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Publisher: Routledge

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Cognition & Emotion

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/pcem20>

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Version of record first published: 07 Jan 2008.

To cite this article: P. N. Johnson-laird & Keith Oatley (1988): Are there only two primitive emotions? A reply to frijda, *Cognition & Emotion*, 2:2, 89-93

To link to this article: <http://dx.doi.org/10.1080/02699938808408065>

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Are there only Two Primitive Emotions? A Reply to Frijda

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We have argued that human emotions have their evolutionary origin in the lives of social mammals (Oatley & Johnson-Laird, 1987). They are a mechanism for guiding behaviour in a way that is more flexible than fixed action patterns on the one hand, and less time-consuming than inference on the other hand. They can rapidly predispose an animal—indeed a society of animals—towards certain general classes of behaviour. The subset of emotions that we take to be basic depend on innately determined internal signals that, like the signals of bodily states such as thirst, have no internal propositional structure but that act to set an individual into a characteristic mode. Emotional modes are created by cognitive evaluations and prepare the individual to behave in certain ways—some of which can communicate the emotion to other members of the society by way of a corresponding external signal. Granted these assumptions, the basic emotions should lead to actions that concern the important individuals and events of the animal's life. This ontology, we argue (see Johnson-Laird, 1988) demarcates the small number of innately determined basic emotions, which we label as happiness, sadness, anger, fear, and disgust. More complex human emotions, of which there appear to be an indefinite number, derive from the cognitive evaluations that result in basic emotions, not from mixtures of basic emotions. This theory is consistent with the intuition that certain emotions can be analysed in terms of others. Thus, for instance, remorse is a form of sadness—a form that is occasioned

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by the thought that one's earlier actions were morally wrong. Whereas sadness is not in general a form of remorse. Once it is granted that there are such asymmetric relations, then a set of basic emotions is almost bound to emerge—those that cannot be reduced any further.

Frijda (1987) has welcomed certain aspects of our theory, but challenged others. In particular, he objects to the postulation of five basic emotion modes. He writes (p. 52): "The notion of five or more irreducible qualia is an unsatisfactory one". He goes on to argue that it is *ad hoc*, conflicts with certain introspective evidence, and "with the massive evidence for an elementary distinction between pleasant and unpleasant experiences". For Frijda there are only two basic feelings: pleasure and pain. This view has been defended by a number of other authorities from Locke (1690) onwards. It is, as Frijda says, elegant, and indeed it may even be correct. But despite its initial plausibility, the arguments that Frijda advances in its favour are unconvincing, as we shall now attempt to show.

His claim that the five basic emotions are *ad hoc* rests principally, we believe, on our failure to spell out their derivation from the ontology of social mammals. However, the facts of life are relatively simple (cf. also Plutchik, 1980). Reproduction depends on social relations: There are potential mates and potential rivals, and much of the organisation of society hinges on a hierarchy of power and status amongst rivals. There may be a need for territory in which to conceive and to raise offspring, and this territory may have to be defended against competitors; and offspring need nurturing until they can fend for themselves. Finally, there may be co-operation in hunting for prey and in defending against predators. These relations are also evident in the lives of human beings, and they suggest the following set of evolutionarily basic emotions:

Happiness, which occurs in making and maintaining successful attachments, but which may have distinct forms depending on whether the attachment is parental, sexual, or co-operation with a peer.

Sadness as a result of separation from an attached individual.

Anger as a precursor to aggression, which may have distinct forms depending on whether it is directed towards rivals, competitors for territory, predators or prey.

Fear as a precursor to submission to dominant rivals, or to flight from predators: again these categories may call for distinct forms.

Disgust as a precursor to rejection of objectionable individuals.

Of course human emotions may also occur as a result of cognitive evaluations of physical states of affairs in relation to goals, such as a dangerous situation or an obnoxious entity. Our claim is that the origin of emotions is to be found in the social life of simpler mammals.

The existence of five or more basic emotions clashes, Frijda argues, with certain introspective evidence (1987, p. 52): "Analytic introspection research, as conducted around the turn of the century, could find the elementary qualities of pleasure and pain, and no more". The trouble is that this research settled nothing; it could not even resolve the "imageless-thought" controversy. By way of more recent support, Frijda cites the findings of Diener and Iran-Nejad (1986). Their subjects reported that they did not simultaneously experience both intense positive and intense negative moods, but that they did experience several affects of the same valency simultaneously. Unfortunately, the terms that denoted different affects of the same valency were often variants on the same basic emotion, e.g. happy, joyful, pleased. Moreover, even if people can experience several emotions simultaneously—and retrospective reports can hardly be decisive on this matter, it does not follow that there must be some common basic emotion underlying all of them. The question of basic emotions therefore seems unlikely to be settled by appeal to introspections.

By far the most plausible case for just two basic feelings is Frijda's argument that pleasant emotions resemble one another more than they resemble unpleasant emotions, and vice versa. But does it follow that because emotions can be grouped into two classes—pleasant and unpleasant—that there are just two basic emotions? Perhaps, not. Consider, for example, an argument that might be made about the chemical elements. Someone who is sceptical about the periodic table might argue that because the alleged elements can be grouped into two classes: those that react with other substances and those that are inert, it follows that there are only two basic chemical elements. We believe that Frijda is in danger of making the analogous argument about basic emotions. This possibility is reinforced by another consideration. Many bodily sensations—from a caress to a toothache—can also be classified as pleasant or unpleasant. Hence, to push Frijda's argument one stage further, one could argue that it is a mistake to distinguish between bodily sensations and emotions: there is just one underlying distinction: pleasure versus pain, which applies to both. In short, the pleasant–unpleasant distinction applies to emotions and to much else besides, and so it cannot be used as the foundation for the basic emotions (cf. the remarks of Clore, Ortony, & Foss, 1987, p. 752, on the question of valency).

Suppose that there were just two basic feelings: pleasure and pain. How would a theorist account for the difference between the phenomenological experience of anger and sadness, which would presumably both be species of pain? Unlike a complex emotion such as remorse, one can feel angry (or sad) without knowing the reason for one's feeling. What, then, could be the additional phenomenological components that distinguish anger and sadness? We do not believe that there are any conscious components, X

and Y, such that when X is experienced with pain, one feels anger, and that when Y is experienced with pain, one feels sadness. Certainly, such conscious components could not be cognitive, because these emotions can be experienced without any accompanying conscious cognitions. If the emotions are distinguished by unconscious cognitions, then what is it that emerges into consciousness as components X and Y to distinguish them phenomenologically? It seems that the components would have to be feelings other than pain itself, and thus place the theory in danger of postulating more than two basic feelings. The only way that we can see out of this impasse is to revert to James' (1890) theory: The emotion depends on the perception of an incipient bodily response. The objections to this theory are too well-known to require elaboration here.

Frijda writes that pleasure and pain are the signals contingent upon match and mismatch between goals and events or expectations. We believe, with Frijda, that such matches and mismatches are an essential step in the generation of emotions, but that emotions themselves are modes into which mental processors enter in order to mediate physiological responses, actions, and subjective experiences. Frijda claims that emotions are psychological events that have a complex causal structure that begins with an event and that passes by way of various cognitive processes to an action. Once again, we agree that complex causal sequences of this sort do occur. According to our analysis, however, these sequences consist in the cognitive precursors to an emotion, the emotion itself, and the concomitants and consequences of the emotion. Frijda appears to classify the whole sequence as an emotion. In our view, this classification does violence both to common parlance and to the underlying facts. Finally, we should emphasise that despite these differences, the most obvious feature of Frijda's theory and ours is their resemblance and, in particular, their emphasis on the adaptive evolution of emotions.

Manuscript received 6 November 1987

Revised manuscript received 9 December 1987

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