

Russell T. Hurlburt,
Christopher L. Heavey & Arva Bensaheb

Sensory Awareness

Abstract: *Sensory awareness — the direct focus on some specific sensory aspect of the body or outer or inner environment — is a frequently occurring yet rarely recognized phenomenon of inner experience. It is a distinct, complete phenomenon; it is not merely, for example, an aspect of a perception. Sensory awareness is one of the five most common forms of inner experience, according to our results (the other four: inner speech, inner seeing, feelings, and unsymbolized thinking). Despite its high frequency, many people do not notice its appearance nor recognize its theoretical import. We describe sensory awareness and distinguish it from other aspects of experience. We give examples and discuss how it appears when moments of inner experience are examined carefully. We note that there are large individual differences in the observed frequency of sensory awareness and consider its relationship to mental health and other aspects of psychological functioning.*

Keywords

Sensory awareness; Descriptive Experience Sampling; phenomenal consciousness; inner experience

Sensory Awareness

Careful examination of momentary experience will reveal moments such as the following:

Example 1:

Andrew is dialing his cell phone. At the moment, he is just ‘zeroed in’ on the shiny blueness of the brushed

Correspondence:

R.T. Hurlburt, Department of Psychology, University of Nevada, Las Vegas, NV 89052-5030, USA. russ@unlv.nevada.edu.

aluminum phone case. He is not, at that moment, paying attention to the number he is dialing; his experience has momentarily left that task (which continues as if on autopilot) to be absorbed in the shiny blueness.

Example 2:

Betty is in conversation with her friend Wendy, and as Wendy speaks, Betty takes a sip of Dr. Pepper. At that moment, Betty is drawn to the coldness of the liquid as it moves through her throat. Wendy continues to talk, but Wendy's voice is not part of Betty's experience; Betty is focused on the coldness in her throat.

Example 3:

Carol's friend Candy is telling Carol how to log into a computer web site. Carol is paying attention to the sweetly longish *a* sound in Candy's slight drawl; at that moment, Carol is not paying attention to what Candy is saying about the log-in procedure.

Example 4:

Damian is checking out at the grocery store, and at the moment is noticing a twinge in the back of his neck — a slight stabbing sensation. He is in the act of putting three candy bars on the conveyer, but at that moment he is not at all noticing candy bars, the checker's activity, or anything else in his environment — his attention is occupied by the neck sensation.

These examples represent a common phenomenon that we have found frequently in the inner experience of the hundreds of people whom we have examined over the last several decades. Each example involves the individual's being immersed in the experience of a particular sensory aspect of his or her external or internal environment without particular regard for the instrumental aim or perceptually complete-objectness. We have called such phenomena 'sensory awareness' (Hurlburt, 1990; 1993; 1997; Hurlburt & Heavey, 2001; 2002; 2006). In example 1, Andrew's momentary interest is not instrumental: he's dialing but he's attending to the shiny-blueness, not the dialing. And his momentary interest is not in the complete object: he is drawn not to the *phone*, which happens to be shiny-blue, but to the *shiny-blueness*, which happens to be of the phone.

Heavey and Hurlburt (2008; Hurlburt & Heavey, 2002) showed that sensory awareness is a feature of roughly one quarter of all

apprehended moments of waking experience, and thus appears to be one of the five most common features of everyday inner experience (the other four: inner speech, inner seeing, feelings, and unsymbolized thinking). Despite the prevalence of sensory awareness it remains little discussed within the consciousness literature.

Sensory awareness is certainly nothing new or unusual: almost everyone can notice a shiny blueness, feel the coldness of an iced drink, hear a feature of a friend's voice, or feel a muscle twinge. What is extraordinary, and what needs to be taken seriously by consciousness science, is that some people may experience such sensory awareness at nearly all their waking moments (Heavey & Hurlburt, 2008), others may experience it at almost none, and others may experience it frequently but not always.

This paper describes not only the sensory awareness phenomenon but also its manner of appearing, a necessity because of the nature of the phenomenon. Sensory awareness becomes an interesting phenomenon only when it is explored as it naturally occurs in natural environments, as part of pristine experience (Hurlburt, 2009, this issue; Hurlburt & Akhter, 2006). In the laboratory, it is easy to contrive situations where subjects *always* report sensory phenomena and other situations where subjects *never* report sensory phenomena. If individual differences are important, we will have to use a method that allows those differences to emerge and to be observant about how they emerge.

The Appearing of Sensory Awareness

The examples above are typical products of investigations using the Descriptive Experience Sampling (DES) method, a method aimed at exploring inner experience in natural environments (Hurlburt, 1990, 1993; Hurlburt & Akhter, 2006; Hurlburt & Heavey, 2006; Hurlburt & Schwitzgebel, 2007). Briefly, DES gives a subject a beeper that is carried into the subject's natural environments. At the beeper's random beep, the subject is to pay attention to the experience that was ongoing at the last undisturbed moment before the beep began and then, immediately, to jot down notes about that experience. Within 24 hours, the DES investigator interviews the subject about the (typically six) sampled moments from that day. Then the sample/interview procedure is repeated (iterated; see Hurlburt, this issue) for several (typically three) more sampling days. The adequacy of the DES procedure has been discussed by Hurlburt (1993; 1997), Hurlburt and Heavey (2002; 2006), and Hurlburt and Schwitzgebel (2007).

Example 5:

Here is a typical example of the manner in which sensory awareness appears in a DES interview. This verbatim (but slightly edited to remove redundancies and irrelevancies) transcript is from a second-sampling-day interview conducted with 'Ephraim' by Arva Bensaheb, who begins by asking Ephraim to describe his experience at the fifth beep:

Ephraim: [laughs nervously] At the moment of the beep I'm eating clam chowder with a relatively large spoon. And at the moment of the beep I'm pushing ... I had ... I had put the spoon [laughs sheepishly] laying on the top surface of the soup, and I was pushing down slightly, feeling the resistance of it, and then watching the soup spill over the edges really slowly, and watching [laughs sheepishly] the way that it cascaded over the edges of the spoon and filled it up. [scratches head in apparent resignation] I'd done this quite a few times already, but it was still very fun [smiles sheepishly] — I ate the whole bowl of soup that way. But I was definitely ... the things that stuck out in my mind were the resistance of having to push the spoon down, and the way that — particularly because it's clam chowder — it's [laughs sheepishly] going over the edge: it was like you could see it, the path that it took over the edge, and how it didn't fill, like, symmetrically. Like one part would go over faster, rather than just like going in, in a slowly collapsing circle. It was more of like an amoeba shape [sighs resignedly] getting smaller. [smiles nervously] At this point there ... I know as a fact of the universe there was music in the background, but I wasn't ... it wasn't there ... any more.

Arva: So right at the moment of the beep you are aware of this resistance of the spoon against the soup...

E: Um hm.

A: ... and watching the soup spill into the spoon asymmetrically.

E: [nods affirmatively, nervously]

A: Anything else [laughs] in your experience at the moment of the beep? ...

- E: [shakes head negatively, resignedly]
- A: ... The music, you said, was there.
- E: Yeah ... I know it was on, but it wasn't ... I wasn't listening to it. I was just really intent on the shape and watching the way that it moved over the spoon. [pauses, shakes head in resigned sheepishness] That's about it.
- A: And this resistance ... Does it make sense to ask you, like, where you were feeling this resistance? Like, I don't know, if you were holding the spoon, was it in your arm, or in your hand, or ...
- E: I felt the resistance in the end of the spoon, like the spoon part of the spoon. Like I don't even know if that makes sense, but ...
- A: The spoon meaning not the handle, ...
- E: Not in the handle, yeah...
- A: ... the scoopy part. [laughs]
- E: [laughs] Yes, in the scoopy part of the spoon. That's where I perceived the resistance, not in my fingers or in my hand. [shakes head in resignation] Just kind of weird.
- A: And what is this feeling/sensation? Can you describe it any further?
- E: Resistance. Like soft, like, I don't know, it's hard to explain, because it's like [laughs sheepishly] you have to be kind of gentle with how hard you push on the spoon, but the more ... like it builds up [laughs sheepishly]. You have to push the spoon [laughs embarrassedly] rather gently, but in order to do it gently enough the resistance actually feels pretty great, to the point where once the end of the spoon finally gets right below the surface of the soup, you can feel it just go away, like there was a *ton* of resistance, but [smiles sheepishly] it's probably not that much resistance. But just the carefulness of it made it seem that way.
- A: So was there like a different degree of resistance, by any chance? I don't know if this makes sense, but, like, at the moment of the beep, and I don't know how much the

beep caught, but it seems like there's more resistance and then the spoon goes in and resistance is less, and Is there a change, or anything like that, in your experience, or is it just the initial ...

E: Hm. [nods quizzically] I would say that what I was experiencing was the initial resistance against it. I did just say ... I guess I mentioned ... that it changes. But that isn't really at the moment of the beep. That was just more from doing it a couple ... 20 times. I learned! [laughs embarrassedly]

A: And then the soup pouring into the spoon. Is that part of your experience at the moment of the beep? Or...

E: Yeah.

A: ... the shape of it, or whatever?

E: Yeah. The shape, the way that it looked.

A: And how is that in ...?

E: That was more, I mean, we've focused on the resistance thing, but the purpose of it [smiles abashedly] was so that I could see what it would look like. Um, watching like the surface tension build up in the edge. At the moment of the beep it was ... the spoon wasn't completely through [smiles sheepishly] the soup yet, but there was still a little bit spilling over from the back end, and there was the residual from the last [laughs embarrassedly] ... from the last attempt that was still there. Just watching the way that the liquid moved [laughs resignedly].

This is in some ways a typical relatively early (second sampling day) encounter with sensory awareness by a DES subject. We observe nine characteristics of the way this experience presents itself to Ephraim.

First, note that the sensory features are a primary focus of Ephraim's experience: he is aimed at, drawn to, interested in the resistance of the spoon against the soup and the shape of the pool of soup in the spoon.

Second, Ephraim's interest is in the sensory experience itself, not in the instrumental aim that employs the sensation. That is, Ephraim is interested in the resistance of the spoon against the soup for its own sake; he is not merely eating soup and making the sensory

observations that that task requires. The eating-soup task is secondary or nonexistent in his experience at the moment of this beep.

Third, note the power of the sensory interest. Ephraim is not merely *idly* feeling the resistance and seeing the soup patterns — he is drawn directly to the sensory interests, they grab him to the exclusion of other aspects of his environment. There is music playing, but he does not hear it; there are doubtless other people and objects in his environment, but they don't exist in his experience at the moment of the beep.

Fourth, note the precision and confidence with which Ephraim describes his experience: he perceives the resistance in the scoopy part of the spoon, not in his hand; he's interested in the shape the soup makes and the paths it takes, not (for example) its color. This is not merely a dim sensation at the edges of his experience; the sensation is not a building block for some subsequent perception; the sensory is at the center of his experience. Ephraim has no doubt about his being focused on this sensory experience at the moment of the beep, no question about whether there is a fully differentiated sensation at the center of his experience.

Fifth, note that Ephraim is quite embarrassed or sheepish about reporting sensory awareness. This embarrassment/sheepishness is quite typical of subjects who frequently report sensory awareness, especially early in their sampling. Our aim is to describe the manner of appearing of sensory awareness; here we observe that descriptions of sensory awareness are frequently accompanied (at least at the outset) with embarrassment or sheepishness. It is not our aim to explain this embarrassment, although we will permit ourselves this speculation: Sensory awareness is a direct access to what looks good, what feels good, what attracts Ephraim, what repels him, in a very elemental, basic, sensual way. Sensual interests are intensely personal, by their very nature exceedingly private. To reveal one's basic sensuality is to stand naked before the observer, and sheepishness is a natural response. Some would say that Ephraim's sheepishness may come from having been 'caught' in a childish act (playing with his food), but we think the sheepishness is more elemental, arising from the experience, not the act: the sheepishness (in Ephraim and others) comes from the recognition and admission that the sensations themselves are *fun/attractive/alluring*, regardless of whether they are acted upon. We emphasize that this is speculation; it is in accord with our frequent casual observations but requires further study.

Sixth, all five of the samples on this sampling day contained sensory awarenesses. However, none of the samples from the first sampling day contained sensory awareness. It is not uncommon for

sensory awareness to be overlooked or avoided on the first sampling day. Whether this is the result of a presupposition that attending to some sensory detail is too trivial to count as a feature of experience, or is a corollary to the embarrassment described above, or is the result of the punishment of talk about sensory awareness (see the *Weihnachten Carousel* below), or stems from some other factor remains to be explored. It does illustrate why an iterative approach to studying experience is necessary (Hurlburt, this issue).

Seventh, we note that the embarrassment/sheepishness is a sign that Ephraim is trying to report faithfully his actual experience. It is evidence that he is not making up his experience — why would he make up something that causes distress?

Eighth, there is one aspect that makes this cited example somewhat unusual: Ephraim here is *actively creating* the situation that makes his particular sensory awareness possible: he is actively, repeatedly pressing his spoon slowly into the soup just so he can see the flow and the shape of the soup into the spoon. Most sensory awarenesses, including all the sensory awarenesses in Ephraim's other samples, are not the result of direct creation of the situation, but rather merely involve the specific noticing of the already existing (inner or outer) environment. Ephraim's other samples on this sampling day have this incidental, not actively sought, observational quality: At sample 1, Ephraim was drawn to a shininess on a particular part of a traffic policeman's vest. He had stepped outside to have a cigarette, and the shininess simply attracted him. At sample 2: Ephraim is reading the booklet from a new CD, and while he's reading he happens to be attracted to the shadow that falls diagonally across the page. At sample 3, Ephraim was waiting for a computer game to load; at the moment of the beep he was particularly observing the '8' in '68% Done,' noting that the progress bar split the '8' perfectly in half. At sample 4, Ephraim was feeling the sharp edge of the Excedrin package as he opened it. In none of those examples was he manipulating the environment to observe some sensory aspect; on the contrary, it is as if the sensory aspect draws his attention unbidden.

Ninth, had this sensory observational experience not been interrupted by the beep, leading the subject to focus on it, it would likely have been forgotten, like a dream (or like a short-term memory not consolidated into long-term memory), almost immediately. If a friend were to ask him, in a few minutes, 'How was the soup?' Ephraim will almost certainly not recall the resistance or the flow patterns — even though that was actually what occupied most of his experience while eating the soup — and will instead respond that it tasted good.

Sensory Awareness: The Phenomenon

As we have seen in the examples, sensory awareness is the focused, thematic experience of a particular sensory aspect of the external or internal environment without particular regard for the instrumental aim or perceptually complete-objectness of that environment. To discriminate sensory awareness from non-sensory-awareness experience, here are some additional examples with brief commentary:

Example 6:

Fatima was playing a computer game. At the beep she was focused on an orange gear that was rotating on the screen, meshing with another gear that lifted the elevator up to the next level. She was paying more attention to the color and shape of the gear than to its function as the mover of the elevator.

Fatima is paying attention to a sensory, non-goal-oriented, non-instrumental aspect of the environment. The color and shape of the gear occupy Fatima's attention, not the instrumental aspect of the gear. Therefore this is a straightforward sensory awareness.

Example 7:

Georg was looking at the microwave clock to see what time it was. The clock read '4:28,' but at the moment of the beep he was focused on the pointy shapes of the line segments that made up the numbers. The appearance of these line segments, rather than the actual time, occupied his awareness.

Georg is not, at the moment of the beep, occupied with the clock as a time-telling instrument; he is occupied with the sensory aspects of the digits. Because he is focused on the sensory, not the instrumental value of his perception, this is a straightforward sensory awareness.

Example 8:

Harold wondered what time it was and looked at the digital clock, which read 8:42. Harold was interested in the time-of-day represented by the 8:42 display, not its color or shape.

Harold looks at the clock for its instrumental value — to determine the time of day. This is *not* a sensory awareness. Examples 7 and 8 illustrate that sensory awareness is a feature of *experience*, not a characteristic of a sensory process. Georg's and Harold's sensory processes are

doubtless quite similar: the pointy line segments impact their retinas the same way, and so on. But experientially (for reasons that we do not seek to explain), Georg apprehends the pointiness of the line segments whereas Harold apprehends the time represented by the line segments.

Example 9:

Irma is waiting to cross the street. She is looking at the Walk / Don't Walk sign, which is displaying a red hand, so she doesn't cross.

There is not enough information here to know whether the red of the hand is apprehended only as a stop signal (in which case the red has instrumental, not sensory-awareness significance), or whether Irma is also interested in the red for its sensory qualities — that it is the same red as her lipstick, for example. Further questioning would be necessary.

The next examples illustrate that sensory awareness can be an aspect of inner seeing (aka seeing an image). The rules for determining whether to call an experience a sensory awareness apply equally to inner as to external seeing.

Example 10:

Juan was talking with his wife Jill about Jill's mother, who is ill. At the moment of the beep Juan was innerly seeing Jill's mother in the hospital bed. Juan was particularly aware of the shininess of the oxygen tube in the mother's nose — the shininess seemed to stand out against the otherwise muted inner seeing.

This illustrates that sensory awareness can occur in an inner seeing. Had Juan been attending to the life-supportness (the instrumentality) of the imaginary oxygen tubes, this would be considered an inner seeing only; but because he is primarily drawn to the shininess, to a sensory aspect, DES would call it a sensory awareness as well as an inner seeing.

Example 11:

Kevin was talking with his wife Kelly about Kelly's mother, who is ill. At the moment of the beep Kevin was innerly seeing Kelly's mother, seeing her as he had seen her the day before in the hospital. Kevin could describe the visual details of this seeing: she was wearing a blue hospital gown; there were oxygen tubes in her nose; he clearly saw the red sore on her cheek. Kevin understands

this seeing to be something like an illustration of the conversation he and Kelly were having.

This inner seeing has many sensory qualities (blue of the gown, red of the sore, etc.), but these qualities are not seen for the blueness or the redness themselves. The blueness and the redness are facts of the inner seeing, characteristics of the object being innerly seen, but they are not centrally or particularly in attention. This is *not* a sensory awareness.

Example 12:

Linda was discussing the power steering of her car with her friend Lily. At the moment of the beep Linda was innerly seeing a schematic representation of a power steering system. She saw fluid-filled tubes and pistons; the different parts were in different pastel colors, as though represented in a textbook. Although she doesn't actually know how power steering works, she was imagining how it might work.

The question here is whether the pastel colorfulness of the inner seeing counts as sensory awareness, and the answer is that we don't know without further questioning. If these colors were merely incidental facts of the inner seeing, then they would not count as sensory awareness. For example, in Hurlburt and Schwitzgebel (2007), Melanie describes an inner seeing that accompanied a book she was reading. She saw a Greek woman on a road talking with a soldier. She reported that the image was quite detailed: the road went diagonally from close left to far right; there were green shrubs and lighter gray-green olive trees, and so on. In that image, the green and the gray-green were understood to be characteristics of the shrubs/trees, not particularly of interest in and for themselves, and therefore they are *not* sensory awareness. The same logic would apply to the pastel tubes and pistons. If Linda was imagining a schematic drawing of power steering, wherein the pressurized fluid happened to be pink and the low-pressure fluid happened to be green, then, like Melanie's shrubs/trees, this would not be sensory awareness. But if Linda was interested in the pinkness or the greenness; if she created these colors not because they represented a typical schematic drawing but because she was drawn to the pinkness and/or the greenness, then this would have been sensory awareness.

It is therefore not always entirely unambiguous whether a particular sample should be considered an instance of sensory awareness. Let's

say schematic drawings are usually in primary colors, and Linda, who happens to be an engineer, knows that. Despite that, she creates an inner seeing of a schematic in pastels. But at the moment of the beep, she is interested in the pressures and is not paying attention to the pastelness of the pressure representations. Determining whether this image deserves to be called a sensory awareness would be a tough call.

The good news is that whereas some judgments are tough calls about individual samples, the characteristics of individual *people* are not usually that problematic. For example, Ephraim, in our examples, has a high frequency of sensory awareness *no matter how you make the tough calls*. Whether that high frequency is 75% or 85% might depend on the details of the tough calls, but it's a high frequency either way.

Example 13:

Miguel is angry; that anger manifests itself in part by Miguel's sensing the hair on the back of his neck bristle.

DES considers the bodily aspect of a feeling to be *not* sensory awareness. This experience would be called the feeling of anger, not the sensory awareness of hair standing on end. This may seem an arbitrary distinction; should we call this both a feeling and a sensory awareness? DES seeks to apprehend experience. If the organizing principle of the experience seems to be the emotion, and the hair bristling is understood to be an aspect of the emotional experience, then the hair bristling is not considered to be a sensory awareness — there is not focus on the bristling for its own sake. The bodily aspect of an emotion is not called a sensory awareness by DES unless that bodily aspect is a focus of awareness apart from the emotional experience or any other perceptual/meaning aspect of awareness.¹

Example 14:

Steven was pacing around his condo engaged in a mental argument. At the beep he was innerly saying the word 'whatever' to himself in his own voice, as if directed at the person he was mentally arguing with. He was also

[1] Science is an evolving process, and we acknowledge that it may, at some future point, be desirable to reverse course on this decision. DES reveals that some people experience emotion with clearly available bodily aspects, whereas others experience emotion without any bodily aspects. Those experiences are phenomenologically quite different, but DES and the emotion literature refers to both as 'feelings.' We think that an adequate discussion of the phenomenology of feelings is yet to be performed, and when that happens, it may be clearer what to do about the common ground between sensory awareness and feelings.

aware of a sense of frustration and an accompanying sensation of heat and outward-radiating pressure behind his ears and eyes. Simultaneously, he was also aware of a 'frenetic' restless energy in his arms and legs which made him feel like he had to be moving.

It is possible to have a sensory awareness at the same time as a feeling. Here, the frenetic energy is itself a focus of experience along with (but not part of) the frustration. DES would consider this both a feeling and a sensory awareness.

Individual Differences in the Frequency of Sensory Awareness

Sensory awareness is a frequently observed phenomenon, occurring in roughly a quarter of all everyday experience samples. However, there are large individual differences in the observed frequency of sensory awareness. Heavey and Hurlburt (2008) stratified large introductory psychology classes on a measure of psychological distress (the SCL-90-R; Derogatis, 1994) and randomly selected 30 individuals. This stratified sample therefore was quite representative of the entering students in a large U.S. state university. They then applied the DES technique to each. Sensory awareness occurred in 22% of all sampled experiences. However, within subjects the observed frequency of sensory awareness ranged from 0% to 100%. The median frequency of sensory awareness across subjects was 16%, but 30% of subjects (9 of 30) had no sensory awareness at all. So while sensory awareness may be very common, it is by no means omnipresent.

Heavey and Hurlburt (2008) reported that the correlation between the subjects' frequency of sensory awareness and their psychological distress (SCL-90-R) scores was .04. This is only one study with only one measure of distress, but there is no reason to conclude that sensory awareness is unequivocally a beneficial or a detrimental characteristic of experience.

Jones-Forrester (2006, 2008) sampled the inner experience in women with bulimia nervosa, and discovered frequent sensory awareness, averaging about 40% across 18 subjects. For some of these women, the predominance of sensory awareness was striking. For example, Stella (Jones-Forrester, 2006) had sensory awareness in 35 of her 40 samples (88%). Here are some typical samples:

Sample 3.4 (the fourth sample on the third sampling day):

Stella was at work pulling a box off the shelf. She was

focused on the dry, dustiness of the box surface and waviness of the surface caused by the corrugations beneath it.

Sample 6.3:

Stella was playing with the tips of her hair and was aware of the grainy texture of the tips against her fingers.

Sample 7.4:

Stella was changing clothes in the bathroom and was aware of the aqua color of the floor tiles and also was aware of the sensation of cold pressure from the floor on the balls of her feet. (This is two simultaneous sensory awarenesses.)

In 7 of her 35 sensory awareness samples (20%) Stella seemed to be using sensory awareness actively to avoid potentially distressing stimuli. For example:

Sample 7.5:

Stella was at work eating her lunch. She was focused on the heaviness in her eyebrows as she intentionally furrowed them in an explicit, currently successful attempt to avoid the worry and upset that was currently just outside her awareness.

Sample 3.6:

Stella was on the phone with her father, who was screaming at her. Instead of hearing what her father was screaming, she was noticing the distortion of the sound as the speaker was being overdriven by the screams. She was also noticing the vibrating sensation in her skin next to her ear caused by the phone.

Sample 5.6:

Stella was stuck in traffic. She was actively trying to channel her frustration into a sense of calm by looking at the fuzzy blue outline of the sky framed by the spokes of her steering wheel.

Sample 7.1:

Stella was at work in conversation with her new boss. He had physically moved too close to her in a way that Stella found threatening. In response, Stella had leaned back. At the moment of the beep, Stella was feeling the

stretching sensations in her back as she arched away from him. Thus, at the moment of the beep Stella was *not* aware of feeling threatened by her boss' advance; in fact, she was not aware of her boss at all. She was focused on the relatively inconsequential arching sensations of her back.

Discriminating Sensory Awareness

When we describe sensory awareness to colleagues unfamiliar with the topic, they frequently jump to incorrect conclusions about the nature of the phenomenon. Here is what sensory awareness is *not*.

Sensory awareness is not merely some sensory aspect of a perception. If you are driving and you stop for a stop sign, the redness of the sign was doubtless an aspect of the perception that led you to stop. But that is *not* a sensory awareness as DES defines it *unless, as a central feature of your experience, you were drawn to or absorbed in or particularly noticing the redness*.

Sensory awareness is not part of the subject matter generally called 'sensation and perception.' Sensory awareness has little or nothing to do with the topics generally called 'sensation,' topics such as sensory threshold, receptor cells, adaptation, brain projection areas, and so on. Doubtless, sensory awareness depends on processes such as those, but sensory awareness is *the result of* those processes, not merely one more process among many others.

Sensory awareness is not a process, perceptual or otherwise, that occurs or is presumed to occur. Sensory awareness is a phenomenon in its own right, the figure of experience, something directly observed.

Some would distinguish between (a) first-order conscious perception (e.g., Andrew's seeing the shiny-blue patch) and (b) second-order conscious reflection or introspection (Andrew's reflecting upon the fact that he is looking at something blue). The concept of sensory awareness is orthogonal to that distinction. Sensory awareness is a directly apprehended phenomenon. Whether sensory awareness (or any other introspectable event) requires both a first-order perception and a second-order reflection is not known to us; we do not seek to explain how sensory awareness works, only that it exists as a phenomenon. We can say with confidence that we have inquired with substantial care on hundreds of occasions and only very rarely will a subject acknowledge that there is any hint of an awareness of a second-order process. We do not intend this to rule out the existence or necessity of a second-order process; we do intend to say that if there is a

second-order process, it escapes the notice of subjects at the moment of the beep, including those subjects who are relatively skilled at knowing the difference between a first-order and a second-order process.

Sensory awareness is, however, the target of at least some forms of mindfulness training. For example, Segal, Williams, and Teasdale (2002) describe one of the techniques they use to teach people to be more mindful:

If there is a window in the room, we ask people to look outside, paying attention to the sights as best they can, letting go of the categories they normally use to make sense of what they are looking at; rather than viewing elements of the scene as trees or cars, or whatever, we ask them simply to see them as patterns of color and shapes and movement. (p. 160)

This type of mindfulness training attempts to enhance the ability of individuals to focus on sensations without regard to their meaning, symbolism, or other informational significance and thereby to increase the relative frequency of the phenomenon of sensory awareness in the individual's ongoing experience.

We have found training DES investigators that sensory awareness is the most difficult of the main five characteristics for investigators to grasp. Unsymbolized thinking is difficult because many would-be investigators presuppositionally deny its existence (Hurlburt & Akhter, 2008). But sensory awareness is *more* difficult because many would-be investigators presuppositionally, but incorrectly, believe they *already know* what sensory awareness is, and therefore don't feel the need to try to master it. As a step toward ameliorating this difficulty, Hurlburt and Bensaheb have developed a multimedia training program comprising examples of moments of sensory awareness and moments of experience that in some way resemble sensory awareness but are not instances of sensory awareness. Bensaheb (2009) demonstrated that this training program increases the ability of naïve individuals to discriminate moments of sensory awareness from moments which are not sensory awareness. This increase is larger than that due to reading a written description of the nature of sensory awareness such as the one you are reading. This multimedia training program can be obtained at <http://www.nevada.edu/~russ/des-imp-request.html>.

Impediments to the Recognition of Sensory Awareness

We claim that sensory awareness is a robust phenomenon, identifiable by anyone who might look carefully at experience moment by

moment, occurring in roughly a quarter of sampled moments. However, there is little or no discussion of the phenomenon in the literature. It is our aim to describe the phenomenon, not to explain the social psychology of its absence, but ten observations may be useful.

First, it may seem that there is nothing to understand, nothing unknown, about the phenomenon of sensory awareness. A common presupposition is that everybody has sensory awareness most of the time; *of course* we pay attention to sensory details — how else could we navigate our way through the world. That presupposition reflects a serious misunderstanding of sensory awareness as we define it. It is *not* true that everybody has sensory awareness most of the time: as best we can ascertain, roughly a third of people experience sensory awareness only rarely if at all. Navigating through the world around us does *not* require this thematic sensory awareness: I can easily stop at a stop sign without paying particular attention to the particular shade of its redness, listen to a lecture without paying particular attention to the timbre of the speaker's voice, and so on. A sensory awareness is *not* merely a building block out of which a perception is constructed. Sensory awareness is a center of interest, not a substructure, subpart, or ingredient of some other perceptual center of interest.

Second, as we observed above, sensory awareness is sometimes not reported by DES subjects on their first sampling day, even by those subjects who experience sensory awareness frequently. The iterative nature of DES (Hurlburt, this issue; Hurlburt & Akhter, 2006) can solve this potential under-reporting. But the non-reporting of sensory awareness on the first sampling day can be a problem for methods that rely on one-shot data gathering and for multiple-occasion methods that train subjects only on one occasion.

Third, and related to the second point, some people who have frequent sensory awareness do not know that they have sensory awareness at all. It is not until they examine the details of their experiences moment by moment that they recognize a frequent characteristic of their own experience.

Fourth, many people (including many students of consciousness) assume that everyone's experience is just like their own. We have tried to show that experience may differ dramatically from one person to the next (Heavey & Hurlburt, 2008; Hurlburt & Akhter, 2006, 2008; Hurlburt & Heavey, 2006; Hurlburt & Schwitzgebel, 2007), but the prejudice that everyone's experience is just like their own may lead people who do not have frequent sensory awareness (including many students of consciousness) to fail to recognize the occurrence of sensory awareness in others.

Fifth, it is difficult, if not impossible, to explore sensory awareness using armchair introspection. Hurlburt and Heavey (2004; cf. Hurlburt & Schwitzgebel, 2007) have argued against the use of armchair introspection in general. Armchair introspection is particularly problematic in apprehending sensory awareness because the hallmark of sensory awareness is that the sensory aspect grabs you, draws you, attracts you, as if unbidden. This unbiddenness is difficult for armchair introspection to simulate because armchair introspectors have already made themselves purposefully ready to observe.

Sixth, as we saw above, reporting a sensory awareness, at least at first, is often accompanied by a sense of embarrassment. That embarrassment is likely to cause a substantial (perhaps complete) under-reporting of sensory awareness except in those situations where subjects trust that the truth and the whole truth about experience is sincerely desired.

Seventh, as we saw above, sensory awarenesses, despite their at-the-moment vividness, are, like dreams, almost immediately forgotten. Although we are not aware of such a survey, this forgetting would likely lead to a substantial (perhaps complete) under-reporting of sensory awareness by all retrospective methods including questionnaires and interviews.

Eighth, the vocabulary that untrained people use to describe sensory awareness is substantially imprecise. In particular, people (including students of consciousness) frequently use the word 'feeling' in three quite distinct ways (cf. Hurlburt & Akhter, 2008): (1) to describe bodily sensory awarenesses (e.g., 'I was feeling a tickle in my throat'); (2) to describe emotional experience (e.g., 'I was feeling anxious'); and (3) to describe an inward impression or state of mind (e.g., 'I was feeling that I should take Elm Street instead of Pine Street because there would be less traffic'). That imprecision in the language makes it difficult at the outset to get a clear view of sensory awareness. It is difficult to reduce such imprecision unless an iterative method is employed (Hurlburt, 2009, this issue).

Ninth, as in the recognition of any phenomenon of inner experience, observers must bracket their presuppositions about what is observed; bracketing presuppositions is not easy (Hurlburt & Akhter, 2006; Hurlburt & Heavey, 2006; Hurlburt & Schwitzgebel, 2007).

Tenth, sensory awareness may be systematically punished. We give one example. The family is playing an informal game at the dinner table. It's the Christmas season, and the centerpiece is a candle-lit *Weihnachten* Carousel (aka windmill carousel or pyramid carousel): the updraft from the candles turns a balsa wood windmill which

rotates carousels on the three levels of the pyramid. On these carousels is a Nativity scene: Mary, Joseph, the crèche, the wise men, the angels, the animals, and so on, all brightly painted and gaily rotating within the wooden framework. The game is a version of *I Spy*. 8-year-old Peter is 'it'; he has 'spied' an item on the carousel, and the rest of the family takes turns asking yes/no questions to try to guess which item Peter has selected: Is it moving? No. Is it made of wood? Yes. Is it white or partly white? Yes. The children love this game, which they have made up and elaborated over the years. Eventually the family gives up and requires Peter to tell what he has spied; he says it is the balls that sit on the fence posts around the base of carousel. 'Peter! There isn't any white on those balls! They're totally red!' And they are: the balls are, objectively, uniformly red painted, not a speck of white paint on them. The family has a light-hearted conversation about how much easier it would have been had Peter given the *correct* answer to his brother's 'Is it white or partly white?' question. Peter doesn't enter into this conversation.

However, a more careful look at the red balls reveals that each has the reflection of the two adjacent candle flames on it, two tiny spots of experienced white on the objectively uniformly red-painted balls. The spots are tiny, and they don't count as 'white' for anyone except Peter, who may be more sensorially aware than anyone else in the family. But they are indeed, looked at closely, experientially white. Peter has been punished (mildly, to be sure) for his sensory sensitivity, and he doesn't have the confidence to defend himself.

We speculate that inner experiences (sensory awareness, inner speech, inner seeing, etc.) are skills that may be acquired across development. Peter has learned a small lesson: that sensory awareness doesn't count; that talking about your sensory awarenesses will get you punished. We speculate that a long series of that kind of event — in the family, in the classroom, eventually in the workplace — may cause Peter's sensory awareness skill either to atrophy or to go underground: he will not talk about it, even to himself; he will be embarrassed if he is somehow cornered into talking about it (as was Ephraim); he will deny that he has it; he will not really identify the fact that he has it in his self-narratives.

We do not wish to claim that we know how sensory awareness does or does not develop. However, we think that this example may help the reader overcome the presuppositional stance against accepting the importance of sensory awareness and the individual differences of its occurrence.

Speculations about Sensory Awareness

Our experience of observing sensory awareness across many subjects leads us to believe its desirability can be thought of as something of a 'razor's edge.' On the one hand, sensory awareness seems a highly desirable characteristic of experience: it is a direct apprehension of the sensory features of the world around and within. As we discussed above, sensory awareness is the target of many forms of mindfulness training, which train individuals to focus on raw sensations. Mindfulness training has been shown to improve mental health (Segal, Williams, & Teasdale, 2002). This view has been confirmed by Hurlburt's unpublished sampling of the experience of adept meditators, whose inner experience was in fact dominated by sensory awareness.

On the other hand, we have sampled with a number of subjects whose inner experience was dominated by sensory awareness who did not enjoy good mental health. Stella, discussed above, is one example of a person for whom sensory awareness often appeared to serve as an escape or distraction from the meaningful demands/requirements of her situation. In Stella and others like her, the immersion in the sensory aspects of experience seemed to lessen the ability to cope effectively with the real world demands they faced. For example, Jones-Forrester (2006, 2008) demonstrated that sensory awareness was a frequent characteristic of women with bulimia nervosa.

Thus we are not in a position to say when sensory awareness is useful or a sign of health and when it is destructive or a symptom of pathology. Neither are we in a position to comment on the directionality of any relationship between sensory awareness and health (as we saw, its correlation with psychological distress is approximately zero). Our goal here has been to describe a frequent phenomenon of inner experience that deserves more attention so that questions such as whether or when sensory awareness is desirable can someday be answered. Some readers may find it frustrating that we provide few connections between sensory awareness and anything else. But that is the way, we think, of basic science. In 1957, Arthur Schawlow explored the coherent light rays that could be produced by stimulating rubies (a process later called a laser). He didn't immediately say, 'Aha! Grocery store checkout tool!' or 'Aha! Two hours of video in the palm of your hand!' Those came only at the end of a long series of observations, constructions, false starts, and refinements. For sensory awareness in Western science, it's 1957.

References

- Bensaheb, A. (2009), 'Descriptive experience sampling interactive multimedia training tool' (Doctoral dissertation, University of Nevada, Las Vegas).
- Derogatis, L.R. (1994), *The SCL-90-R: Scoring, Administration, and Procedures*, 3rd edition (Minneapolis, MN: National Computer Systems).
- Heavey, C.L. & Hurlburt, R.T. (2008), 'The phenomena of inner experience', *Consciousness and Cognition*, **17**, pp. 798–810.
- Hurlburt, R.T. (1990), *Sampling Normal and Schizophrenic Inner Experience* (New York: Plenum).
- Hurlburt, R.T. (1993), *Sampling Inner Experience In Disturbed Affect* (New York: Plenum).
- Hurlburt, R.T. (1997), 'Randomly sampling thinking in the natural environment', *Journal of Consulting and Clinical Psychology*, **65**, pp. 941–49.
- Hurlburt, R.T. (2009, this issue), 'Iteratively apprehending pristine experience'.
- Hurlburt, R.T. & Akhter, S.A. (2006), 'The Descriptive Experience Sampling method', *Phenomenology and the Cognitive Sciences*, **5**, 271–301.
- Hurlburt, R.T. & Akhter, S.A. (2008), 'Unsymbolized thinking', *Consciousness and Cognition*, **17**, pp. 1364–74.
- Hurlburt, R.T. & Heavey, C.L. (2001), 'Telling what we know: Describing inner experience', *Trends in Cognitive Sciences*, **5**, pp. 400–403.
- Hurlburt, R.T. & Heavey, C.L. (2002), 'Interobserver reliability of Descriptive Experience Sampling', *Cognitive Therapy and Research*, **26**, pp. 135–42.
- Hurlburt, R.T. & Heavey, C.L. (2004), 'To beep or not to beep: Obtaining accurate reports about awareness', *Journal of Consciousness Studies*, **11**(7–8), pp. 113–28.
- Hurlburt, R.T. & Heavey, C.L. (2006), *Exploring Inner Experience: The Descriptive Experience Sampling Method* (Amsterdam: John Benjamins).
- Hurlburt, R.T. & Schwitzgebel, E. (2007), *Describing Inner Experience?* (Cambridge, MA: MIT Press).
- Jones-Forrester, S. (2006), 'Inner experience in bulimia' (Master's thesis, University of Nevada, Las Vegas).
- Jones-Forrester, S. (2009), 'Inner experience in bulimia nervosa' (Doctoral dissertation, University of Nevada, Las Vegas).
- Segal, Z.V., Williams, J.M.G. & Teasdale, J.D. (2002), *Mindfulness-based Cognitive Therapy For Depression* (New York: Guilford).