

The Affective Control of Thought: Malleable, Not Fixed

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Despite decades of research demonstrating a dedicated link between positive and negative affect and specific cognitive processes, not all research is consistent with this view. We present a new overarching theoretical account as an alternative—one that can simultaneously account for prior findings, generate new predictions, and encompass a wide range of phenomena. According to our proposed affect-as-cognitive-feedback account, affective reactions confer value on accessible information processing strategies (e.g., global vs. local processing) and other responses, goals, concepts, and thoughts that happen to be accessible at the time. This view underscores that the relationship between affect and cognition is not fixed but, instead, is highly malleable. That is, the relationship between affect and cognitive processing can be altered, and often reversed, by varying the mental context in which it is experienced. We present evidence that supports this account, along with implications for specific affective states and other subjective experiences.

Keywords: affect, emotion, cognition, affect-as-information, cognitive processing

There are trivial truths and great truths. The opposite of a trivial truth is plainly false.

The opposite of a great truth is also true.

Niels Bohr (cited in McGuire, 1973)

Something of a great truth in the affect-cognition literature might be the idea that the cognitive consequences of affect are etched in psychological stone. Affect has distinct cognitive and perceptual effects: Positive affect is thought to trigger heuristic processing (Schwarz & Clore, 2007), a global focus (Fredrickson & Branigan, 2005), and widened attention (Derryberry & Tucker, 1994; Rowe, Hirsh, & Anderson, 2007). Negative affect is thought to elicit systematic or elaborated processing, a local focus, and narrowed attention. Despite the extensive evidence consistent with this truth, the opposite also appears to be true. Emerging evidence indicates that positive and negative affect can also have cognitive effects opposite to those obtained in past research.

Rather than viewing the existence of these conflicting truths as problematic, following McGuire's (1989) perspectivist approach,

we propose that they present an opportunity to clarify our understanding of how affect regulates cognition. Because existing theories predict fixed effects of positive and negative affect on cognition, a different perspective on how affect regulates cognition may be useful, one that can simultaneously account for the established truth and its opposite. Our purpose here is to provide such an account. In what follows, we first briefly review research regularly taken as evidence of a direct or dedicated link between positive and negative affect and styles of cognitive processing. In the second part, we provide a historical review of the major theoretical accounts for these findings. In the third part, we present an "affect as cognitive feedback" account that predicts that the impact of affect on cognition is malleable. We then present studies that demonstrate this malleability. In the last part, we describe extensions of this account to specific emotions and other subjective experiences.

Before we continue, we define some key terms. The first concerns what we mean by *affect*. Affect is a general term that we use to refer to any evaluative reaction. Such reactions are representations of value; they are about the goodness-badness of something. Thus, there are affective feelings, affective thoughts, affective expressions, and so on. Common terms referring to different kinds of affective conditions include emotion, mood, attitude, and temperament. They can be distinguished by whether they are states and whether they have a salient object (Clore & Schnall, 2005). *Emotions* represent affective states with salient objects. The nature of the object (i.e., what the emotion is about) gives structure to the emotion. Thus, a negative reaction focused on an external threat, fear, is different than a reaction focused on one's own blameworthy action, guilt. *Moods*, in contrast, are diffuse affective states without salient objects and hence without much structure. From the present view, any number of reactions and experiences may signal that something is good or bad in some way. Thus, the actions of

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head nodding or shaking are affective in that they signal approval or disapproval, and the experiences of cognitive fluency or disfluency are affective in that they signal coherence or incoherence. In addition, affective concepts involve linguistic representations of value (e.g., love and death). Thus, affective reactions are evaluations, which may be represented in multiple modalities.

Evidence for a Dedicated Link Between Affect and Cognitive Processing

The notion that negative affect is associated with a decrease in breadth of attention dates back more than a half a century to Easterbrook's (1959) classic research on anxiety and arousal. Since that time, and especially over the past three decades, a significant amount of data across a wide variety of domains has accumulated in support of the notion that negative affect is associated with narrowed attention, systematic processing, and attention to detail, whereas positive affect is associated with increased breadth of attention, heuristic processing, and reliance on categorical information. In fact, a remarkably consistent and compelling picture has emerged over the years. Given that this literature is voluminous, we discuss only a selection of representative findings here.

In the 1980s, when interest in the relationship between affect and cognition began to resurface, researchers initially explored the impact of affect on cognitive organization. Work by Isen and her colleagues, for example, found that happy moods, compared to neutral ones, lead individuals to form more inclusive categories in which nonprototypical exemplars (e.g., cane) are included in common categories (e.g., clothing; Isen & Daubman, 1984). This work suggests that positive affect leads individuals to perceive relatedness among diverse stimuli. Indeed, research on creative problem solving has supported this view. For example, relative to sad or neutral moods, happy moods have been associated with increased performance on the remote-association test (RAT), a task in which participants are given three words (e.g., mower, atomic, foreign) and are asked to find one word that relates to each of them (e.g., power). Likewise, happy individuals have been shown to be better able to entertain ideas about how objects might serve different purposes and thus, are more successful at completing Duncker's candle task (Isen, Daubman, & Nowicki, 1987).

In many other tasks, individuals in happy moods have been found to rely on broad, global, and categorical information when processing and making judgments, whereas individuals in sad moods rely on more local, detailed information. For example, happy individuals are more likely to use stereotypes and traits in impression formation than are individuals in sad or neutral moods (Bodenhausen, Kramer, & Süsser, 1994; Isbell, 2004). In one study for example, Isbell (2004) presented participants with global trait information about a target along with both trait-consistent and trait-inconsistent behaviors that the target performed. Happy participants' judgments reflected the trait information, whereas unhappy participants' judgments instead reflected the mixed behaviors. When given the opportunity to seek out information about another person, happy participants are more likely than unhappy ones to select global trait information rather than detailed behaviors as a basis for their impressions (Isbell, Burns, & Haar, 2005). Happy individuals are also more likely than sad individuals to use abstract language when describing behaviors, events, and them-

selves (Beukeboom & Semin, 2005, 2006; Isbell, McCabe, Burns, & Lair, 2013).

Relative to sad moods, happy moods promote reliance on behavioral scripts to process information about routine events (e.g., eating at a restaurant), leading happy participants to incorrectly identify script-consistent information as having been previously presented (Bless, Clore, et al., 1996). Consistent with this finding, using a false memory paradigm, Storbeck and Clore (2005) found that individuals in happy moods were more likely than those in sad moods to incorrectly identify words as previously presented if they were related to presented words. Together these results demonstrate that happiness is more likely than sadness to involve relational processing in which incoming information is related to information already activated in memory.

A robust body of evidence has also emerged in the persuasion domain demonstrating that positive affect leads to less systematic and more heuristic processing than sadness. Indeed, the attitudes of people in happy moods seem immune to the quality of message arguments and are instead often based on heuristic cues, such as source expertise (for a review, see Schwarz, Bless, & Bohner, 1991). In contrast, in sad moods, people seem attuned to the quality of message arguments and immune to the allure of heuristic cues. Sad individuals tend to process arguments carefully and are more persuaded by strong than by weak arguments, whereas happy individuals tend to be equally persuaded by both.

The impact of affect extends beyond the processing of conceptual information and also influences basic attentional processes. Individuals in happy moods are more likely than those in sad moods to see the "big" picture. That is, while people in positive moods tend to focus on the forest, those in negative moods tend to focus on the trees. When judging the similarity between a series of geometric figures, people in positive moods base their judgments on the global features of the stimuli more so than those in negative moods (Fredrickson & Branigan, 2005; Gasper & Clore, 2002; see also Rowe et al., 2007). The tendency of individuals in happy moods to focus broadly also leads them to display better memory for extraneous environmental information (Biss & Hasher, 2011) and enhances the amount of information stored in sensory memory (Kuhbandner, Lichtenfeld, & Pekrun, 2011).

Explanations for a Dedicated Link Between Affect and Processing

Based on the research just reviewed, considerable agreement has developed over the years concerning how affect influences cognition; however, significant disagreement has ensued over *why* such effects emerge. In this section we review several major theoretical accounts proposed to explain affect-induced processing differences, including ability, motivational, and informational accounts. All of these approaches either explicitly or implicitly assume that the relationship between affect and cognition is fixed.

Ability and Motivational Accounts

According to cognitive ability accounts, positive and negative affective cues differentially influence individuals' *ability* to process information carefully. Based on Bower's (1981) associative network model, which asserts that affective states serve to prime similarly valenced information in memory, some theorists propose

that positive affect activates a relatively larger amount of information in memory than does negative affect. Thus in this view, individuals in positive moods have limited cognitive resources available to process information carefully, and instead rely on stereotypes, heuristics, and other simplifying strategies (e.g., Mackie & Worth, 1989). Although some evidence is consistent with this view, other evidence suggests instead that negative moods reduce or limit attentional resources (e.g., Ellis & Ashbrook, 1988). Although both are likely to be true under different and well-circumscribed conditions, ability accounts alone provide an insufficient explanation for the full array of findings that have been reported (see Bless & Schwarz, 1999).

Motivational accounts posit that positive and negative affective experiences do not differentially influence individuals' ability to process information carefully but, instead, impact their *motivation* to do so. According to this view, individuals experiencing negative moods may be motivated to engage in activities that might improve their moods. Thus, these individuals are more likely to engage in careful and systematic processing. In contrast, when individuals are in positive moods, they may be motivated to maintain their mood state and therefore may be especially likely to avoid cognitively taxing work that could have a detrimental impact on how they feel (e.g., Clark & Isen, 1982; Isen, 1987). Like the ability accounts, motivational accounts explain well the phenomena they were designed to explain but are limited in the extent to which they can account for the range of findings reported in the literature (see Bless & Schwarz, 1999).

Affect-as-Information Account

The ability and the motivational accounts just reviewed both maintain that differences in cognitive processing emerge as a direct consequence of affect. Unlike these approaches, the affect-as-information account posits that the *information* that affect provides is the key to such effects, *not* the affect itself. And the information from affect depends on what the affect appears to be about.

According to the affect-as-information account, affective feelings are conscious information about unconscious appraisals of situations. This appraisal process is always active, giving rise not only to strong emotional feelings but also to weaker affective cues, which are always available as evaluations of one's current situation (Barrett & Bliss-Moreau, 2009; Clore, 1992; Russell, 2003). Just as emotional facial expressions provide affective information to others, affective feelings play a role in judgment and cognition by providing such affective information to oneself. As such, affective feelings serve an adaptive and important feedback function, and they provide a sufficient basis for many judgments and cognitive processing outcomes.

The earliest affect-as-information conceptualization pertained exclusively to affective influences on judgment, asserting that affective feelings serve as input to evaluative judgments, with positive affect often resulting in more positive judgments than negative affect (e.g., Schwarz & Clore, 1983; see Isbell & Lair, 2013 for a review). This early model, however, was later expanded to account for differences in cognitive processing. Consistent with functional theories of emotion that assert that affect serves a signaling function that adaptively directs our behaviors (Frijda, 1986; Lazarus, 1991; Simon, 1967), Schwarz and his colleagues

theorized that affective cues can similarly serve to direct our cognitive processing by providing information about our psychological environment (Clore, 1992; Frijda, 1988; Schwarz, 1990, 2012; Schwarz & Clore, 2007; Wyer, Clore, & Isbell, 1999).

According to this view, negative affect signals the presence of a problem and thus triggers more careful, detailed, and bottom-up processing in an attempt to resolve the perceived problem. In contrast, positive affect signals a safe and benign environment, which does not require careful detailed processing. In such cases, individuals overwhelmingly rely on heuristic, top-down processes that have served them well in the past. Some have suggested that these differences are the result of positive affect increasing confidence in global, heuristic processes and general knowledge structures, thereby promoting reliance on such approaches, whereas negative affect is associated with decreased confidence in such information and thus increased reliance on careful and detailed processing (Bless, 2001).

A key tenet of the affect-as-information account is that the information conveyed by affect, and its consequences for judgment and cognitive processing, depend on how the experience of affect is attributed. For example, the influence of affect on evaluative judgment depends on whether current affect is experienced as a reaction to the object of judgment. In Schwarz and Clore's (1983) classic research, individuals relied on their weather-induced moods as a basis for their life satisfaction judgments, evaluating their life satisfaction more favorably on sunny days than on rainy ones. However, under conditions in which individuals were first asked about the weather, participants' feelings showed no influence on their life satisfaction ratings. That is, when participants attributed their feelings to the weather, they were not experienced as information about their life satisfaction. Importantly, asking about the weather did not change participants' feelings; it changed only what participants perceived their feelings to be about. An identical effect can be seen in studies examining affective influences on cognitive processing (e.g., Beukeboom & Semin, 2006; Gasper, 2004; Isbell et al., 2013; Sinclair, Mark, & Clore, 1994). For example, Gasper (2004) found that happy and sad moods regulated perceptual focus only when participants perceived them as relevant to the task at hand. When these affective cues were perceived as irrelevant, affect's influence on perceptual focus was eliminated. Results such as these strongly implicate the meaning or information value of affect as the active ingredient in their influence on judgment and cognitive processing.

An Affect-as-Cognitive-Feedback Account

The affect-as-cognitive-feedback account of the affect-as-information approach just described represents a more flexible variant of the earlier processing assumptions. Rather than assuming that affect simply provides information about the benign or problematic nature of a situation, the affect-as-cognitive-feedback account emphasizes that the information that affect provides is more general and less constrained than previously thought. According to this view, the influence of positive and negative affect on cognition is like that of reward and punishment in that they are not dedicated to any one cognitive outcome but tend to reinforce or inhibit whatever cognitive responses are associated with them (Clore & Huntsinger, 2009; Huntsinger & Clore, 2012). This view underscores that people more or less automatically tend to expe-

rience affect as a reaction to their current mental content. Given that affective feelings follow unconscious appraisals of a current situation instantly, affective reactions are almost always experienced as responses to whatever is in focus at the moment (Barrett & Bliss-Moreau, 2009; Clore et al., 2001; Russell, 2003). Thus, affective reactions convey information about the value of cognitively accessible mental content, including accessible thoughts and processing inclinations. The positive value conferred on accessible thoughts by positive affect can make these thoughts seem particularly valid and can lead people to have great confidence in them, whereas the negative value conferred on such thoughts by negative affect tends to have the opposite effect.

In terms of general processing inclinations, positive affect may lead people to view accessible processing strategies (e.g., global or local) as appropriate ways of dealing with incoming information, or more generally acting on the world. Negative affect should have the opposite effect. Though the information conveyed by affect about accessible thoughts and responses may be experienced in different ways, in each case it should adjust whether people rely on such thoughts and responses. In effect, positive affect serves as a green light, or a “go signal,” that validates and facilitates the use of accessible mental content, whereas most negative affect serves as a red light, or a “stop signal,” that invalidates and inhibits the use of such content (e.g., Clore & Huntsinger, 2007, 2009; Clore et al., 2001; Isbell & Lair, 2013; Isbell, Lair, & Rovenpor, 2013; Martin, Ward, Achee, & Wyer, 1993; Wyer et al., 1999).

Early work consistent with this view was conducted by Martin et al. (1993). In one study, for example, individuals in happy and sad moods were given a stack of cards containing behavioral information about a target and were instructed to form an impression of him. Half of the participants were told to read the information until they felt that they had enough for forming their impression, whereas the other half were told to continue reading until they no longer enjoyed it. Consistent with the idea that happiness serves as a “go” signal and sadness as a “stop” signal, happy participants in the “enough information” condition stopped reading behaviors sooner than did sad participants. Importantly, these effects reversed in the “enjoy” condition. That is, individuals in happy moods relied on their affective cues to indicate that they were still enjoying the task, and thus the implication was that they should continue it. In contrast, those in sad moods interpreted their affect as an indication that they no longer enjoyed the task, and consequently they stopped sooner. These results were among the first to reveal that the information conveyed by mood varies with what is accessible in different contexts (in this case different goal contexts).

According to our affect-as-cognitive-feedback account then, the impact of affective feelings on cognition should be flexible. That is, because affect confers positive or negative value on cognitively accessible mental content, its impact on cognition should depend on what thoughts and processing inclinations happen to be accessible at the moment (see Figure 1). This approach is compatible with the more general recent intellectual movement emphasizing the socially situated nature of cognition (e.g., Mesquita, Barrett, & Smith, 2010; E. R. Smith & Collins, 2010; E. R. Smith & Semin, 2007). Just as social cognition researchers have found that the impact of cognitive representations and processes on judgments and behaviors are easily altered by situational details, our approach likewise emphasizes that the impact of affect on cognition is

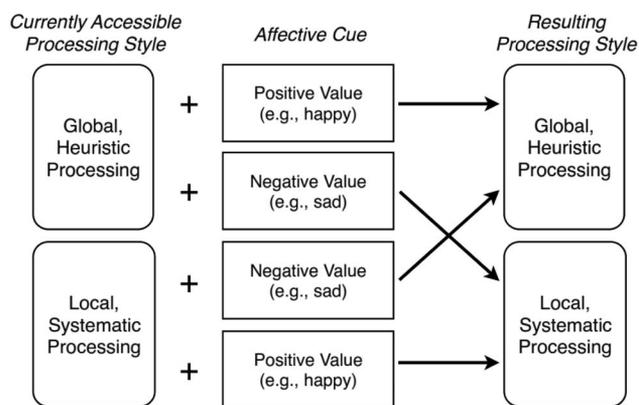


Figure 1. The affect-as-cognitive-feedback account (for information processing styles). Adapted from “Affect-as-Information About Processing Styles: A Cognitive Malleability Approach,” by L. M. Isbell, E. C. Lair, and D. Rovenpor, 2013, *Social and Personality Psychology Compass*, 7, Figure 2, p. 99. Copyright 2013 by Wiley.

highly malleable and depends on the particular cognitive context in which it is experienced.

At first glance, this view might seem to suggest that affect’s influence on cognition is capricious or difficult to specify a priori. After all, a prediction requires knowing what kinds of thoughts and responses are accessible to be promoted by the green light of positive affect or inhibited by the red light of negative affect. This apparent problem can be resolved by recognizing that there is remarkable similarity in the kinds of thoughts and thought processes that are cognitively accessible for most people most of the time and in most situations. Indeed because of the accessibility of certain common default processes, our account also predicts the various influences of happiness and sadness on cognitive processes uncovered in the past research described earlier.

Take, for example, a domain in which evidence for a dedicated connection between affect and cognition is seemingly most robust: the finding that people in happy moods focus on the forest, whereas those in sad moods focus on the trees. This finding can be explained by the fact that a global focus is a dominant or highly accessible way of viewing the world, the so-called global superiority effect. That is, although people show an astounding ability to mentally zoom in and out, focusing on the forest or the trees, in the default case a focus on the forest takes precedence (Bruner, 1957; Fiske & Taylor, 2008; Kimchi, 1992; Köhler, 1929; Navon, 1977, 1981; Neisser, 1976; Pomerantz, Sager, & Stover, 1977; Reicher, 1969). Not only is a global focus perceptually and conceptually dominant for most people, as argued elsewhere, this general tendency to adopt a global focus is reinforced in most experimental contexts (Clore & Huntsinger, 2007).

Therefore, rather than directly triggering a global focus or a local focus, in past research positive and negative affect may simply have conferred positive and negative value on the highly accessible global way of viewing the world. Because prior research failed to manipulate the relative accessibility of a global versus local focus, there was little opportunity to observe anything but what appeared to be a dedicated link between affect and perceptual focus. To test our cognitive feedback account then, one must vary the relative accessibility of global versus local orientations or other

thoughts and tendencies that are typically dominant (e.g., stereotypes, heuristic processing). Of primary interest is the impact of such changes in accessibility on the influence that affect has. We next turn to evidence for our account.

Evidence for an Affect-as-Cognitive-Feedback Account

We first present evidence demonstrating that the accessibility of different *general* information processing strategies (e.g., global vs. local) determines the influence of affect on processing across a wide variety of domains. We then review evidence demonstrating that the accessibility of *more specific* types of information (e.g., attitudes, specific thoughts, goals) influences the extent to which affect leads individuals to rely upon such information to guide judgments and behavior across a number of domains. Together the evidence that we present is consistent with our affect as cognitive feedback position and largely inconsistent with the dedicated link position.

Accessibility of General Information Processing Strategies

General information processing strategies are content-free ways of approaching incoming information (Tulving & Schacter, 1990). Certain strategies are frequently a dominant or default strategy (e.g., global processing), but people show a remarkable ability to toggle between different styles of processing. For this reason it is surprisingly easy to manipulate the relative dominance of one or another processing style via procedural priming. In such tasks, a cognitive tendency or processing strategy activated in one task often carries over, without participants' awareness, to other unrelated tasks (Schooler, 2002).

As an example, consider two processing strategies that have recently received considerable research attention: global and local processing (for a review, see Förster & Dannenberg, 2010). Global processing involves tendencies to focus on the big picture or gestalt of objects, to attend to similarities, and to consider abstract representations, whereas local processing reflects tendencies to focus on local details or elemental aspects of objects, to attend to dissimilarities, and to consider concrete representations (Förster, 2012). A modified version of the Navon letter task (Navon, 1977) has often been used to prime a global or local perceptual focus (see Figure 2). In this task, on each trial, a large letter made up of smaller letters appears on a computer screen. Participants are instructed to press the "L" key if the letter "L" appears in the compound stimulus, and press the "H" key if the letter "H" appears. To prime a global perceptual focus, the target on a majority of the trials would be the global-letter (e.g., an H made of F's), whereas to prime a local perceptual focus, the target on a majority of trials would be the local-letter (e.g., the F's that make up the H).

Research has also shown that because of the close connection between perceptual attention and conceptual attention (Anderson & Neely, 1996; Derryberry & Tucker, 1994; Förster & Dannenberg, 2010), priming global or local processing at the perceptual level leads to concomitant changes in the scope of processing at the conceptual level (Förster, Liberman, & Kuschel, 2008). Much of the research that we review next took advantage of such pro-

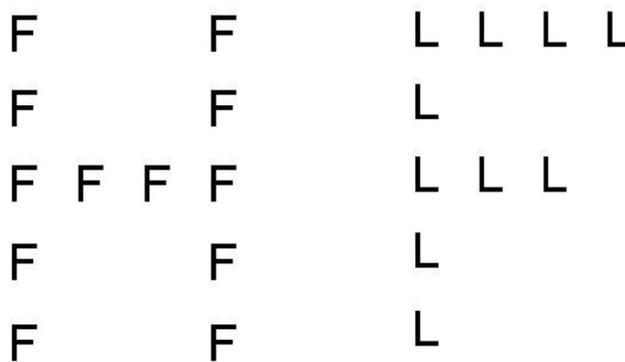


Figure 2. Examples of global-letter targets (left) and local-letter targets (right) from the modified Navon-letter task.

cedural priming methods to modify momentarily the relative dominance of general information processing strategies, especially a broad versus narrow attentional focus. Subtle changes to the cognitive context can lead to complete reversals of positive and negative affective influences that are often assumed to be tightly linked. We now turn to the evidence.

Attentional scope. The consistency with which positive and negative affect influenced attentional focus led many to propose that affect directly tunes the attentional system to focus either broadly or narrowly. From our view, in this past research, positive and negative affect conferred positive and negative value on the usually dominant tendency to focus broadly, leading to the appearance of a fixed influence of affect on attentional scope. If this is the case, flexibility in this link should be produced by varying the momentary dominance of a particular focus. If a narrow focus is made momentarily dominant, happy moods should narrow people's focus, and sad moods should broaden their focus (for a more detailed discussion, see Huntsinger, 2013c).

Evidence for this idea comes from research in which a broad or narrow attentional scope was manipulated using either a version of the Navon (1977) letter task (described earlier) or a lexical decision task that surreptitiously primed concepts related to a global or local focus (Huntsinger, Clore, & Bar-Anan, 2010). Positive and negative affect was manipulated by having participants recall happy or sad memories or listen to happy or sad musical selections. Attentional focus was measured using a standard version of the Navon letter task or an abridged version of the Kimchi-Palmer matching figures task (Kimchi & Palmer, 1982). On both measures of perceptual focus, global priming led people in happy moods to focus on the forest and people in sad moods to focus on the trees. However, local priming led to the reverse pattern, in which happy moods led to a focus on the trees, and sad moods to a focus on the forest. Importantly, in neither study was there a hint of a direct effect of mood on perceptual style.

Because responses on such perceptual outcomes may reflect postperceptual processes, such as biases in selecting global or local options, this initial research may have merely revealed superficial shifts in the scope of attention. This alternative was ruled out in recent work in which a flanker task was employed as the index of attentional focus (Huntsinger, 2012). This task more directly captures attentional broadening or narrowing and provides evidence

that these shifts reflect differences in attention at encoding (Rowe et al., 2007). This research also included a priming condition in which tendencies toward a broad or narrow focus were primed equally. This condition provided a strong test of the possibility that, rather than directly modifying attentional scope, positive and negative affect have the effects that they do by conferring positive and negative value on the dominant attentional orientation in a given situation. If affect operates on whichever focus is dominant, then when global and local orientations are equally accessible, no association between mood and attentional scope should be evident. On the other hand, if affect does directly tune the scope of attention, one should observe differences in attentional scope in this equal-priming condition.

The results clearly supported the affect-as-cognitive-feedback account in that the link between mood and perceptual scope depended on changes in accessibility of global or local perceptual orientations. When a global focus was accessible, happy mood elicited a larger flanker effect than sad mood. When a local focus was dominant, happy mood elicited a smaller flanker effect than sad mood. Finally, when neither focus was dominant, affect failed to influence the scope of attention at all.

Impression formation. In impression formation tasks, positive affect appears to promote global, category-based processing, and reliance on stereotypes, whereas negative affect appears to promote local, item-based processing, and reliance on behavioral information (Bless, Clore, et al., 1996; Bodenhausen et al., 1994; Krauth-Gruber & Ric, 2000). From our view, this customary influence of affect on stereotyping results from the fact that global, category-based processing tends to be the default tendency in impression formation tasks (Brewer, 1988; Fiske & Taylor, 2008); however, making local, item-based processing momentarily dominant should reverse the typical relationship between affect and the use of category-based information. Recent work on impression formation is consistent with this prediction (Hunsinger, Isbell, & Clore, 2012).

Three studies varied the relative dominance of global, category-based processing or local, item-based processing. In one, for example, an unexpected but pleasant odor was introduced in the environment to induce a local, item-based processing style. In the global, category-based (default) processing condition, no odor was introduced. Past research demonstrates that exposure to an unexpected odor narrows focus of attention (Barker et al., 2003). Following the odor manipulation, participants wrote about a recent life experience that made them feel either happy or sad. They then indicated their impression of a woman described as an introverted librarian or an extroverted sales representative, but who performed an equal number of introverted and extroverted behaviors. Participants relying on category-based, stereotype information should judge the librarian to be more introverted than the sales representative. Participants relying on behavioral information should judge the target equally introverted and extraverted regardless of whether the librarian or sales representative stereotype was activated.

Consistent with our affect-as-cognitive-feedback account, when global, category-based processing was dominant, happy participants' impressions were informed by the stereotype, such that they judged the librarian to be relatively more introverted than the sales representative. Sad participants in contrast, judged the target similarly regardless of the stereotypes. When local, item-level processing was dominant, the opposite pattern of findings emerged.

That is, happy participants' impressions were similar regardless of stereotype, whereas sad participants' impressions reflected the activated stereotypes (Hunsinger et al., 2012). These findings were replicated using a different manipulation of detail-oriented processing, and similar results also emerged regardless of whether resting affect was measured or experimentally manipulated.

Perceptions of out-group homogeneity. A large body of research demonstrates that individuals tend to perceive members of out-groups to be more similar to one another than they actually are (e.g., Linville, Fischer, & Salovey, 1989; Messick & Mackie, 1989; Park & Judd, 1990); however, this tendency emerges among individuals in happy moods and disappears when individuals are in neutral moods (Queller, Mackie, & Stroessner, 1996; Stroessner, & Mackie, 1992; Stroessner, Mackie, & Michaelson, 2005). According to the affect as cognitive feedback view, happiness may not directly promote perceptions of out-group homogeneity but may instead simply reinforce the dominant global mode of processing information. In fact, evidence demonstrates that when global processing is primed, individuals attend to similarities among stimuli, whereas under local priming conditions, they attend to differences (Förster, 2009). Thus, global priming should promote perceptions of out-group homogeneity among individuals in happy moods but should inhibit such perceptions among individuals in sad moods. In contrast, local priming should lead to the opposite. Recent evidence is consistent with these predictions (Isbell, Lair, & Rovenpor, 2013b).

In one study, participants in experimentally manipulated happy or sad moods completed one of three map tasks designed to prime global, local, or both types of processing (see Friedman, Fishbach, Förster, & Werth, 2003, for a similar manipulation). Participants then viewed interviews conducted with students who were ostensibly from a different college, and judged the extent to which the students are similar to one another on a number of dimensions (e.g., intellect, worries). As expected, under global priming conditions, happy participants perceived greater homogeneity than sad participants; however, under local processing conditions, this effect reversed, leading sad participants to perceive greater homogeneity than happy ones. Consistent with the notion that affect confers value on currently dominant processing inclinations, under conditions in which neither processing style was dominant (i.e., control conditions), no relationship between mood and homogeneity judgments emerged.

A similar pattern was found in a second study using a more highly stigmatized group (i.e., homeless people) and a manipulation of integral rather than incidental affect. After completing the map priming task described above, participants read a newsletter about several homeless individuals. Half received relatively positive information first and half received relatively negative information first. They then judged the extent to which the homeless individuals were similar to one another on several dimensions (e.g., honesty, work ethic), reported their attributions for homelessness (i.e., systemic [e.g., lack of affordable housing] vs. individual causes [e.g., addiction]) and indicated their intentions to donate money to homeless individuals and organizations. Consistent with the results of the previous study, under global conditions, integral positive affect led to greater perceptions of homogeneity than did integral negative affect; however, under local priming conditions, the opposite pattern of results emerged. Again, in control conditions, no relationship between mood and homogeneity

ity judgments was found. Importantly, under global conditions, happy mood led to relatively greater systemic attributions for homelessness (i.e., lack of affordable housing), and under local conditions, sad participants made relatively greater systemic attributions. Further, mood influenced intentions to donate money to homeless individuals and organizations through its impact on systemic versus individual attributions.

Assimilation and contrast. People with a global focus exhibit assimilation to primed mental concepts, whereas those with a local focus exhibit contrast (Förster et al., 2008). This pattern occurs because a global focus elicits a search for similarities and more abstract representations, whereas a local focus elicits a search for dissimilarities and more concrete representations. For example, in studies where people with a global focus were primed with favorable trait concepts, they formed more favorable impressions of an ambiguously described fictitious person than those primed with unfavorable traits. In contrast, people with a local focus displayed the opposite pattern of impressions. That is, priming with favorable traits led to more unfavorable impressions than priming with unfavorable traits (Förster et al., 2008).

Under default processing conditions, positive affect should confer value on the default global processing orientation, leading to assimilation effects, whereas negative affect should inhibit such processing, leading to contrast effects. Just such a pattern was shown in recent research in which participants completed a positive or negative mood manipulation task and were primed with either favorable (e.g., persistent) or unfavorable (e.g., stubborn) trait concepts (Huntsinger, 2014; Experiment 2). Participants were then asked to form an impression of a person whose behavior could be construed as either persistent or stubborn. Happy participants exhibited assimilation in that they formed more positive impressions when primed with favorable than unfavorable traits. Sad participants exhibited contrast in that they formed more negative impressions when primed with favorable than unfavorable traits.

Although the results of this experiment are consistent with our account, they do not test it directly. A subsequent study was designed specifically to accomplish this by making *either* a local or a global focus especially accessible. According to the cognitive feedback account, a local focus should reverse the link between positive and negative affect and assimilation versus contrast. Results revealed that when a global focus was dominant, participants in happy moods displayed assimilation, whereas those in negative moods exhibited contrast, replicating the results of the study just described. When a local focus was made dominant however, the pattern reversed, as predicted. Participants in happy moods displayed contrast and those in sad moods displayed assimilation. Taken together, these results reveal a flexible, rather than fixed, connection between affect and assimilation or contrast, with the influence of affect depending on whether a global or local processing style is made momentarily dominant.

Creativity. Research repeatedly shows that happy people are more creative and flexible in their thinking than are sad people (Isen, 1987, 2008). Effects on creativity are revealed in research employing a variety of tasks, including the RAT (Mednick, 1962), insight problems, the unusual uses of a brick task, the Tower of Hanoi problem, and categorization tasks. As discussed earlier, these findings have led to assumptions of a direct connection between positive affect and creativity (Isen, 2008). Although this

certainly could be the case, consistent with our affect-as-cognitive-feedback account, even the link between mood and creativity appears flexible.

In an early demonstration of such flexibility, investigators successfully changed the relationship between mood and creativity by altering whether a focus on similarities or differences was most accessible (Murray, Sujan, Hirt, & Sujan, 1990). Participants in happy or sad moods sorted the names of television program into piles while focusing either on differences or on similarities among the programs. When a focus on differences was accessible, positive moods led to greater breadth of categorization than negative moods, but when a focus on similarities was accessible, positive moods led to less categorization breadth.

Whether happy or sad moods are linked to greater creativity also depends on the framing of the task. When focused on enjoyment, people in positive moods may persist longer on a creativity task than those in negative moods because positive mood signals that the task is enjoyable. Greater persistence may then lead to mood-related differences in creativity (Wyer et al., 1999). Consistent with this idea, on tasks that stress enjoyment, people in positive moods have been found to devote more time and thus generate more responses than those in negative moods (Martin et al., 1993). Conversely, when performance is emphasized, people in positive moods devote less time to the task, and generate fewer responses than those in negative moods. One might speculate that many creativity tasks are among the more enjoyable tasks encountered in psychology experiments. If so, participants may spontaneously adopt an enjoyment focus when completing creativity tasks, which may underlie many of the mood-related differences in creativity found in past research (see also Wyer et al., 1999).

Although this research suggests malleability in the link between affective feelings and creativity, it is important to distinguish mood effects on quantitative measures (e.g., number of responses generated, time spent on the task) and qualitative measures (e.g., objective creativity of responses). Some research has shown that malleability emerges on quantitative but not on qualitative measures of creative performance (Hirt, Levine, McDonald, Melton, & Martin, 1997; but see Martin & Stoner, 1996). For example, in one study participants in positive or negative moods listed as many modes of transportation as they could. The instructions emphasized either enjoyment or performance. Enjoyment instructions led happy participants to spend more time on the task and generate more responses, whereas performance instructions led them to spend less time and generate fewer responses than sad participants. However, qualitative outcomes (e.g., objective creativity of responses) showed the usual relation between affect and creativity, with greater creativity in happy than in sad moods regardless of the enjoyment versus performance framing (Hirt et al., 1997).

These results would seem to present a problem for our affect-as-cognitive-feedback account as they seem to support the existence of a direct link between affect and qualitative aspects of creativity. From our view, such results are in fact quite consistent with our affect-as-cognitive-feedback account. The manipulations of task focus used in this research targeted processing effort, which influences the number of responses generated, and they did not target processing style, which influences the objective creativity of responses generated. Therefore, it is not surprising that in this research the usual relation between affect and creativity was observed on qualitative measures of performance. To observe mal-

leability in the link between affect and qualitative measures of creativity, one must manipulate processing styles, rather than processing effort.

Evidence consistent with flexibility in the link between affect and qualitative measures of creativity comes from research (Huntsinger & Ray, 2014, Experiment 1) involving the priming of global or local processing styles and then a positive or negative mood induction. After these manipulations, participants generated creative uses for a brick. Consistent with the proposed model, coding of their responses revealed more creative responses in positive than negative moods after global priming and more creativity in negative than positive moods after local priming. No effect of affective feelings on quantitative performance was found (e.g., number of uses generated), which is consistent with past research that manipulated global and local attentional orientations (Förster, Friedman, & Liberman, 2004; Friedman et al., 2003; Lichtenfeld, Elliot, Maier, & Pekrun, 2012). In a second study, the same pattern of flexibility for performance on a remote-association test and insight problems was observed (Huntsinger & Ray, 2014, Experiment 2). Because the RAT and insight problems have objectively correct answers this study also provides evidence for malleability in qualitative aspects of creative performance.

In summary, consistent with our affect-as-cognitive-feedback account the link between affect and both quantitative and qualitative aspects of creativity shows malleability, but under different conditions. Malleability in the link between affect and quantitative performance should be observed when manipulations target processing effort, and malleability in the link between affect and qualitative performance should be observed when manipulations target processing style.

Heuristics and biases. Research shows that happy people are more likely to commit common cognitive errors than sad people. For example, individuals in happy moods are more likely than those in sad moods to fall prey to the availability bias (Ruder & Bless, 2003) and the conjunction fallacy (Gasper, 1999). Although the tendency to think more systematically may insulate sad people from many judgmental biases, one exception can be found in research on anchoring effects. Anchoring effects occur when judgments are influenced by a salient anchor or starting point, even when the value of the anchor is arbitrary or meaningless. One explanation is that people initially entertain the possibility that the values of such anchors are correct (Mussweiler, 2003). The more they do so, the more information consistent with the correctness of the anchor that comes to mind, ultimately biasing final judgments toward the anchor. If so, and if negative affect leads to more deliberative processing, then the increase in the accessibility of anchor-consistent information, should make sad individuals more susceptible to judgmental anchoring (Bodenhausen, Gabriel, & Lineberger, 2000), and happy individuals should be less susceptible (Englich & Soder, 2009).

Several studies show that the link between affect and the commission of cognitive errors depends on changes in the relative accessibility of heuristic or deliberative processing styles (Huntsinger & Ray, 2014, Experiments 3 and 4). In this research, participants first completed a word completion task shown in past research (Huntsinger, 2011) to activate a heuristic or deliberative processing style and then experienced a positive or negative mood induction. Results of the first experiment revealed that when heuristic processing styles were made accessible, participants in

happy moods were more likely than those in sad moods to show the conjunction fallacy on the classic Linda problem (Tversky & Kahneman, 1983). That is, happy participants were relatively more likely to say that Linda was both a banker teller and active in the feminist movement than that she was simply a bank teller. However, when a deliberative processing style was dominant, happy participants were less likely to commit this error than sad participants. A second experiment demonstrated similar flexibility for anchoring effects. When heuristic processing was activated, happy participants showed a less pronounced anchoring effect than sad participants. But when deliberative processing was activated, happy participants showed more, rather than less, pronounced anchoring effects.

Culturally dominant styles of causal reasoning. Do positive and negative affect prompt an analytic or holistic style of reasoning? Or does their influence depend on the particular style of reasoning that is culturally dominant? Recent research suggests the latter possibility (Koo, Clore, Kim, & Choi, 2012). Westerners tend to adopt an analytic style of reasoning that emphasizes the separation of individual objects from other elements in the environment. East Asians tend to adopt a holistic style of reasoning that emphasizes the connection of individual objects to other elements in the environment (Nisbett, Peng, Choi, & Norenzayan, 2001). As a result, Westerners tend to base their explanations for events on a few possible causes, whereas East Asians tend to assume that events have many causes. Consistent with our affect-as-cognitive-feedback account, the results of Koo et al. (2012) showed that positive affect promoted and negative affect inhibited whatever style of reasoning was culturally dominant. Specifically, happy moods led Americans to engage in more analytic reasoning and Koreans to engage in more holistic reasoning. By contrast, sad moods showed no such differences.

Summary. In this section we reviewed evidence consistent with a view stressing the malleable impact of affect on cognition as a consequence of the relative accessibility of different information processing strategies. Such flexibility was shown for several outcomes for which evidence of a dedicated connection between affect and cognition is usually assumed and seems robust, including attentional scope, impression formation, perceptions of outgroups, creativity, and the application of judgment heuristics.

Accessibility of Specific Types of Information

The evidence reviewed so far focuses on broad differences in information processing strategies that affect a variety of domains. In this section, we focus more specifically on how affect influences the use of other more specific types of accessible information (e.g., particular affective and cognitive associations, implicit attitudes, particular thoughts, goals). As discussed earlier, the affect as cognitive feedback perspective maintains that positive affect tends to validate and negative affect to invalidate current mental content. Thus, positive affect should increase reliance on currently accessible information, whereas negative affect should inhibit such reliance. The results of numerous studies, which we review next, are consistent with this prediction.

Priming. Various priming phenomena commonly observed in cognitive and social psychology are more common among happy than sad people. For example, when positive and negative moods were induced prior to participants completing a lexical decision

task, happy participants exhibited semantic priming effects, whereas sad participants did not (Corson, 2002; see also Hänze & Hesse, 1993; Hesse & Spies, 1996). Similar effects have also been reported for both evaluative and categorical priming (Storbeck & Clore, 2008). Such effects are consistent with the notion that positive moods validate and negative moods invalidate accessible mental associations, thereby altering tendencies to respond based on such activated associations.

Moral reasoning. Although past research suggested a rather direct link between mood and moral reasoning (Valdesolo & DeSteno, 2006), recent research suggests instead that this link depends on what thoughts are activated at the moment of moral judgment (Pastötter, Gleixner, Neuhauser, & Bäuml, 2013). In this work participants in happy and sad moods read the now classic footbridge dilemma in which participants imagine they are standing on a footbridge over trolley tracks and see an out of control trolley hurtling down the tracks. Several children, unaware of the danger, are playing on the tracks. Participants can save the children's lives by pushing a man onto the tracks. Participants are asked whether they would push the man off the bridge. After reading the trolley dilemma happy and sad participants were primed with an active decision frame ("Do you think it is appropriate to be active and push the man?") or passive decision frame ("Do you think it is appropriate to be passive and not push the man?"). Consistent with our affect-as-cognitive-feedback account, the manipulation of decision frame dictated whether positive or negative mood led participants to endorse pushing the man onto the tracks. When thoughts of pushing were primed, happy participants were more likely than sad participants to say they would push the man. However, when thoughts of not pushing were primed, happy participants were less likely than sad participants to endorse pushing the man.

Implicit-explicit attitude correspondence. More direct evidence for malleability can be seen in research examining the influence of affective feelings on correspondence between implicit and explicit attitudes. According to the associative-propositional evaluation model (APE; Gawronski & Bodenhausen, 2006), implicit attitudes are thought to reflect the output of associative processes (i.e., the activation of mental associations from memory). Explicit attitudes are thought to reflect the output of propositional processes, which involve validation or invalidation of the information implied by activated associations. Consistent with our account, affect has been shown to influence the subjective validity of one's implicit attitudes (Huntsinger & Smith, 2009). That is, positive mood promotes correspondence between implicit and explicit attitudes to the extent that it increases the apparent value of implicit attitudes, and negative mood promotes divergence between them to the extent that it decreases the value of implicit attitudes (Huntsinger & Smith, 2009).

As predicted from the affect-as-cognitive-feedback account, the impact of affective feelings on implicit-explicit attitude correspondence is variable, and it depends on whether the tendency to trust or distrust one's intuitions is more accessible (Huntsinger, 2011). Past research demonstrates that when people trust their intuitions, the apparent validity of implicit attitudes increases, leading such attitudes to be incorporated into explicit attitude reports. In contrast, when people distrust their intuitions, the apparent validity of implicit attitudes decreases, resulting in the construction of explicit attitudes that are uninfluenced by implicit ones (Jordan, Whitfield,

& Zeigler-Hill, 2007). According to our view, positive affect should enhance confidence in tendencies to trust or distrust intuition, whereas negative affect should cast doubt on such tendencies. Four experiments confirmed these predictions. Tendencies to trust or distrust intuition in this research were first manipulated via standard procedural priming techniques (Jordan et al., 2007). Next participants experienced the positive or negative mood inductions, and then completed implicit and explicit measures of attitudes and self-esteem. When the tendency to trust intuition was made accessible, the usual impact of affect on implicit-explicit attitude correspondence was observed. However, when the tendency to distrust intuition was accessible, the usual impact of affect was reversed. Happy people were then less likely than sad people to allow their implicit attitudes to inform their explicit attitude reports.

Stereotype-relevant thoughts. In past research, the experience of positive affect appeared to promote tendencies to rely on activated stereotypes and negative affect appeared to inhibit such tendencies (Huntsinger, Sinclair, & Clore, 2009). From our view, the link between affect and stereotyping emerges because stereotypes may automatically spring to mind whenever people actually encounter or merely entertain thoughts about members of stereotyped groups (Bargh, 1997). In past research, positive affect may have simply conferred positive value (and negative affect conferred negative value) on such accessible stereotypes. If so, then varying the accessibility of stereotype-relevant thoughts and responses should alter the link between affect and stereotyping. Such malleability is illustrated in recent research (e.g., Huntsinger, Sinclair, Dunn, & Clore, 2010). Specifically, two studies demonstrated that varying the accessibility of counterstereotypic thoughts altered the link between affect and stereotyping (Huntsinger et al., 2010). Among individuals for whom counterstereotypic thoughts were made accessible, from exposure to strong female leaders (Dasgupta & Asgari, 2004) or through formation of counterstereotypic implementation intentions (e.g., think safe in the presence of African Americans; Stewart & Payne, 2008), happy moods reduced automatic stereotyping compared to sad moods. The opposite and customary influence of happy and sad mood on automatic stereotyping was found among individuals for whom such thoughts were not accessible.

Persuasion. Evidence for the affect-as-cognitive-feedback approach has also emerged when examining people's responses to persuasive messages (Briñol, Petty, & Barden, 2007). In one study, for example, participants wrote down their thoughts after reading persuasive arguments. Thoughts tended to be positive following exposure to strong arguments and negative following exposure to weak ones. Happy or sad moods were then induced, and participants expressed their opinion on the issue. The results indicated that happy moods had validated the thoughts that participants had written down about the messages, so that they were more persuaded by strong than by weak arguments. In contrast, sad moods had invalidated such thoughts, eliminating any effect of argument strength on attitudes.

This research may appear to contradict past findings discussed earlier in which people in positive moods were found to be equally persuaded by strong and weak persuasive appeals, whereas those in negative moods were found to be more persuaded by strong than weak appeals (Schwarz et al., 1991). The key to resolving this contradiction is to consider each experimental context and locate

what thoughts and thought processes were accessible for affect to act on. In past research, mood was induced prior to exposure to persuasive appeals. In that case, mood should have signaled the value of accessible response tendencies, with positive affect enhancing confidence in such tendencies and negative affect casting doubt on these customary ways of processing information. Because people's general inclination is to conserve cognitive resources (Fiske & Taylor, 1984, 2008), in past research positive affect typically led to superficial processing and negative affect to systematic processing. In contrast, in the Briñol et al. (2007) studies, affect was induced after participants had expressed their thoughts about the persuasive appeals so that the most accessible cognitions were participants' expressed thoughts about the messages, rather than the messages themselves. As a result, in happy but not sad moods, participants relied on those thoughts to evaluate the persuasive appeal.

Goal adoption. Research demonstrates that affect may influence goal pursuit in different ways depending on what phase of goal pursuit is in focus at the moment. When considering whether to pursue a goal, people often reflect on its feasibility or desirability. Such judgments about goal feasibility and desirability then shape goal adoption (Gollwitzer & Moskowitz, 1996). Research indicates that people often use their affective reactions to goals when deciding whether to pursue them (Schwarz & Bohner, 1996). In such instances, positive affect signals that accessible goals are feasible or desirable, whereas negative affect signals just the opposite.

In research consistent with this idea, Fishbach and Labroo (2007) primed either a self-improvement or a mood-maintenance goal and then induced happy or sad moods. In one study, the outcome of interest was performance on a cognitive test that ostensibly had long-term diagnostic value. The results were consistent with the notion that affective feelings signal the value of accessible mental content, in this case goals. On a difficult cognitive task, happy people worked harder than sad people when a self-improvement goal was accessible but less hard when a mood-maintenance goal was accessible.

This research is inconsistent with the suggestion that positive and negative moods prompt people to adopt goals with specific content, such as proposals that happy moods prompt people to adopt mood maintenance goals (e.g., Isen & Patrick, 1983; Isen & Simmonds, 1978; Wegener & Petty, 1994, 2001) or encourage people to adopt cooperative or affiliation goals (Forgas, 2002; Fredrickson, 1998, 2001). Rather, consistent with our affect-as-cognitive-feedback account, the association between affect and adoption of particular goals appears highly variable and ultimately depends not on any fixed preference for one kind of goal in one kind of affective state but simply on whether a given goal is accessible at any given moment to be promoted or inhibited by positive or negative affect.

Extensions of the Affect-as-Cognitive-Feedback Account

Our account is sufficiently broad that it can easily be extended to affective experiences other than positive and negative moods. According to our theoretical perspective, affective cues are functional and serve as a source of information about current mental content *regardless* of the source of these cues. Thus, the affective

aspects of moods, specific emotions, cognitive experiences (e.g., fluency), bodily actions (e.g., approach behavior), or evaluative concepts should all function in a similar manner. What differs is the specific type of information that these experiences provide. In this section, we review the implications of the affect-as-cognitive-feedback view for specific emotions, as well as for other types of experiences, such as cognitive feelings (e.g., perceptual fluency) and bodily feelings (e.g., approach motor actions).

Specific Emotions

Research on the cognitive consequences of specific emotions is relatively new. This work, which has mostly focused on anger and fear, reveals that emotions that are similar in valence can have different cognitive effects. Anger for example tends to promote global, superficial processing and therefore has been shown to increase the use of stereotypes (Bodenhausen, Sheppard, & Kramer, 1994), heuristics (Ask & Granhag, 2007; Small & Lerner, 2008), and scripts (Tiedens, 2001) and decrease the impact of argument strength in persuasion tasks (Rydell et al., 2008; Tiedens & Linton, 2001). Angry individuals also describe themselves in more abstract language (Isbell, McCabe, et al., 2013). Fear and anxiety, by contrast, tend to promote local, systematic processing and therefore promote reliance on detailed information in decision-making tasks (Tiedens & Linton, 2001), a focus on argument quality in response to persuasive communications (Baron, Logan, Lilly, Inman, & Brennan, 1994; Bohner & Weinerth, 2001), and narrowed attentional focus (e.g., Easterbrook, 1959).

In research that directly compared the impact of anger and fear, Parker and Isbell (2010) found that individuals who were led to feel angry prior to selecting information about two political candidates from a website were more likely to base their voting decisions on the amount of general information (e.g., ideology) they viewed about each candidate (i.e., global criteria). In contrast, those exposed to a fear-inducing manipulation based their vote choice on their agreement with the candidates on specific issues (i.e., local criteria).

One approach to accounting for the effects of specific emotions on cognition is the appraisal tendency framework (Lerner & Keltner, 2000, 2001). The idea is that the patterns of appraisal that distinguish one emotion from another may carry over to influence subsequent judgment, decisions, and processing just as affect does. For example, although fear and anger are negative emotions, fear results from the appraisal of a situation as uncertain, unpredictable, and involving situational control, whereas anger results instead from an appraisal of a situation as certain and involving personal control (e.g., Roseman, 1984; C. A. Smith & Ellsworth, 1985). Tiedens and Linton (2001) applied this logic to emotional effects on cognitive processing, predicting that emotions associated with certainty (e.g., anger, contentment) should promote the use of currently accessible thoughts and styles of processing, and emotions associated with uncertainty (e.g., fear, anxiety) should inhibit the use of such thoughts and styles of processing.

We concur that the situational and cognitive factors of specific emotions are likely to play an important part in the processes of interest here. A related way of thinking about these factors is that they constrain what people are likely to focus on. Thus, for example, sadness is about past outcomes, whereas fear is about future outcomes. Accordingly, reviews of the literature conclude

that sadness influences what people remember, but not what they attend to in the environment. In contrast, fear influences what people attend to in the environment, but not what they remember (MacLeod & Mathews, 1988; Mathews & MacLeod, 1994).

How does our affect as cognitive feedback approach deal with the fact that anger affects processing like happiness rather than like other negative emotions? Lerner and Tiedens (2006) entertained the idea that anger can be thought of as a positive, rather than a negative, emotion in some respects. Indeed, anger is an interpersonal emotion conferring positive value on the angry person's perspective and negative value on the other person's perspective. Thus, anger increases confidence in one's own thoughts just as happy mood does by conferring positive value on them. We propose, therefore, that the principles of the affect-as-information approach explain the effects of anger without modification. They indicate that positive mood influences thought because positive affect confers value on one's own cognitions, beliefs, and inclinations. The same analysis applies to anger. Whereas anger is generally a response to some bad outcome, it gives the angry person moral superiority. Anger confers positive value on one's own cognitions, beliefs, and inclinations. The key to predictions from an affect-as-information approach, then, is not whether an emotion is positive or negative in general but what the information value is of the affect involved. Whereas disapproval is a negative reaction, the information it carries about one's own viewpoint is decidedly positive. Indeed, a frequent task of therapists counseling divorced men is to get them to feel something other than anger (Emery, 2011). They prefer anger, because unlike sadness or hurt feelings, anger is self-justifying and empowering.

Some evidence is consistent with this possibility. In a set of studies Isbell, Rovenpor, and Lair (2014) induced angry and fearful or sad states and randomly assigned participants to complete either a global or local priming task. After this, participants completed the Twenty Statements Task (TST; Kuhn & McPartland, 1954), in which they were asked to write down the first 20 thoughts that came to mind in response to the prompt "I am ____." Prior research demonstrates that when global and local processing are not primed, individuals in angry states describe themselves in more abstract terms than do individuals in sad or fearful states (Isbell, McCabe, et al., 2013). Consistent with the notion that global processing tendencies tend to be chronically active for most people by default as described earlier, under global priming conditions Isbell et al. replicated this effect; however, consistent with our affect-as-cognitive-feedback account, this effect reversed under local priming conditions. That is, when a local focus was more accessible, anger led to less abstract self-descriptions than sadness and fear.

Also consistent with our account is recent research demonstrating that anger confers value on accessible cognitive content in the form of activated implicit attitudes (Huntsinger, 2013b). In this research, the tendency of anger to empower one's point of view was predicted to enhance the subjective validity of implicit attitudes. This anger-induced validation of implicit attitudes was expected to increase implicit-explicit attitude correspondence. Across three experiments using two different attitude objects and two measures of implicit attitudes, these predictions were confirmed. That is, anger, compared to sad and neutral emotions, led to greater correspondence between implicit and explicit attitudes. Consistent with our cognitive feedback account, mediation analy-

ses indicated that the impact of anger on implicit-explicit attitude correspondence resulted from changes in appraisals of certainty about their position.

Our account suggests that flexibility in the impact of emotion on cognition should be observed for many other outcomes that appear to be tightly linked to the experience of a particular emotion. For example, the connection between anger and stereotyping might simply result from the fact that stereotypes are often highly accessible thoughts when one encounters or merely imagines members of stereotyped groups (Bargh, 1999). Thus, if one replaced the usually highly accessible stereotypical thought with a counterstereotypical one, then anger should lead to less stereotyping. Likewise, the link between anger and superficial or heuristic processing might be the result of people's general inclination to conserve cognitive resources (Fiske & Taylor, 2008). Thus, in past research, anger may have merely boosted confidence in this customary way of processing information, leading to the appearance of a fixed link between anger and superficial processing of incoming information. These possibilities await empirical examination.

Other Subjective Experiences

Other subjective experiences, such as cognitive feelings (e.g., fluency) and bodily feelings (e.g., approach motor actions), have been shown to influence cognition in ways that parallel affective feelings (for reviews, see Friedman & Förster, 2010; Schwarz, 2012). Indeed, as with affective feelings, when the informational value of such experiences is called into question through attribution manipulations, their influence on judgment and cognition is eliminated (for reviews, see Greifeneder, Bless, & Pham, 2011; Schwarz, 2012). The impact of these subjective experiences on cognition is usually assumed to result because these experiences signal a benign or problematic environment.

Cognitive feelings such as fluency and disfluency can produce differences in general information processing strategies (Alter, Oppenheimer, Epley, & Eyre, 2007; E. R. Smith et al., 2006; Song & Schwarz, 2008). To illustrate, in one experiment Alter et al. (2007) manipulated feelings of fluency and disfluency by having participants read a persuasive appeal written in either an easy or difficult to read font. The experience of fluency led to heuristic processing of the appeals, whereas disfluency led to systematic processing. Likewise, bodily feelings have been shown to regulate general processing strategies, such as the tendency to focus either broadly or narrowly on one's physical and mental environment. Approach motor actions (e.g., arm flexion) lead to a broadening of attention and facilitate creative responding, whereas avoidance motor actions (e.g., arm extension) lead to a narrowing of attention and impair creative responding (Friedman & Förster, 2000, 2002).

We propose that these subjective experiences provide the same information about value as affective feelings, and thus their impact on cognition should show the same malleability. Specifically, subjective experiences of positive valence should act as a "go signal," and experiences of negative valence should act as a "stop signal," to use accessible thoughts and processing inclinations.

Some recent research is consistent with this proposal. Feelings of fluency, for example, have been shown to validate and disfluency to invalidate accessible thoughts and information processing inclinations (Greifeneder & Bless, 2010; Häfner & Stapel, 2009; Huntsinger, 2013a; Huntsinger, 2013d; Tormala, Falces, Briñol, &

Petty, 2007; Tormala, Petty, & Briñol, 2002). In research examining ease of retrieval effects on persuasion and judgment, for example, fluency was found to enhance reliance on activated thoughts and disfluency to reduce reliance on such thoughts (Tormala et al., 2007; Tormala et al., 2002). Also consistent with this idea is research showing that fluency influences the use of primed trait concepts in impression formation tasks, such as in the now classic Donald paradigm (Greifeneder & Bless, 2010). This research showed that feelings of fluency resulted in impressions that were assimilated to the primed traits, whereas feelings of disfluency resulted in impressions that were contrasted from the primed traits.

Finally, accessibility experiences, such as ease or difficulty of thought retrieval, have been shown to confer positive and negative value on activated goals (DeMarree et al., 2012). In this research, when goal activation was accompanied by feelings of ease, primed goals (regardless of content) influenced participants' behavior, but when goal activation was accompanied by feelings of difficulty, goals no longer influenced behavior.

In summary, consistent with the proposed affect-as-cognitive-feedback account, subjective experiences other than moods and emotions also have a flexible impact on cognitive processing. Like moods and emotions, other subjective feelings of positive valence appear to validate cognitively accessible thoughts, and feelings of negative valence appear to invalidate accessible thoughts. Future research is necessary to show a similar flexibility in the link between subjective experiences and more general information processing strategies, such as global and local processing orientations.

Comparison to Other Affect-Cognition Theories

Mood-as-Input Model

Like the affect-as-cognitive-feedback account, the mood-as-input model assumes that the influence of affective feelings is context dependent (Martin, 2001). The mood-as-input model is an important historical precursor to the present approach. Research testing that model typically provided participants with explicit stop rules (e.g., "Have I done enough, am I enjoying this, or is this response good enough?") and focused on the link between affective feelings and the extent of processing, which the current model does not. The current model explains contextual shifts in styles of information processing (e.g., global or local) and addresses questions about how affective feelings regulate reliance on accessible thoughts.

The models also differ somewhat in their treatment of the information value of positive and negative feelings. In the mood-as-input model, context determines whether positive or negative feelings convey positive or negative information (Martin, 2001). Evidence comes from research in which positive and negative moods were induced prior to participants rating the success of stories designed to elicit happy or sad emotions (Martin, Abend, Sedikides, & Green, 1997). When participants' current feelings matched a story's intended emotion (i.e., positive mood–happy story or negative mood–sad story), they judged the story positively, but when feelings and the story's emotion mismatched, they judged it negatively. Martin (2001) interpreted such mood incongruent judgments as indicating that context changes the information conveyed by mood. From the standpoint of the current model,

the information conveyed by affect remained unchanged—happy and sad moods still conveyed positive and negative information—what changed was the judgmental criterion (see also Schwarz, 2001). Thus, feeling happy while reading a sad story indicates that the story failed to produce the intended emotion, and so we rate it negatively. This may not imply that happy mood conveyed negative information. From our view, a change in context should change the object of affect, rather than the positive or negative value conveyed by affect (Clore & Huntsinger, 2009). More generally, the two models are compatible but not redundant.

Motivational Intensity Model

The motivational intensity model (Harmon-Jones, Price, & Gable, 2012) is also consistent with our view that affective valence is not tied to particular cognitive processing styles. This model maintains that the motivational intensity associated with specific affective states is crucial to predicting their influence on cognition (for a review, see Harmon-Jones et al., 2012). According to this view, affective states that are high in motivational intensity (e.g., disgust, anger, enthusiasm) are connected to active goal pursuit (i.e., to either avoid or approach an object or opportunity). Thus, these states are theorized to lead to a narrow scope of attention that will aid individuals in achieving their goals. In contrast, states that are low in motivational intensity (e.g., satisfaction, amusement, sadness) are associated with goal completion (either successfully or unsuccessfully) and therefore are theorized to broaden individuals' cognitive processes to allow them to be receptive to new opportunities.

This is an important new account that brings motivation into the picture. Consistent with this view, research demonstrates that positive affective states that are low in motivational intensity (e.g., amusement elicited by viewing a video of funny cats) led individuals to have a broader attentional focus compared to states that are high in motivational intensity (e.g., desire elicited by viewing a video of desserts; Gable & Harmon-Jones, 2008). In later work, Gable and Harmon-Jones (2010) found that disgust, a negative emotion high in motivational intensity, led to cognitive narrowing, whereas sadness, a negative emotion ostensibly low in motivational intensity, led to cognitive broadening.

Although both propose flexibility in the link between affective valence and attentional scope, these accounts focus on largely independent contributors to such flexibility. Our research shows that, holding motivational intensity constant, knowing whether a broad or narrow focus is the momentary default is crucial to predicting the influence of affect on attention and processing. The motivational intensity model focuses exclusively on the impact of affective states on attention and categorization. Predictions derived from the motivational intensity model also appear inconsistent with at least some past research. For example, the motivational intensity model predicts that anger, an experience of high motivational intensity, narrows attention, yet research discussed earlier (e.g., Bodenhausen et al., 1994; Isbell, McCabe, et al., 2013) demonstrates instead that anger widens conceptual attention. Sadness, an experience of low motivational intensity, is frequently found to narrow attention (Biss & Hasher, 2011; Gasper, 2004; Gasper & Clore, 2002; Kuhbandner et al., 2011; Rowe et al., 2007), yet the motivational intensity view predicts increased perceptual and cognitive broadening. Finally, as suggested elsewhere

(Friedman & Förster, 2011; Huntsinger, 2013c; Isbell, Lair, & Rovenpor, 2013a), some manipulations of high motivational intensity positive emotion may be confounded with a local attentional focus (e.g., videos of desserts may prime *both* local processing as well as positive feelings). Thus, certain motivational intensity effects may result from processes outlined by the proposed affect-as-cognitive-feedback account (for an additional critique of this model, see Friedman & Förster, 2011).

Self-Validation Theory

Our perspective has much in common with self-validation theory (Petty, Briñol, & Tormala, 2002), including a largely parallel history in which the general outline of each theory was sketched out in the early 2000s (e.g., Clore & Gasper, 2000; Clore et al., 2001; Petty et al., 2002; Wyer et al., 1999). Both theories highlight the role played by affective feelings and other subjective experiences in validating or invalidating accessible thoughts. Although self-validation theory was initially tested within the persuasion domain, both theories now cover much of the same empirical ground. There are, however, some key differences between the two.

Self-validation theory proposes that the validation or invalidation of accessible thoughts is a metacognitive process. Such metacognitive activity is typically assumed to involve controlled processing in which the thoughts themselves need to be available to conscious scrutiny. Further, self-validation theory proposes that validation and invalidation of thoughts is most likely to emerge when cognitive elaboration is high. Our account does not assume controlled processing or the moderating role of cognitive elaboration. Indeed, in some of the studies discussed earlier, particularly those that employed subtle priming methods, participants were unlikely to be aware of the processing tendency or thoughts evoked during the task. In studies that included implicit measures of attitudes and stereotypes as outcomes, cognitive elaboration was necessarily constrained to be low. Yet in all of these studies, affective feelings and other subjective experiences were nonetheless found to validate or invalidate general styles of cognitive processing and particular thoughts.

Although under certain conditions, level of cognitive elaboration may moderate the influence of affective feelings on the use of accessible thoughts (e.g., Briñol et al., 2007) we maintain that in many cases, high cognitive elaboration is not a *necessary* condition for such effects to emerge, as predicted by self-validation theory. Future research is needed to specify when and for which types of outcomes, the influence of affective feelings on use of accessible thoughts will (or will not) depend on the level of cognitive elaboration present. Finally, because self-validation theory is a metacognitive model, it focuses on those factors that influence use of accessible thoughts and is silent on the question of flexibility in the link between affect and cognitive processing styles. Nevertheless, despite these important differences, we view self-validation theory as a complementary approach to our own affect-as-cognitive-feedback account.

The Hedonic Contingency Model

The hedonic contingency view (Wegener & Petty, 1994; Wegener, Petty, & Smith, 1995) proposes that whether happy or sad

moods lead to heuristic or systematic processing depends on the hedonic consequences of engaging in one processing style or another. Specifically, happy people are assumed to choose activities based on their perceived hedonic consequences. This view assumes that happy people are motivated to maintain their positive mood and therefore they generally choose their activities wisely as most activities will serve to depress their mood. One consequence is that happy people will typically process information in a superficial or heuristic fashion so as to not disturb their current good mood. Happy people will engage in systematic, detailed processing only if they anticipate that such processing will help maintain their mood. In contrast, sad people are motivated to elevate their mood, and because virtually any activity will be hedonically rewarding (i.e., it will elevate their mood) they will generally process information in a systematic fashion.

This model has been tested largely within the domain of persuasion (Wegener & Petty, 1994; Wegener et al., 1995), although it has been recently applied to explain mood-related differences in creativity (Hirt, Devers, & McCrea, 2008). A typical finding is that when detailed scrutiny of persuasive appeals is mood threatening, happy people engage in more heuristic processing than sad people, who engage in more systematic processing. The opposite pattern emerges when detailed scrutiny of an appeal is mood elevating, in which case, happy people process more systematically and sad people more heuristically.

Like the current approach, the hedonic contingency view proposes that the link between affective feelings and cognitive processing is quite flexible; however, whether this relationship exists because people are motivated to maintain positive and avoid negative moods is unclear. Indeed, recent research suggests that people regulate their emotions for instrumental or utilitarian reasons, rather than a simple desire to feel good (Clore & Robinson, 2000; Erber & Erber, 2001; Parrott, 1993; Tamir, 2009). In the presence of social constraints, such as an upcoming interaction with a stranger, happy people seek to dampen or neutralize their positive mood by reading sad news stories rather than happy stories (Erber, Wegner, & Therriault, 1996). Similarly, people will choose to feel bad if they believe that this will be useful for performance (Tamir, Mitchell, & Gross, 2008). That being said, we grant that flexibility in the link between affect and cognitive processing may result from mood management or hedonic concerns, in addition to the mechanisms outlined in the proposed affect-as-cognitive-feedback account. Future research is necessary to determine when mood will have its effect by conferring value on accessible processing inclinations and thoughts, and when it will have its effect via instigation of mood management concerns.

Summary

The theme of this article is that the influence of affect on cognition is more malleable than past research and theory suggests. We began by noting that something of a great truth in the affect-cognition literature is that the cognitive consequences of positive and negative affect are etched into psychological stone. That is, the notion that positive and negative affect have distinct cognitive and perceptual consequences: Positive affect triggers relational processing and widened attention, and negative affect triggers detailed processing and narrowed attention. We then noted that recent research demonstrates that the opposite of this truth is also true.

Namely, positive affect may also lead to detailed processing and a narrowed focus, and negative affect may lead to heuristic processing and a broadened focus.

In order to take into account evidence consistent with this great truth and its opposite, we proposed our affect-as-cognitive-feedback account. In developing this account, we took as a theoretical starting point the view that affect is embodied information about value so that it signals the value of whatever it takes as its object, including the thoughts and thought processes that happen to be accessible in any given moment. Positive affect confers positive value on accessible thoughts and processing inclinations, facilitating their use, and negative affect confers negative value on such thoughts and inclinations, inhibiting their use. Thus, rather than assuming a fixed or dedicated connection between affect and styles of cognitive processing, our affect-as-cognitive-feedback account implies that the impact of affect on cognition should be flexible in that its evaluative information depends on the momentary mental context.

The evidence that we reviewed is consistent with the proposed account, but inconsistent with a dedicated effects account. This evidence included demonstrations of flexibility for otherwise robust effects for which a dedicated connection has generally (and quite reasonably) been assumed (e.g., attentional scope, stereotyping, impression formation, creativity). As noted in the last section, our perspective is sufficiently broad to apply also to the influence of specific emotions and other subjective experiences on cognition. Thus, the affect as cognitive feedback approach is likely to spawn new research questions and lead to a better understanding of the affect-cognition relationship.

Coda

In the title essay of his book *The Relativity of Wrong*, Isaac Asimov (1989) answered a letter he received in which the letter writer, an English literature major, questioned the idea of scientific progress. The student said that because the scientific discoveries of the previous century were proved wrong by those of the next century, the only thing we can be certain of is that the knowledge we have now is wrong. Asimov initially responded with the following: “John, when people thought the earth was flat, they were wrong. When people thought the earth was spherical, they were wrong. But if you think that thinking the earth is spherical is just as wrong as thinking the earth is flat, then your view is wronger than both of them put together” (Asimov, 1989, p. 81). The idea of a flat earth, said another way, is flat wrong because it fails even remotely to account for the earth’s observable behavior. The idea of a perfectly spherical earth is a good deal more right than the idea of a flat earth, because its ability to predict the earth’s behavior is much superior. The idea of a spherical earth, nevertheless, is still wrong, because in a strict geometric sense, the shape of the earth appears to be more of an oblate spheroid than a sphere.

Asimov (1989) went on to argue that, in the context of scientific explanation, right and wrong are fuzzy concepts. Scientific theories are incomplete explanations of reality that can be placed on a continuum of “right” and “wrong,” in which some theories much more closely resemble what the evidence suggests. As evidence accumulates, scientific theories are gradually refined and extended in ever more subtle ways such that they move closer to the “right”

end of the continuum, that is, more consistent with accumulated observations.

Applying Asimov’s flat-earth example to the evolution of ideas on how affect and cognition interact, the classic idea that affect and cognition are independent forces in the mind might be similar to the classic idea that the earth is flat. Both are deeply wrong. The subsequent idea that positive and negative affect are dedicated to particular cognitive outcomes is perhaps similar to the idea that the earth is spherical. Both are much more right than wrong and provide a satisfactory explanation in most circumstances. Nevertheless, both explanations are incomplete. We hope, in the end, that the affect-as-cognitive-feedback account we offer in this article is not unlike the idea that the earth is an oblate spheroid in that it moves us closer to the “right” end of the continuum by providing a more complete, although certainly still imperfect, picture of how affect may regulate cognition.

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