

To Be Happy and to Know It: The Experience and Meta-Awareness of Pleasure

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The refrain of an old favorite children's song goes "if you're happy and you know it, clap your hands." Implicit in this popular lyric is the curious observation that at least in principle one might be happy but not know it. Although embedded in the folk wisdom of popular culture, the possibility that people might not necessarily know whether or not they are happy is often overlooked in scientific discussions of happiness and pleasure. While researchers who study subjective well-being acknowledge that there are limitations to self-report measures, they generally take individuals' assessments of their happiness at face value. As Myers, one of the foremost purveyors of this research observes: "By definition, the final judge of someone's subjective well-being is whoever lives inside that person's skin. 'If you feel happy' noted Jonathan Freedman (1978) 'you are happy—that's all we mean by the term'" (Myers, 2000).

There are, of course, a number of good reasons why we might want to trust individuals' ability to decipher their experience of pleasure. First, who could possibly be a better arbiter of the hedonic quality of subjective experience than the person who is having that experience? Moreover, surely nothing could be more necessary for survival than an ability to accurately evaluate which experiences are reinforcing and which are not. Finally, and perhaps most importantly as illustrated in the above quote, there is a certain definitional self-evidence to our ability to assess the pleasure that we derive from experiences. The dictionary defines pleasure as "a feeling of

happiness, delight, or satisfaction." Thus, if there is no feeling, an experience simply cannot be pleasurable, at least not as the term is commonly understood. What then could it mean for an individual to experience pleasure if they were not aware of it?

Although the notion of unconscious pleasure seems to undermine the very meaning of the term, we argue that it is still possible that individuals could experience pleasure without being aware of it. We approach this problem by distinguishing between experiential consciousness (i.e., the contents of ongoing experience) and meta-awareness (i.e., one's explicit awareness of the contents of consciousness) (Schooler, 2001, 2002; Schooler et al., 2003; Schooler and Schreiber, 2004). Central to this distinction is the claim that we can have experiences (experiential consciousness) without being contemporaneously aware of the nature of those experiences (meta-awareness). Recent neuroscientific evidence lends some support to this notion: the brain may register valenced responses to events (e.g., subliminally presented stimuli) for which the hedonic reaction is not consciously experienced (e.g., Winkielman and Berridge, 2004).

The dissociation of experiential and meta-awareness is illustrated by the case of mind-wandering during reading. All readers are familiar with the experience of suddenly realizing that despite the best of intentions, one's mind has wandered, and one has no idea what one has been reading. What is so striking about this experience is that although one consciously experiences the contents of the mind-wandering episode, one fails

to notice that one's mind has wandered. Otherwise, one would have either stopped reading or stopped daydreaming. The fact that both activities continue demonstrates the absence of awareness that one is daydreaming even though that is precisely what is occupying one's minds at the time. In short, the common everyday experience of mind-wandering during reading illustrates that we can have an experience without being explicitly aware (i.e., meta-conscious) of the fact that we are having that experience.

Recent laboratory studies demonstrated the ubiquity of mind-wandering during reading, and by extension the ease with which individuals can be unaware of the contents of their own experience (Schooler et al., 2004). Participants read passages and were asked to press a button every time they caught their mind-wandering ("zoning out"). On average, people caught themselves zoning out five times during a 45-min period. In addition, participants were intermittently probed and asked whether at that particular moment they had been zoning out. Despite the fact that a central component of this task was to actively monitor mind-wanderings, on more than 11% of the probe trials, participants were still caught zoning out. Moreover, the frequency of these unaware flights of thought was a strong predictor of ultimate comprehension. This finding suggests that the individuals who were zoning out without awareness during the sampling procedure similarly failed to notice other zoning-out episodes that were never caught at all. Thus, these individuals were ultimately unprepared to answer questions about text that was read when their mind was elsewhere.

If individuals can have conscious, lucid, and perhaps even quite pleasurable mind-wandering experiences during reading without meta-awareness of what they are thinking about, then it seems quite plausible that many other experiences, including pleasurable ones, may also occur in the absence of explicit appraisal. If so, then the notion that individuals might often lack explicit awareness of their states of pleasure shifts from a logical impossibility to a phenomenon that may occur all the time. Indeed, when we consider the available evidence, it seems that many of our most pleasurable experiences occur with little meta-awareness of the fact that we are experiencing pleasure.

Dissociations Between Experience And Meta-Awareness of Pleasure

Two phenomena are particularly well suited to illustrate dissociations between experience and meta-awareness

of pleasure, namely the experience of flow and the influence of forced meta-awareness on judgments.

Experience of Flow

One of the most effective ways of assessing the occurrence of pleasure in everyday life is the experience-sampling technique in which participants are equipped with a pocket computer that intermittently probes them regarding what they are doing and how much they are enjoying it (Csikszentmihalyi and LeFevre, 1989). Using this methodology with over 1000 participants, Csikszentmihalyi and LeFevre (1989) found that many of most pleasurable moments occur when individuals are in what Csikszentmihalyi terms a state of "flow." The flow state occurs when one is deeply absorbed in a task that is both highly challenging yet also accomplishable. What is so striking about research on the flow states is the fact that it indicates that individuals' most positive experiences occur when they are not thinking about themselves, but are rather deeply absorbed in the activity itself. Indeed the flow state is so absorbing that individuals do not have the attentional resources to explicitly notice that they are happy at the time. As Csikszentmihalyi (1999) puts it:

"Strictly speaking, during the experience [of flow] people are not necessarily happy because they are too involved in the task to have the luxury to reflect on their subjective states. Being happy would be a distraction, an interruption of flow. But afterwards, when the experience is over, people report having been in a positive a state as it is possible to feel" (p. 825).

Thus, the conclusion of one of the most extensive investigations of individuals' actual experiences of happiness suggests that people experience the greatest pleasure when they are not reflecting on the fact that they are happy. Importantly, however, as Csikszentmihalyi notes, as soon as individuals in a flow state direct their attention to their hedonic state, they readily report that they were experiencing pleasure. In other words, the flow state illustrates a "temporal dissociation of meta-awareness" (Schooler, 2002), in which an individual goes for a period of time without taking explicit stock of what they are experiencing. However, as soon as the experiential state is explicitly considered, the experience of pleasure is readily acknowledged.

The observation of temporal dissociations between having an experience and explicitly noticing that experience raises the possibility of another type of dissociation between experience and meta-awareness, termed as "translation dissociation" (Schooler,

2002) in which in the process of re-representing the quality of an experience to oneself, one distorts or omit critical elements of the experience, thereby misconstruing it. Although clearly more controversial than temporal dissociations, a variety of findings suggest that individuals may sometimes misrepresent the quality of their own subjective experience to themselves.

Impact of Reflection on the Assessment of Pleasure

If the process of re-representing an experience to oneself could in principle lead to errors in characterizing the experience, then it follows that encouraging extensive elaboration of an experience might be particularly apt to introduce such distortions. In fact, a number of studies suggest that reflection can interfere with people's ability to assess their experience. For example, in a study by Wilson and Schooler (1991), participants sampled five different strawberry jams. In the reflection condition, participants were then asked to reflect on their evaluation, listing the reasons why they felt the way they did about each jam. All participants were then asked to rate the five jams. The correlations between participants' jam ratings and expert judges' ratings (provided by Consumer Reports) were then assessed. Wilson and Schooler found that whereas control subjects provided ratings that were closely aligned with that of the experts ($r=.51$), the judgments of the participants who analyzed their reasons were completely unrelated ($r=.16$) to those of the experts. Within the current context, the findings of Wilson and Schooler can be interpreted as suggesting that reflection caused participants to "lose touch with their feelings," providing ratings that did not correspond to the actual pleasure that they, and others unbiased by reflection, derived from the jams.

One possible concern with Wilson and Schooler's findings is that it used experts' opinions as its normative basis for assessing the quality of participants' hedonic judgments. Failing to agree with an expert does not necessarily mean that one's opinions are unreflective of the pleasure that one derives from an experience. In other words, participants in the self-reflection condition might simply have had different hedonic experiences, which were equally well captured by their self-reports. A follow-up study by Wilson et al. (1993) however argues against this interpretation. In this study, participants examined various different art posters. Participants in the reflection condition analyzed why they felt the way they did about

the posters and then rated them. Participants in the control condition simply rated the posters without reflection. Participants were then given the opportunity to select a poster and take it home. Two weeks later, participants were contacted and asked various questions to assess their postchoice satisfaction, including how much they now liked the poster and whether they had hung it up. Wilson et al. found that participants who had selected posters in the reflection condition were less satisfied with their choices and less likely to have hung them up than participants who had simply gone with their gut. The fact that participants who engaged in reflection were ultimately less satisfied with their selections suggests that reflection did not change the pleasure they experienced. Rather these findings suggest that reflection actually undermined people's ability to decipher the pleasure that they had actually experienced and which they re-experienced after the impact of self-reflection had worn off.

The above findings provide just a sampling of the numerous studies that indicate that self-reflection may impair people's ability to decipher the hedonic value of experience. Other studies have found similar effects of self-reflection on people's ability to judge the pleasure they derive from courses (Wilson and Schooler, 1991), beverages (Wilson and et al., 1984), and even relationships (Wilson et al., 2000). Moreover, additional studies have found that when self-reflection is minimized by forcing individuals to make very quick hedonic judgments, assessments become realigned with actual experience. For example, Wilson and Lindsey (as reported in Wilson et al., 2000) had participants evaluate the quality of their relationship with a significant other (romantic partner). Some participants engaged in self-reflection, analyzing their reasons for their evaluations, whereas other simply gave an overall rating. As in prior studies, they found that self-reflection reduced people's ability to adequately gauge the quality of their relationship, as revealed by the fact that those who analyzed their reasons were less able to predict the quality of their relationship at a later date, relative to the control subjects who did not engage in self-reflection. Importantly, however, Wilson and Lindsey included an additional condition in which, following self-reflection, participants made very quick (2s) evaluations. In this condition, the correlations between participants' ratings of their relationship, and their later-reported ratings, were as high as it was for participants who did not engage in self-reflection at all. Apparently, when self-reflection is discouraged, individuals are able to get a more direct "read-off" of their actual subjective state.

Assessing Accuracy of Meta-Awareness

The suggestion that people can be inaccurate in characterizing their hedonic experience raises the important question of whether there might exist some independent method for assessing individuals' hedonic state, and, by extension, for assessing the degree to which individuals' meta-awareness of their hedonic states is "accurate." In principle, one way of gauging the accuracy of individuals' meta-awareness of their own affective state is to assess the extent to which the self-reported hedonic experience correlates, or coheres, with behavioral or physiological measures of affect (Schooler and Schreiber, 2004). Such an approach is premised on the notion that behavioral measures such as facial behavior, facial electromyography (EMG), or autonomic physiological responses such as heart rate or skin conductance, can provide an accurate gauge of underlying hedonic response. If such measures could be shown to reflect actual hedonic experience, then it could be assumed that the greater the coherence between self-report and other covert measures of hedonic state the greater the accuracy of meta-awareness.

There is, of course, a fundamental logical challenge to validating the use of behavioral and physiological measures as a yardstick for assessing individuals' meta-awareness of their underlying experience (Gilbert, 2006). The only way to demonstrate that such measures tap actual hedonic experience is to show that they systematically covary with self-reports, or with situations that reliably differ in the type of self-reports that they invoke. But if self-reports are themselves suspect, then how can we ever establish the validity of an alternative measure? If the claim were that self-reports rarely if ever adequately capture the hedonic quality of an experience, then this concern would clearly be inescapable. However, the argument is not that self-reports have never any bearing on underlying experience. On the contrary, there are clearly situations in which it is self-evident that people's capacity to self-report their hedonic state is quite reasonable. Who, for example, would question that when someone cries out in pain after hitting their finger with a hammer that they are indeed suffering, or when a child squeals in glee after receiving a long-begged-for gift that she is experiencing genuine pleasure? The more modest claim that we are making is that, under some specified circumstances (as, for example, when individuals engage in extensive reflective analysis), the correspondence between self-reports and underlying experience

can be somewhat discrepant. Accordingly, if self-reports are generally in line with underlying hedonic experience, then measures that are found to consistently covary with self-reported hedonic state may be assumed to serve as a reasonable proxy for underlying hedonic experience. Once such independent proxies of hedonic experience are identified, we will be able to examine situational and individual fluctuations in the accuracy of meta-awareness by assessing the conditions under which self-reports show greater versus less coherence with other measures. This would open interesting avenues for further research because we could then examine the correlates and the potential functions of accurate meta-awareness.

Challenges in Finding Coherence between Self-Report and Covert Measures

Unfortunately, much of the past research on coherence between self-reports and other potential measures of hedonic response have observed only weak correlations between self-report and physiological measures (Hodgson and Rachman, 1974; Mandler et al., 1961; Stemmler, 1992; Weinstein et al., 1968). Studies that have assessed experiential, behavioral, and physiological measures in the context of various affective states have similarly found relatively modest correlations (Bradley and Lang, 2000; Hubert and de Jong-Meyer, 1991; Lang, 1988; Rachman, 1978) (for a review, see Barrett, 2006). In general, links between self-reported hedonic experience and facial behavior have been strongest (Ekman et al., 1980, 1990; Rosenberg and Ekman, 1994), but again, findings are inconsistent across studies (Adelmann and Zajonc, 1989; Blumberg and Izard, 1991; Bonanno and Keltner, 2004; Reisenzein, 2000; Ruch, 1995) (for a review, see Fridlund et al., 1987). Even with sensitive EMG measures of facial behavior, correlations between self-reports of hedonic experience and facial behavior are only low to moderate (Brown and Schwarz, 1980; Cacioppo et al., 1988; Lang et al., 1993). Still more challenging for the use of covert affective measures for appraising the accuracy of meta-awareness is the fact that some studies have found no (Edelmann and Baker, 2002; Fernandez-Dols et al., 1997; Fridlund, 1991; Jakobs et al., 2001; Mauss et al., 2004) or even negative associations between self-reports of hedonic experience and other measures (Buck, 1977; Lacey, 1967; Lang, 1988).

Thus, at first blush, it seems that indirect measures of hedonic response offer little promise for providing

a yardstick by which to assess the accuracy of meta-awareness of hedonic experience. However, this conclusion—at least in its general form—might be premature. After all, one systematic review of coherence studies by Ruch (1995) suggests a range of possible findings. Across 25 studies, correlations between funniness ratings and facial expressions of amusement ranged from -0.30 to nearly 1.0 . Also, a nonnegligible number of studies have reported substantial correlations between self-reported hedonic experience and other measures (Casey, 1993; Chovil, 1991; Gross et al., 2000; Lazarus et al., 1966). This range of findings suggests that perhaps methodological features of prior studies substantively influenced their outcomes. Indeed, some prior studies feature methods that may have made it difficult to detect associations between self-reported experience and other measures. Four of these methodological factors appear particularly relevant.

Factors That May Reduce Coherence between Self-Reports and Other Measures

The first factor that could have contributed to the variability in coherence estimates found in prior research is the intensity of hedonic state induced. The likely target state has to be sufficiently intense in order to find coherence among responses (Davidson, 1992; Rosenberg and Ekman, 1994; Tassinary and Cacioppo, 1992). Thus, some of the low estimates of coherence may have been due to the fact that only weak hedonic states were induced.

The second factor that influences coherence estimates is which measures are assessed and how well they are matched to the hedonic state under investigation. For example, some studies investigating pleasure have found surprisingly low correlations between self-reported feelings of pleasure and laughter (e.g., Bonanno and Keltner, 2004). However, laughter may reflect amusement or relief from a negative emotion rather than pleasure, and thus, might not be an appropriate index of pleasure. This example illustrates that it is important to carefully select one's response measures.

The third important methodological factor is whether coherence has been assessed at the *between-individual* or the *within-individual* level. In the between-individual approach, an individual who reports greater hedonic experience than other individuals would also be expected to exhibit greater behavioral and physiological responses than other individuals.

The alternative approach is to investigate within-individual correlations among responses across time. In this approach, one would expect greater behavioral and physiological responding in time periods when an individual self-reports greater hedonic experience relative to time periods when the same individual self-reports less hedonic experience. As several researchers have noted, the within-participant design is often more sensitive to detecting coherence than the between-participants design because it minimizes sources of between-individual variance (Lazarus et al., 1963; Pennebaker, 1982; Reizenstein, 2000; Rosenberg and Ekman, 1994; Ruch, 1995). In addition, between-individual analyses might be conceptually irrelevant to the question of how tightly responses are associated (Buck, 1980; Cacioppo et al., 1992; Lacey, 1967; Stemmler, 1992). Within-individual as compared to between-individual associations more closely denote accuracy of meta-awareness in the sense that self-reported hedonic experience should be associated with other measures *within individuals* and *across time*.

The fourth factor that affects indices of coherence consists of the timing of measures and their temporal resolution. When measuring self-reported hedonic experience, researchers have often relied on *retrospective* and *aggregated* ratings because rather than assessing emotional experience *online* and *moment-by-moment* (Gottman and Levenson, 1985; Rosenberg and Ekman, 1994). However, assessing experience ratings *after* a hedonic event might lead to measurement error due to processes such as memory biases or defensive mechanisms (Barrett, 1997; Kahneman, 2000; Rosenberg and Ekman, 1994). Thus, low associations between self-reported experience and other measures might be the result of suboptimal measures of self-reported experience. Additionally, prior studies have sometimes neglected to take into account varying lags among measures of emotional responding. This also might artificially decrease indices of coherence because it might lead one to miss responses outside the window under investigation, especially if the responses involved are short-lived (e.g., Kettunen et al., 2000).

Finding Greater Coherence between Self-Reports and Other Measures

Together, these methodological factors might have resulted in the inconsistent and relatively low coherence findings in prior studies. A recent study addressed these methodological considerations in four ways

(Mauss et al., 2005). First, it assessed a positive hedonic state (amusement) induced at relatively high intensity levels using a well-validated film. Amusement is a positive hedonic state especially conducive to detecting coherence because it appears to recruit behavioral as well as physiological responses (Ruch, 1995). Second, the study sampled several important responses systems, including self-reported experience, behavior, and autonomic physiological responses (cardiovascular responding and skin conductance). Third, the study employed a within-individual design by assessing responses to a film continuously across time. Fourth, issues of resolution and timing were addressed by assessing self-reported amusement experience *moment-by-moment* using a variant of the rating dial method introduced and validated by Levenson and Gottman (1983) (see also Gottman and Levenson, 1985). This method minimized measurement error in self-reported amusement experience. In addition, it ensured that measures of self-reported experience, of behavior, and of physiological responses were matched with respect to temporal resolution. Lastly, it enabled a time-series approach that took into account varying lags among measures.

While the rating dial method thus provides a number of advantages when assessing self-reported emotion experience, it raises an important concern. Before we turn to the main results, this concern needs to be addressed. As noted above, instructing participants to report on their hedonic states may alter those hedonic states themselves under certain conditions. Might providing continuous reports of experienced amusement thus distort the very phenomenon under observation? In order to address this question, the study assessed two groups of participants. One group provided continuous reports of amusement ("Adjust the dial so as to indicate how much amusement you feel at each moment.") as well as "traditional" retrospective ratings of amusement after the film clip ("What was the greatest amount of amusement you felt during the film clip?"). The other group only provided retrospective ratings of amusement after the film clip. By comparing retrospective ratings, facial behavior, and physiological responses between the two groups, it could be assessed whether providing continuous ratings distorted the experience of amusement. Results revealed that the two groups did not differ significantly with respect to retrospective amusement experience, facial behavior, or autonomic physiological responding (Mauss et al., 2005), suggesting that providing ratings with the dial did not alter participants' actual hedonic state.

Another recent study argued that perhaps these outcome measures were not sensitive enough to detect group differences. This study thus used a similar design to ascertain whether providing continuous ratings of one's hedonic experience alters brain activation associated with emotional responding (Hutcherson et al., 2005). Findings suggested that providing continuous ratings of hedonic experience did not significantly alter activation of brain areas associated with amusement experience (e.g., temporal cortex, insula). It may be that after some practice continuous ratings using the dial do not require participants' attention. Together, these studies suggest that continuous ratings using a rating dial provide a viable method for assessing meta-awareness.

So how closely then does this continuous measure of meta-awareness track other, more indirect measures of amusement? Results from the study described above indicated average disattenuated cross correlations of .89 between self-reported and facially expressed amusement, of .25 between self-reported amusement and cardiovascular activation, and of .57 between self-reported amusement and skin conductance level (Mauss et al., 2005). In other words, when assessed across time and when taking into account lags between measures, meta-awareness shared moderate to high amounts of variance with other measures. These results suggest that, when using appropriate methods, facial behavior and some measures of autonomic physiological responding (most notably skin conductance level) converge with an index of hedonic experience. In other words, when adequate methods are used, these indirect measures of affect may indeed provide an alternative window on individuals' hedonic experience.

Importantly, beyond these *average* indices of coherence, this study suggests that even under ideal conditions *individuals vary considerably* with respect to how closely their meta-awareness tracks other measures of hedonic experience. For example, disattenuated cross-correlations between self-reported amusement and facial amusement behavior ranged from 0.21 to 1.32, and disattenuated cross-correlations between self-reported amusement and skin conductance level (SCL) ranged from -0.22 to 0.96 across individuals. What are we to make of variations in coherence between self-reports and other measures? Could it be, as intimated above, that those individuals who show greater coherence are more meta-aware of their underlying experience, and that the accuracy of individuals' meta-awareness has functional implications?

Do Variations in Coherence between Self-Reports and Physiological Measures of Pleasures Reflect Differences in Accuracy of Meta-Awareness?

A recent study by Sze et al. (2007) suggests that variations in coherence between self-report and indirect measures may indeed reflect variations in individuals' meta-awareness of their hedonic state. Specifically, these researchers found that Vipassana (body-awareness) meditators as compared to advanced dancers and demographically matched controls exhibited greater coherence between self-reported hedonic states and heart rate during emotionally evocative film clips. In Vipassana meditation, practitioners are trained to increase awareness of physical sensations in the body. These results suggest that teaching individuals to attend to their internal state increases the accuracy of their meta-awareness and thus the coherence between indirect measures and self-reports.

Is Accurate Meta-Awareness Adaptive?

Theoretically, it seems reasonable that greater accuracy of meta-awareness of hedonic states (i.e., greater coherence of self-reported with indirect measures) would be associated with greater socioemotional functioning. Indeed, a variety of lines of research support such a relationship. For example, the emotion regulation literature suggests that in order to effectively regulate one's emotions, one must be able to both promptly notice and correctly identify one's emotional experiences (Barrett et al., 2001; Gross and Thompson, 2007). Similarly, from a communication perspective, individuals who possess accurate meta-awareness might communicate their emotional states better to others, which might in turn produce positive and avoid negative social outcomes (Ciarrochi et al., 2002; Mayer et al., 2004; Roter and Ewart, 1992). Research also suggests that avoiding meta-experience of hedonic states (as is the case in repression or experiential avoidance) is generally associated with negative outcomes for well-being, social outcomes, and health (Gratz et al., 2006; Kashdan et al., 2006; Marx and Sloan, 2005). In contrast, acceptance, reappraisal, and some automatic forms of emotion regulation—emotion regulation strategies that bring in line conscious and meta-aware experience of emotions—appear to be generally associated with positive outcomes (Gross, 1998; Gross and John, 2003;

Hayes et al., 2006; Mauss et al., 2007). Collectively, these studies suggest that individuals who are more "in touch" with (i.e., more meta-aware of) their feelings may experience socioemotional benefits. Accordingly, if coherence between self-report and covert indices of emotions taps the accuracy of individuals' meta-awareness of their emotions, then we would expect a relationship between coherence measures and socioemotional functioning.

Although very little research has directly explored this issue, a recent study offers preliminary evidence that coherence between self-reports and indirect measures of positive emotions may indeed be associated with greater socioemotional functioning. In 150 participants, we assessed coherence between emotional behavior and self-reported hedonic state during an amusing film clip, using a within-participants approach (Mauss et al., in preparation), individuals differed widely in accuracy of their meta-awareness. Participants' well-being (as indexed by depressive symptoms) was assessed 2 years later to examine whether individual differences in accuracy of meta-awareness would predict well-being. Indeed, greater coherence between self-reports and indirect measures was associated with greater well-being. In addition, in line with the idea that individuals who possess accurate meta-awareness might communicate their emotions more effectively, the association between coherence and well-being was mediated by social support. The conclusion that accurate meta-awareness might be adaptive is consistent with the studies described above, which suggested that when dissociations between consciousness and meta-awareness are induced by forcing individuals to extensively reflect on their experiences, they make less apt choices and judgments (Wilson et al., 1984; Wilson et al., 2000; Wilson and Schooler, 1991).

In sum, although more research in this area is clearly needed, the extant literature on coherence suggests that: (1) when adequate methodological considerations are taken into account, indirect measures of hedonic states reasonably cohere with self-reported measures; (2) individuals vary widely in the degree to which their self-reports correspond to their indirect measures of emotion; (3) higher levels of coherence appear to reflect greater emotional meta-awareness; and (4) more accurate meta-awareness might be generally adaptive. Together these findings suggest that coherence measures may provide a useful tool for assessing fluctuations in the accuracy of individuals' meta-awareness of their hedonic state.

Some Implications of Dissociations Between Experience and Meta-Awareness of Pleasure

The claim that there are fluctuations (both across situations and individuals) in accuracy of meta-awareness offers a potentially fresh perspective on variety of domains of hedonic experience. We briefly consider two such domains: (1) failures to pursue flow and (2) failures in affective forecasting.

If Flow Feels So Good, Why Don't People Pursue It More Often?

One puzzling finding in research on flow is that although individuals generally experience maximum pleasure when they are engaged in flow experiences, their leisure time preferences do not reflect this fact, as individuals tend to devote their leisure time to passive activities, such as watching television, that do not promote flow. The riddle that Csikszentmihalyi ponders is why, if flow states are so positive, do people not seek them out more reliably (Csikszentmihalyi and LeFevre, 1989). Within the present context, the answer to this question seems relatively straightforward. People fail to seek out flow experiences because they lack meta-awareness about the fact that such experiences are the most positive. The absence of reflection during flow, though it may enhance individuals' experience of the moment, may also undermine their ability to remember what a wonderful time they are having. As a consequence, individuals may tend to seek out experiences that they have come to believe will make them happy (perhaps through cultural immersion) rather than in engaging in the behaviors that actually have made them happy.

Failures in Affective Forecasting

People's frequent failure to pursue flow despite the pleasure that they derive from such experiences illustrates one of the many situations in which individuals inadequately anticipate the hedonic quality of future experiences. A large body of work reveals numerous situations in which people show a remarkable lack of insight regarding the pleasures and displeasures that will be gleaned from future events. In general, people tend to overestimate both joys and sorrows. With respect to joys, people overestimate the happiness they will gain from increased earnings (Kahneman et al., 2006), a favorable dormitory room (Dunn et al., 2003), or how much they will enjoy a drink if they

have just exercised (Van Boven and Loewenstein, 2003). With respect to sorrows, people overestimate how upset they will feel following their team losing a football game, receiving negative feedback about their performance on a test, and failing to receive tenure (Wilson et al., 2000).

The distinction between experience and meta-awareness may help to illuminate one of the most puzzling aspects of affective forecasting errors, namely, why it is that people do not learn? For example, Wilson et al. (2000) found that individuals reliably overestimate how long they will remain upset following the loss of a home team. They interpreted this finding as suggesting a process of "focalism" whereby people fail to take into account the larger context in which this particular negative event occurred, and thus, overweigh its impact on their lives. Although Wilson et al. (2000) provide compelling evidence that an excessive focus on the impact of a single event contributes to many affective forecasting errors, this account fails to explain one important thing. If (as seems certain) everyone who cares about their home team has experienced big game losses, why do they fail to learn how quickly other events distract them from the pain of the loss? From the present perspective, one reasonable explanation is that individuals' frequent lack of meta-awareness of their hedonic states prevents them from noticing how quickly they move on, and thus, from factoring the richness of their lives into their predictions.

The distinction between experience and meta-awareness also raises potential concerns about how to interpret affective forecasting findings. Importantly, affective forecasting errors are revealed by discrepancies between what individuals predict they will feel prior to an event, and what they report experiencing after the event. However, if the veracity of individuals' self-reports of their hedonic responses can vary, then discrepancies between predicted and experienced affect may not only stem from errors in the affective forecast, but may also result from errors in reporting the hedonic experience itself. For example, one potential method for overcoming the hardship of a negative experience may be to downplay how upsetting it is. Accordingly, people's seemingly exaggerated forecasts of the magnitude and duration of negative response to learning that they did particularly badly on a test, might be at least partially due to participants not wanting admit to themselves the displeasure they are actually experiencing. If underreporting of experienced affect contributes to affective forecasting discrepancies, then the inclusion of behavioral and physiological measures of hedonic experience (such as those described earlier)

might reveal covert evidence of hedonic responses that are more in tune with people's predictions than their self-reports.

Although the distinction between experience and meta-awareness raises the possibility that self-reports may exaggerate affective forecasting errors, it also suggests that in some cases self-reports might actually underestimate the magnitude of such errors. Specifically, one hypothesized source of dissociations between experience and meta-awareness are faulty theories about how people think they ought to be feeling (Schooler and Schreiber, 2004). If this is the case, then it seems quite possible that people would consult the very same theories they use to generate their predictions about how they will feel in the future, when they actually come to make appraisals of their current state. If one has a theory which predicts he or she should be feeling bad in a particular situation (i.e., "I feel unhappy when people tell me I have done poorly on a test"), then this theory may color the appraisal of that experience, leading them to report being unhappy longer than they really are. Once again, the evidence reviewed earlier that indirect measures can be used as a metric for assessing the accuracy of meta-awareness suggests that we may now be poised to assess the situations in which self-reports exaggerate, underestimate, and accurately characterize affective forecasting errors.

Final Thought: The Relative Merit of the Experience Versus Meta-Awareness of Pleasure

The suggestion that people may experience pleasure without realizing that they are doing so raises the fundamental issue of the relative merit of having an experience of pleasure versus knowing that you are having it. Consider two situations: you can have an experience that you would rate a "9" if only you stopped to consider it, or one that is an "8" but that you are actually able to stop and savor as it occurs. Does the fact that you can attend to a pleasure as it happens somehow give it greater value, even if it is of lesser sheer hedonic quality? Or is the memory of an intense pleasure, even if it was not acknowledged as such at the time, ultimately of greater importance? Furthermore, if you did not actually attend to the quality of the pleasure at the time, how confident can you be that it really was as good as it is remembered? As you recall the thrill of going down that roller coaster, you may remember it as intense pleasure, but perhaps this is just

a reframing of the sheer fear that you actually experienced as you plummeted down the ramp. And if it is the meta-awareness that is remembered, should we live our lives to maximize the actual fleeting pleasure of experiences, or the more enduring, if flawed, retrospective appraisal of it? Although resolving the relative merit of maximizing the experience versus meta-awareness of pleasure is clearly a difficult task, recognizing that there may be sizable differences between the two is certainly an important first step.

References

- Adelmann, P. K. and Zajonc, R. B. (1989) Facial efference and the experience of emotion. *Annu. Rev. Psychol.* 40, 249–280.
- Barrett, L. F. (1997) The relationships among momentary emotion experiences, personality descriptions, and retrospective ratings of emotion. *Pers. Soc. Psychol. Bull.* 23, 1100–1110.
- Barrett, L. F. (2006) Are emotions natural kinds? *Perspect. Psychol. Sci.* 1, 28–58.
- Barrett, L. F., Gross, J., Christensen, T. C. and Benvenuto, M. (2001) Knowing what you're feeling and knowing what to do about it: Mapping the relation between emotion differentiation and emotion regulation. *Cogn. Emot.* 15, 713–724.
- Blumberg, S. H. and Izard, C. E. (1991) Patterns of emotion experiences as predictors of facial expressions of emotion. *Merrill Palmer Q.* 37, 183–197.
- Bonanno, G. A. and Keltner, D. (2004) Brief report: the coherence of emotion systems: Comparing "on-line" measures of appraisal and facial expressions, and self-report. *Cogn. Emot.* 18, 431–444.
- Bradley, M. M. and Lang, P. J. (2000) Measuring emotion: Behavior, feeling, and physiology. In: *Cognitive Neuroscience of Emotion*, pp. 242–276. Eds. R. D. Lane and L. Nadel. Oxford University Press: New York, NY.
- Brown, A. and Schwarz, G. E. (1980) Relationship between facial electromyography and subjective experience during affective imagery. *Biol. Psychol.* 11, 49–62.
- Buck, R. (1977) Nonverbal communication of affect in preschool children: Relationships with personality and skin conductance. *J. Pers. Soc. Psychol.* 35, 225–236.
- Buck, R. (1980) Nonverbal behavior and the theory of emotion: the facial feedback hypothesis. *J. Pers. Soc. Psychol.* 38, 811–824.
- Cacioppo, J. T., Martzke, J. S., Petty, R. E. and Tassinary, L. G. (1988) Specific forms of facial EMG response index emotions during an interview: From Darwin to the continuous flow hypothesis of affect-laden information processing. *J. Pers. Soc. Psychol.* 54, 592–604.
- Cacioppo, J. T., Uchino, B. N., Crites, S. L., Snyder-Smith, M. A., Smith, G., Berntson, G. G. and Lang, P. J. (1992) Relationship between facial expressiveness and sympathetic activation in emotion: a critical review, with emphasis on modeling underlying mechanisms and individual differences. *J. Pers. Soc. Psychol.* 62, 110–128.
- Casey, R. J. (1993) Children's emotional experience: Relations among expression, self-report, and understanding. *Dev. Psychol.* 29, 119–129.

- Chovil, N. (1991) Social determinants of facial displays. *J. Nonverbal Behav.* 15, 141–154.
- Ciarrochi, J., Deane, F. P., Wilson, C. J. and Rickwood, D. (2002) Adolescents who need help the most are the least likely to seek it: the relationship between low emotional competence and low intention to seek help. *Br. J. Guid. Coun.* 30, 173–188.
- Csikszentmihalyi, M. (1999) If we are so rich, why aren't we happy? *Am. Psychol.* 54, 821–827.
- Csikszentmihalyi, M. and Lefevre, J. (1989) Optimal experience in work and leisure. *J. Pers. Soc. Psychol.* 56, 815–822.
- Davidson, R. J. (1992) Prolegomenon to the structure of emotion: Gleanings from neuropsychology. *Cogn. Emot.* 6, 245–268.
- Dunn, E. W., Wilson, T. D. and Gilbert, D. T. (2003) Location, location, location: the misprediction of satisfaction in housing lotteries. *Pers. Soc. Psychol. Bull.* 29, 1421–1432.
- Edelmann, R. J. and Baker, S. R. (2002) Self-reported and actual physiological responses in social phobia. *Br. J. Clin. Psychol.* 41, 1–14.
- Ekman, P., Davidson, R. J. and Friesen, W. V. (1990) The Duchenne smile: Emotional expression and brain physiology: II. *J. Pers. Soc. Psychol.* 58, 342–353.
- Ekman, P., Friesen, W. V. and Ancoli, S. (1980) Facial signs of emotional experience. *J. Pers. Soc. Psychol.* 39, 1125–1134.
- Fernandez-Dols, J.-M., Sanchez, F., Carrera, P. and Ruiz-Belda, M.-A. (1997) Are spontaneous expressions and emotions linked? an experimental test of coherence. *J. Nonverbal Behav.* 21, 163–177.
- Fridlund, A. J. (1991) Sociality of solitary smiling: Potentiation by an implicit audience. *J. Pers. Soc. Psychol.* 60, 229–240.
- Fridlund, A. J., Ekman, P. and Oster, H. (1987) Facial expressions of emotion. In: *Nonverbal Behavior and Communication* (2nd ed.), pp. 143–223. Eds. A. W. Siegman, S. Feldstein. Lawrence Erlbaum Associates: Hillsdale, NJ.
- Gilbert, D. T. (2006) *Stumbling on Happiness*. Knopf: New York.
- Gottman, J. M. and Levenson, R. W. (1985) A valid procedure for obtaining self-report of affect in marital interaction. *J. Consult. Clin. Psychol.* 53, 151–160.
- Gratz, K. L., Rosenthal, M. Z., Tull, M. T., Lejuez, C. W. and Gunderson, J. G. (2006) An experimental investigation of emotion dysregulation in borderline personality disorder. *J. Abnorm. Psychol.* 115, 850–855.
- Gross, J. J. (1998) Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *J. Pers. Soc. Psychol.* 74, 224–237.
- Gross, J. J. and John, O. P. (2003) Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *J. Pers. Soc. Psychol.* 85, 348–362.
- Gross, J. J., John, O. P. and Richards, J. M. (2000) The dissociation of emotion expression from emotion experience: a personality perspective. *Pers. Soc. Psychol. Bull.* 26, 712–726.
- Gross, J. J. and Thompson, R. A. (2007) Emotion regulation: Conceptual foundations. In: *Handbook of Emotion Regulation*, pp. 3–24. Ed. J. J. Gross. Guilford Press: New York.
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A. and Lillis, J. (2006) Acceptance and commitment therapy: Model, processes and outcomes. *Behav. Res. Ther.* 44, 1–25.
- Hodgson, R. and Rachman, S. (1974) II. Desynchrony in measures of fear. *Behav. Res. Ther.* 12, 319–326.
- Hubert, W. and de Jong-Meyer, R. (1991) Psychophysiological response patterns to positive and negative film stimuli. *Biol. Psychol.* 31, 73–93.
- Hutcherson, C. A., Goldin, P. R., Ochsner, K. N., Gabrieli, J. D., Barrett, L. F. and Gross, J. J. (2005) Attention and emotion: Does rating emotion alter neural responses to amusing and sad films? *NeuroImage* 27, 656–668.
- Jakobs, E., Manstead, A. S. R. and Fischer, A. H. (2001) Social context effects on facial activity in a negative emotional setting. *Emotion* 1, 51–69.
- Kahneman, D. (2000) Experienced utility and objective happiness: a moment-based approach. In: *Choices, Values, and Frames*, pp. 673–692. Eds. D. Kahneman and A. Tversky. Cambridge University Press: New York.
- Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N. and Stone, A. A. (2006) Would you be happier if you were richer? A focusing illusion. *Science* 312, 1908–1910.
- Kashdan, T. B., Barrios, V. and Forsyth, J. P. (2006) Experiential avoidance as a generalized psychological vulnerability: Comparisons with coping and emotion regulation strategies. *Behav. Res. Ther.* 44, 1301–1320.
- Kettunen, J., Ravaja, N. and Keltikangas-Jarvinen, L. (2000) Smoothing facilitates the detection of coupled responses in psychophysiological time series. *Int. J. Psychophysiol.* 14, 1–10.
- Lacey, J. I. (1967) Somatic response patterning and stress: Some revisions of activation theory. In: *Psychological Stress: Issues in Research*, pp. 14–42. Eds. M. H. Appley and R. Trumbull. Appleton-Century-Crofts: New York.
- Lang, P. J. (1988) What are the data of emotion? In: *Cognitive Perspectives on Emotion and Motivation*, pp. 173–191. Eds. V. Hamilton, G. H. Bower, and N. H. Frijda. Kluwer Academic/Plenum Publishers: New York.
- Lang, P. J., Greenwald, M. K., Bradley, M. M. and Hamm, A. O. (1993) Looking at pictures: Affective, facial, visceral, and behavioral reactions. *Psychophysiology* 30, 261–273.
- Lazarus, R. S., Opton, E. and Tomita, M. (1966) A cross-cultural study of stress-reaction patterns in Japan. *J. Pers. Soc. Psychol.* 4, 622–633.
- Lazarus, R. S., Speisman, J. C. and Mordkoff, A. M. (1963) The relationship between autonomic indicators of psychological stress: Heart rate and skin conductance. *Psychosom. Med.* 25, 19–30.
- Levenson, R. W. and Gottman, J. M. (1983) Marital interaction: Physiological linkage and affective exchange. *J. Pers. Soc. Psychol.* 45, 587–597.
- Mandler, G., Mandler, J. M., Kremen, I. and Sholiton, R. (1961) The response to threat: Relations among verbal and physiological indices. *Psychol. Monographs* 75 (No. 513).
- Marx, B. P. and Sloan, D. M. (2005) Peritraumatic dissociation and experiential avoidance as predictors of post-traumatic stress symptomatology. *Behav. Res. Ther.* 43, 569–583.
- Mauss, I. B., Cook, C. L. and Gross, J. J. (2007) Automatic emotion regulation during anger provocation. *J. Exp. Soc. Psychol.* 43, 698–711.
- Mauss, I. B., Levenson, R. W., McCarter, L., Wilhelm, F. H. and Gross, J. J. (2005) The tie that binds? Coherence among emotion experience, behavior, and physiology. *Emotion* 5, 175–190.
- Mauss, I. B., Shallcross, A. J., Caston, A. T., Ferrer, E., Wilhelm, F. H., John, O. P., and Gross, J. J. (in preparation) Socioemotional correlates of emotional response system coherence.
- Mauss, I. B., Wilhelm, F. H. and Gross, J. J. (2004) Is there less to social anxiety than meets the eye? Emotion

- experience, expression, and bodily responding. *Cogn. Emot.* 18, 631–662.
- Mayer, J. D., Salovey, P. and Caruso, D. R. (2004) Emotional intelligence: Theory, findings, and implications. *Psychol. Inq.* 15, 197–215.
- Myers, D. G. (2000) *The American Paradox: Spiritual Hunger in An Age of Plenty*. Yale University Press: New Haven, NJ.
- Pennebaker, J. W. (1982) *The Psychology of Physical Symptoms*. Springer: New York.
- Rachman, S. (1978) Human fears: a three systems analysis. *Scand.J.Behav.Theor.* 7, 237–245.
- Reisenzein, R. (2000) Exploring the strength of association between the components of emotion syndromes: the case of surprise. *Cogn.Emot.* 14, 1–38.
- Rosenberg, E. L. and Ekman, P. (1994) Coherence between expressive and experiential systems in emotion. *Cogn. Emot.* 8, 201–229.
- Roter, D. L. and Ewart, C. K. (1992) Emotional inhibition in essential hypertension: Obstacle to communication during medical visits? *Health Psychol.* 11, 163–169.
- Ruch, W. (1995) Will the real relationship between facial expression and affective experience please stand up: the case of exhilaration. *Cogn.Emot.* 9, 33–58.
- Schooler, J. W. (2001) Discovering memories in the light of meta-awareness. *Journal of Aggression, Maltreatment and Trauma* 4, 105–136.
- Schooler, J. W. (2002) Re-representing consciousness: Dissociations between experience and meta-consciousness. *Trends Cogn. Sci.* 6, 339–344.
- Schooler, J. W., Ariely, D. and Loewenstein, G. (2003) The pursuit and monitoring of happiness can be self-defeating. In: *Psychology and Economics*, pp. 41–70. Eds. J. Carrillo and I. Brocas. Oxford University Press: Oxford.
- Schooler, J. W., Reichle, E. D. and Halpern, D. V. (2004) Zoning out while reading: Evidence for dissociations between experience and meta-consciousness. In: *Thinking and Seeing: Visual Metacognition in Adults and Children*, pp. 203–226. Ed. D. T. Levin. MIT Press: Cambridge, MA.
- Schooler, J. W. and Schreiber, C. A. (2004) Experience, meta-consciousness, and the paradox of introspection. *Journal of Consciousness Studies* 11, 17–39.
- Stemmler, G. (1992) *Differential Psychophysiology: Persons in Situations*. Springer-Verlag: Berlin.
- Sze, J. A., Yuan, J. W., Gyurak, A. and Levenson, R. W. (2007) Poster presented at the annual meeting of the Society for Personality and Social Psychology, Memphis, TN.
- Tassinari, L. G. and Cacioppo, J. T. (1992) Unobservable facial actions and emotion. *Psychol.Sci.* 3, 28–33.
- Van Boven, L. and Loewenstein, G. (2003) Social projection of transient drive states. *Pers.Soc.Psychol.Bull.* 29, 1159–1168.
- Weinstein, J., Averill, J. R., Opton, E. M., Jr. and Lazarus, R. S. (1968) Defensive style and discrepancy between self-report and physiological indexes of stress. *J.Pers.Soc. Psychol.* 10, 406–413.
- Wilson, T. D., Dunn, D. S., Bybee, J. A., Hyman, D. B., and Rotondo, J. A. et al. (1984) Effects of analyzing reasons on attitude-behavior consistency. *J. Pers. Soc. Psychol.* 47, 5–16.
- Wilson, T. D., Lindsey, S. and Schooler, T. Y. (2000) A model of dual attitudes. *Psychol.Rev.* 107, 101–126.
- Wilson, T. D., Lisle, D. J., Schooler, J. W., Hodges, S. D. and et al. (1993) Introspecting about reasons can reduce post-choice satisfaction. *Pers. Soc. Psychol. Bull.* 19, 331–339.
- Wilson, T. D. and Schooler, J. W. (1991) Thinking too much: Introspection can reduce the quality of preferences and decisions. *J. Pers. Soc. Psychol.* 60, 181–192.
- Winkielman, P. and Berridge, K. C. (2004) Unconscious emotion. *Curr.Dir.Psychol.Sci.* 13, 120–123.