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Making Sense of Subliminal Perception

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Chapter 3

MAKING SENSE OF SUBLIMINAL PERCEPTION

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ABSTRACT

Considerable confusion surrounds the notion of 'subliminal perception'. While empirical findings from subliminal perception experiments appear to demonstrate that subliminal perception can both occur and lead to a variety of (often dramatic) effects, the present conceptualisations of subliminal perception are problematic since they fail to clarify specifically what is, and is not, known when perceiving subliminally. Consequently, accounts of subliminal perception are vulnerable to sceptical disbelief and criticism, since the coherency of the theoretical framework has not been adequately established. This paper reviews the current accounts and evidence of subliminal perception and proposes a framework for clarifying existing thinking. 'Knowing' is discussed as a relation between a cognising subject and a cognised object term, which provides a platform for clarifying the questions concerning the subject and object terms involved when discussing subliminal perception. On this view, in knowing one does not automatically know that one knows (i.e., one can know something without having knowledge of knowing it). Furthermore, 'becoming conscious' (knowing that one knows) requires a second mental act, independent of the first act of knowing. This theoretical position unifies the competing accounts of subliminal perception, and provides a clear conceptualisation of perception and its objects when perceiving subliminally. Additionally, this account provides an avenue for investigating experimental manipulations of subliminal perception, as well as explaining why subliminal stimuli presentations, and not supraliminal ones, lead to the specific variety of empirical findings found in subliminal perception research. Directions for future research based on this approach are discussed.

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INTRODUCTION

One of the most long-standing unresolved issues within modern psychology concerns whether it is possible to “perceive information even when we do not have the subjective experience of perceiving” (Merikle and Joordens, 1997, p. 219). At times referred to as “unconscious perception” (Merikle and Reingold, 1992, p. 56), “perception without awareness” (Bornstein, 1992, p. 3), or “knowing without knowing” (Masling, 1992, p. 259), the study of *subliminal perception* research has a long and tumultuous history within academic psychology (Dixon, 1971, 1981; Erdelyi, 1985, 1996, 2004a; Eriksen, 1960; Holender, 1986; Merikle, 1992). Despite empirical demonstrations of subliminal perception since the 19th century (e.g., Sidis, 1898²⁴), attitudes towards the possibility of subliminal perception have oscillated back and forth between acceptance and outright denial (Dixon, 1971, 1981; Eriksen, 1960; Greenwald, 1992; Holender, 1986; Erdelyi, 2004a). Nevertheless, the notion of unconscious mental processes has now become widely accepted within modern psychology (Kihlstrom, 1987; Greenwald, 1992), and the sheer magnitude of findings suggesting that we can be influenced in a variety of ways by stimuli that we perceive or are influenced by *unknowingly* is now difficult to ignore (e.g., Bargh and Chartrand, 1999; Erdelyi, 1985, 1996; Wegner and Wheatley, 1999; Westen, 1999).

Despite this, however, the field of subliminal research remains mired in controversy. Erdelyi (2004a) writes: “Although the notion of subliminal perception—perception below the threshold or limen of consciousness—is at least as old as scientific psychology, it remains a problematic concept, neither fully accepted nor fully rejected by the field” (Erdelyi, 2004a, pp. 73-4). In fact, Kihlstrom (2004) proposes that “[i]n some ways, the status of subliminal perception is the most problematic topic in the entire domain of the psychological unconscious” (p. 92). While methodological inadequacies and limitations of valid inference fuel concerns as to whether it is possible to perceive subliminally (e.g., Eriksen, 1960; Holender, 1986), the conceptualisation of subliminal perception itself obscures the discussion. As Dixon (1971) notes, “[t]here evidently *is* something about subliminal perception which invites confusion” (p. 5, his italics). It is the contention here that the problematic status of subliminal perception is largely a consequence of conceptual ambiguity associated with the concept of subliminal perception itself. This paper first discusses subliminal perception research and associated methodological concerns. The issue of conceptual ambiguity is then discussed before proposing a conceptual framework for understanding subliminal perception within.

²⁴ See Dixon (1971) and Erdelyi (1985) for discussion of early experimental work.

SUBLIMINAL PERCEPTION STUDIES AND THE DISSOCIATION PARADIGM

Subliminal perception research typically involves presenting visual stimuli²⁵ (such as words, phrases and pictures) by means of devices that allow control for a variety of factors related to perception (e.g., tachistoscopes), including exposure duration, forms of masking (e.g., forward, backward), and other techniques designed to degrade perception (e.g., poor illumination) (Erdelyi, 2004a; Erdelyi and Zizak, 2004; Merikle and Reingold, 1992). One technique, described as “[t]he most reliable and valid methodology used” for subliminal perception research (Meyer and Waler, 1999, p. 320), involves presenting stimuli for intervals that are ostensibly too brief to allow recognition of the stimulus, typically at durations of less than 5 milliseconds (ms). Here the specific stimulus content cannot ostensibly be recognised and “[s]ubjects are unable to report seeing anything more than flickers of light” (Weinberger, 1992, p. 172).

To demonstrate subliminal perception with such techniques, most studies employ the logic of what is known as the *dissociation paradigm* (Erdelyi, 1985, 1996, 2004a; Reingold and Merikle, 1990). Here subliminal perception is demonstrable via a dissociation between two different indicators of perceptual sensitivity, α and ε , where α is taken to indicate information *accessible* to “awareness” or “consciousness” (i.e., what can be known or recognised by the subject), while ε is “an event that indicates available (but not necessarily accessible) information” (Erdelyi, 1985, p. 76). For instance, a subject might be incapable of reporting the content of a presented stimulus (so that $\alpha = 0$), but displays sensitivity to the presented stimulus, nonetheless, as seen in various task performances (for instance, displaying preference for stimulus-relevant words in word-stem completion tasks). While the specific terminology of the indicators varies (they are variously described as *direct* and *indirect* tests—Jacoby, Lindsay and Toth, 1992; Reingold and Merikle, 1988; Reingold and Merikle, 1990—or *explicit* and *implicit* perceptual tasks—Kihlstrom, Barnhardt and Tatarzyn, 1992; Kihlstrom, 2004)²⁶, a common element is that the indicator α is said to explicitly or directly assess the subject’s knowledge of the target stimulus, whereas ε attempts to demonstrate, implicitly or indirectly, that the target stimulus was in fact perceived. An incongruity between these indicators, such that $\varepsilon > \alpha$, is then taken to demonstrate that there is more information *available* than *accessible*, and hence evidence for subliminal perception (Erdelyi, 1985, 1996, 2004a).

While any dissociation where $\varepsilon > \alpha$ demonstrates subliminal perception (see Erdelyi, 1985, 2004; Erdelyi and Zizak, 2004), interest is mostly directed at studies involving what Erdelyi (2004a) terms the ‘special case’ of the dissociation paradigm. Here the subject reports *null awareness* of the target stimulus, yet apparent sensitivity to the stimulus (such that $\varepsilon > \alpha$ | $\alpha = 0$) demonstrates that “stimulus information that is completely unavailable to consciousness is nevertheless perceived and capable of influencing higher-level decision processes” (Merikle and Reingold, 1992, p. 57). Many studies ostensibly reveal that this readily occurs across a number of differing domains. For example, in studies investigating the

²⁵ However, auditory subliminal primes have also been developed (e.g., Kouider & Dupoux, 2005).

²⁶ As Merikle and Reingold (1990, 1991) note, though, the explicit/implicit distinction is problematic since Schachter’s (1987) account confuses method with process: “The dual meaning of the terms has blurred the distinction between theoretical constructs and empirical measures” (Merikle & Reingold, 1991, p. 224).

mere-exposure effect (where preference towards stimuli develops after repeated exposure) subjects presented with a series of random shapes (polygons) for very brief 1 ms exposures were later incapable of recognising the presented stimuli (chance-level recognition). However, there was a significantly greater *preference* for the ones presented subliminally, which appears to demonstrate the special case ($\epsilon > \alpha \mid \alpha = 0$) (Kunst-Wilson and Zajonc, 1980; cf. Monahan, Murphy and Zajonc, 2000; see Erdelyi, 2004a). Furthermore, although the mere-exposure effect occurs, too, with easily recognisable stimuli, the effect is “more pronounced when obtained under subliminal conditions than when subjects are aware of the repeated exposures” (Zajonc, 2001, p. 225; cf. Bornstein, 1990). Alternatively, other studies report that unrecognisable 4 ms exposures of *abandonment* stimuli (e.g., words such as ‘lonely’) significantly increase eating behaviour, whereas *neutral* cues (e.g., words such as ‘gallery’) have no effect (Waller and Barter, 2005, p. 156; cf. Meyer and Waller, 1999, 2000; Patton, 1992).

Arguably the area of subliminal perception research that demonstrates the greatest evidence of dissociation, yet is also the most controversial, involves what is known as *Subliminal Psychodynamic Activation* (SPA). Developed by Lloyd Silverman, the SPA method generally involves presenting visual word stimuli, sometimes accompanied with pictures, via a tachistoscope for typically 4 ms exposures (Hardaway, 1990; Weinberger and Hardaway, 1990). The most robust findings involve the stimulus content MOMMY AND I ARE ONE (MIO), based on the premise that each person harbours an unconscious desire for oneness and merger with “the good mother of early childhood”, and that stimulating this desire, so as to not arouse defenses, will mobilise normally inhibited sources of drive (Silverman and Weinberger, 1985, p. 1297). Here a large body of research reveals that presenting MIO stimuli and derivatives under null-awareness conditions produces a range of effects from improvements in adaptive behaviour, such as educational and therapeutic gains (e.g., pathology reduction, managing addictions), as well as triggering pathology under certain conditions (Bornstein, 1990; Weinberger and Hardaway, 1990; Weinberger, 1992). For instance, studies with schizophrenic individuals using MIO have demonstrated decreases in psychopathology, whereas aggressive stimuli (e.g., DESTROY MOTHER) have been found to increase pathology (Silverman and Weinberger, 1985; Silverman, Lachmann and Milich, 1982). On the other hand, within non-clinical populations, MIO has been associated with helping people quit smoking, maintaining food reduction regimes, and even producing academic improvements (see Silverman and Weinberger, 1985; Bornstein, 1990). Alternatively, using subliminally presented *neutral* stimuli, such as PEOPLE ARE WALKING, or variations such as MOMMY AND I ARE THE SAME or MOMMY IS INSIDE ME does not produce the same results (see Silverman and Weinberger, 1985, Silverman, Lachmann, and Milich, 1982, Weinberger and Hardaway, 1990). Consistent with the thesis of defensive interference, SPA effects are typically not found when the stimuli are presented so that they are easily recognised (e.g., presentations greater than 5 ms — Silverman and Weinberger, 1985)²⁷.

While considerable controversy surrounds these findings, and the results may appear literally unbelievable²⁸, the procedures employed have been generally methodologically

²⁷ See also Erdelyi (1985) and Erdelyi & Zizak (2004) for discussion about ‘everyday’ subliminality and censorship.

²⁸ As Weinberger (1992) writes: “I have never read a review of even a mention of SPA research in which the word *controversial* was not somewhere included” (p. 176, italics in original). See, for instance, the discussion

rigorous, if not more so, than other field of research in psychology (e.g., employing double-blind conditions—Silverman and Weinberger, 1985; Weinberger, 1992), and reviews of SPA studies using MIO show “robust and reliable” effects (Weinberger, 1992, p. 175; Hardaway, 1990). Importantly, however, for the present discussion, the cited studies all demonstrate the $\epsilon > \alpha \mid \alpha = 0$ special case. In fact, the SPA studies are of particular interest here since the effect only occurs when the stimuli are presented under null awareness conditions.

SKEPTICISM AND THE PROBLEM OF INFERENCE

While such an array of findings may at first glance appear impressive, any conclusions drawn remain a matter of dispute. As Merikle and Reingold (1992) write: “Despite more than 100 years of experimental studies directed at demonstrating unconscious perceptual processes, decisive experiments remain elusive” (p. 76; cf. Reingold and Merikle, 1990; Merikle and Reingold, 1992). In fact, Dijksterhuis, Aarts and Smith (2005) recently note that “[d]espite numerous findings demonstrating effects of subliminal perception, some people still maintain that the phenomenon itself does not even exist” (p. 77). The apparent reason for this involves a number of methodological issues disputing the possibility of “unconscious perception” and validity of inferences made. As Kihlstrom (1987) writes: “Almost since the beginning, a variety of methodological critiques have sought to demonstrate that stimuli cannot be processed for meaning unless they have been consciously identified” (p. 1448; cf. Merikle, 1992). For instance, Holender’s (1986) critical review of studies purporting to demonstrate subliminal perception concluded that the evidence could not rule out conscious recognition of the stimuli, a point recently made explicit by Erdelyi (2004a). Even if the subject demonstrates null awareness at the time of testing “[t]here may have been some consciousness for the stimulus earlier, before the experimenter got to testing for consciousness” (Erdelyi, 2004a, p. 80; cf. Hardaway, 1990). Although, as Hardaway (1990), notes “[a] briefly conscious, immediately forgotten stimulus is still an unconscious influence” (p. 190), the possibility of unconscious perception remains in doubt.

The issue is further compounded by problems concerning the validity of the indicator α as a satisfactory measure of what is accessible to conscious awareness (Erdelyi, 1986, 2004a; Merikle, 1992; Merikle and Reingold, 1992; Reingold and Merikle, 1990). Assessments of “conscious awareness” (α) tend to involve some variety of *subjective reports* as to whether the stimulus was detected or not (Merikle and Reingold, 1992), and whether this actually reflects *null awareness* of the target stimulus is disputable. As many correctly observe, there are a plethora of factors that may influence whether a subject reports detecting a stimulus or not, quite independent of whether the stimulus is, in fact, perceived (e.g., demand characteristics, motivation, attention, uncertainty). As Merikle and Reingold (1992) write, “[s]tatements indicating an absence of relevant conscious experience may simply reflect biases introduced by either the experimental instructions or an individual’s preconceived ideas concerning the value or particular types of perceptual experiences for making decisions” (p. 59). Accordingly, any such evidence is always disputable as to whether the subject did, or

between Balay and Shevrin (1988, 1989), Weinberger (1989), Moore (1989), Figueroa (1989), and D. K. Silverman (1989). Even researchers in the field of SPA research note that SPA appears to be an instance of “psychoanalytic” magic (Sohlberg et al, 2000; Weinberger, 1992; Weinberger & Hardaway, 1990).

did not consciously perceive the stimulus, and conversely, a lack of response does not necessarily indicate a lack of conscious awareness, either (Erdelyi, 1985, 1996, 2004a; Holender, 1986; Kihlstrom, 1984; Latta and Campion, 1986; Lupker, 1986; Merikle, 1992; Merikle and Reingold, 1992; Moore, 1989; Reingold and Merikle, 1990; Reingold, 2004).

The issue is further complicated by considerations of whether any indicator *exhaustively* and *exclusively* indicates what is known consciously by the subject (or otherwise) (Erdelyi, 2004a; Reingold and Merikle, 1990; Merikle, 1992). The indicator α “must be assumed to be sensitive to *all* relevant conscious experience” (Merikle, 1992, p. 792, his italics; cf. Merikle and Reingold, 1992, p. 62), since if any given assessment tool elicits only certain aspects of the subject’s knowledge, without exhausting all that the subject actually knows concerning the target stimulus, then again we can doubt as to whether subliminal perception has actually occurred (Merikle, 1992; Merikle and Reingold, 1992; Reingold and Merikle, 1990). This is a valid point, since it is well recognised that different assessment procedures, such as recognition and recall tests, elicit different indications as to what a subject actually knows (Erdelyi, 2004a). An exclusive indicator, on the other hand, “defined as any measure that is influenced only by conscious perceptual experience” (Reingold and Merikle, 1990, p. 14), is deemed necessary for demonstrating an “uncontaminated” dissociation between the two sets of indicators (Erdelyi, 2004a, p. 88).

THE CRUX OF THE PROBLEM

While there has been much progressive discussion here with respect addressing the issues above (e.g., Erdelyi, 2004a; Jacoby, Toth, Lindsay and Debnar, 1992; Merikle and Reingold, 1992), the focus of the discussion has primarily centred on methodological and assessment issues. For instance, Merikle and Reingold (1992), write that “[t]he controversy surrounding the concept of unconscious perception revolves almost entirely around questions concerning what constitutes an adequate behavioural measure of conscious experience” (p. 56). However, while such issues are obviously important, what appears to be neglected within this discussion is clarification of the basic conceptual issues subsumed within subliminal perception research in the first place and some authors believe that this conceptual matter can be resolved simply by conducting further empirical research. Reingold and Merikle (1990), for instance, write:

It is now clear that any successful approach to the measurement of conscious awareness requires an operational definition of consciousness that can be validated by converging empirical evidence. In other words, empirical evidence is needed to justify any assumption that a particular measure provides an adequate index of conscious awareness (p. 25).

However, while the value of empirical evidence is not disputed, it is difficult to imagine how an appropriate empirical test can be determined from other empirical tests if one is uncertain about what one is testing in the first place. Simply put, how can anyone clearly test or measure a particular theory or concept if one remains unclear about what one is, in fact, talking about? (Michell, 2000). Developments in technology have certainly not appeared to have clarified the issue here, since, if anything, they have created further confusion by

conflating methods and devices (“gizmos”) with the phenomena that they are attempting to assess (Erdelyi and Zizak, 2004). Instead, to assess what constitutes an “adequate index of conscious awareness” depends upon what is taken to be “conscious experience”, *prior* to determining how to assess this. Hence, we cannot say what a ‘pure’ indicator of *x* is without knowing what *x* is in the first place. Accordingly, conceptual clarification is the logically prior step to empirical clarification (Michell, 2000), and what is required then is much greater conceptual scrutiny of the constructs being assessed. As Latta and Campion (1986) rightly note, “[t]he central problem in trying to design experiments to determine whether the subject is aware of stimuli that are affecting his behaviour is that we have no adequate definition of conscious awareness” (p. 37). Similarly, Lupker (1986) writes that “[w]hat has to be dealt with first is the issue of how to define the concept being measured” (p. 38). Consequently, the conceptual foundations of subliminal perception research need to be squarely faced.

To some extent, however, there has been an increasing recognition that “the crux of the problem is theoretical” (Erdelyi, 2004a, p. 74) and Erdelyi and Zizak (2004) write that “[i]n recent times, the focus in the experimental psychology of subliminal processes has been shifting from the methodological to the conceptual” (p. 17). As Erdelyi (2004a) recently points out, the specific problem with the field of subliminal perception research is that it is guided by unarticulated assumptions about what constitutes conscious and unconscious processes:

As one methodological challenge after another has been surmounted, it is becoming clear that experimentalists have been trying to impose exacting methodological strictures upon “pretheoretic” concepts—concepts that had not been formalised mathematically or logically... The ubiquitous “artifacts” worried over in the subliminal perception literature of the past decades were based on implicit theories about what the true facts properly entailed (Erdelyi, 2004a, p. 74; cf. Reingold and Merikle, 1990, p. 24).

Accordingly, the field is weighed down by a lack of attention to conceptual and theoretical issues, and if the crux of the problem here is theoretical then the solution must also be in that arena. In fact, it has long been recognised that scientific progress is not simply a result of empirical studies and that rigorous theoretical and conceptual assessment is also a vital component of the scientific process (Michell, 2000; Maze, 1983, 2001). All research fields and methods in psychology subsume theory, and the role of critically evaluating theoretical premises via logical and conceptual analysis is a vital component of developing valid empirical endeavours.

The specific problem for subliminal perception research here is the lack of conceptual foundation for investigating conscious and unconscious processes. As Weinberger and Hardaway (1990) note, “[m]uch if not all of the dispute regarding the existence of subliminal perception rests on the absence of a consensual definition for the term *subliminal* (as well as for related terms such as *unconscious*, *supraliminal*, and *conscious identification*)” (p. 742, their italics). Similarly, Reingold and Merikle (1990) write that “the lack of definitional and conceptual clarity in the study of the unconscious often results in arbitrary and contradictory interpretations of empirical findings” (p. 12), and that “the debate over empirical findings is more often a reflection of differences in implicit theoretical starting points or assumptions” (Reingold and Merikle, 1990, p. 25; cf. Erdelyi, 1985, 2004a; Eriksen, 1960; Weinberger and

Hardaway, 1990; Kihlstrom, 2004). Indeed, the numerous terms found within the literature associated with subliminal perception (“conscious”, “preconscious”, “nonconscious”, “unconscious”, “subconscious”) are both *vague* (indefinite in meaning) and *ambiguous* (open to various interpretations). Terms are often left undefined or used idiosyncratically, which can only confuse empirical efforts to understand the topic. As Reingold and Merikle (1990) note:

The first problem, which becomes immediately apparent to anyone attempting to review the relevant psychological literature, is the proliferation of terminology associated with the conscious/unconscious distinction. Terms such as conscious, aware, intentional, explicit, controlled, and attentional are not sufficiently differentiated and are sometimes used as synonyms. The same can be said for terms unconscious, unaware, incidental, implicit, subliminal, pre-attentive, inaccessible, and covert (p. 10).

As Bowers (1984) rightly notes, then, “the debate has been fuelled for the most part by conceptual and definitional disagreements, and that progress must be made at this level before subliminal perception can even be sensibly addressed as an empirical issue” (p. 231). However, addressing this issue successfully will not occur by simply introducing another set of definitions into the fray. As Erdelyi (2004b) writes, “[w]e cannot make progress on conceptual problems merely by shifting to new terminology. We only postpone the day of reckoning” (p. 431). Instead, what is required is scrutiny of the concepts presently in use. What is required, then, is a coherent conceptual framework that clarifies the existing terms relevant to the study of subliminal perception.

WHAT IS MEANT BY CONSCIOUS AND UNCONSCIOUS?

While the reality of unconscious mental processes may no longer be disputed (Bowers, 1984; Erdelyi, 1974; Kihlstrom, 1987; Greenwald, 1992), “the distinction between conscious and unconscious processes remains highly controversial” (Reingold and Merikle, 1990, p. 15). An initial approach to understanding consciousness and subliminal perception was intimately connected with classical psychophysical studies that searched for *thresholds* of sensory experience (Kihlstrom, 1987). Consciousness was achieved after reaching a certain threshold of awareness, and the *absolute threshold* was the least amount of stimulus intensity that a subject could perceive. Within this framework, “[s]ubliminal perception refers to the possibility that stimuli too weak to be consciously detected nonetheless have an impact on perceptual and cognitive functioning” (Kihlstrom, 1987, p. 1448). This threshold could only be determined after a number of trials where a subject judged whether the stimulus is present or absent and could be operationalised as the stimulus intensity value detected on 50% of occasions (Erdelyi, 2004a).

A guiding assumption of this approach was that consciousness was either present or absent, which is empirically disputable (Erdelyi, 1985, 1996, 2004a), and the operational definition simply means that thresholds are “arbitrary statistical definitions” (Eriksen, 1960, p. 285; cf. Erdelyi, 2004a). As Erdelyi and Zizak (2004) write:

Almost all contemporary experimental psychologists would now espouse the position that there is no true limen except as a statistical abstraction. As the stimulus is gradually intensified, the probability of its perception increases gradually (in an ogival

fashion). There is no step-function cleaving perception into two distinct states, detect and nondetect (Erdelyi and Zizak, 2004, p. 17).

Furthermore, as the earlier discussion also indicates, there are a variety of factors that influence whether a subject responds with a 'yes' or 'no' on any particular trial (e.g., motivational factors, instructions, beliefs) (Dixon, 1971; Eriksen, 1960; Erdelyi, 1985; Holender, 1986). On the other hand, the introduction of *Signal Detection Theory* (SDT) (Green and Swets, 1966; Swets, 1964) and subsequent developments (e.g., Macmillan, 1986; Macmillan and Creelman, 1991), acknowledges that each subject's perceptual sensitivity changes across time, and that the observer's *criterion* for making a judgement as to whether a stimulus was present or absent also requires consideration. This approach abandons the search for any absolute threshold, and instead evaluates 'perceptual sensitivity' (d') in terms of the probability of a subject reporting 'yes' to a present or absent stimulus (Swets, Tanner and Birdsall, 1964). Rather, then, than a threshold dividing awareness from unawareness, there is simply an increase in the probability that a subject will report detecting a stimulus as the stimulus intensity increases, in part mediated by the criterion employed by the subject: "SDT differs from threshold theory in assuming that there is a continuum of sensory states on which the observer places a *criterion* to divide "yes" from "no" responses" (Macmillan, 1986, p. 39).

SDT itself, however, does little to clarify the issue of conscious awareness. SDT "has no construct corresponding to consciousness" (Macmillan and Creelman, 1991, p. 255), and "SDT takes no stand on whether below-criterion stimuli are consciously perceived" (Macmillan, 1986, p. 39); subjects may feasibly have 'partial' or 'full' knowledge of the stimulus content, even when none is reported (Erdelyi, 2004a). Although a researcher could determine whether the subject appears to have zero sensitivity ($d' = 0$) or define the *empirical threshold* as some low value (e.g., $d' = 1$) (Macmillan, 1986), we are still left with uncertainty as to whether unconscious perception can occur, as well as the problem that "there is no unique unarbitrary criterion for subliminality" (Erdelyi and Zizak, 2004, p. 20). In fact, Kihlstrom, Barnhardt and Tataryn (1992) "advocate abandoning the notion of "subliminal" perception entirely, and with it all the unfortunate psychophysical implications of the concept of *limen*" (p. 20, their italics). However, even if we do postulate a threshold between awareness and unawareness, or consciousness and unconsciousness, this only tells us that there is a division of some sort and nothing about what stands on either side of the limen. The basic issue of aware/unaware or conscious/unconscious remains unresolved.

To address this, then, a useful entry point to the discussion is to first address what is meant by 'awareness' and 'unawareness'. Eriksen (1960), in fact, notes a preference for using these over the terms 'conscious' and 'unconscious' since the former carry less connotations than the latter. What, then, do we mean by 'awareness' and 'unawareness'? To begin with, it appears fairly straight forward to say that when we say someone 'is aware' we mean, either implicitly or explicitly, that that someone is *aware of something*. In fact, it is difficult to conceptualise what precisely 'awareness' would be, if not awareness *of* some *object* of awareness (i.e., a situation or state of affairs) (Maze, 1983; Michell, 1988). Furthermore, to say 'awareness of something' implicates, too, 'something' or 'someone' being aware (what can be described as a *subject* being aware of the object term). The immediate point to recognise here, then, is that when we speak of awareness we are, in fact, speaking of a particular type of *relationship* (awareness *of*) between a *subject S* (that which is aware) and an

object term x (that which the subject is aware of), such that S is aware of x . This is, in fact, demonstrably true for all acts of cognition, such as knowing and perceiving, since each of these terms implicates a knower or perceiver, as well as something known or perceived. On the other hand, just as ‘awareness’ is a relationship, it can also be seen that ‘being unaware’ (or ignorant) is also to be ‘unaware’ or ignorant *of something*, and so, too, a relation between a subject and some state of affair. If ignorance is a relation, then we can also, of course, be ignorant of our own ignorance (Michell, 1988; Nisbett and Wilson, 1977). Furthermore, to say that S is aware or unaware of x is not to say anything about x ; only that x stands in a particular relationship of being known or unknown.

This ‘relational’ viewpoint of mentality has a long history within psychology (e.g., Brentano’s concept of *intentionality*—1874/1973) and has also been extensively developed by Anderson (1927/1962, 1930/1962), Maze (1983), Michell (1988) and McMullen (1996), as well as being either implicit or explicit in all modern day accounts of cognition (e.g., Marcel, 1983). While much more could be said about both the nature of the relationship of *knowing*, as well as the precise object of cognition (see Michell, 1988), for the present purposes the position presents us with a defining feature of mentality. As Maze (1983) observes, “psychological processes are ... typified by a kind of relation not to be found in merely physical interactions, and that is the relation of *knowing about* or *referring to* (Maze, 1983, p. 83, his italics; cf. Maze and Henry, 1996, p. 1089). Furthermore, the relational position might help flesh out the meaning of a “continuum of awareness” (Weinberger, 1992, p. 175. ff. Erdelyi, 1985, 2004a). For instance, Lupker (1986) writes, “knowledge about the identity of a word is not an all-or-none thing but is, in fact, better represented as a continuum... Recognising, then, the essentially continuous nature of knowledge about a word, one’s first problem with “conscious identification” becomes where to draw the line” (p. 38). Erdelyi also writes: “It does seem clear that our popular distinctions—conscious-unconscious, explicit-implicit, supraliminal-subliminal—are polar rather than categorical. They are more-or-less, and depend on the specific indicators sampled and the time-frames over which they are measured” (Erdelyi, 2004a, p. 88). While there must be some distinction between knowing and ignorance, otherwise the terms are reduced to nonsense, it is clear, too, that knowing could never be an all-or-none affair since we could never know literally *everything* about any given situation since this would mean knowing every quality or property of something through time and space, as well as knowing every relationship that the thing enters into. In other words, given the infinite complexity of any state of affairs in space and time there is never the possibility of *total* knowledge—only more or less. Hence, in knowing something about something we always know more or less, and are always ignorant of other aspects.

‘KNOWING’ AND ‘KNOWING THAT ONE KNOWS’

So far, we have developed the analysis of ‘awareness’ in terms of a relationship where S is aware of some situation x . What, then, are we to make of consciousness? This is where ample opportunity arises for confusion. One position which still has influence is the philosophical position that whatever is mental is *also* conscious (e.g., Brentano, 1874/1973; Sartre, 1956; Thornton, 1999). This tradition, with its philosophical roots in Cartesian philosophy, asserts that when subject S knows x , he or she is also conscious of the fact that he or she knows x (i.e., they know that they know that x). Freud similarly notes that if mentality

is defined by consciousness, then “something psychical being unconscious is self-contradictory” (Freud, 1940, pp. 157-8), and to the modern day this position is used to rule out the coherence of unconscious mental processes *a priori*, since they are seen as a contradiction in terms (e.g., Thornton, 1999, p. 7). This is, of course, also one of the reasons why *subliminal perception* has the appearance of being paradoxical, because ‘unconscious perception’ is then a contradiction in terms. However, it is the Cartesian approach that is logically problematic, since if my knowing that *x* involves my knowing that I know that *x*, then an infinite regress of knowing follows, since I should also know that I know that I know that *x*, and so on, *ad infinitum* (see Maze, 1983, p. 90; Michell, 1988, p. 236).

On the other hand, we can fruitfully distinguish *knowing something* from *knowing that we know it*. That is, while we may know many things, we do not necessarily have knowledge of knowing these things, and in fact, at any given moment the majority of our beliefs might be said to be unknown, and some of these may never become the object of attention. Freud (1912) calls this the *descriptive* view of unconscious mental processes, and comparing the totality of a person’s beliefs with what he or she is currently aware of provides us with clear evidence for unconscious mental life:

... in support of there being an unconscious psychical state, that at any given moment consciousness includes only a small content, so that the greater part of what we call conscious knowledge must in any case be for very considerable periods of time in a state of latency, that is to say, of being psychically unconscious. When all our latent memories are taken into consideration it becomes totally incomprehensible how the existence of the unconscious can be denied (Freud, 1915, p. 167; Cf. Freud, 1912, p. 260; 1933, p. 70; 1939, p. 95).

For instance, we all know that the earth is round, but whether this becomes known (the object of cognition) depends upon whether attention is drawn to this belief (of which there may be many different causal antecedents). At any given moment, then, we have numerous beliefs, some of which may or may not be currently known, and some of which in fact may never become the object of attention, and hence, we may be ignorant (or unconscious) of the beliefs that we hold. Freud is accordingly justified then in claiming that “there are mental things in a man which he knows without knowing that he knows” (Freud, 1916-17, p. 101). Moreover, it makes sense to say that such unconscious beliefs are currently believed, without presently being the object of awareness. As Armstrong (1973) points out, “it is perfectly intelligible to attribute a belief to somebody although there is no relevant vivid idea in his consciousness. We can, for instance, intelligibly attribute a current belief that the earth is round to a man who is sleeping dreamlessly or is unconscious” (Armstrong, 1973, p. 7). Furthermore, it is not the case that such beliefs are dormant and inactive in guiding behaviour: “Many of the beliefs which guide our actions never enter consciousness while the action is being performed, yet the belief must be causally active at that time” (Armstrong, 1973, p. 21). A simple everyday example occurs when a person is driving a car and is both guided by beliefs of laws and safety, whilst currently aware of matters quite unrelated to driving (listening to the radio, thinking about the destination, and so on) (cf. Greenwald, 1992). In fact, acknowledging the distinction between knowing, and knowing that one knows, resolves, to some extent the long-standing issue of whether stimuli must be ‘conscious’ for them to influence behaviour. What appears to be the “very reasonable assumption that a stimulus must be consciously perceived before it is capable of guiding our actions in the world” (Merikle

and Joordens, 1997, p. 230) requires differentiating between whether the stimulus is known, *but without knowledge of perceiving the stimulus* (which, as was just argued, could still influence behaviour), *or* whether both the stimulus *and* the act of perceiving, itself, are known. If the former is sufficient for impacting upon behaviour, then the latter is superfluous, and if it were the case that we must necessarily know that we know our beliefs for them to guide our behaviour then our everyday courses of action would be much more tiresome (cf. Bowers, 1984). In fact, Erdelyi's (2004a) point that the field of subliminal perceptual research is guided by pretheoretic concepts demonstrates that unconscious beliefs very easily guide action, even to the detriment of scientific progress.

To formalise the point then, when *S* knows (or perceives, etc.) *x*, the relation of knowing (or perceiving, etc.) (*SRx*) is itself unconscious and does not become conscious unless it becomes the object of a *second mental act* such that *S* knows *SRx*. As Michell (1988) writes:

... my own awareness of any of my cognitions must involve a second cognitive act (quite independent of the one known), in which I direct my attention upon the subject (myself), the object (the environmental situation known in the initial cognitive act) and the connection between them (p. 236).

For example, at a specific time a subject *S* becomes aware that *x*, and then at a later time is prompted to pay attention to the fact that they had become aware that *x* (i.e., *S* knows that *S* knows *x*) (Maze and Henry, 1996). This implies that no mental act can be conscious without first having been unconscious, which Freud correctly recognises when he writes, "we see the process of a thing becoming conscious as a specific psychical act, distinct from and independent of the process of the formation of a presentation or idea" (Freud, 1900, p. 144). Hence Freud is justified in saying that all "mental processes are in themselves unconscious" (1916-17, p. 143), and may or may not go on to become conscious: "Everything conscious has an unconscious preliminary stage: whereas what is unconscious may remain at that stage and nevertheless claim to be regarded as having the full value of a psychical process" (Freud, 1900, pp. 612-3). Similarly, "every psychical act begins as an unconscious one, and it may either remain so or go developing into consciousness" (Freud, 1912, p. 264; cf. Freud, 1916-17, p. 295). An unconscious process may never become the object of attention, and so may remain unconscious: *S* may know *x* and never know of knowing *x*, if the appropriate causal antecedents fail to occur. Consequently, knowing our own cognitions must involve a second mental act (independent of the one known), and the notion of unconscious mental processes is perfectly legitimate and theoretically justified.

Furthermore, unconscious mental processes are fully-fledged psychological processes, and not merely neural processes as some maintain. Gillett (1988), for example, proposes a reductionist stance claiming that "terms referring to unconscious mental events actually refer to neural events, and to postulate the existence of a psychical unconscious in the sense of something non-physical distinct from neural events commits one to an untenable dualism on the unconscious level" (p. 570). Similarly, Searle (1995) criticises Freud's view that unconscious processes are mental: "The naïve notion of the unconscious that we have inherited from Freud is that unconscious mental states are just the same as conscious mental states only minus the consciousness" (p. 332). Instead, he proposes a 'dispositional unconscious', where unconscious states are in fact neural states that are mental only by virtue of their power to bring about conscious mental states. However, although neurological

processes may constitute one term of the knowing relation, they are insufficient to constitute the knowing relation itself, and an unconscious mental process is no less psychological than a conscious one (see Petocz, 1999, p. 237).

IMPLICATIONS OF THE RELATIONAL ACCOUNT FOR UNDERSTANDING SUBLIMINAL PERCEPTION

The distinction between *knowing* and *knowing that one knows* is already found within the subliminal perception literature. Moore (1989), for instance, writes that subliminal perception findings demonstrate “an inconsistency between what observers know and what “they know that they know”” (p. 1420). On the other hand, Bowers’ (1984) distinction between stimuli which are “perceived” and “noticed”, can also be understood in this manner. Here he notes that it is possible to *perceive* something without *noticing* that we perceive it, and that “it is selective attention that transforms a perception into consciousness of what is perceived” (Bowers, 1984, p. 230; cf. Lundh, 1979, Jacoby et al., 1992). Bowers’ subsequent point that “perceived information is logically prior to noticed information” (p. 230) is simply to say that perceiving x is a necessary condition for being able to know that x is being perceived. On the other hand, ‘implicit perception’ appears to be another way of saying that we can perceive something without knowing that we perceive it. Kihlstrom, Barnhardt and Tartaryn (1992), for instance, write: “Connection to the self is just what appears to be lacking in the phenomena of implicit perception” and that “contact between the event and the self is by no means automatic. A number of circumstances may prevent such contact” (p. 42; cf. Bowers, 1987, p. 1451). That is, when S knows x , although x is known, the relation itself involving S (SRx) is not. Thus, we can agree “perception is not to be identified with consciousness and that quite a bit of perception can take place outside of awareness” (Kihlstrom, Barnhardt and Tartaryn, 1992, p. 42).

However, while the above demonstrates that the distinction between knowing and knowing that one knows is not unappreciated, the implications have yet to be fully appreciated for helping us to understand subliminal perception. If we accept that knowing does not involve automatically knowing that we know, then there is no logical objection to perceiving stimuli, without knowledge of perceiving them. In fact, the above analysis demonstrates that subliminal perception is analogous to other ordinary, everyday experiences (cf. Dixon, 1971). Consider, for instance, tip-of-the-tongue experiences (Brennen, Vikan and Dybdahl, 2007), where we might know a person’s name, but are incapable of reflecting upon it. What all discussions of subliminal perception require, however, is to distinguish whether we are discussing the *target stimulus* being known (where S knows that target x), or the *act* of perceiving the target itself being known (S knows x , and then becomes aware of knowing it—that is, S knows that S knows—or has knowledge of knowing— x). It appears too, then, that the search for appropriate indicators of ϵ and α within the dissociation paradigm is really the search for indicators of *knowing*, and *knowing that one knows*. Given that the researcher is interested in is all that is capable of becoming known (i.e., all that the subject knows, and is capable of making known), then the indicator α also reflects whatever is presently unconscious but capable of becoming conscious, which means that the *exclusivity* assumption (Reingold and Merikle, 1990; Merikle, 1992) requires further thinking through.

This aside, however, the relational view adds clarity to the discussion and dispenses with the apparent paradox of subliminal perception. Given the relational view of cognition, any discussion of perception, subliminal or otherwise, requires clarifying the object term of perception (what is perceived). Unfortunately, not enough of the discussion concerning ‘conscious processes’ has focused upon whether a conscious process involves a knowing process (i.e., where S knows x), or whether a conscious process is a knowing process known (i.e., where S knows that S knows x). If ‘perception’ is ‘synonymous with ‘awareness’ then ‘perception without awareness’ is simply to propose a contradiction (perception without perception). For instance, Dixon writes that “[s]trictly speaking ‘perception’, predicated by ‘subliminal’, is a contradiction in terms for, if the subject is unaware of a stimulus, then how can he be said to perceive it?” (Dixon, 1971, p. 12). However, it is not that the subject is unaware of the stimulus, but only that it is known without knowledge of it being known. In fact, it can be seen that much of the confusion surrounding issues of subliminality comes down to simply a lack of specificity concerning what precisely the object term is when discussing ‘perception without awareness’. For instance, Merikle, Smilek and Eastwood (2001) at one point write, “stimulus information can be perceived even when there is no awareness of perceiving” (p. 116). This is clearly consistent with the relational account discussed here, since it proposes that the ‘stimulus information’ (x) may be known, but awareness of the act of ‘perceiving’ itself (knowing of the relation S knows x) may be absent. However, on the very next page of that same paper we find the statement that “observers can perceive critical stimuli even when they are unaware of the stimuli” (Merikle, Smilek and Eastwood, 2001, p. 117). At face value, this appears paradoxical, since without any clear differentiation of the objects of either ‘perception’ or ‘awareness’ it may as well read that a person can be both aware and unaware of the *same state of affairs*.

Hence, we can make sense of “unconscious perception” (Merikle and Joordens, 1997, p. 219) if we recognise that in knowing x we are not necessarily aware (or conscious) of knowing x . Similarly, “perception without awareness” (Bornstein, 1992, p. 3; Fowler, 1986, p. 34), or “knowing without knowing” (Masling, 1992, p. 259), could both be re-written in terms of perceiving or knowing x , without knowing that we either perceive or know x . So, when Merikle and Joordens (1997) ask whether “we perceive information even when we do not have the subjective experience of perceiving?” (Merikle and Joordens, 1997, p. 219), the question can be re-written in terms of, ‘can we know something without knowing that we know it?’, which as the above analysis demonstrates is clearly so. Similarly, in Erdelyi’s (2004a) discussion of subliminal *mere-exposure* effects (Monahan, Murphy and Zajonc, 2000), where he states that “the subjects preferred the stimuli that they had presumably not seen” (p. 75), we can tighten up the point by saying that the subjects must have *seen* the stimuli, but not *known* that they had seen it, and hence were incapable of recognising the stimuli. Hence, when Nisbett and Wilson (1977) write, that “[w]e cannot perceive without perceiving, but we can perceive without remembering” (p. 240), we note the distinction (albeit expressed somewhat differently), that it is possible to perceive without knowledge of perceiving. Furthermore, when Merikle and Joordens (1997) write that “it is still unclear whether perception without awareness is a laboratory curiosity that occurs under a limited set of conditions or whether perception without awareness is an instance of a much more general phenomenon that occurs in a wide variety of contexts” (p. 219), it appears fairly safe to say from the earlier examples that this is the normal state of affairs. All mental acts (including

perception) are unconscious in the first instance, and do not become known until taken as the object of cognition of a second mental act.

While various authors have recommended searching for qualitative distinctions between conscious and unconscious processes, as a means of demonstrating subliminal perception via dissociation (e.g., Merikle and Cheesman, 1986; Merikle and Reingold, 1992; Dixon, 1971), there is much room here for further clarification. As Erdelyi (2004a) notes, what precisely is meant by “qualitative difference” itself, is rarely articulated. What needs to be clarified, then, is whether a difference is being postulated between known and unknown processes, or between processes of knowing and knowing that one knows. To demonstrate a qualitative difference between either of these requires demonstrating that the qualities of one are not found in the other (i.e., each has “unique aspects”—Reingold, 2004, p. 121), and as Erdelyi (2004a) observes, “the existence of qualitative differences, however, they may be defined, need not differentiate between conscious and unconscious processes since, presumably, there are such differences to be found *within* both types of processes” (Erdelyi, 2004a, p. 81)²⁹. Furthermore, if a conscious process is simply a process that is known, and an unconscious process simply one that is not, then there are no *a priori* qualitative differences between either process based on being either known or unknown alone. It is simply to say that the process stands in a particular relationship (that of being known or unknown), which is to say nothing about the process itself. In this sense it is not intelligible to ask the question as to whether an unconscious process is ‘smart or dumb’ (Loftus and Klinger, 1992), which itself appears to be based on assumptions concerning the nature of unconscious processes. What requires further articulation, then, is distinguishing exactly what is unconscious (e.g., the source of the process, the process itself, or the effect that it has on other things—Gawronski, Hofmann and Wilbur, 2006. cf. Adams, 1957). The common distinction of equating conscious with “intentional” and unconscious with “nonintentional” (or “automatic”) (e.g., Marcel, 1984, pp. 252-3), also requires further consideration. For example, Dixon (1971) refers to the “‘censoring’ and restrictive role of consciousness” (p. 178), while *consciousness* is also said to function in an “inhibitory manner” (Weinberger and Hardaway, 1990, p. 743). Similarly, Snodgrass (2004) writes that “conscious influences override unconscious ones when both are present” (p. 110), and Jacoby et al. (1992) write: “Consciousness also serves the equally important function of inhibitory action by opposing influences that would otherwise prevail” (p. 95). However, we need to consider whether there is such a qualitative distinction. In fact, as a relationship, knowing of a process does not, in and of itself, have any effect on it, any more than knowing of a mountain (say) makes any change to it. However, knowledge may allow *interference* with the process cognised (i.e., control of ‘automatic’ impulses, etc.), which is more parsimonious than postulating qualitative differences and appears to be what is sometimes meant. For example, Bornstein (1990) writes that stimulus awareness “permits additional ego defenses and conscious countercontrol strategies to diminish the impact of the stimulus” (Bornstein, 1990, p. 202). Similarly, Jacoby et al. (1992) note “awareness is a prerequisite for conscious control” (p. 84). In the case of SPA studies, for instance, the means of stimuli delivery prevents (for whatever reason) reflection upon the target stimulus, which may in turn then prevent anxiety from being generated and thus preventing defensive responses from occurring. On the other hand, when there is knowledge of the stimulus then

²⁹ See Petocz’s (1999) similar critique of the system *Conscious* and *Unconscious* in Freud’s systematic view of mentality.

defenses can interfere with the effects. Furthermore, the precise meaning of ‘consciousness’ requires careful consideration here, since what is sometimes implicated here is a sense of ‘consciousness’ as the *knower* (or inhibitor), which raises questions about the structure of personality and the motivation of becoming conscious of beliefs in the first place (which, for whatever reasons, appear to involve subsequent inhibition). While there may be several causes that prompt our paying attention to our own mental states (e.g., the instruction to do so within an experiment), one source of individual differences of self-monitoring may have to do with socialisation, where desires and beliefs deemed threatening may more or less make the drives vigilant to these as possible sources of punishment and withdrawal of the caregivers’ love (Freud, 1926; Maze, 1983).

FUTURE DIRECTIONS FOR SUBLIMINAL PERCEPTION RESEARCH

Appreciating the distinction between knowing and knowing that one knows allows questions to be asked about anything that prevents the second mental act from occurring. What is interesting about subliminal perception procedures is that they appear to prevent mental content from becoming the object of a second mental act, so that *S* knows *x* but knowledge of this is not available. There are multiple possibilities of why this may occur (for instance, the brief duration of the stimulus exposure might allow *S* to know *x*, but not allow enough time for the second mental act to occur—that is, *S*’s knowing *x* occurs too quickly to allow *S* to know, or reflect upon, that it knows *x*)³⁰. However, as many note, various neuroclinical phenomena (e.g., Korsakoff’s syndrome, Alzheimer’s dementia, split-brain procedures) demonstrate a distinction between what an individual knows, and whether they know that they know it (Erdelyi, 1986, 2004a; Kihlstrom, 1987). For instant, the phenomenon of “blindsight” (Weiskrantz, Warrington, Sanders and Marshall, 1974), where subjects with visual cortex lesions report being unaware of objects in their blind visual field yet demonstrate knowing the objects nonetheless (as evident in their actions), is very similar conceptually to subliminal perception generally. If it is true that an “implication of this [blindsight] finding is that different parts of the brain may be responsible for detection of stimuli on the one hand, and consciousness of them on the other” (Bowers, 1984, pp. 233-234. cf. Bachmann, 2004), then we could entertain the possibility of discerning whether the neural registrations of *knowing* are distinct from *knowing that one knows*. In particular, various ‘syndromes of unawareness’, where subjects are ostensibly aware of certain things yet are incapable of knowledge of what they know (e.g., asognosia) (Eslinger et al., 2005; Hartman-Maeir, Soroker, Oman and Katz, 2003; Rankin, Baldwin, Pace-Savitsky, Kramer and Mille, 2005; Salmon et al., 2006; Vallar and Ronchi, 2006) are pertinent here. Investigating neurophysical factors associated with limitations of ‘conscious’ (second-act) awareness may then be of particular interest. If it were in fact possible to identify the neural machinery necessary for allowing the second mental act then we could know with greater certainty whether conscious awareness is occurring (or not) when addressing whether stimuli are consciously known or not during subliminal perception investigations. Such a suggestion

³⁰ There may be some type of ‘reflective threshold’, a minimum amount of time required to notice one’s own perceiving of a stimulus, perhaps without which defenses cannot operate. This account of awareness and conscious awareness is also a step towards clearing up difficulties associated with “perceptual defense” and repression (‘knowing in order not to know’) (Postman, 1953; see Boag, 2007).

is presently premature, given the relative indeterminacy of mind/brain assessment techniques (see, for instance, Deeprose and Andrade—2006). However, given that self-reflection (knowing that one knows) may be a distinctly human capacity, there is the possibility that this requires specific brain machinery over and above normal acts of knowing.

Furthermore, if we accept the claim that “the brain has evolved specialized mechanisms for selecting certain information from the environment, while filtering out extraneous or unimportant input” (Visser, Merikle and Lollo, 2005, pp. 1362-1363), then this too has implications for understanding brain mechanisms associated with subliminal perception. An interesting body of neuroscientific evidence already exists suggesting that we can evaluate threatening stimuli without knowing that this is occurring (LeDoux, 1995; Windmann and Krüger, 1998). Furthermore, such threat sensitivity implicates the study of motivational factors when investigating perception, and there is enough evidence to implicate motivational factors in subliminal perception to warrant much further investigation here (Dixon, 1971; Snodgrass, Shevrin and Kopka, 1993; Visser and Merikle, 1999; Karremans, Stroebe and Claus, 2006)³¹. In this respect, the study of motivational factors associated with limitations of conscious (second-act) awareness (e.g., defense mechanisms), is of particular note. In fact, the concept of attention, itself, implicates motivation (*S* is motivated to attend to *x* rather than *y*) (Michell, 1988), and so the question whether “need is a determinant of perception” (Jenkin, 1957; p. 122) still requires much further exploration (see also Erdelyi, 1974, 1985, 2004a)³². Lastly, a general recommendation for all fields of scientific research involves paying greater attention to the conceptual bases of theories and terms used within any given field of research. Conceptual scrutiny of the theoretical approaches needs to be developed and maintained as a necessary aspect of scientific research (Michell, 2000). To neglect this is to simply invite confusion.

CONCLUSION

The preceding analysis demonstrates that there is no obstacle to coherently conceptualising subliminal perception. A major source of the persistent controversy revolves around the proliferation of competing terminology and lack of clarification concerning what the terms precisely mean, which leads to competing claims and apparent contradictions within the literature. Recognising the distinction between *knowing*, which entails a knowing subject and known object term, and *knowing that one knows*, where a mental act is the object of cognition, allows a conceptual platform that harmonises the competing accounts. In particular, specifying what precisely is known (the object of cognition, or the act itself), clarifies apparent paradoxes of subliminal perception since there is no logical obstacle to knowing stimuli on the one hand, without knowing that one knows them. Viewed in this light, subliminal perception is conceptually similar to many other phenomena, and the similarities here with brain pathologies associated with ‘syndromes of unawareness’ provides a rationale for future exploration of the mechanisms underlying second-act cognition.

³¹ SPA studies, of course, also demonstrate the importance of motivational factors both explicitly in theory and implicitly in their offering financial incentives for accurate responses (see Weinberger & Hardaway, 1990).

³² In this respect, the “New Look” in psychology (Bruner and Postman, 1949) was arguably one of the better efforts to provide an integrated account of functioning involving both motivation and perception, rather than studying perception in a vacuum, and the premature demise of this approach was a backward step for psychology.

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