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A

Appraisal Theory of Emotion

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Synonyms

Cognitive emotion theory; Evaluation theory of emotion; Information processing theory of emotion

Definition

Appraisal theory of emotion proposes that emotions or emotional components are caused and differentiated by an appraisal of the stimulus as mis/matching with goals and expectations, as easy/difficult to control, and as caused by others, themselves or impersonal circumstances.

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Introduction

Appraisal theories (e.g., Arnold 1960; Ellsworth 2013; Frijda 1986; Lazarus 1991; Ortony et al. 1988; Roseman 2013; Scherer 2009) are a species of emotion theory. The basic premise of appraisal theories is that emotions are caused and differentiated by appraisal, a process in which values are determined for a number of appraisal factors such as goal relevance, goal in/congruence, un/expectedness, control, and agency. To situate appraisal theories in the theoretical landscape, the current chapter starts by clarifying how scientific theories often develop, and then applies it to the case of emotion theories and appraisal theories in particular. This should allow a sharper characterization of appraisal theories and help demarcate them from other emotion theories. In addition to the interspecies variety, the current chapter will also consider a few important axes that allow understanding the intra-species variety, the variety within the family of appraisal theories.

Theory development often takes the form of a cycle comprising four steps. The first step is a provisional demarcation or working definition of the explanandum (i.e., the to-be-explained phenomenon). In the second step, an explanation is proposed in which the explanandum is linked to an explanans (i.e., an explaining fact). Explanations come in different types. Common types are structural explanations (in which the components of a phenomenon are specified), causal explanations (in which observable factors are identified as

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the cause of the phenomenon), and mechanistic explanations (in which the processes mediating between the cause and the phenomenon are specified on a lower level of analysis). In the third step, the explanation is verified in empirical research. If the explanation is sufficiently validated, there is often a fourth step in which the proposed explanans eventually becomes part of the scientific definition of the phenomenon. These four steps can also be identified in the development of emotion theories and in appraisal theories in particular. The following sections describe the working definitions, explanations, empirical research programs, and eventually, the scientific definitions that appraisal theories have proposed for emotions.

Step 1: Working Definition of Emotion

All emotion theories set out to explain emotions (explandum), but different theories take different working definitions as their starting point. Some theories set out to explain specific emotions as they figure in natural language, such as anger, fear, sadness, and happiness. Other theories aim to explain certain striking features of emotions, such as their intense, overwhelming, nature, that they have positive or negative valence, and/or their embodied aspects (see more below). The first working definition (in terms of specific emotions) is a definition in divisio format, as it specifies the subsets within the total set of emotions. The second working definition (in terms of features) qualifies as a definition in intensional format, as it specifies necessary and sufficient, or at least typical, conditions for a phenomenon to be included in the provisional set of emotions. Appraisal theories can be divided into two flavors based on what they try to explain (Moors 2014). A first flavor of appraisal theories tries to explain specific emotions; they start from a working definition in divisio format. A second flavor of appraisal theories tries to explain features or components of emotions; they start from a working definition in intensional format.

Step 2: Explanations of Emotion

The types of explanations put forward by emotions theories include structural, causal, and mechanistic ones. Structural explanations specify the components of emotions; causal explanations specify the cause of emotions on a high (preferably observable) level of analysis; and mechanistic explanations specify the mechanism on a lower level of analysis (mental level or brain level) that intervene between the cause and the emotion. In the case of mental mechanisms, some mechanisms specify the content of the input or output representations whereas others specify the operations acting on these representations. Now follows a discussion of the structural, causal, and mechanistic explanations provided by emotion theories and appraisal theories in particular.

Structural Explanation

Regarding the structural explanation of emotion, two classes of theories can be distinguished: theories that are inspired by or try to vindicate folk ideas of emotions – let's call them folk theories – and componential theories. Folk theories equate emotions with emotional experience or feelings; they thus include only one component. Componential emotion theories, in contrast, propose that emotions are better conceived of as episodes in which besides changes in feelings (subjective component), there is also room for changes in information processing (cognitive component), changes in action tendencies (motivational component), changes in physiological responses (somatic component), and changes in overt behavior (motor component). For instance, a loud noise in the hall may prompt an information process in which the noise is evaluated as a threat, and it may induce a tendency to flee, an adrenaline rush, a startled facial expressions, and actual flight behavior. All these changes may be accompanied by feelings, which can but do not have to be labeled as fear. Most contemporary appraisal theories qualify as componential emotion theories.

The explananda of the two flavors of appraisal theories can now further be specified as follows:

First-flavor appraisal theories aim to explain specific emotions, such as anger, fear, and sadness; second-flavor appraisal theories aim to explain specific components of emotions, such as specific action tendencies (e.g., tendencies to flee, fight, and give in), specific somatic response patterns, specific facial expressions, and/or specific feelings.

Causal Explanation

Causal explanations of emotions try to discover regularities between features of the environment and features (or the occurrence) of emotions. Certain evolutionary theories capitalize on discovering fixed regularities between specific (innate) stimuli and specific emotions (e.g., wild animals elicit fear). Appraisal theories, in contrast, emphasize that there are hardly any one-to-one relations between features of stimuli and features of emotions. One stimulus can produce different emotions in different individuals or on different occasions. For instance, a loud noise in the hall may elicit fear in one person, but annoyance or no emotion at all in another person. Turning it around, one emotion can be elicited by different stimuli. For instance, anger can be elicited by a loud noise, an insult, watching moral injustice, a flat bike tire, or hitting one's foot against the bed. Appraisal theories take these observations to suggest that perceptual stimulus information is combined with other types of information, such as the person's goals and expectations, the amount of action options that are available, and the cause of the stimulus. According to appraisal theories, the occurrence and variety in emotions can be explained by the interaction between the stimulus and each of these other types of information. The interaction of the perceptual stimulus information with these other sources of information is captured in so-called appraisal factors. Goal relevance refers to the extent to which a stimulus impacts on goals; goal in/congruence refers to whether the stimulus mis/matches with these goals; un/expectedness refers to whether the stimulus mis/matches with expectations; high/low control refers to whether there are more/less action options available for solving a goal-incongruent situation; and agency refers to whether the cause of the stimulus is the self, another person, or impersonal circumstances.

Some appraisal theories take appraisal factors to be nothing more than descriptions of the deep features of the situation (e.g., Clore and Ortony 2013). These appraisal theories have been labeled *descriptive* appraisal theories. Most appraisal theories, however, go further in that they submit that appraisal is also a literal mechanism, which determines the value of stimuli for the respective appraisal factors. In other words, these theories put forward a mechanistic explanation of emotion with appraisal as the explanans. These appraisal theories have been labeled *process* theories of appraisal (e.g., Scherer 2009, see Moors 2013). They are discussed in the next section.

Mechanistic Explanation

For process theories of appraisal, it makes sense to split the process from stimulus to emotion into two step: one step in which a stimulus is processed by appraisal and another step in which the output of the appraisal process is translated into a specific emotion (in first-flavor appraisal theories) or in specific values of the other emotional components (in second-flavor appraisal theories). For ease of communication, we group these other components under the label of output components. After zooming in on the operations that appraisal theories have proposed for these two steps, the moderating role of person factors on both steps is considered.

Step 1. Regarding the first step, it is worth pointing out that even so-called *process* theories (who take appraisal to be a mental process) have not put any restrictions on the operations that may be involved in appraisal, as long as the output of these operations are representations of values on the proposed appraisal factors (Moors 2013). Many appraisal theorists distinguish between (at least) two types of operations: rule-based computation and the activation of associations (Leventhal and Scherer 1987; Smith and Kirby 2001). Stimuli that are encountered for the first time require rule-based appraisal in which a value is computed for each appraisal factor separately and the values are integrated in an appraisal pattern. Once an association is established in

memory between the stimulus and an appraisal pattern, the pattern can again be activated by the same or similar stimuli. Dual process models typically assume that associative but not rule-based operations can be automatic. Yet, the question whether (or the degree to which) rule-based appraisal can be automatic must be studied in empirical research (Moors 2010). Finally, it is worth mentioning that some appraisal theorists have also studied the brain correlates of appraisal (see review by Brosch and Sander 2013). Sander et al. (2003), for instance, have shown that regions (e.g., the amygdala) that were previously thought to be specific for one basic emotion (fear) are actually specific for one appraisal factor (goal relevance). It is an open question, however, whether appraisal factors are tied to specific neural substrates (and whether we should search for these susbtrates) or whether they are processed by content-independent neural mechanisms.

Step 2. Appraisal theories have not only proposed operations involved in the transition from stimulus to appraisal output but also operations involved in the transition from the output of the appraisal process to specific emotions (in first-flavor theories) or to the values of the other emotional components (in second-flavor theories). Appraisal theories of the first flavor set out to explain specific emotions. They propose that the appraisal pattern resulting from the appraisal process is integrated in a summary appraisal value (called a core relational theme by Lazarus 1991) and that this summary value determines the specific emotion that is at stake. This, in turn, determines the values of the output components. For instance, a pattern consisting of the appraisal values goal relevance, goal incongruence, and low control can be summarized as danger. Danger determines that the emotion at stake is fear, and this determines the tendency to flee, somatic responses preparing for fleeing, actual fleeing, and feelings of fear.

Appraisal theories of the second flavor, by contrast, set out to explain the values of the output components, without linking them to specific emotions. They propose that each appraisal value has a separate influence on the values of the output components and together these values form the emotion (Scherer 2009). Each appraisal output has an influence on the action tendency, which mobilizes somatic responses that prepare the organism for overt action. Aspects of all these components seep into consciousness where their integrated sum makes up the content of the feeling component. In this scenario, the organism at no point has to determine the specific emotion that is at stake; instead, emotions are considered as emergent phenomena. The episode can be labeled by the person undergoing the episode or by an outside observer, but this is not necessary. If the person does label her emotion or elaborates on its meaning, these thoughts also figure into consciousness and in this way, they do also influence the quality of the person's feelings.

Some appraisal theories build in the notions of recurrence and immediate efference (Scherer 2009). Recurrence means that changes in motivational, somatic, motor, and feeling components feed back as input in the appraisal component either directly or indirectly (i.e., via a change in the stimulus). Immediate efference means that the processes in each of the components do not need to be completed before they can produce changes in later components. In this way, the appraisal process can start influencing the output components before it is fully completed. Both notions of recurrence and immediate efference make it clear that the components in emotional episodes do not follow a strict linear sequence.

Influence of person factors on Step 1 and 2. Appraisal theories have started from the observation that there is a variable relation between stimuli and emotions: The same stimulus does not always lead to the same emotion. To explain this variability, appraisal theories have inserted appraisal as a third, mediating factor. Inserting a third factor, however, is not sufficient to explain a variable relation between two other factors. If one stimulus always causes the same appraisal pattern and the same appraisal pattern always causes the same emotion, the stimulus always causes the same emotion. Appraisal theories make the additional assumption that appraisal is not only influenced by the stimulus but also by person factors and that this is responsible for the variable relation between stimuli and emotions

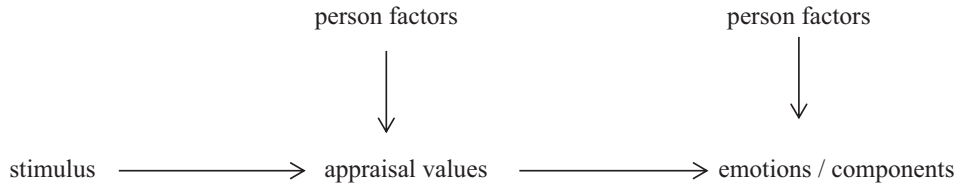
(see Fig. 1). Different individuals may appraise the same stimulus in different ways (e.g., as more or less goal relevant, goal in/congruent, un/expected, controllable, and attributable to others) depending on person factors like goal priorities, expectations, self-efficacy, and attributional style.

In addition to the claim that the relation between stimuli and appraisals is variable because of the influence of person factors, appraisal theories have traditionally made the claim that the relation between appraisals and emotions or components is stable across individuals (irrespective of culture or gender) and hence universal (e.g., Ellsworth 1994; Roseman and Smith 2001). Same appraisal patterns cause same emotions (in Flavor 1 theories) or same patterns of values on the output components (in Flavor 2 theories). In addition, all individuals in all cultures dispose of the same repertoire of appraisal factors and the same repertoire of output components (but see Mesquita and Ellsworth 2001).

On closer consideration and in line with what some authors have argued (Kuppens et al. 2007; Scherer 2009), emotions or components are not only determined by appraisals but also by person factors that do not exert their influence via the appraisal factors (see Fig. 1). For example, people may have different thresholds or propensities for the activation of particular action tendencies independent of the way in which they appraise the situation, as in people with a fiery temper (Frijda, 2009). This should lead to variable relations between appraisals and emotions or components in contrast with the traditional claim. Detailed hypotheses about which aspects of appraisal and output components can be influenced by person factors are described by Scherer and Brosch (2009; see also *Cognition and Emotion*, *23,* 2009). The question arises whether and how these two seemingly contradictory positions (fixed vs. variable relation between appraisal and emotion) can be reconciled. One possibility would be to assume that the influence of appraisal outweighs the influence of person factors. For instance, one could assume that individual differences in propensities for the activation of action tendencies merely add shades to emotions that are primarily determined by appraisal.

Step 3: Empirical Testing of Explanations

Empirical work has focused on evaluating the hypotheses put forward by appraisal theories about links between appraisal patterns and specific emotions and/or specific values of components. Appraisal theories of the first flavor examine hypotheses about causal relations between specific appraisals and specific emotions. For instance, they examine the hypothesis that goal-incongruent stimuli that are difficult to control lead to fear whereas goal-incongruent stimuli that are easy to control lead to anger (Roseman 2013). Appraisal theories of the second flavor, on the other hand, examine hypotheses about causal relations between specific appraisal values and specific values of output components, such as the motivational component (Frijda 1986; Frijda et al. 1989), the somatic component (central and peripheral, Scherer 1993, 2009; Smith 1989), and the motor component (facial expressions, Smith and Ellsworth 1985; Laird and Bresler 1992; vocal expressions, Scherer 2009). For instance, they study the appraisal patterns responsible for the elicitation of the tendency to fight vs. flee without linking these to the emotions of anger



Appraisal Theory of Emotion, Fig. 1 Relations between stimuli, appraisal values, emotions, and person factors

vs. fear, or they examine causal relations between appraisal values (e.g., goal incongruence) and facial action units (e.g., frown). In this way, they circumvent unproductive discussions about which emotions are really studied. Detailed hypotheses about relations between appraisals and values of output components are listed by Scherer (2001; Table 5.3) and Moors and Scherer (2013, Table 2.8). They also review empirical studies that attempt to test some of these hypotheses, and they organize these studies according to the various methods used for the manipulation of appraisals and the measurement of the output components.

Hypotheses about relations between specific appraisals and specific emotions (proposed by first-flavor appraisal theories) are often studied with questionnaires using self-reports of appraisal values and emotion labels. This method has received extensive criticism (Frijda and Zeelenberg 2001; Parkinson 1997). A first criticism concerns the use of correlational studies because these do not yield evidence for causal relations. A second criticism questions the use of emotion labels to measure emotions because (a) an emotion label is not a component of emotion and (b) appraisals and emotion labels are conceptually related, hence observed relations may reflect conceptual relations in people's minds instead of causal or other relations in the world (Frijda and Zeelenberg 2001; Parkinson 1997). A third criticism concerns the use of self-report to assess appraisal values. The appraisal process is supposed to be largely automatic. Even though some appraisal values may pervade into consciousness, they often do so in an integrated form that is difficult to dissect (Scherer 2009) and they tend to be forgotten and replaced by stereotypic scripts about appraisals and emotions (Robinson and Clore 2002).

To alleviate these criticisms, contemporary appraisal researchers have increasingly turned to alternative methods. To accomodate the first and third criticisms, appraisal researchers have started to manipulate appraisal variables in real or simulated environments instead of measuring them (Bossuyt et al. 2014; Smith and Ellsworth 1987; van Reekum et al. 2004). The second criticism has been countered by measuring emotions via components such as action tendencies, somatic responses, and behavior instead of via emotion labels (Aue and Scherer 2008; Bossuyt et al. 2014; Frijda et al. 1989; Scherer and Ellgring 2007; van Reekum et al. 2004). Yet measuring emotions via one component only makes sense if it is assumed that the emotion under study has a unique value for that component. For instance, it only makes sense to measure anger via aggressive behavior if it is assumed that aggression is unique for anger (and does not occur in other emotions). Importantly, this problem does not arise for research aimed at testing hypotheses about relations between appraisal values and values of output components (proposed by second-flavor appraisal theories).

The development of hypotheses and their empirical testing and subsequent adjustment is a work in progress. This enterprise is further complicated by at least two issues. First, appraisal theories have traditionally presented the relation between appraisal values and emotions or output components as following the logic of a hierarchical tree. Yet, some authors (Scherer 2009) have voiced the possibility that appraisal factors interact in such a way that the values of some factors receive different weights depending on the values of other factors. For instance, it is possible that control has a stronger weight when a stimulus is appraised as goal incongruent than when it is appraised as goal congruent. The level of complexity that can be anticipated to result from these interactions makes them a suitable topic for computational modeling. Second, appraisal theories embrace the idea that stimuli are constantly reappraised. This makes it difficult (but perhaps not impossible) to isolate one emotion-generative cycle and to distinguish between appraisals that cause emotions and those that follow or coincide with them.

Another line of empirical research systematically examines the question which appraisal factors can be processed automatically (using behavioral and neuroscientific methods). There is support for the automatic processing of novelty (e.g., Berns et al. 1997) goal relevance (e.g., Gati and Ben-Shakar 1990), intrinsic

valence (e.g., Fazio et al. 1986; Grandjean and Scherer 2008), goal congruence (Moors et al. 2004), control (e.g., Aarts 2007; Moors and De Houwer 2005), and agency/intentionality (Scholl and Tremoulet 2000).

Step 4: Scientific Definition of Emotion

Emotion theories, including appraisal theories, have come up with scientific definitions of emotions based on the explanations that they propose for emotions. One might argue, however, that these definitions are somewhat premature given that the explanations have not received irrefutable empirical evidence and that consensus is not imminent. Regarding the intensional definition of emotion (specifying necessary and sufficient conditions), appraisal theories use their causal explanation of emotions as a criterion to demarcate emotions from other phenonomena. Indeed, they define emotions as collections of components in which the output components are caused by a stimulus that is appraised as relevant for a highly important goal (Frijda 1988; Lararus 1991; Moors 2007; Oatley and Johnson-Laird 1987). This is manifested in an action tendency with control precedence (i.e., that calls for priority in influencing behavior and experience; Frijda 1986, 2007), and/or in a high degree of synchronization among all components (Scherer 2001, 2009).

Regarding the divisio definition of emotions (i.e., the organization of the total set of emotions into subsets), appraisal theories of the first flavor tend to endorse a discrete emotions view, that is, they organize the set of emotions internally into discrete subsets corresponding to specific emotions. Appraisal theories of the second flavor, by contrast, hold a dimensional view. For them, the set of emotions encompasses an infinite number of subsets that can best be organized with the help of dimensions corresponding to appraisal factors: goal relevance, goal in/congruence, un/expectedness, control, and agency.

Conclusion

Appraisal theories were analyzed using the four steps of the scientific cycle for theory development. This allowed identifying the specifics of appraisal theories compared to other theories, and to identify different approaches within the family of appraisal theories. Regarding the working definition of emotion (Step 1), appraisal theories either take specific emotions (Flavor 1) or features of emotions (Flavor 2) as the explanandum. Regarding the explanation of emotion (Step 2), appraisal theories take emotions to be episodes or collections of components (structural explanation). They propose hypotheses about deep features of situations (causal explanation in descriptive theories), which in some theories also correspond to the contents of the representations that form the output of a mental appraisal process (mechanistic explanation in process theories). Operations involved in appraisal process are rule-based and associative. Operations involved in the transition from the appraisal output to the values of the output components include the integration of appraisal values in a summary appraisal value (Flavor 1), or alternatively, the direct and separate influence of each appraisal value on the output components (Flavor 2). It was further argued that both steps in the stimulus-to-emotion/components chain can be influenced by person factors. Regarding the scientific definitions (Step 4) that appraisal theories have proposed for the demarcation of emotions (intensional definition), appraisal theories take emotions to be episodes in which stimuli are appraised as highly goal relevant, leading to action tendencies with control precedence, and a high level of synchronicity among components. Concerning the internal organization of the set of emotions (divisio definition), appraisal theories either adopt a discrete (Flavor 1) or dimensional view (Flavor 2), consistent with the working definitions from which they started.

Cross-References

- Anger
- Cognitive Theory of Emotion
- Facial Expressions and Emotion
- Fear
- Happiness
- Information-Processing Models of Emotion
- Sadness

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