

Beyond the Moment, Beyond the Self: Shared Ground Between Selective Investment Theory and the Broaden-and-Build Theory of Positive Emotions

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Selective investment theory (SIT) challenges us to take a fresh look at bonding and attachment. It envisions them not as special cases of reinforcement learning, but as functional and motivational forces in their own right. Over the past 10 years, our lab has taken a similar approach to the study of positive emotions such as joy, contentment, and gratitude: Rather than seeing positive emotions as mere rewards or signals of desirable circumstances, we argue that they are complex phenomena that help *create* adaptive behavior. Much like Brown and Brown's (this issue) social bonds, positive emotions orient our physiology, attention, and cognition away from short-term personal survival and toward cumulative long-term benefits. We welcome Brown and Brown's work for its contributions to the emerging study of long-term resource building, and suggest ways in which our two programs of research support, enlarge, and intertwine with one another.

The Broaden-and-Build Model of Positive Emotion

Fredrickson's broaden-and-build theory of positive emotions (Fredrickson, 1998; 2001) argues that positive emotions function to enlarge our cognitive, attentional, and motivational scope beyond basic needs in the present moment. Positive emotions differ qualitatively from negative emotions, which have been the subject of most emotions research to date. Negative emotions have reliable and easily recognized thought-action tendencies, each a compelling and stereotyped response that, in our evolutionary ancestors, increased chances of survival against a clear and present threat. Positive emotions are less differentiated and specific (Fredrickson & Branigan, 2001), and in the past they were considered to be less clearly adaptive, perhaps even epiphenomena not shaped by selection at all. We argue that positive emotions are exquisitely shaped and distinctly valuable to survival, but in ways that previously escaped attention. This is because positive emotions were not shaped to each respond to a single type of situation, but rather lead us to proactively explore the environment for resources and opportunities. Joy, for instance, sparks the urge to play, interest the urge to explore and learn, contentment the urge to savor and integrate our past experiences, and love a recurring cycle of each of these urges with or toward

other people. Evolutionarily, this *broadening* effect had little survival value on its own, but over time, actions that arose within broadened states led to *building*: Play builds physical abilities that are used seriously later in life (Dolhinow, 1987; Panksepp, 1998); curiosity builds knowledge about wayfinding, environmental resources, and other useful domains; savoring builds self-insight and a clearer understanding of the phenomenon being savored; and love builds enduring and supportive relationships with other people. When we are in a state of relative safety and satiety—when there are few threats demanding intense, narrowed attention—positive emotions allow us to pursue our long-term interests. In our ancestors, transitory states of positive emotions led to behavior that may seem pointless or extravagant from the perspective of immediate survival, but that perhaps conferred serious advantages in the long term.

Experimental research from our lab, involving both induced and naturally varying emotions, has demonstrated broadening across a variety of domains: People in positive emotional states

- Literally take a “big-picture” view, attending to the general outline of images rather than the details (Fredrickson & Branigan, 2005).
- Increase their use of adaptive reframing and perspective-taking coping skills (Fredrickson & Joiner, 2002).
- Find more varied and adaptive ways to use their social support network (Cohn & Fredrickson, 2005).
- Broaden their sense of self to include close and potentially close others (Vaughn & Fredrickson, 2005).
- Recognize people of different races in ways more similar to their own race (Johnson & Fredrickson, 2005).

Our theory also provides an overarching framework for a variety of other findings, which show that positive emotions reduce anchoring biases in complex decision-making (Estrada, Isen, & Young, 1998) and enhance creative, synthetic thought—sometimes, but not always, at the cost of careful, detail-oriented processing (Aspinwall, 1998; Schwarz, 2002).

The broaden-and-build model provides a cohesive picture of the evolutionary origin of positive emotions

and of the phenomenon of broadening that underlies their various unique functions for both ancient and modern humans. We have found evidence for broadening at levels ranging from the very basic (visual perception) to the highly complex (self-concept and social groups). In the next sections, we discuss ways researchers working with the broaden-and-build and SIT models can learn from and contribute to one another.

What the Broaden-and-Build Model Contributes to SIT

“Broadening” Includes the Self as Well as Others

SIT argues for the existence of a motivational system that enhances reproductive success by including select others in one’s utility calculus, and by intermittently expanding one’s concerns and attentional focus to include others as well as the self. The broaden-and-build theory proposes a parallel function for positive emotions: They enlarge our time horizons, such that we will invest resources in far-future outcomes in addition to present ones, and shift our values such that we will be attracted to goals other than immediate nourishment, reproduction, or survival (e.g., cultivating a new relationship or practicing a new skill).

Brown and Brown see the mechanisms behind costly, targeted long-term giving as evolutionarily recent, compared to the numerous cognitive and behavioral instincts designed for self-preservation and self-enrichment. We believe a similar situation pertains for the broaden-and-build theory: As animals developed longer life-spans and greater behavioral flexibility, the value of building long-term resources increased, and positive emotions became more valuable. However, we also carry heuristics and biases honed by millions of years of evolution for short-term survival. Humans tend to discount future relative to present gains (Rachlin, 2000), respond to dangerous situations with stereotyped, overlearned behaviors (Staw, Sandelands, & Dutton, 1981), and weigh risks and losses more heavily than opportunities and gains (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Tversky & Kahneman, 1981). Taking a long-term view is not a psychologically trivial act; broadening must overcome these counterbalancing forces to put us in a state in which we can build resources for the future.

We suggest, then, that SIT could broaden its scope to include the *self* as a target for selfless investment. Investing in one’s own future requires one to ignore short-term anxieties and concerns just as much as investing in others does. Clearly altruistic behavior is not the same as long-term self-interest, but both are opposed by short-term needs and biases and may use overlapping mechanisms to overcome them. It may be

only a quirk of history that these two forms of investment have been conceptualized separately up to now: Investment in others was seen as a challenge to natural selection, requiring the attention of evolutionary science, whereas investment in oneself was seen as evolutionarily unproblematic and approached as a problem for social and personality psychology. The broaden-and-build theory primarily draws from the latter tradition, including research on mood and cognition, helping, and emotional appraisals. However, our research is also guided by an evolutionary rationale, which allows us to seek common theoretical ground and areas of functional overlap with SIT. We will say more in a later section about the potential for an integrated theory of broadened investment.

Undoing Offers a Mechanism for Longevity Effects

Some of Stephanie Brown’s most provocative work has been epidemiological research suggesting that costly long-term investment in significant others leads to increased longevity (Brown, Nesse, Vinokur, & Smith, 2003). Although SIT offers an explanation for why evolution may have shaped organisms to live longer when they are giving to others, it does not suggest a proximate mechanism for the link between costly long-term investment and longevity. We would point to the ability of positive emotions to “undo” the physiological effects of stress. Our research has determined that positive emotions not only relieve the negative emotions related to stress (Tugade & Fredrickson, 2004); they also reduce the time needed to return to baseline levels of cardiovascular activation (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000). The sympathetic activation syndrome associated with stress is valuable when a threat is imminent and can be dealt with in the present, but chronic or excessively frequent activation, including lingering cardiovascular activation after a stressor is past, is associated with depression, cardiovascular disease, and immune dysfunction (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002).

There is already an established link between positive emotion and longevity (Danner, Snowdon, & Friesen, 2001; Moskowitz, 2003; Ostir, Markides, Black, & Goodwin, 2000), and we have argued that the link is at least partially mediated by positive emotions downregulating the effects of excessive or inappropriate sympathetic activation (stress, anxiety, or anger). Positive emotion also enhances certain adaptive coping styles (Fredrickson & Joiner, 2000; Fredrickson, Tugade, Waugh, & Larkin, 2003), which can reduce stress responses by speeding the resolution of the stressor. Thus, Brown’s findings may be explained by the fact that costly long-term investment in an interdependent partner feels good (Otake et al., 2005), leading

to reduced physiological wear and tear from stress. A more subtle possibility may come from the cognitive and attentional aspects of SIT: If a social bond encourages us to think about another person *instead of* or *in addition to* ourselves, then we have less attention to devote to our own threats, difficulties, and annoyances. In addition to offering opportunities to undo the effects of stress, social bonds and costly long-term investment may reduce our opportunities to become distressed in the first place.¹

To assess this hypothesis, we suggest that future studies of SIT directly investigate whether acts of investment evoke positive emotion above and beyond other interactions with social-bond partners. Future epidemiological studies could also test stress levels and frequency of positive emotions: We would expect to find that the relationship between caregiving and longevity is underlain by the following causal chain:

Caregiving (costly long-term investment) ⇒ Positive Emotion ⇒ Reduced Stress ⇒ Longevity

We also suggest investigating whether the reduction in deaths among caregivers is caused by a reduction in specifically stress-related mortality, though this would admittedly be difficult due to the wide range of pathology to which stress can contribute.

Additionally, Brown and Brown's work suggests that we expand our own experimental research on positive emotions and helping. We are currently investigating the relationships between positive emotion, broadening, helping behavior toward a stranger, and psychophysiological responses to giving help. SIT suggests that the degree of help given to a stranger should vary with the perceived existence of or opportunity for developing a social bond. It also suggests that we examine the *meaning* participants attribute to giving help, and the responses they expect to elicit from the recipient. For example, is the established link between positive mood and altruism mediated by a belief that the giver is nurturing a bond?

What Does SIT Offer the Broaden-and-Build Theory?

Benefits Need Not Accrue Only to the Self

The broaden-and-build theory focuses on building personal resources. We conceptualize relationships

¹Neither the broaden-and-build theory nor SIT argues that self-focus and negative emotion are entirely undesirable. Caregiver burnout is a vivid example of the destructive effects of overfocusing on others. More generally, evolution has clearly preserved strong self-interest and threat-vigilance biases in humans, perhaps because those who found costly long-term investment or broadening too easy were less likely to meet their own immediate needs.

with other people as a kind of resource, in that they enhance survival (House, Landis, & Umberson, 1988) and are amenable to building while in broadened states (Vaugh & Fredrickson, 2005). Relationships are also valuable in themselves, as potent sources of positive emotions and key pieces of a functional and fully realized human life (Ryff & Singer, 1998). Regardless, our evolutionary explanation for broadening has always rested on enhancing the survival of the *organism*. Brown and Brown articulate a phenomenon very similar to broadening, but one that has propagated by enhancing the survival of the *gene* as well. This expansion of scope suggests that the broaden-and-build theory could give a greater role to relationships, rather than simply seeing them as one potential context for broadening or one particular kind of resource.

Specifically, it suggests that building is only one way in which broadening can be adaptive. Consider a situation in which an individual in a positive emotional state—feeling expansive, generous, or grateful—invests resources in another. Benefits could arise because,

1. As in our original formulation, the interaction helps build a relationship. In the future, the giver could call on the other as an ally, receive advice or emotional support from them, or experience shared positive emotion in their company.
2. The individuals are fitness-interdependent, and the giver's investment helps the recipient either build future resources or survive an immediate threat.
 - 2a. The recipient's mere survival later helps the giver survive, even in the absence of interaction between the two (e.g., by increasing coalition size or providing added cover from predators [Alexander, 1979]).
 - 2b. The giver receives no benefit, but the recipient shares genes with the giver (and, as specified by Hamilton's rule, the degree of relatedness outweighs the cost of giving).

Outcome 2a could be described as building a resource that exists in the environment rather than in the individual, but 2b requires us to shift from an organism view to a gene view. If these two types of outcome did indeed affect the evolution of a shared mechanism underlying broadening and costly long-term investment, then it follows that broadening should not be restricted to situations in which resources are likely to be built. Broadening in a social context, including altruism and consideration toward others, does not need to build resources if it directly enhances survival for the recipient, and the recipient enhances the giver's survival (either genetic or personal). Our ancestors would have bene-

fited from broadening in any situation in which their interaction partners shared fitness interdependence due kinship or to a preexisting social bond.

We note that this applies only to broadening in social situations; the explanatory value of the broaden-and-build theory is still great when it comes to less-social broadening phenomena such as exploration, curiosity, and individual play.

Additional Perspectives on Broadening

Earlier we suggested that the perception of separate domains for the broaden-and-build theory (social and personality psychology) and SIT (evolutionary psychology) may be illusory. Even so, it is enriching. Brown and Brown have sought to ground their theory in endocrinology and comparative ethology. SIT is poised to take advantage of research on hormones (e.g., oxytocin), brain areas, and animal behavior that may also be applicable to the broaden-and-build theory. These are perspectives we have only begun to explore on our own, and can help clarify questions about the situational and biological antecedents of broadening.

SIT also offers a perspective that focuses on the suppression of one's immediate interests, in comparison with our focus on the activation of mechanisms for one's long-term interest. In some ways the difference may be merely semantic, but in others it is consequential: If broadening is a process of suppression, we might find that it involves effortful and resource-limited control over one's thoughts. This would also suggest that broadening is dependent on neocortical control structures, and that we should see an interspecies correlation between the development of executive control and behavior that resembles broadening. Ideas like these are currently entirely speculative, both in the broaden-and-build theory and SIT, but they reflect important distinctions and deserve attention in the future.

The Broaden-and-Build Theory and SIT Combined: A More Comprehensive Perspective on Other-Investment

Social bonds are a fixture of both the broaden-and-build theory and SIT. In SIT, bonds represent a gradual decision that another person is a worthy target of costly long-term investment, and in moments of social interaction, bonds direct attention toward that person and motivate giving to them. In the broaden-and-build theory, as discussed earlier, bonds are valuable resources for survival and learning and also elicitors of further positive emotion. We believe that combining the perspectives of SIT and the

broaden-and-build theory can give us further insight into the structure and function of social bonds.

Bond Formation

Brown and Brown state that bonds form gradually, as repeated interaction with another person causes us to perceive them as emotionally positive, fitness-interdependent, and irreplaceable. We propose that broadening is critical to the development of a bond. First of all, the time-horizon aspect of broadening enables us to consider investment at all, rather than focusing on our immediate needs. By itself, this can lead to creative and far-sighted ways of fulfilling our needs, such as scouting out new food sources or developing physical abilities. However, broadening also increases the scope of the self. People in positive emotional states form more inclusive social groups (Dovidio, Isen, Guerra, Gaertner, & Rust, 1998) and even perceive racial differences less readily (Johnson & Fredrickson, unpublished data). They also feel more overlap between themselves and their friends (Waugh & Fredrickson), and are able to use social-support resources more adaptively and flexibly, contributing support when they have the resources to do so, and receiving support when they lack them (Cohn & Fredrickson, 2005). They perceive strangers in a more positive light (Forgas, 2001) and feel more trust toward casual acquaintances (Dunn & Schweitzer, 2005). The broaden-and-build theory is thus, in many ways, a naturally social theory. The same state that makes us attentive to opportunities for investment makes us attentive to opportunities to invest in other people.

Brown and Brown suggest that synchronized actions should be helpful in the formation of a bond. Research on positive emotion bears this out, and also suggests that the contagion of positive emotion is particularly important. In a new theory on the evolved function of laughter, Gervais and Sloan-Wilson (2005) suggested that laughter communicates not just well-being, but a state of receptivity to social influence and preparedness to invest in or receive investment from others. Hearing someone laugh is thus a persuasive signal to broaden one's attention: Their laughter indicates that they believe the situation is safe, and that they will be a receptive partner for bond development or investment. Broadened individuals who move on to investing in others are also engaging in a communicable act: Neurohormonal research shows that when one individual expresses trust in another in an investment game paradigm, the recipient show increases in oxytocin, a hormone that facilitates bonding (Zak, Kurzban, & Matzner, in press). This type of reciprocity may help explain why the positive emotion—trust link was able to evolve, rather than leading those who expressed it to death through exploitation.

Bond Maintenance

The research discussed to this point involves short-term emotional experiences, followed by immediate, often one-shot responses to partners who are strangers or acquaintances. SIT, in contrast, deals with rich, long-term relationships. Further, Brown and Brown argued that a social bond obviates the need for ongoing scrutiny of the partner's behavior and intentions. Does this suggest that the effects of positive emotion are relevant only to the tentative, early stages of bond formation, after which the relationship partners move beyond them?

We suggest that social bonds resemble a localized state of *permanent broadening*. Somehow the transient positive emotional state of overlapping selves and willingness to ignore personal needs becomes a reliable part of a relationship. In this model the role of positive emotion does not change at all: Because social bonds encode emotional information and potent memories of past experiences, they can allow bond partners themselves to become elicitors of positive emotion. Bringing them to mind reliably puts us in a positive emotional state, which leads us to broaden out to include them. Thus, the stable and reliable phenomenon of costly long-term investment would be made up of many individual acts, each of which begins with positive emotions and takes place in a broadened frame of mind.

Research on emotions and stable relationships bears out this suggestion. Marriage is certainly representative of a social bond, but it cannot simply begin with a "seed" of positive interaction and get along on bonding afterward—marriages in which positive emotions do not occur frequently are at high risk for conflict and divorce (Gottman, 1994). Our research on the nonlinear dynamics of flourishing in dyads, groups, and organizations brings together additional evidence that mutualistic, investment-heavy relationships rely on the continuing production of positive emotions, at a high ratio relative to negative emotions, to remain functional (Fredrickson & Losada, 2005). The social bond still automatizes important parts of the process—for example, the effects of emotional states on trust disappear when the respondent has an established relationship with the trustee (Dunn & Schweitzer, 2005). No doubt social bonds also produce other changes that help reduce the cost of investment, including overlapping self-concept (Aron, Aron, Tudor, & Nelson, 1991), transactive memory structures (Wegner, Erber, & Raymond, 1991), and positive expectations about the partner. However, we believe that in nearly all cases, broadening will be the proximate mechanism. That is, some combination of evoked positive emotion, bonds and reinforcement learning, and positive expectations for the interaction will lead individuals to feel positively towards each

other. As a result they will broaden their self-images and subjective utilities to include one another, and this broadening is the penultimate step in the chain of events leading to altruism.

A General Theory of Broadened Investment?

We have attempted to restate parts of SIT in terms of the broaden-and-build theory, and vice versa. Our purpose is not to reduce one to a special case of the other, for each offers positive and irreplaceable contributions to our overall understanding of human adaptations. Rather, by exploring their common ground and shared concepts, we hope to reveal the outline of the more general phenomenon that both of them target. We suggest the umbrella term *broadened investment*: a willingness to put one's resources into something beyond the demands of the present moment. Positive emotions make it easier for individuals to take temporarily painful steps that enhance their future resources (Aspinwall & Brunhart, 1996; Raghunathan & Trope, 2002), to ignore personal anxieties and allow their self-concepts to overlap with those of others (Cohn & Fredrickson, 2005; Tesser, Martin, & Cornell, 1996; Waugh & Fredrickson, 2005), and perhaps even to expand beyond the self and act entirely in the interest of their loved ones, or their genes.

Notes

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