

Universality Reconsidered: Diversity in Making Meaning of Facial Expressions

Maria Gendron¹, Carlos Crivelli², and Lisa Feldman Barrett¹

¹Department of Psychology, Northeastern University; and ²School of Applied Social Sciences, De Montfort University

Current Directions in Psychological Science
2018, Vol. 27(4) 211–219

© The Author(s) 2018



Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/0963721417746794
www.psychologicalscience.org/CDPS



Abstract

It has long been claimed that certain facial movements are universally perceived as emotional expressions. The critical tests of this universality thesis were conducted between 1969 and 1975 in small-scale societies in the Pacific using confirmation-based research methods. New studies conducted since 2008 have examined a wider sample of small-scale societies, including on the African and South American continents. They used more discovery-based research methods, providing an important opportunity for reevaluating the universality thesis. These new studies reveal diversity, rather than uniformity, in how perceivers make sense of facial movements, calling the universality thesis into doubt. Instead, they support a perceiver-constructed account of emotion perception that is consistent with the broader literature on perception.

Keywords

emotion, facial expression, culture, diversity, universality

That certain configurations of facial movements are universally perceived as expressing particular emotions (e.g., anger, disgust, fear, happiness, sadness, and surprise) is assumed to be one of psychology's most basic "facts." This view, which we refer to as the *universality thesis* (after Nelson & Russell, 2013), is part of psychology's standard undergraduate curriculum and guides research within psychology and related disciplines, such as neuroscience, computer science, and engineering. The strongest evidence supporting the universality thesis comes from early reports published between 1969 and 1975 sampling participants from small-scale societies in the Pacific (see Fig. 1a).¹ These samples provided an opportunity for a critical test of universality: Participants typically had limited exposure to Western cultural practices and norms, including media, thereby minimizing alternative explanations for any cross-cultural consistencies that were observed (Norenzayan & Heine, 2005). No studies conducted in small-scale societies were published from 1976 to 2008. Since 2008, five additional small-scale societies were studied, again testing the universality thesis for facial expressions (see Fig. 1b). These new studies outnumber the old and included a greater diversity of research methods, sampled a greater diversity of social and

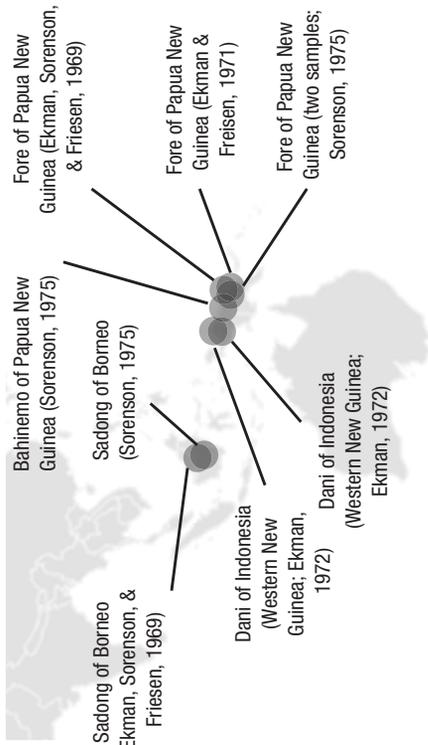
ecological contexts, and were conducted by multiple research teams; in addition, the researchers behind these studies complied with newer standards for transparency and scientific rigor in reporting methods and data analysis.

In this article, we discuss how one of these innovations—increased diversity in research methods—provides new insights into the nature of emotion perception in small-scale societies. We propose that these new data fit with a perceiver-constructed view of emotion perception that is consistent with research on perception more generally: People are active perceivers who categorize facial movements using culturally learned emotion concepts (Barrett, 2017; Barrett, Lindquist, & Gendron, 2007). Affect concepts (e.g., for pleasure-displeasure) may be similarly used to categorize facial movements across cultures, whereas emotion concepts (e.g., for fear) may not be. Furthermore, people may not always infer a mental cause of facial movements. Alternative ways of conceptualizing facial movements as situated

Corresponding Author:

Maria Gendron, Yale University, Department of Psychology, Box 208205, 2 Hillhouse Ave., New Haven, CT 06520-8205
E-mail: maria.gendron@yale.edu

a



b

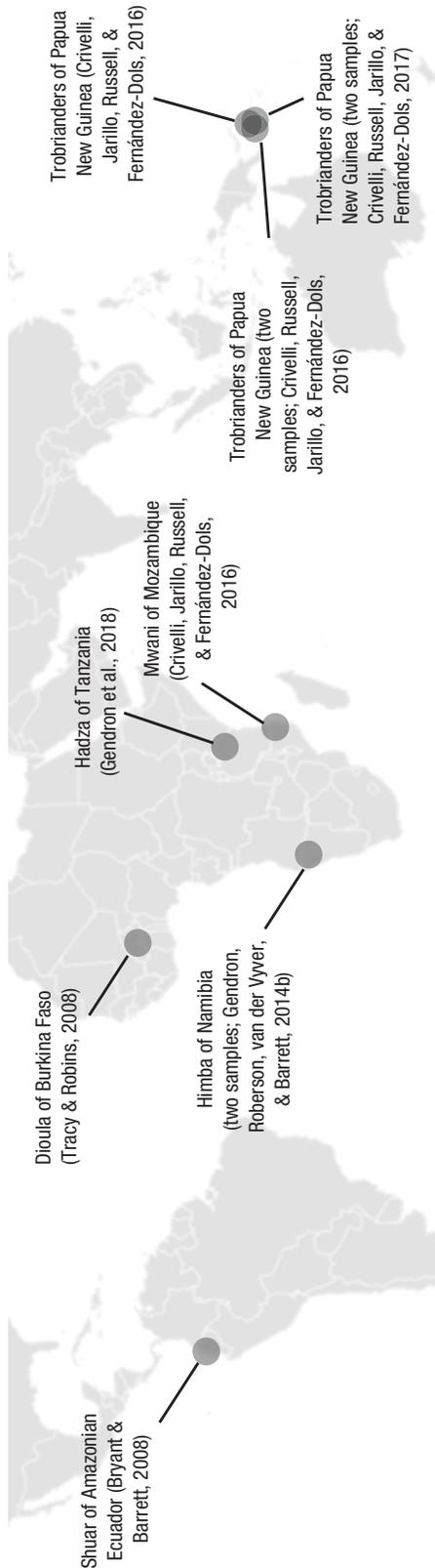


Fig. 1. Maps showing the locations of studies that tested the universality thesis for facial movements in small-scale societies, separately for studies conducted (a) between 1969 and 1975 (Epoch 1) and (b) between 2008 and 2017 (Epoch 2). Small-scale societies typically have members numbering in the hundreds or low thousands and often maintain autonomy in social, political, and economic spheres. The studies conducted in Epoch 1 were geographically constrained to societies in the Pacific area. The studies conducted in Epoch 2 spanned a broader geographic range, including Africa and South America, resulting in increased diversity in the ecological and social contexts of the societies tested. This type of diversity is a necessary condition for discovering the extent of cultural variation in psychological phenomena (Medin, Ojalehto, Martin, & Bang, 2017).

actions or social motives may also be observed across cultures.

Epoch 1: Constrained Tests of the Universality Thesis

Early tests of the universality thesis in small-scale societies used experimental tasks (Figs. 2a and 2b)² that required participants to match posed configurations of facial movements—such as scowls, pouts, and smiles (referred to as *facial expressions*)—with researcher-provided response options, such as emotion words or stories (Ekman, 1972; Ekman & Friesen, 1971; Ekman, Sorenson, & Friesen, 1969). These studies provided a liberal test of the universality thesis because their task features are now known to augment agreement (Nelson & Russell, 2013; Russell, 1994). For example, asking participants to label a face by choosing from a limited set of response options allows them to use a process-of-elimination strategy, in which unused options from prior trials are selected (DiGirolamo & Russell, 2017); response options can also be selected on the basis of broader affective qualities of valence (pleasure-displeasure) or arousal (high or low activation; Yik, Widen, & Russell, 2013). Information provided in stories (Fig. 2a) may inadvertently teach participants emotion concepts (Hoemann, Crittenden, Ruark, Gendron, & Barrett, 2018). As a result, in constrained tasks, participants are more likely to match scowls to “anger,” pouts to “sadness,” and so on than they would without those task constraints (Barrett et al., 2007; Crivelli & Gendron, 2017; Nelson & Russell, 2013; Russell, 1994), and, indeed, support for the universality thesis using these more constrained tasks was moderate to strong (see Table 1).

Constrained tasks, such as those used in this initial phase of testing the universality thesis, do not provide a context for discovery and therefore allow other important phenomena to be overlooked. Methodological diversity, including less constrained, more discovery-based tasks, reveals sources of cross-cultural consistency and diversity, ultimately providing a more robust approach to mapping human behavior, perception, and thought across cultural contexts (Medin, Ojalehto, Marin, & Bang, 2017).

Epoch 2: Methodological Diversity

When tasks are designed to be less constrained, allowing participants more freedom in their responses (as in Figs. 2c and 2d), empirical support for the universality thesis from small-scale societies weakens considerably, calling the universality thesis into doubt (Table 1). For example, Himba, Hadza, and Trobriand participants

presented with the typical facial poses used in studies of emotion perception rarely spontaneously offered the emotion labels predicted by the universality thesis (Crivelli, Russell, Jarillo, & Fernández-Dols, 2017; Gendron et al., 2018; Gendron, Roberson, van der Vyver, & Barrett, 2014b). The results of experiments designed to control for affective differences between targets and foils or process-of-elimination effects (Table 1, far-right column) also strongly call the universality thesis into doubt. Moreover, as expected, these studies have discovered additional sources of both cross-cultural consistencies and diversity.

Affect perception

Affective properties such as pleasantness-unpleasantness (i.e., valence) and high-low activation (i.e., arousal) are consistently perceived in facial movements across industrialized societies (Russell, 2003) and small-scale societies. This consistency is referred to as *minimal universality* (Russell, 1995). In recent tests of the universality thesis, Himba, Trobriand, and Hadza participants rarely confused normatively pleasant and unpleasant facial poses in free-sorting (Gendron et al., 2014b), free-labeling (Crivelli et al., 2017), word-matching (Crivelli, Jarillo, Russell, & Fernández-Dols, 2016), and choice-from-array (Gendron et al., 2018) tasks. Moreover, Trobrianders easily rated the valence and arousal in photos of spontaneous facial expressions in individuals from the Fore society (who also live in Papua New Guinea); their affect ratings largely agreed with those of U.S. participants, even as their emotion perceptions did not (Crivelli et al., 2017). Finally, Himba, Hadza, and Trobriand participants routinely offered labels for pleasant and unpleasant feelings when asked to freely describe the state of people in photographs (Crivelli et al., 2017; Gendron et al., 2018; Gendron et al., 2014b).³

Perception of social motives

Inferences about social motives, such as another person’s intent to affiliate with or threaten someone, are another potential facet of how people make facial movements meaningful. Such mental inferences are consistent with the behavioral-ecology view of faces (Crivelli & Fridlund, 2018), an account of facial movements as context-dependent tools for social influence (i.e., a functionalist account). In the behavioral-ecology view, facial actions are flexible, context-dependent social signals contingent on the history of past interactions and are uninformative regarding the internal mental mechanisms that covary with these movements (i.e., an externalist view).

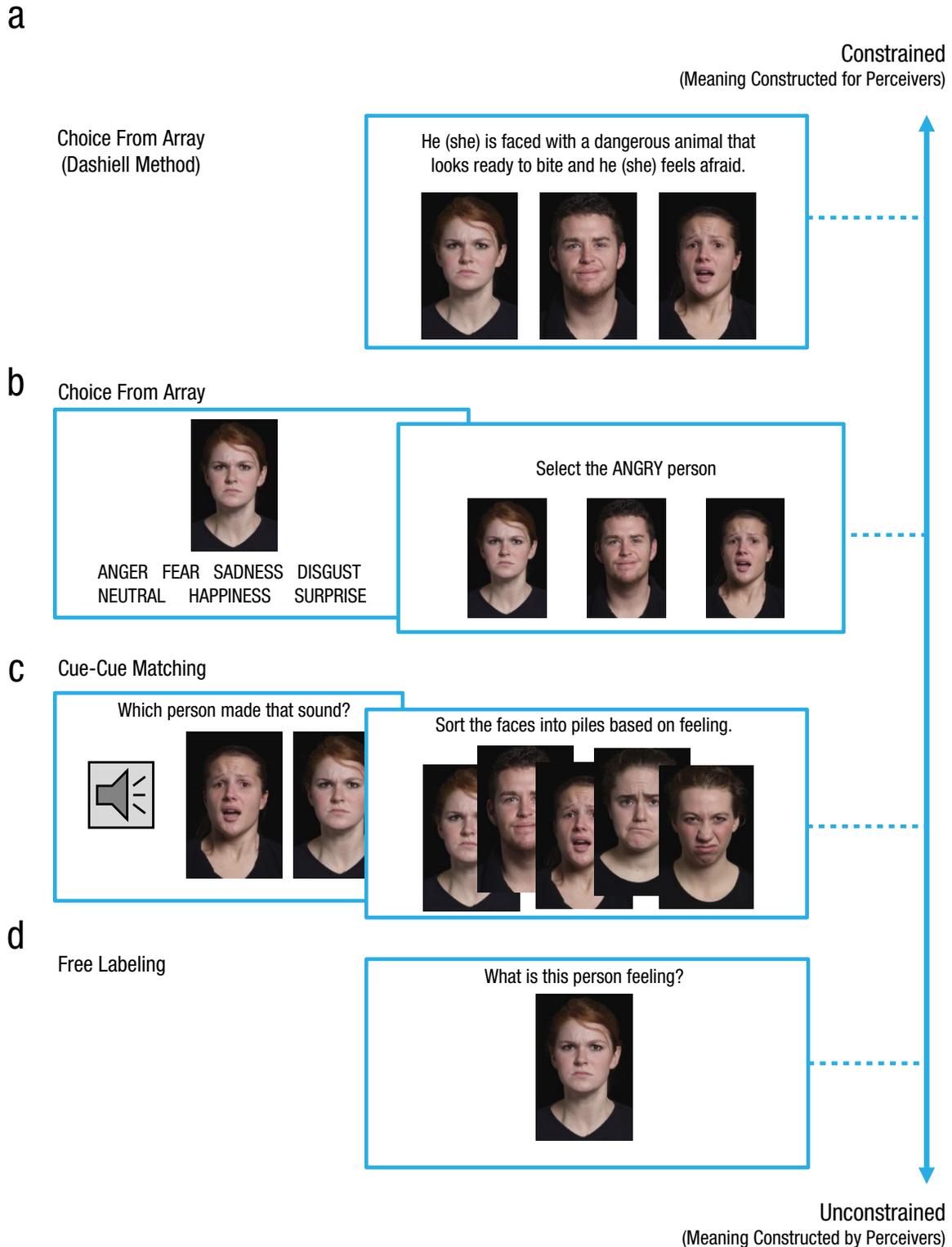


Fig. 2. Experimental tasks employed in tests of the universality thesis over time, from more constrained (choice from array) to less constrained (cue-cue matching, free labeling). Notably, the constrained methods all introduce conceptual information to the perceiver, which may have primed a mode of inference (essentialism) or salient content (situated actions) that guided performance. Only data from some studies using constrained tasks met the Haidt and Keltner (1999) criterion for strong support of the universality thesis, with agreement in the 70% to 90% range. Less constrained methods sometimes (but not always) yielded above-chance agreement with universality-thesis predictions, the considerably weaker criterion for the universality thesis proposed by Ekman (1994). See Table 1 for a conceptual summary of study results. This figure depicts only one potential source of experimental constraint that has been identified in studies of emotion perception. Others (Table 1, far-right column) are too sparse to depict and analyze on a continuum. Other sources of context, including relational history, perceiver motivation, and affect should also be examined as important sources of variance in emotion perception across societies. Figure adapted from Gendron (2017).

Table 1. Emotion-Perception Studies in Small-Scale Societies: Tests of the Universality Thesis and Alternative Hypotheses

Hypothesis tested and society	Sample size	Citation	Universality-thesis support			Constraint continuum	Universality-thesis task modifications
			Weak	Moderate	Strong		
1969–1975							
Universality thesis							
Bahinemo of Papua New Guinea	71 adults	Sorenson (1975)	X			Free labeling	None
Dani of New Guinea (Indonesia)	34 adults	Ekman (1972)		X		Choice from array (Dashiell method)	None
Fore of Papua New Guinea	32 adults	Ekman, Sorenson, and Friesen (1969) ^a		X		Choice from array	None
Fore of Papua New Guinea	130 children, 189 adults	Ekman and Friesen (1971)			X	Choice from array (Dashiell method)	None
Fore of Papua New Guinea	130 children, 189 adults	Sorenson (1975)			X	Choice from array (Dashiell method)	None
Fore of Papua New Guinea	100 adults	Sorenson (1975)		X		Free labeling	None
Sadong of Borneo	15 adults	Ekman et al. (1969)		X		Choice from array	None
Sadong of Borneo	15 adults	Sorenson (1975)		X		Free labeling	None
2008–present							
Universality thesis							
Dioula of Burkina Faso	39 adults	Tracy and Robins (2008)		X		Choice from array	None
Hadza of Tanzania	48 adults	Gendron et al. (2018), Study 1	X			Choice from array (Dashiell method)	Foils
Hadza of Tanzania	43 adults	Gendron et al. (2018), Study 2	X			Free labeling	None
Himba of Namibia	28 adults	Gendron, Roberson, van der Vyver, and Barrett (2014b)	X			Choice from array	None
Himba of Namibia	26 adults	Gendron, Roberson, van der Vyver, and Barrett (2014a)	X			Cue-cue matching	None
Mwani of Mozambique	36 children and adolescents	Crivelli, Jarillo, Russell, and Fernández-Dols (2016), Study 2	X			Choice from array	Dynamic
Shuar of Amazonian Ecuador	23 adults	Bryant and Barrett (2008), Study 2 ^b		X		Cue-cue matching	None
Trobrianders of Papua New Guinea	32 adolescents	Crivelli, Russell, Jarillo, and Fernández-Dols (2017), Study 1	X			Free labeling	Spontaneous
Trobrianders of Papua New Guinea	24 adolescents	Crivelli et al. (2017), Study 2	X			Choice from array	Spontaneous
Trobrianders of Papua New Guinea	68 children and adolescents	Crivelli, Jarillo, et al. (2016), Study 1	X			Choice from array	Between subjects
Trobrianders of Papua New Guinea	36 adolescents	Crivelli, Russell, et al. (2016), Study 1a	X			Choice from array	None
Affect perception						Free labeling	None
Hadza of Tanzania	48 adults	Gendron et al. (2018), Study 1				Choice from array (Dashiell method)	None
Mwani of Mozambique	36 children and adolescents	Crivelli, Jarillo, et al. (2016), Study 2				Choice from array	None

(continued)

Table 1. (Continued)

Hypothesis tested and society	Sample size	Citation	Universality-thesis support			Constraint continuum	Universality-thesis task modifications
			Weak	Moderate	Strong		
Trobrianders of Papua New Guinea	68 children and adolescents	Crivelli, Jarillo, et al. (2016), Study 1				Choice from array	None
Trobrianders of Papua New Guinea	32 adolescents	Crivelli et al. (2017), Study 1				Free labeling	None
Action identification						Free labeling	None
Hadza of Tanzania	43 adults	Gendron et al. (2018), Study 2				Free labeling	None
Himba of Namibia	28 adults	Gendron et al. (2014b)				Cue-cue matching	None
Himba of Namibia	26 adults	Gendron et al. (2014a)				Choice from array	None
Social motives						Free labeling	None
Trobrianders of Papua New Guinea	36 adolescents	Crivelli, Russell, et al. (2016), Study 1b				Choice from array	None
Trobrianders of Papua New Guinea	58 adolescents	Crivelli, Russell, et al. (2016), Study 2				Choice from array (Dashiell method)	None

Note: A given society has multiple entries in the table when the publication, study, method condition (indicated with a superscripted “a” or “b” after the study number), or the hypothesis tested differed. The column showing universality-thesis support indicates weak (< 40% or near chance), moderate (40%–70%), and strong (> 70%) agreement with universality-thesis predictions. (Note that sorting evidence is not directly comparable with accuracy-based designs but is represented on the basis of the conceptual fit with these levels of support.) “Constraint continuum” reflects how much concept information was embedded in the experimental paradigm, from the most constrained method (choice from array—Dashiell method) to the least constrained method (free labeling), as depicted in Figs. 2a to 2d, respectively. Unless noted, all universality-thesis tests used static, posed facial expressions and repeated measures designs (multiple trials for each participant), and foils were not manipulated on the basis of affect. The column showing universality-thesis task modifications presents four exceptions: foils (manipulation of affect in response alternatives), dynamic (moving faces), spontaneous (facial actions that occurred spontaneously, not posed), and between subjects (each participant was randomly assigned to match a face to only one emotion category in a between-subjects manipulation). Note 1 provides an overview of reporting inconsistencies that may affect this table (identical samples and results across reports).

^aThese data were from more Westernized Fore (Ekman et al., 1969, p. 87) but are included here to avoid falsely dichotomizing cultures as “isolated from” versus “exposed to” one another (Crivelli & Fridlund, 2018; Gewald, 2010; Sauter, Eisner, Ekman, & Scott, 2010). ^bThis study is less comparable with others: First, it was designed to examine emotion perception from vocalizations, but is included because perceivers matched to faces, and second, the sample was tested in a second language (Spanish) in which the participants received training.

Trobriand adolescents, for example, perceived facial movements as signaling social motives and emotions, although their emotion perceptions differed significantly from those of U.S. participants and therefore did not support the universality thesis (Crivelli, Russell, Jarillo, & Fernández-Dols, 2016). For example, Trobriand participants consistently labeled wide-eyed gasping faces (the stipulated expression for fear) as signaling an intent to attack (i.e., an intent to threaten) rather than fear or submission (for additional evidence in carvings and masks, see Crivelli, Jarillo, & Fridlund, 2016). These findings are consistent with prior evidence that social motives are perceived from faces (Yik & Russell, 1999) but go further by demonstrating cultural diversity in the social motives inferred from a given set of muscle movements.

Mentalizing versus action identification

Discovery-oriented methods (specifically, free labeling; Fig. 2d) reveal that perceivers in small-scale societies do not always infer a specific mental feature (e.g., fear or pleasure) as the cause of facial movements (termed *mentalizing*). They also make sense of facial movements as behaviors (e.g., looking or smelling), referred to as *action identification* (e.g., Kozak, Marsh, & Wegner, 2006).⁴ Action identifications emphasize the functions of behaviors rather than unobservable mental causes of movements. Himba, Hadza, and Trobriander participants all routinely described facial movements as behaviors rather than as expressions of internal, mental events (Crivelli et al., 2017; Gendron et al., 2018;

Gendron et al., 2014b); facial poses were frequently described as “smiling,” “looking,” or “smelling.” These actions were sometimes placed in a situational context, such as “crying at a death.”⁵ By comparison, U.S. participants offered very few behaviors or situations and more frequently engaged in mental state inference by labeling faces with emotion words (Gendron et al., 2018; Gendron et al., 2014b). Evidence for action identification also comes from a face-sorting task with Himba participants (Fig. 2c; Gendron et al., 2014a).⁶

These findings are broadly consistent with the contemporary anthropological hypothesis that inferences for actions exist on a continuum across cultures, anchored by explicit inferences about other peoples’ minds at one end and opacity of mind at the other (Duranti, 2015). One’s place on this continuum is culturally learned (Heyes & Frith, 2014) and reinforced as a mode of social perception.⁷ Action identification also provides an alternative explanation for data that was originally interpreted as empirical support for the universality thesis in Epoch 1: In research using the constrained choice-from-array task (Fig. 2a; Table 1), participants were presented with stories that may have primed knowledge of particular actions fitting the situation.

Implications for Psychological Science

To date, most research on emotion perception across cultures (extending beyond studies of small-scale societies) has been designed to validate the universality thesis rather than to discover or rule out diversity in how people make meaning of other people’s facial movements (e.g., Elfenbein & Ambady, 2002; Nelson & Russell, 2013). Studies of emotion perception in small-scale societies, as well as laboratory studies on U.S. samples (see Barrett, 2017; Barrett et al., 2007), consistently reveal that the constrained methods used in the studies of cross-cultural emotion perception (Figs. 2a and 2b) are not psychologically inert. For example, words often serve as placeholders for undefined mental essences that are thought to cause observable features (Gelman, 2003). Asking participants to apply emotion words to faces may lead participants to mentalize when they otherwise might not.

The research reviewed here reveals the need for more data-driven and discovery-oriented empirical approaches that allow for the capacity to discover cultural variation in emotion perception and examine how this variation might relate to specific cultural features. Of course, cultures are not static, bounded, and uniform; they are constantly in flux because of continual cultural learning and transmission (Boyd, Richerson, & Henrich, 2011), which implies that cultural variation in emotion perception may also be dynamic, evolving over

time. Emotion-perception research will build a more robust, replicable body of scientific findings if it engages with broader cultural conversations (e.g., Brewer et al., 2017) concerning the flexibility of human brains to wire themselves to diverse social and ecological contexts (Barrett, 2017). A more discovery-based research agenda will necessitate using multidisciplinary research teams to implement a broader array of methodology (Crivelli & Gendron, 2017) that allows for a robust description of emotion dynamics in real-world contexts and interactions. Specifically, future work must map individual and situational patterning of facial movements and the use of social (including emotion) concepts in meaning making about those facial movements. Such research investments will result in a robust ecology of emotion in the wild, something that is sorely needed in basic and translational settings alike.

Conclusions

The experimental study of emotion perception in small-scale societies is consistent with a broader body of evidence that facial movements are not perceived to have uniform meanings as emotion expressions (Hassin, Aviezer, & Bentin, 2013; Jack & Schyns, 2017). Emotion perception is as much a product of meaning making by a perceiver as it is driven by the physical movements of a face (Barrett, 2017; Barrett, Mesquita, & Gendron, 2011). Continued development of a diverse, context-based science of emotion perception (and social perception more broadly) will have the potential to reshape policy and practice built on these basic science observations.

Recommended Reading

- Barrett, L. F. (2017). (See References). Provides an in-depth but accessible account of how emotions (and perceptions) are perceiver-constructed phenomena constrained by culture, learning, and a biological imperative to regulate the body (allostasis).
- Crivelli, C., & Fridlund, A. J. (2018). (See References). A recent article outlining the behavioral-ecology approach, which postulates that facial displays serve as social tools rather than readouts of internal states.
- Crivelli, C., Russell, J. A., Jarillo, S., & Fernández-Dols, J. M. (2016). (See References). Provides the first evidence that a canonical facial expression can be associated with a distinct emotion on the basis of the cultural context.
- Gendron, M., Roberson, D., van der Vyver, J. M., & Barrett, L. F. (2014b). (See References). The first published study to test an alternative account to the universality thesis using unconstrained research methods.

Action Editor

Randall W. Engle served as action editor for this article.

ORCID iD

Maria Gendron  <https://orcid.org/0000-0002-1845-6722>

Acknowledgments

M. Gendron completed the research discussed in this article while at Northeastern University but is now at Yale University.

Declaration of Conflicting Interests

The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

Notes

1. Several of these samples were written up only in brief, resulting in omissions in reporting data and statistical analysis (Russell, 1994). For example, the following inconsistencies in reporting affect Table 1. First, the Dani sample reported in Ekman (1972) is likely a subset of the data from an unpublished manuscript by Ekman and colleagues. This sample was reported by Elfenbein and Ambady (2002) as from the Fore cultural group, but Ekman (1972) referred to them as from the Dani society. Second, the Fore samples in Ekman and Friesen (1971) and Sorenson (1975) were the exact same size (189 adults and 130 children) and yielded nearly identical results; they are reported separately because Ekman (1994) indicated that the samples were distinct. Third, the sample size, marginal means, and exact pattern of errors reported for the Sadong samples is identical in Sorenson (1975) and Ekman et al. (1969). Yet the two source texts report distinct methods for achieving these results (choice from array in Ekman et al., 1969; free labeling in Sorenson, 1975). As a result, we decided to report these as distinct samples.

2. Even early tests of the universality thesis that were not constrained in response format were constrained in the analysis approach. Sorenson (1975) conducted tests in three cultural samples (Fore, Bahinemo, and Sadong) using an unconstrained response format (i.e., free labeling) but did not report on responses outside of a priori emotion categories (anger, fear, sadness, disgust, happiness, surprise). Even in the Bahinemo sample, in which emotion responses clearly did not fit with universality-thesis predictions, it is unclear whether facial expressions were systematically perceived in some other manner.

3. Many freely produced labels were consistent in valence with the facial expressions participants viewed, even when they were world-focused in nature, such that pleasant-unpleasant connotation was embedded in the attributes of a person (“he looks mean”), object (“eating delicious food”), or situation (“she has a problem”).

4. The theoretical proposition that facial expressions *are* functional actions dates back to the beginning of psychology (Dewey, 1894) and has appeared in recent “functionalist” accounts of the form of facial expressions (e.g., Susskind et al., 2008). These accounts focus on the specificity of action-emotion links. Action-identification theory, on the other hand, articulates variation in perceptions of actions and does not address the cause or specificity of actions.

5. Action-identification theory posits that perceptions exist along a continuum, from low-level mechanizing (i.e., how an observable behavior is completed) to causal attributions (i.e., why the behavior occurred). In Western samples, inferring why typically invokes essentialism, such that people who engage in *why* action identifications more often also invoke mental causes. This is not necessarily the case when actions are situated, however. Placing an action within a situation may instead be an attempt to ascribe a causal attribution to a situation rather than an internal state, which would be nonessentialist.

6. Action identification does not appear to be unique to the perception of facial expressions—Himba individuals also frequently perceived vocal portrayals of emotion as actions (Gendron, Roberson, van der Vyver, & Barrett, 2014a).

7. We do not consider action identification and mental state inference mutually exclusive; instead, different societies appeared to express a relative bias toward action perception or mental state inference, even when paradigms instruct for mental state inference.

References

- Barrett, L. F. (2017). *How emotions are made: The secret life of the brain*. New York, NY: Houghton Mifflin Harcourt.
- Barrett, L. F., Lindquist, K. A., & Gendron, M. (2007). Language as context for the perception of emotion. *Trends in Cognitive Sciences, 11*, 327–332. doi:10.1016/j.tics.2007.06.003
- Barrett, L. F., Mesquita, B., & Gendron, M. (2011). Context in emotion perception. *Current Directions in Psychological Science, 20*, 286–290. doi:10.1177/0963721411422522
- Boyd, R., Richerson, P. J., & Henrich, J. (2011). The cultural niche: Why social learning is essential for human adaptation. *Proceedings of the National Academy of Sciences, USA, 108*(Suppl.), 10918–10925. doi:10.1073/pnas.1100290108
- Brewer, J., Gelfand, M., Jackson, J. C., MacDonald, I. F., Peregrine, P. N., Richerson, P. J., . . . Wilson, D. S. (2017). Grand challenges for the study of cultural evolution. *Nature Ecology & Evolution, 1*, Article 0070. doi:10.1038/s41559-017-0070
- Bryant, G. A., & Barrett, H. C. (2008). Vocal emotion recognition across disparate cultures. *Journal of Cognition and Culture, 8*, 135–148. doi:10.1163/156770908X289242
- Crivelli, C., & Fridlund, A. J. (2018). Facial displays are tools for social influence. *Trends in Cognitive Sciences, 22*, 388–399. doi:10.1016/j.tics.2018.02.006
- Crivelli, C., & Gendron, M. (2017). Facial expressions and emotions in indigenous societies. In J. M. Fernández-Dols & J. A. Russell (Eds.), *The science of facial expression* (pp. 497–515). Oxford, England: Oxford University Press.
- Crivelli, C., Jarillo, S., & Fridlund, A. J. (2016). A multidisciplinary approach to research in small-scale societies: Studying emotions and facial expressions in the field. *Frontiers in Psychology, 7*, Article 1073. doi:10.3389/fpsyg.2016.01073
- Crivelli, C., Jarillo, S., Russell, J. A., & Fernández-Dols, J. M. (2016). Reading emotions from faces in two indigenous societies. *Journal of Experimental Psychology: General, 145*, 830–843. doi:10.1037/xge0000172

- Crivelli, C., Russell, J. A., Jarillo, S., & Fernández-Dols, J. M. (2016). The fear gasping face as a threat display in a Melanesian society. *Proceedings of the National Academy of Sciences, USA, 113*, 12403–12407. doi:10.1073/PNAS.1611622113
- Crivelli, C., Russell, J. A., Jarillo, S., & Fernández-Dols, J. M. (2017). Recognizing spontaneous facial expressions of emotion in a small-scale society of Papua New Guinea. *Emotion, 17*, 337–347. doi:10.1037/emo0000236
- Dewey, J. (1894). The theory of emotion: I. Emotional attitudes. *Psychological Review, 1*, 553–569. doi:10.1037/h0069054
- DiGirolamo, M. A., & Russell, J. A. (2017). The emotion seen in a face can be a methodological artifact: The process of elimination hypothesis. *Emotion, 17*, 538–546. doi:10.1037/emo0000247
- Duranti, A. (2015). *The anthropology of intentions*. Cambridge, England: Cambridge University Press.
- Ekman, P. (1972). Universals and cultural differences in facial expressions of emotion. In J. Cole (Ed.), *Nebraska Symposium on Motivation, 1971: Cultural Psychology* (Vol. 19, pp. 207–282). Lincoln: University of Nebraska Press.
- Ekman, P. (1994). Strong evidence for universals in facial expressions: A reply to Russell's mistaken critique. *Psychological Bulletin, 115*, 268–287. doi:10.1037/0033-2909.115.2.268
- Ekman, P., & Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology, 17*, 124–129.
- Ekman, P., Sorenson, E. R., & Friesen, W. V. (1969). Pan-cultural elements in facial displays of emotion. *Science, 164*, 86–88. doi:10.1126/science.164.3875.86
- Elfenbein, H. A., & Ambady, N. (2002). On the universality and cultural specificity of emotion recognition: A meta-analysis. *Psychological Bulletin, 128*, 203–235. doi:10.1037//0033-2909.128.2.203
- Gelman, S. A. (2003). *The essential child: Origins of essentialism in everyday thought*. New York, NY: Oxford University Press.
- Gendron, M. (2017). Revisiting diversity: Cultural variation reveals the constructed nature of emotion perception. *Current Opinion in Psychology, 17*, 145–150. doi:10.1016/j.copsyc.2017.07.014
- Gendron, M., Hoemann, K., Crittenden, A. N., Msafiri, S., Ruark, G., & Barrett, L. F. (2018). Emotion perception in the Hadza hunter-gatherers. Manuscript submitted for publication.
- Gendron, M., Roberson, D., van der Vyver, J. M., & Barrett, L. F. (2014a). Cultural relativity in perceiving emotion from vocalizations. *Psychological Science, 25*, 911–920. doi:10.1177/0956797613517239
- Gendron, M., Roberson, D., van der Vyver, J. M., & Barrett, L. F. (2014b). Perceptions of emotion from facial expressions are not culturally universal: Evidence from a remote culture. *Emotion, 14*, 251–262. doi:10.1037/a0036052
- Gewald, J.-B. (2010). Remote but in contact with history and the world. *Proceedings of the National Academy of Sciences, USA, 107*, E75. doi:10.1073/pnas.1001284107
- Haidt, J., & Keltner, D. (1999). Culture and facial expression: Open-ended methods find more expressions and a gradient of recognition. *Cognition & Emotion, 13*, 225–266. doi:10.1080/026999399379267
- Hassin, R. R., Aviezer, H., & Bentin, S. (2013). Inherently ambiguous: Facial expressions of emotions, in context. *Emotion Review, 5*, 60–65. doi:10.1177/1754073912451331
- Heyes, C. M., & Frith, C. D. (2014). The cultural evolution of mind reading. *Science, 344*, Article 1243091. doi:10.1126/science.1243091
- Hoemann, K., Crittenden, A. N., Ruark, G., Gendron, M., & Barrett, L. F. (2018). Context facilitates the cross-cultural perception of emotion. Manuscript submitted for publication.
- Jack, R. E., & Schyns, P. G. (2017). Toward a social psychophysics of face communication. *Annual Review of Psychology, 68*, 269–297. doi:10.1146/annurev-psych-010416-044242
- Kozak, M. N., Marsh, A. A., & Wegner, D. M. (2006). What do I think you're doing? Action identification and mind attribution. *Journal of Personality and Social Psychology, 90*, 543–555. doi:10.1037/0022-3514.90.4.543
- Medin, D. L., Ojalehto, B., Marin, A., & Bang, M. (2017). Systems of (non-)diversity. *Nature Human Behaviour, 1*, Article 0088. doi:10.1038/s41562-017-0088
- Nelson, N. L., & Russell, J. A. (2013). Universality revisited. *Emotion Review, 5*, 8–15. doi:10.1177/1754073912457227
- Norenzayan, A., & Heine, S. J. (2005). Psychological universals: What are they and how can we know? *Psychological Bulletin, 131*, 763–784. doi:10.1037/0033-2909.131.5.763
- Russell, J. A. (1994). Is there universal recognition of emotion from facial expressions? A review of the cross-cultural studies. *Psychological Bulletin, 115*, 102–141.
- Russell, J. A. (1995). Facial expressions of emotion: What lies beyond minimal universality? *Psychological Bulletin, 118*, 379–391.
- Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review, 110*, 145–172.
- Sauter, D. A., Eisner, F., Ekman, P., & Scott, S. K. (2010). Reply to Gewald: Isolated Himba settlements still exist in Kaokoland. *Proceedings of the National Academy of Sciences, USA, 107*, E76.
- Sorenson, E. R. (1975). Culture and the expression of emotion. In T. R. Williams (Ed.), *Psychological anthropology* (pp. 361–372). Chicago, IL: Aldine.
- Susskind, J. M., Lee, D. H., Cusi, A., Feiman, R., Grabski, W., & Anderson, A. K. (2008). Expressing fear enhances sensory acquisition. *Nature Neuroscience, 11*, 843–850.
- Tracy, J. L., & Robins, R. W. (2008). The nonverbal expression of pride: Evidence for cross-cultural recognition. *Journal of Personality and Social Psychology, 94*, 516–530.
- Yik, M., & Russell, J. A. (1999). Interpretation of faces: A cross-cultural study of a prediction from Fridlund's theory. *Cognition & Emotion, 13*, 93–104.
- Yik, M., Widen, S. C., & Russell, J. A. (2013). The within-subjects design in the study of facial expressions. *Cognition & Emotion, 27*, 1062–1072. doi:10.1080/02699931.2013.763769