

Why Emotions Vary in Intensity

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Why Emotions Involve Feelings

An important issue in the design of information-processing systems concerns how to schedule limited attentional and processing resources. Animate systems, whether living or robotic, appear more likely to succeed if ongoing processing can be interrupted when important situations arise (Simon, 1967). Understanding emotions involves not only figuring out how appraisals about the personal significance of situations are made, but also how the results of appraisals govern cognitive processing. A possible answer comes from considering the nonemotional processes involved in governing attentional processes.

In both higher and lower organisms, attentional and information-processing resources appear to be sense driven. External stimuli capture attention and processing resources through sensory organs devoted to visual, auditory, or other sensory stimulation. Bright lights and loud noises, for example, are effective ways of capturing someone's attention, a fact well known to both advertisers and small children. One of the functions of emotion seems to be to redirect cognitive processes, and it is interesting that emotion does this in the same way that an external stimulus does. The main difference is that, in the case of emotion, the sensory stimulation that captures attention is internally generated. This internal stimulation comes in the form of emotional feelings generated by affective appraisal processes, but they have the same attention-grabbing power as external stimuli. Just as in the case of externally stimulated sensory cues, the greater the intensity of these internally generated feelings, the more completely they command attention and redirect processing resources. For the system to work well, however, this intensity should reflect the urgency of the appraised situation, so that resources can be devoted to important matters. I will discuss recent work on this relationship—the relationship between the importance of situations and emotional intensity.

Emotional Intensity

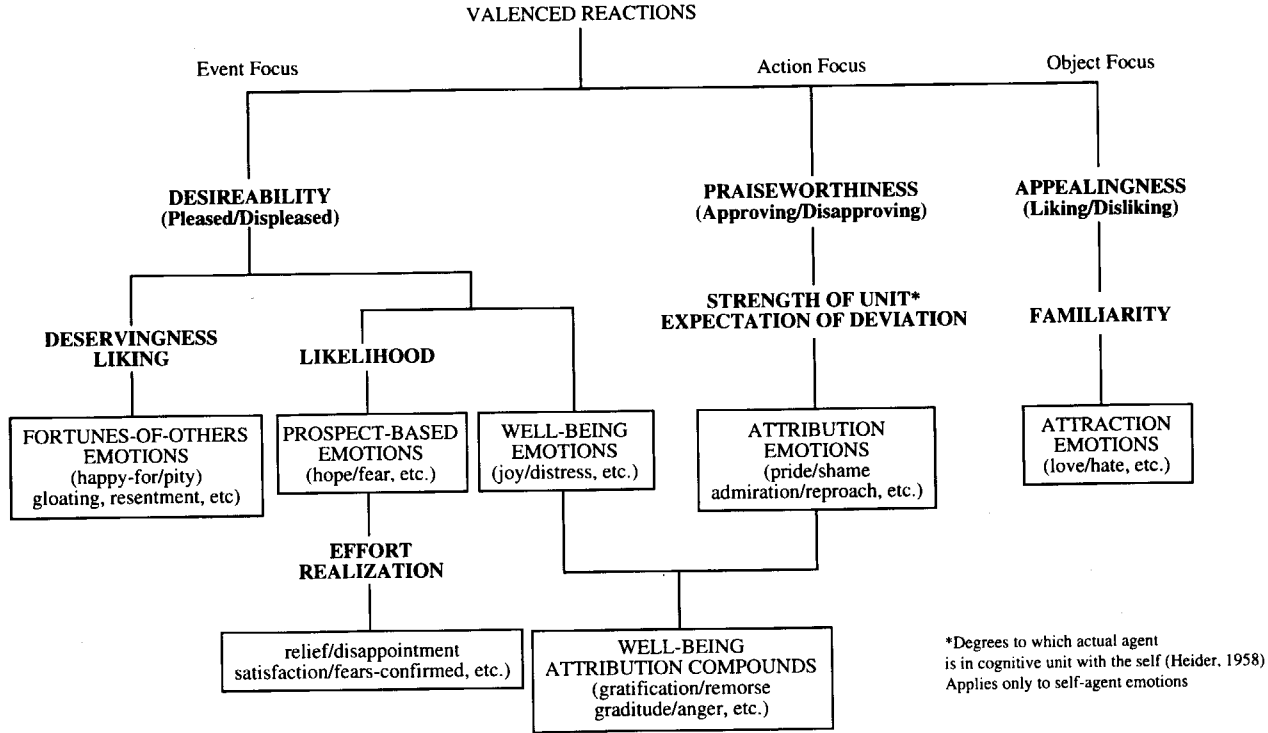
The Cognitive Structure of Emotional Intensity

A curious thing about emotion research is that psychologists have paid relatively little attention to the fact that emotions vary in intensity of subjective experience. This is surprising in part because, both within and between people, variation in intensity is one of the most salient aspects of emotional experiences. An adequate account of emotion, therefore, would have to address the question of what determines intensity (Frijda, Ortony, Sonnemans, & Clore, 1992).

Our general view is that the intensity of emotions depends on a number of variables, all of which are present in the construal of the situation that gives rise to the emotion in the first place. Thus, to address the question of intensity, one needs a general conception of how emotion-inducing situations are appraised. Ortony, Clore, and Collins (Ortony et al., 1988) proposed that such appraisals are based on three kinds of cognitive structures—goals, standards, and attitudes. The variables that govern the intensity of emotion, according to this view, include the importance of the particular goals, standards, and attitudes that underlie a given emotional episode. Which of the many possible emotions occur depends on one's focus of attention. One can focus on the outcome of events as relevant to one's goals, the actions of agents as relevant to one's standards, or the attributes of objects as relevant to one's attitudes (or tastes). A distinctive affective reaction corresponds to each focus so that one can be pleased or displeased about events, approve or disapprove of actions, or like or dislike objects. The intensity of pleasure or displeasure depends on how desirable or undesirable an event is perceived to be, which in turn depends on the importance of relevant goals. The intensity of approval or disapproval depends on how praiseworthy or blameworthy an action is, which in turn depends on the importance one attaches to relevant standards. And the intensity of liking or disliking depends on how appealing or unappealing an object is, which depends on the importance of relevant attitudes. (Note that, since emotions are states, it is not dispositional liking and disliking that are being referred to but states of liking and disliking in the moment.)

Specific emotions are differentiations of these three affective reactions, and their intensity is similarly a function of the importance of the goals, standards, and attitudes on which they are based. The structure shown in the following figure is thus a hierarchical one in which emotions lower in the hierarchy are necessarily influenced by variables active at higher levels.

Also shown in the figure are local variables that affect particular groups of emotions that share the same eliciting conditions. For example, it indicates that the degree of *expectation deviation* should influence the intensity of emotions such as pride, shame, or anger, which are based on perceptions of the praiseworthiness or blameworthiness of actions. Thus, one might admire an old lady who dives into a river to save a drowning child more than a lifeguard who does so. The figure also indicates that the degree to which an outcome is seen as *deserved* should influence the intensity of emotions such as pity or resentment that are concerned with outcomes to others. The more one's colleague was seen as undeserving, for example, the more one might resent the colleague being awarded a large pay raise. The figure indicates that



Global and local cognitive variables that govern the intensity of 22 emotion types according to Ortony, Clore, and Collins (1988).

the perceived *likelihood* of an outcome should influence such prospect-based emotions as fear. Thus, one is more fearful when a frightening prospect seems likely than when it seems unlikely. In addition, not pictured are global variables that influence the intensity of all emotions (e.g., *surprisingness*, *proximity*, *sense of reality*).

Basketball Study

One study designed to test predictions about the cognitive factors in emotions and emotional intensity was a study of sports fans (Clore, Ortony, Brand, & Levine, in preparation). Self-reports of emotion were obtained from nearly 100 college basketball fans during 20 basketball games. The fans answered questions and made predictions before, during, and after games seen both live and on television. The reports of their emotions were cluster analyzed separately for wins and losses. Consistent with the theory, three clusters of emotions emerged separately in both the win and the loss data sets. The loss data showed goal-based emotions (e.g., disappointment, depression), standard-based emotions (e.g., anger, embarrassment), and an attitude-based emotion (e.g., momentary disliking toward the coach). Similarly, the win data also showed some goal-based emotions (e.g., relief, being pleased), some standard-based emotions (e.g., pride, admiration), and an attitude-based emotion (momentary liking for the coach). In addition, the variables that predicted these qualitatively different experiences followed expectations from theory. Goal-based emotions were experienced when games were seen as important and the score was close, standard-based emotions were experienced when the teams played especially well or poorly, and attitude-based emotions depended on whether fans did or did not have strong positive attitudes toward the team.

The results for emotional intensity were also consistent with theory. The intensity of being embarrassed and other standard-based emotions that depend on approval or disapproval were made more intense by perceptions that the team had “not played well,” had “not hustled,” and did not have “a desire to win”—all factors concerned with standards of play. In contrast, disappointment and other event-based emotions were made more intense by perceptions that the game was an important one and that the outcome was unexpected—factors concerned with goals and outcomes. Thus, some emotions reflected disapproval of the team for not trying hard enough, while some others reflected a focus on the outcome of events relevant to an important goal.

Intensity and Goal Importance

In line with the general neglect of emotional intensity as a research topic, the hypothesis that the intensity of emotional experience should vary with the importance of relevant goals and concerns has also received little attention. But since this is a fundamental assumption of a cognitive view, it is a hypothesis worth testing. Does the intensity of emotional experience vary with the importance of underlying goals and concerns? On the negative side, one can readily think of situations that would seem to challenge the hypothesis. Sometimes, for example, people get quite upset over seemingly unimportant occurrences such as spilling a cup of coffee or misplacing

something. Similarly, sports fans react strongly when their team loses, even though the fate of their team is probably peripheral to their real goals in life.

Indeed, in the basketball study, we asked fans about the importance of the teams' success in the context of their general life goals. In that context, how well the team did was generally not very important. However, since many of these same fans indicated that they reacted with great intensity at the game, the importance values of goals must be highly situated. Methodologically, that implies that one may need to specify the context when obtaining goal importance values. Theoretically, it implies that the goal importance hypothesis must be modified so that it concerns the *momentarily* perceived importance (or salience) of a goal.

Sporting events provide an especially good example of the situated nature of goal importance, and viewing sporting events in this way provides an interesting angle on their emotional function. A primary function of all entertainment, including spectator sports, film, theater, and so on, may be to allow one to escape from the unremitting burden of real-world goals and concerns (e.g., that taxes are unpaid, articles are unfinished, etc.). Seeing one's team win or lose can be intense because inside the stadium one focuses primarily on the game, and the goals that are activated are the limited set of goals relevant to the game. Such events, although intense, are relaxing because they allow one to take a vacation in an artificial world with a simplified goal structure, one in which the goals are fully attainable within the event.

The Concept of Emotional Intensity

In addition to the fact that goal importance values are situated, another obstacle to understanding when emotion will be intense concerns the concept of intensity itself. Frijda et al. (1992) propose that one needs to distinguish multiple aspects of emotional intensity. In particular, we argued that the *amplitude* of a reaction is distinct from its *duration*. One might very well get upset in the moment over spilled coffee or over a loss by one's favorite sports team, but such reactions may not last long. In contrast, important events, even when not reacted to extremely in the moment, may be dwelled on for some time. In other words, goal importance may influence the overall emotional impact of a situation through the duration of an emotional reaction, as well as (or instead of) through its momentary amplitude (Sonnemans, 1991). A study by Pfennig, Clore, and Ortony (1991, May; see also Ortony, 1990, August) shows that the more that events are relevant to one's goals, the greater the duration of the emotional reactions that result.

Thanksgiving Study

One obstacle to testing the goal importance hypothesis has been the difficulty of measuring goals. The basic strategy in the Thanksgiving study was to elicit from college students a sample of goals and desires regarding a fixed period of time, in this case the Thanksgiving vacation. This period has the advantage that it involves the potential for emotionally intense experiences as students try to integrate themselves back into their families for the vacation. As a way of getting them to think about the vacation period, subjects were asked to describe in some detail the kinds of things

that were likely to happen over the break. With these probable events in mind, they also listed 15 goals and desires for the period using an elicitation procedure developed by Emmons (1986). Each goal was rated on various attributes, including the difficulty of the goal, the likelihood of achieving the goal, its importance, and so on.

During the Thanksgiving break, respondents recorded five emotional events each day. They described the events briefly and rated the intensity of their reaction and how long the feelings lasted. After the holidays, they rated the relevance of each goal to each emotional event. They also indicated how much they had thought about the event, how long the feelings lasted, and how strongly they still felt about it. The results suggest that goal importance is more likely to affect the duration than the amplitude of emotional reactions. The most powerful predictor of duration was the total goal relevance of an event (the number of goals involved and the degree to which each was relevant). Thus, the more an event is seen to affect specific goals, the more intensely one may react in the sense that it may influence emotional feelings and preoccupation over time. The results suggested that one might want to think of emotional intensity as a function of the total area under the curve (amplitude \times duration) rather than merely of the amplitude of the reaction. It should be noted that recent research by Fredrickson and Kahneman (1993) shows that differences in the duration of an aversive event are given little weight in retrospective views of intensity, but their research concerned the duration of exposure to an aversive stimulus instead of the duration of an emotional reaction to the stimulus.

Cognitive Restructuring

A question of some interest is how the cognitive variables discussed above actually influence the intensity of subjective experience. There are doubtless many possible ways to approach such a question, but, at the cognitive level, the intensity of an experience (emotional or otherwise) may be a direct function of the amount of cognitive restructuring involved. To take a nonemotional example, consider one's reaction to an amazing vista. As one looks out at the vista, the intensity of the experience would presumably be tied to some implicit comparison of that view with something else, such as what one expected, the scene just beforehand, other vistas, and so on. It may be difficult to maintain the feeling of awe or amazement to the extent that one gets used to the scene and comes to have a clear mental model of it, so that the mere sight of the scene no longer restructures anything. When one vacations in the mountains, or in the midst of some other natural wonder, it can be distressing that one adapts to the surrounding beauty so quickly. Looking at photographs or thinking about the experience later can regenerate some of the intensity of the actual experience, even though stimulus vividness is much reduced. That is, the representational dynamism afforded by contrasts between the photographs and the new context may allow some new experience of amazement.

The applicability of the cognitive change hypothesis to the emotions we (Ortony et al., 1988) have classified as goal-based (left branch of the previous figure) is reasonably straightforward. Consider an intense emotional experience, such as grief over the death of a spouse. Assuming the marriage involved a close relationship of

long standing, there might be few aspects of the grieving person's life that would not be changed or for which the mental representation would not be restructured. The experience might be intense to the extent that the person has to accommodate mentally to an endless number of violated assumptions about the other's presence. In general, the intensity of event-based emotions depends on the desirability of the event, which depends on the centrality of relevant goals, and hence on the amount that a change in the goal dislocates the rest of one's network of goals.

It is interesting to consider the experience of suspense from this perspective. What makes suspense an intense experience may be the fact that one alternately entertains first one outcome and then another, each with opposite implications. As one's cognitive model of the situation flip flops in this way, a lot of cognitive restructuring is experienced and the overall experience of intensity increases correspondingly. In a similar vein, discovering that one's spouse has been having an affair of long standing or reinterpreting established family relationships in the course of psychotherapy are peculiarly intense emotional experiences both in magnitude and duration, presumably because so much mental content becomes restructured.

The hypothesis also applies to the emotions we classify as standard-based emotions. The intensity of the shame one feels for one's shameful act, for example, (or the contempt for another person's contemptuous act) might depend on how much the appraisal changes one's view of oneself (or one's view of the other person). For example, one's conception of a priest who does some immoral act would presumably change more than one's conception of a criminal who does the same thing, and one's judgment of blameworthiness and the intensity of moral outrage should be correspondingly greater toward the priest. An application of the same principle can be seen in the heightened potential for embarrassment typical of adolescence. Without a firmly rooted sense of self, the self-image of the adolescent can change rapidly after committing an embarrassing act, an experience to which adults, with more firmly rooted senses of themselves, are less vulnerable.

The cognitive restructuring hypothesis is also relevant to the emotions classified by Ortony et al. (1988) based on reactions to objects on the basis of tastes or attitudes (the right branch of the previous figure). Consider the intensity of affective reactions to humor, music, or drama. The most satisfying examples of these genres are those in which later developments build on earlier ones. The audience is more intensely satisfied, for example, when the punch line to a joke clears up prior ambiguities, when the final movement of a symphony unifies previously distinct themes, and when the last act of a play resolves formerly unresolved problems. Humor is not so satisfying when the humorist fails to build a sufficiently well-developed cognitive structure to be transformed by the punch line. Racial, religious, and other stereotypes may be as prevalent as they are in humor, in part because they provide, without undue effort, ready-made expectations and cognitive structures with which the humorist can work (for a provocative theory of humor, see Wyer & Collins, 1992). In an analogous process, both symphonic and jazz performances are often built around simple melodic themes that stay firmly in memory to serve as the basis for variations. But rhythmic and melodic transformations are only satisfying when a representation of the untransformed theme is cognitively available to be restated and embellished. The amount of change in cognitive structure is not the same thing as the amount of

raw stimulus change available to the senses. In a well-written drama, the introduction of one new fact can change completely one's cognitive construction of the events and people involved. But splicing scenes from a different drama into the middle of a film, for example, although it would constitute a large stimulus change, would not restructure one's representation of the ongoing drama, and hence would not intensify the emotions produced by it.

One attractive feature of this approach is that it handles well the curious contextual-embeddedness of emotions to which I alluded earlier. The fact that fans at a basketball game (or viewers of a dramatic film) find themselves responding with intense emotions, even though the outcome has no real bearing on their important goals, is to be expected from the cognitive reorganization hypothesis. All that is required for emotional intensity is the experience of cognitive reorganization. The potential for such restructuring exists whenever one is sufficiently invested to generate an elaborate model of the situation and to attend fully to it.

Overall magnitude of cognitive reorganization and change appears to offer one way of thinking about the machinery of emotional intensity, a way that is compatible with a cognitive approach emphasizing the appraisal of events, agency, and objects (Ortony et al., 1988). It is not clear whether intensity of feeling is the experience of cognitive reorganization per se or whether it is the experience of physiological arousal triggered by such change. But it seems not unreasonable to view such affective experiences as disappointment and such nonaffective experiences as amazement as experiences of dramatic cognitive restructuring, a process in which the magnitude of cognitive change is the intensity of disappointment or amazement.

Summary

This essay began with the assertion that attention in animate systems is usually driven by externally generated sensory cues, and that emotion commands attention and processing resources in a similar way through internally generated cues. A set of global and local cognitive variables were outlined that are believed to contribute to the intensity of specific emotions. Among the most general factors was the importance of the particular goal or concern on which an emotion is based. To deal with complications in this goal-importance hypothesis, we noted that the importance of goals is context dependent, and that the concept of emotional intensity may need to include the duration as well as the amplitude of an emotional reaction. Finally, the idea was proposed that the ultimate cognitive variable in emotional intensity is the extent to which cognitive restructuring takes place.

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