 questions on their scale. Hurlburt and Akhter (2006) discussed the notion that one-shot training of any duration for the apprehension of inner experience is inadequate; training should be “iterative”: participants should make attempts at observing/describing their own phenomena, receive feedback on those attempts, then make new observing/describing attempts, followed by new feedback, and so on. For example, DES shows repeatedly that many, if not most, people who have unsymbolized thinking (the experience of thinking without words or other symbols) will at first report such thinking to



be in words. Only after repeated training as they iteratively confront *the apprehension of their own experience* do they come to recognize their presupposition of words as being false.

Thus we believe that Klinger and Cox's participants were not in an adequate position to report with fidelity about the actual phenomena of experience. Therefore, when Klinger and Cox (1987–1988) reported the presence of “Interior Monologue, which was nonzero in three quarters of the thought samples” (p. 117) and when we say that inner speech occurs only about *one* quarter of the time, we believe that large differences in method are the cause of the large discrepancy in reported frequency.

We believe that careful attention to the characteristics of the methods used to explore inner experience is crucial to the advancement of the science of consciousness; the example of the frequency of talking to oneself serves as a case in point. How successful can consciousness science be if it accepts 26% (this paper), 75% (Klinger and Cox, 1987–1988), and 100% (Baars, 2003, p. 106: “human beings talk to themselves every moment of the waking day”) as estimates of the frequency of inner speaking? We have advanced arguments, here and elsewhere (e.g., Hurlburt & Akhter, 2006; Hurlburt & Heavey, 2006; Hurlburt & Schwitzgebel, 2007), for the adequacy of DES as a method for the exploration of the phenomena of inner experience. Perhaps we are mistaken; we hope this article stimulates this important discussion.

#### 4.2. *Unsymbolized thinking*

We found that the experience of thinking without inner speaking or any other symbols (i.e., unsymbolized thinking) is actually quite common. The overall frequency of unsymbolized thinking was 22%, and half our participants experienced unsymbolized thinking in at least a quarter of their samples. One might explain their reported lack of symbols by claiming that our participants, for whatever reason, simply characteristically do not notice or remember words, visual images, or other symbolic experiences. However, the fact is that all of our participants who experienced unsymbolized thinking in *some* of their samples noticed words and/or images occurring during *other* sampled moments. Thus all our participants were fully capable of recognizing symbols at least some of the time. With practice, participants became confident that at some moments they have a clear thought but no experienced symbolic representation of that thought, and distinguished confidently between moments of unsymbolized thinking and moments where symbols were present, such as inner speech or inner seeing.

Despite its high frequency, many people, including many professional students of consciousness, believe that unsymbolized thinking is impossible (Hurlburt & Akhter, 2006; Hurlburt & Heavey, 2006). Hurlburt and Akhter (submitted) give two main reasons for that belief: the common presupposition among investigators and participants that thinking is in words, and the (related) fact that unsymbolized thinking is typically slow to emerge in participant interviews, implying that it is likely to be overlooked by one-shot or retrospective methods. Unsymbolized thinking has been discovered in every DES investigation since it was first reported by Hurlburt (1990).

#### 4.3. *Inner seeing*

Controversy about the nature of the experience of mental images, which we call inner seeing, has also existed since the beginning of psychology. In about 1870, Sir Francis Galton asked his friends in the scientific world to:

think of some definite object—suppose it is your breakfast-table as you sat down to it this morning—and consider carefully the picture that rises before your mind's eye. . . . To my astonishment, I found that the great majority of the men of science. . . . protested that mental imagery was unknown to them, and they looked on me as fanciful and fantastic in supposing that the words “mental imagery” really expressed what I believed everybody supposed them to mean (Galton, 1883/1951, p. 58).

However, when Galton posed the same questions to persons in general society, he found different results: “Many. . . . declared that they habitually saw mental imagery, and that it was perfectly distinct to them and full of colour” (Galton, 1883/1951, p. 59). These conversations led Galton to present an open-ended questionnaire

about imagery to hundreds of men, women, and children, including many notable scientists. On that basis, Galton concluded that there were substantial individual differences in the ability to form mental images. The present study comports well with Galton's observations.

#### 4.4. Feelings

Similar controversy exists within the realm of emotion. Watson (2000) used the Positive and Negative Affect Schedule (PANAS; Watson & Clark, 1994; Watson, Clark, & Tellegen, 1988) to conclude that people are essentially always experiencing some form of affect. The PANAS presents participants with affect descriptors and asks them to indicate the extent to which they have experienced each during a specified time period ranging from "right now (at the present moment)" to "in general, that is, on average" using a scale that ranges from *very slightly or not at all* to *extremely* (Watson et al., 1988). Based on his extensive use of this instrument with thousands of participants, Watson concluded, "In fact, I would argue that waking consciousness is experienced as a continuous *stream of affect* such that people are always experiencing some type of mood" (2000, p. 13, italics in original). Russell (2003), on the other hand, proposed that although there may be an underlying stream of affect, which he calls "core affect," it rises into consciousness only under certain circumstances:

Intense core affect can be the focus of consciousness, but milder core affect is typically part of the background of the person's conscious world. Change in core affect, in proportion to its rapidity and extent, fills consciousness. When the feeling weakens or stabilizes, it recedes into the background. When neutral and stable, perhaps core affect disappears altogether from consciousness (p. 148).

Our participants experienced feelings in approximately one quarter of the sampled moments, a finding highly discrepant from Watson's (2000) characterization of the experience of continuous stream of affect but concordant with Russell's (2003) theory of core affect.

#### 4.5. Sensory awareness

The phenomenon of sensory awareness requires additional explanation to ensure that it is comprehended. Sensory awareness, as we define it, is the experience of being drawn to and the paying particular, thematic attention to some sensory quality of the inner or outer environment. Sensory awareness is not merely the perception of some object; it is the direct attention to some particular sensory quality of the object. Thus Sally is reaching for a can of Coke with the intention of taking a drink. She is perceptually aware of the can as she reaches toward it, and could, if asked, report its shape, color, and so on. That does *not* count as sensory awareness by our definition. By contrast, Maria is also reaching for a can of Coke with the intention of taking a drink. As she reaches, she notices how the light reflects off the shoulder of the can, notices the can's slightly rosy redness below the shoulder and its deeper redness above. Maria does have a sensory awareness as we define it. Both Sally and Maria are outwardly engaged in the same act, and both are obviously encoding the sensory aspects of the environment (they successfully reach). But their inner experience is far different: Sally is seeing the can as a means to an end (the drink); Maria is seeing the colors of the can as the primary focus of her attention at the moment.

Thus sensory awareness is a quite specific phenomenon, and it is striking that it occurs with the frequency that it does (22% of all samples; one of our participants experienced sensory awareness in 100% of his samples). However, as far as we know, psychology currently does not recognize the existence of sensory awareness as a frequent or important phenomenon of experience.

#### 4.6. Within-participant differences

There were strikingly large within-participant differences in the frequency of all the phenomena. The frequency of inner speech ranged from 0% to 75% across participants; the frequency of inner seeing ranged from 0% to 90%; unsymbolized thinking ranged from 0% to 80%; feelings ranged from 0% to 90%; and sensory awareness ranged from 0% to 100%. It is of course possible that these differences may be the result of sampling

fluctuations: that if we had larger samples from each participant, the lower frequencies might be small but not zero, and the upper frequencies might be high but not as high. On the other hand, had we had more participants, we might have found frequencies even more extreme.

Furthermore, it is possible that these participants may all have actually had quite similar inner experiences; it is merely the *reports* of those experiences that differed. We have discussed this issue in detail elsewhere (Hurlburt & Heavey, 2006; Hurlburt & Schwitzgebel, 2007); our interpretation is that these differences in frequencies cannot be explained away by mere differences in reporting style. These participants did not merely give differing check-marks on a questionnaire; such markings do little or nothing to diminish the possibility that participants may have had disparate understandings of the queries. By distinct contrast, our participants were all interviewed in detail about every response by skilled interviewers who probed diligently about potentially idiosyncratic understandings or meanings of words. Furthermore, participants could be expected, as we have discussed above, to have profited from the iterative nature of DES.

Inner speech, for example, is a quite straightforward concept to explain, to understand, and to identify if an adequate procedure is used. Nonetheless, 5 of our participants, despite multiple probing interviews, claimed that inner speech never occurred in their samples; by contrast, 6 participants experienced this phenomenon in 50% or more of their samples. We conclude that the most parsimonious way of understanding this is to accept that there are in fact large individual differences in the frequencies of the phenomena of inner experience. This conclusion also accords with other studies we have conducted that routinely reveal substantial differences in the inner experience of individuals.

If future studies by other researchers support this conclusion, it will have substantial ramifications for the study of personality and individual differences. If some people spend nearly all their waking moments seeing images, whereas others spend nearly all their waking moments engaged in inner speech, it seems likely that those characteristics of inner experience will be linked to important characteristics of personality and functioning. For example, Hurlburt et al. (2002) showed that the external characteristic of fast talking is associated with complex inner experience such as inner seeing. Hurlburt, Heavey, and Akhter (2006) speculated about other relationships between inner experience and personality. Furthermore, such individual differences could have important implications for clinical interventions. For example, primarily verbally oriented clinical interventions, such as those used in cognitive therapy, may align more effectively with some types of inner experience than with others.

In contrast to the large within-person variability, it is noteworthy that there were no substantial gender differences in the frequencies of the characteristic forms of inner experience. In general, these findings support the “gender similarities hypothesis” (Hyde, 2005).

## 5. Conclusions

It's an exciting time in consciousness research. There is a substantial renewed interest in consciousness and in first-person accounts of it (e.g., Jack & Roepstorff, 2003), and yet we still lack a comprehensive understanding of the phenomena of normal awareness. Differing methods of exploration have provided dramatically different results about the characteristics of inner experience. As we have seen, some hold that we are constantly experiencing feelings; others hold that we are constantly engaged in inner speech. We found both feelings and inner speech to be present only about a quarter of the time. Moreover, we found two common phenomena of inner experience that are not widely recognized in the scientific literature on consciousness—unsymbolized thinking and sensory awareness. Such discrepancies and discoveries highlight the methodological difficulties that the science of inner experience must yet face and the importance of carefully surveying the landscape of inner experience. We are certainly not in a position to claim that our results are absolutely correct.

Nonetheless, this study serves as one initial foray into the realm of describing the phenomena of naturally occurring inner experience. This study has clear weaknesses: we used a moderate sized sample of college students; we used a method developed in our lab and not yet fully vetted through the process of replication by other labs and triangulation with other methods of inquiry; we and our colleagues are the only ones yet to apply the DES method—others may recognize additional phenomena that are important that we have missed.

Despite these weaknesses, we believe this study is of substantial value to the science of consciousness for three primary reasons. First, the study does what it set out to do: to estimate the frequencies of important

phenomena of inner experience. As such, it should provide a benchmark for future studies of experience. That is a bold claim, because it implies, for example, that any future investigation of the phenomena of everyday experience in a varied population, by us or by others, using DES or using some other adequate method, should discover inner speech about a quarter of the time. Our claim is that the phenomenon of inner speech is pretty much independent of us, in much the same way that the concept of the desert is pretty much independent of the organization or entity that studies deserts. There will always be some discrepancy about what counts as an instance of the phenomenon of inner speech, just as there will always be some discrepancy about what counts as a desert. Our claim is that these discrepancies should be minor if actual phenomena are explored with an adequate method: the desert may account for 10% or 12% of the earth surface, depending on how you measure, but no reasonable measurement will say 30% or 73%. Thus we claim that there is a way out of the dilemma of the wildly disparate emotion frequency estimates of Watson and of Russell; there is a way out of the dilemma of wildly disparate inner speech estimates of this study and of Klinger and Cox. That way is to explore phenomena with an adequate method.

Second, the study highlights the issue of how to explore the phenomena of inner experience. We have argued the desirability of beginning such an exploration by conducting an initial survey of the phenomena of conscious experience without preconceptions about what might be found. Furthermore, we would argue that DES, with its idiographic, qualitative, open-ended and open-beginning approach, is one way of apprehending those initial phenomena, capable of discovering both what is anticipated and what is not and providing high-fidelity accounts of experience (Hurlburt & Akhter, 2006; Hurlburt & Heavey, 2004, 2006; Hurlburt & Schwitzgebel, 2007). We are specifically *not* arguing that DES is the ultimate way of apprehending the phenomena of inner experience. We hope that this study demonstrates that consciousness science needs to pay substantial attention to the methods it uses in the exploration of phenomena, and that that attention may lead to the development of methods that apprehend phenomena more faithfully than does DES.

Third, this study is important because it shows that exploring the phenomena of normal inner experience is potentially possible and constructive. We have shown that there are identifiable phenomena of inner experience, some of which are widely anticipated and some not. It shows large individual differences in inner experience. This contradicts the implicit but widely held belief that everyone's inner experience is pretty much the same and underlines the need for more systematic investigations of the characteristics of everyday waking inner experience.

DES investigations have all been performed by us and our colleagues. Certainly this study needs examination and replication by others not related to us. The more methodological heterogeneity the better, we think, as long as there is an adequate attention to the method used and regard for the phenomena under consideration.

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