

What Scientists Who Study Emotion Agree About

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Abstract

In recent years, the field of emotion has grown enormously—recently, nearly 250 scientists were identified who are studying emotion. In this article, I report a survey of the field, which revealed high agreement about the evidence regarding the nature of emotion, supporting some of both Darwin’s and Wundt’s 19th century proposals. Topics where disagreements remain were also exposed.

Keywords

emotion survey, universality, basic emotions, facial expression

In considering how emotions might be distinguished one from another, two approaches were proposed in the 19th century. Darwin (1872/1998) took for granted that emotions are *modular* (or discrete) and used terms such as anger, fear, disgust, and so forth to specify separate modules. Allport (1924), Ekman and Friesen (1969), Izard (1971), Tomkins (1962), and Woodworth (1938) all utilized very similar approaches to organizing emotions and posited many of the same modules.

Wundt (1896) proposed differentiating emotions via the *dimensions* of pleasant–unpleasant and low–high intensity. Plutchik (1962), Russell and Fernandez-Dols (1997), and Schlosberg (1954) all advocated similar approaches. Wundt also described a modular organization of emotions, advocating the combination of both a dimensional and modular approach. For example, the anger module differs from the fear module, but anger varies in how unpleasant it feels and in its strength.

Whereas Plutchik set out to describe what emotions are and not just how language is used to represent them, Schlosberg’s focus was on how to best represent the information signaled by facial expressions. James A. Russell (personal communication, January 25, 2015) believes that his “dimensions are useful descriptors of the meaning of words and parts of emotions themselves”.

Fifty years ago, only a handful of scientists pursued the study of emotion, but in recent years, experiments in this field have grown enormously. Many of these experiments have focused on facial expression, but an increasing number have examined the physiology of emotion

and other issues as well. Recent years have also seen the rise of respected scientific journals devoted to emotion, such as *Emotion*, and anthologies (Evans & Cruse, 2004; Solomon, 2003) presenting the diverse views of philosophers, sociologists, psychologists, and neuroscientists.

The purpose of the survey was to evaluate the status of this field of research today. Were disagreements revealed in 1994 (albeit using different methods) resolved by the evidence obtained since then? What topics remain unsettled? The survey focused on those scientists using quantitative methods to study emotion.

The participants in this email survey were identified by multiple criteria: (a) They had published five or more times in the past 8 years within or across the following scientific journals: *Emotion*, *Journal of Experimental Psychology: General*, *Psychological Science*, *Proceedings of the National Academy of Sciences*, *Psychological Review*, *Psychological Bulletin*, *Journal of Neuroscience*, *Neuron*, *Nature*, *Nature Reviews Neuroscience*, or *Science*; (b) they were on the editorial board or reviewed articles for the journal *Emotion*; (c) they had contributed to the first edition of the *Nature of Emotion*, edited by P. Ekman and R. A. Davidson (21 of the original 24 contributors were still alive); or (d) they were invited by R. A. Davidson and associates to contribute to a second edition of the *Nature of Emotion*.

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A reviewer of this report raised the possibility that the selection criteria might have skewed the sample toward older, more established scientists. The age distribution was examined and found to be normal, with as many participants between 30 and 40 as there were over 60. There were no significant differences in the answers to the survey as a function of age.

To guard against unwitting substantive bias in the selection process, the author of this report, who is an early and well-known contributor to emotion research and has used a modular approach in studies of expression and physiology cross culturally, enlisted the help of a well-known scientific critic of the author's findings and theory. James A. Russell verified that the selection process was free from bias, except for excluding those not using quantitative methods. Russell also vetted the survey questions and contributed one of the questions included in the survey (Question 2 in the Appendix).

The survey was emailed to 248 scientists in mid-June of 2014. The cover letter explained how the participants were selected and the steps taken to guard against bias in participant selection and questions asked. Participants were told that the survey had been kept brief to encourage their participation—only six questions plus a possible nine follow-up questions. The responses offered were closed-ended. A follow-up reminder was sent 2 weeks after the initial email. There was a moderately high response rate of 60%.

The existence of “compelling evidence for universals in any aspect of emotion” was endorsed by 88% of the respondents. The evidence supporting universal signals (face or voice) was endorsed by 80%. There was less agreement about whether there is compelling evidence for universals in the events that trigger an emotion (66%), physiology (51%), or appraisal mechanisms (44%). Thus, Darwin's claim in 1872 and the more recent work of Ekman and Friesen (1969) and Izard (1971) regarding the universality of some facial expressions were supported.

In response to the question “which of the following best captures your orientation toward emotion in your research?”, 49% chose “discrete emotions (anger, fear, etc.) combining both biological and social influences,” 11% chose “emotions as constructed, either socially or psychologically to fit current conditions,” and 30% indicated they used both approaches.

Because there has been disagreement in the past literature about the meaning of the phrase “basic emotions,” the question “what is most basic about emotions” was asked. In responses, 18% chose dimensions such as approach–avoidance, positive–negative, or a model including two dimensions; 16% chose “discrete packages of emotional responses,” whereas the majority (55%) reported both views to be most basic about emotions, the stance taken by Wundt (1896).

All those who chose both approaches, in addition to those who had chosen only the discrete choice (a total of 74% of those surveyed), were asked which emotion labels (out of a list of 18) should be considered to have been empirically established. There was high agreement about five emotions (all of which were described by both Darwin and Wundt): anger (91%), fear (90%), disgust (86%), sadness (80%), and happiness (76%). Shame, surprise, and embarrassment were endorsed by 40%–50%. Other emotions, currently under study by various investigators drew substantially less support: guilt (37%), contempt (34%), love (32%), awe (31%), pain (28%), envy (28%), compassion (20%), pride (9%), and gratitude (6%).

Finally, there was high agreement about whether “specific moods may be related to specific emotions(s) such as anger to irritability” (88%), whether “specific personality traits are related in some way to specific emotions, such as fear to shyness” (82%), and whether specific emotional disorders are related in some way to specific emotions, such as disgust to anorexia (75%).

When only those who responded to some but not all of the questions, or just those who only met the frequent publications criterion, were examined, the findings did not differ by more than 2 or 3 percentage points. None of the demographic responses—country, discipline, year Ph.D. was achieved, age, or sex—were related to the survey question answers. A comparison of a random sample of 30 people who responded to the survey with a random sample of 30 nonrespondents revealed no differences in any of the demographic variables.

Comparing these findings to an investigation of the views of the 24 most active emotion researchers 20 years ago (Ekman & Davidson, 1994) reveals much more agreement now than then. There was no agreement then about universals or about what emotions should be considered. The agreement now about the evidence for universals in emotional signals and the evidence for five emotions is robust. There was no agreement 20 years ago about whether moods differ from emotion. Today, most emotion scientists agree that moods are related to emotions, but this survey did not explore how. In a similar fashion, most scientists see personality and psychopathology related to each emotion, but the nature of that relationship was not explored in this survey. Twenty years of research has been productive, but as this short survey revealed, there are still many aspects of emotion that deserve further scrutiny to reduce the disagreements that still persist. Perhaps most important, the question remains: Will compelling evidence for more than just five emotions be forthcoming in the coming decades, or is that all that can be empirically established?

This survey should help to eliminate the confusion in the popular press about whether there is any agreement at all about the nature of emotion. Disagreements, which still

persist about every question asked, have been misinterpreted (for example, *The Atlantic*, February 2015) as a lack of agreement about anything (Beck, 2015). This survey has found broad areas of agreement about the evidence for some of the major issues about the nature of emotion. Also, most emotion scientists find both a modular and a dimensional view of emotions useful in their research, as suggested by Wundt more than 100 years ago.

Because of the need to keep the survey short in order to achieve a high response rate, questions did not address many current active areas of research. It should also be noted that those who study emotion using a qualitative approach may hold very different views about the nature of emotion than what was found for those using a quantitative approach.

Appendix

Emotion Survey Emailed to 248 Scientists

1. Which of the following best captures your orientation toward emotion in your research?
 - A. Discrete emotions (anger, fear, etc.) combining both biological and social influences
 - B. Emotions as constructed, either socially or psychologically to fit current conditions
 - C. Both A and B
 - D. other _____
2. What is most basic about emotions?
 - A. Discrete packages of emotional responses? *If the person clicks on A, then the follow-up question appears*
Check one or more of the discrete emotions you consider or think should be considered:
 - Anger
 - Awe
 - Compassion
 - Contempt
 - Disgust
 - Embarrassment
 - Envy
 - Fear
 - Gratitude
 - Guilt
 - Happiness
 - Hatred
 - Love
 - Shame
 - Surprise
 - B. Dimensions (circumplex, approach-avoidance, positive-negative)?
If the person check's B then the follow-up appears:
Check one or more of the dimensions listed below:

Approach-avoidance

Circumplex model

Positive-negative

C. I FIND both choices A and B useful yes no

D. You have another answer to the question about what is most basic about basic emotions, please provide it here. _____

3. Is there compelling evidence for universals in any aspect of emotion? YES NO

If they answered yes then the following appears

Is there evidence for any universals (check ALL that apply)?

Signals (face and/or voice)

Appraisal Mechanisms

Events that trigger an emotion

Physiological changes which characterize emotion

4. Do you use the terms emotions and moods interchangeably, seeing no difference between the two? YES NO

If your answer was NO, Do you believe specific moods may be related to specific emotion(s) such as anger to irritability?

YES NO

5. Do you use the terms Personality traits and emotions interchangeably, seeing no difference between the two? YES NO

If your answer was NO, Do you believe specific personality traits are related in some way to specific emotion(s), such as fear to shyness? YES NO

6. Do you use the terms Emotional Disorders and emotions interchangeable, seeing no difference between the two? YES NO

If your answer was NO, do you believe specific emotional disorders are related in some way to specific emotions, such as disgust to anorexia? YES NO

Thank you very much for your participation. Unless you tell us differently we will send you the results.

We will keep your email address in a file to receive the findings (if you indicated you want to receive them), but we will disconnect your name from your answers. You can enable more interesting results from this survey if you will tell us:

Your discipline or sub discipline _____

The year you received your PhD _____

Your Age _____

Your Sex _____

The country you reside in _____

Author Note

Paul Ekman is professor emeritus at the University of California, San Francisco and President of the Paul Ekman Group, LLC.

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References

- Allport, F. (1924). *Social psychology*. Boston, MA: Houghton Mifflin.
- Beck, J. (2015, February 24). Hard feelings: Science's struggle to define emotions. *The Atlantic*. Available from <http://www.theatlantic.com>
- Darwin, C. (1998). *The expression of the emotions in man and animals* (3rd ed.). London, England: John Murray. (Original work published 1872)
- Ekman, P., & Davidson, R. A. (Eds.). (1994). *The nature of emotion*. New York, NY: Oxford University Press.
- Ekman, P., & Friesen, W. V. (1969). The repertoire of nonverbal behavior: Categories, origins, usage and coding. *Semiotica*, *1*, 49–98.
- Evans, D., & Cruse, P. (Eds.). (2004). *Emotion, evolution and rationality*. New York, NY: Oxford University Press.
- Izard, C. E. (1971). *The face of emotion*. New York, NY: Appleton-Century-Crofts.
- Plutchik, R. (1962). *The emotions: Facts, theories, and a new model*. New York, NY: Random House.
- Russell, J. A., & Fernandez-Dols, J. M. (Eds.). (1997). *The psychology of facial expression*. New York, NY: Cambridge University Press.
- Schlossberg, H. (1954). Three dimensions of emotion. *Psychological Review*, *61*, 81–88.
- Soloman, R. C. (Ed.). (2003). *What is an emotion? Classic and contemporary readings*. New York, NY: Oxford University Press.
- Tomkins, S. S. (1962). *Affect, Imagery, Consciousness: Vol. 1. The positive affects*. New York, NY: Springer.
- Woodworth, R. S. (1938). *Experimental psychology*. New York, NY: Henry Holt.
- Wundt, W. (1896). Emotions. In *Grundriss der Psychologie*, *13*. Leipzig, Germany: Engelmann.