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Agnes Moors

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fanned their righteous indignation, and others' confirmation also helped to redeem their self-esteem, and justified their aggression.

The matching Japanese scenario read very differently: Many Japanese participants wondered what they themselves could have done to prevent the offending situation, or how they had given reason for it; they tried to understand the situation from the point of view of the offender, and they typically had not shared their feelings with other people. Therefore, they did not gain social approval for their anger, and they ended up relativizing how much they had been harmed. Their actions differed as well: The most common response was "doing nothing."

Data like these are complex, in part because they force us to abandon the sort of essentialism on which our science is based (Barrett, 2013). As a consequence, psychologists are not fond of these data, as I have found out the hard way (Mesquita et al., 2007 [unpublished manuscript]). Reviewers have wanted to know if the American and the Japanese appraisal and action readiness modes respectively, are attributes of "the same thing": Do Americans and Japanese experience the same anger? The question is the remnant of a deep-seated belief in essentialism, the belief that there is a *thing* deep down—the emotion of anger—and that we are looking for its features. Therefore, if we find different features in different cultures, the question becomes: did they really pertain to the same thing?

Our sociodynamic model of emotions (Mesquita & Boiger, 2014) suggests that emotions are not essences deep down, but rather emerge from interactions with the social world. Different from Agnes Moors' suggestion (2014, p. 304), our model neither "eschews talk of mental processes" nor "de-emphasizes the role of appraisal." Rather it places mental processes, appraisal included, in the context of the social interactions in which they occur. Placing emotions in their social context is like describing the air and the soil of a plant: It is not *merely* a different level of description, but rather it adds information that renders the quality of the emotion understandable and predictable. It makes it possible to not just "taste" emotions in different cultures, but to understand just how different tastes were achieved in the course of individuals' interactions with their social worlds.

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Author Reply: Toward a Multilevel Mechanistic Explanation of Complex Regularities Between Environment and Emotional Components

Agnes Moors

Department of Psychology, Ghent University, Belgium

Swiss Center for Affective Sciences, University of Geneva, Switzerland

Abstract

In reply to the commentaries of Clay-Warner (2014), Gendolla (2014), Nesse (2014), Shweder (2014), and Zachar (2014), I repeat the essential features of appraisal theories of the second flavor: They take emotional components (and not specific emotions) as the phenomenon to be explained, and they strive for a multilevel mechanistic explanation that leaves room for complex and dynamical processes or mechanisms. Every mechanistic explanation starts with an accurate description of regularities between inputs and outputs. Regularities do not preclude context-dependent variety, because there is no limit to the number of input factors that can influence the output, and back.

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Corresponding author: Agnes Moors, Department of Psychology, Ghent University, Henri Dunantlaan 2, Ghent, B-9000, Belgium. *Email*: agnes.moors@ugent.be

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Keywords
appraisal, mechanistic, regularities, situated

Theories can be situated on a continuum from broad to narrow. As noted by Nesse (2014), none of the theories presented in this special section is situated on the extreme broad end because none of them seeks to answer all possible questions. Still, each of the theories comprises (a) a broad framework with working hypotheses that are provisionally accepted, and (b) a more narrow body of concrete falsifiable hypotheses. I agree with Gendolla (2014) and Shweder (2014) that there is room for improvement on the narrow side, but I do not think we should get rid of the broad frameworks that spell out the background assumptions. It is not by keeping our assumptions implicit that they will disappear or stop influencing our research.

As Zachar (2014) argues, differences between emotion theories can sometimes be clarified by positioning them into larger philosophical debates. Let me be more explicit about some of my philosophical commitments, and in passing, try to correct a few tenacious misunderstandings about appraisal theories, again.

One issue is essentialism. Appraisal theories of the second flavor are not committed to, but neither are they incompatible with, some form of essentialism (e.g., the idea that *some* objects have some essential properties; Robertson & Atkins, 2013). The point is that they are not essentialist about specific emotions. They do not put forward an essence of anger and fear. This is exactly why they propose to shift the to-be-explained phenomenon from specific emotions (e.g., anger, fear) to emotional components (e.g., the tendency to fight and flee; Ortony & Turner, 1990). They may or may not be essentialist about emotional components or other things.

Another issue is type of explanation. Appraisal theorists of the second flavor seek a mechanistic explanation for the emotional components of action tendencies, expressive behavior, physiological responses, and feelings (as was noted by Nesse, 2014). Any mechanistic approach is multilevel. On a high level, appraisal theorists try to map out the regularities between environmental conditions and emotional components. In addition, they assume that an information process called appraisal is part of the transition from environment to the emotional components. On a lower level, the appraisal process or mechanism can be decomposed further into subprocesses. In addition to identifying the subprocesses, a mechanistic explanation must specify how they are organised or interact so that they constitute the appraisal process as a whole and influence the other emotional components. Taking a mechanistic approach does not commit one to embracing the existence of simple, linear mechanisms, but is entirely compatible with complex and dynamic ones (Bechtel, 2008; Scherer, 2009). Decomposition can be reiterated across ever lower levels until the subprocesses correspond to physical brain processes.

Research on the neural underpinnings of appraisal gains territory (cf. Brosch & Sander, 2013), but most appraisal research to date has concentrated on the high level, describing the regularities between environmental factors and emotional components. Appraisal theories have proposed many narrow hypotheses of the kind requested by Gendolla (2014) and Shweder (2014). The emotional intensity theory (Brehm, 1999) discussed by Gendolla proposes a list of factors, of which some overlap with appraisal factors (e.g., "as long as success is possible" overlaps with the appraisal factor "control") and others do not (e.g., "the difficulty to act").

The reason why Gendolla (2014) does not appreciate this overlap in agenda is that he exclusively targets the first flavor of appraisal theories and ignores the second flavor. This is apparent when he writes that it is unclear if emotions or the appraisals themselves influence behavior (p. 317). Second flavor appraisal theories, however, are very clear that emotions do *not* mediate between appraisals and behavior; the only thing that comes between appraisals and behavior are action tendencies and bodily responses preparing for behavior. Emotion is nothing but the umbrella term covering all components. Gendolla (2014, p. 317) also writes that appraisal theories claim that fear motivates avoidance of the object one is afraid of, but that this only specifies fear as the input and avoidance as the output, and that the conditions under which an organism avoids remain unclear. Again, second-flavor appraisal theories do *not* take fear as the input and avoidance as the output. They consider relations between appraisals and action tendencies or actions without linking any of these to specific emotions such as fear. In this way, they do focus on the conditions under which avoidance occurs. They examine, for example, whether avoidance is more likely under conditions of goal incongruence and low control.

The list of conditions or factors studied is open to elaboration, or as Ellsworth (2013) put it, current "appraisal theories can get us to the right branch of the emotional tree, but not to the right twig" (p. 127). Moreover, Clay-Warner (2014) correctly notes that research should extend its focus beyond appraisal factors to factors whose influence is mediated by appraisal factors and factors that moderate the influence of appraisal factors. Thus, appraisal theories' commitment to the existence of regularities is not in opposition to the idea that emotional components are situated (i.e., vary according to the context) because there is no limit to the number of factors that may influence the components or to the complexity of the relations among the factors. Unraveling these complexities is precisely what appraisal researchers try to do (e.g., Bossuyt, Moors, & De Houwer, in press).

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Author Reply: Incompatible Conclusions or Different Levels of Analysis?

Jessica L. Tracy
Department of Psychology, University of British Columbia, Canada

Abstract

This exchange provides an array of perspectives on the questions of what emotions are, how they function, and how they should be studied. While my approach is evolutionary and functionalist—viewing each distinct emotion as having evolved to serve a particular function (though not necessarily one entirely unique to that emotion)—this approach is not the only one needed to fully understand emotions. Furthermore, several of the accounts offered here might be effectively synthesized by accepting the importance of *both* universal evolutionary factors and sociocultural particulars in shaping emotion experiences.

Keywords
distinct emotions, evolution, functionalist approach

> What is the payoff for connecting the social and cultural levels of analysis to the psychological and biological ones? It is the thrill of discoveries that could never be made within the boundaries of a single discipline. (Pinker, 2002, p. 72)

> Researchers are learning a great deal about the biology of fear— and the psychology of fear— from studies of the amygdala, but this does not mean that fear is activity in the amygdala. That is simply not the meaning of the term. "Fear" is not reducible to biology. (Miller & Keller, 2000, p. 212)

These passages encapsulate some of the core issues that have arisen in this thought-provoking discussion. Superficially, there is a surprising amount of disagreement on the seemingly simple question of what an emotion is. Several views may in fact be incompatible; Barrett's (2014) definition of emotions as distinct only in the minds of individuals who conceive them is difficult to reconcile with the evolutionary model I espoused (Tracy, 2014), in which each distinct emotion evolved in response to distinct selection pressures. Others, however, are more convergent; the model I discussed fits well with "first flavor" appraisal models highlighted by Moors (2014). In many cases, the core disagreement lies not in the question of what emotions are, but rather in the *level of analysis* used to answer it.

Like Mesquita and Boiger (2014) and Shweder (2014) and Clay-Warner (2014), I take seriously that emotions are contextually situated, and that much of their function pertains to the regulation of behavior within those contexts. As Mesquita and Boiger (2014) note, "shame is not generally dysfunctional, but only in cultures that highlight individual success and self-sufficiency" (p. 299). Indeed, this may explain an anomaly in the research mentioned in my target article (Tracy, 2014), in which individuals from numerous cultures, as well as the congenitally blind, displayed shame following public failure (Tracy & Matsumoto, 2008). The one group of participants who failed to reliably show this response were those from Western, individualistic cultures. These individuals apparently inhibited shame because of differing cultural norms about its social value. In related work in North America, we have found that recovering alcoholics' shame about past drinking predicts worsened health and relapse (Randles & Tracy, 2013). The present discussion raises the question: Would we find a similar problematic effect in cultures that consider shame necessary for social harmony?

These kinds of questions are currently being addressed both by researchers who adopt a sociocultural approach and those who adopt a more evolutionary approach, which can and should incorporate cultural differences. This emphasis on culture within evolutionary-based emotion research is not new; it dates back at least to Ekman (1971), who labeled his early model of emotions a "neuro-cultural" theory. Nonetheless, the recognition of major cultural variation in emotional processes does not require abandoning a basic-level, aggregation-oriented approach, which is necessary to explain the many commonali-

Corresponding author: Jessica L. Tracy, Department of Psychology, University of British Columbia, 2136 West Mall, Vancouver, BC V6T 1Z4, Canada. *Email*: jltracy@psych.ubc.ca

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