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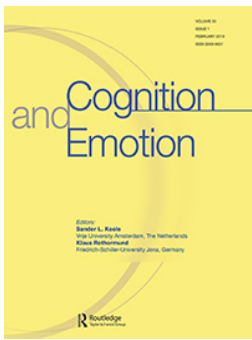
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INVITED ARTICLE



## Reflections on 30 years of *Cognition & Emotion*

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### ABSTRACT

The publication of the first issue of *Cognition & Emotion* in 1987 helped open the floodgates to what has become a golden age of emotion research in the social and biological sciences. In this article, I describe the intellectual landscape of that era and trace key developments that helped foster the growth of the field of affective science. Looking back from a present-day perspective, I offer some thoughts on the major changes that have occurred over the past three decades, the opportunities and challenges that lie ahead, and my own personal journey toward becoming an affective scientist (which largely occurred during this period). Finally, I offer three considerations that might be helpful for young researchers who are already in the field of affective science or are considering entering it.

### ARTICLE HISTORY

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The publication of the first issue of *Cognition & Emotion* in 1987 was a bellwether event in the history of affective science, setting the stage for three remarkable decades of growth and discovery. In the contemporary environment, research on emotion is so pervasive and so richly connected to other areas of science that it's almost impossible to imagine that this was not always the case. However, it most definitely was not. A time traveller going back to 1987 would encounter a strikingly different landscape, one in which there were no emotion journals, no emotion textbooks, little mention of emotion per se in many of the introductory psychology textbooks, no emotion research societies, and relatively few scientists who identified themselves as emotion researchers. On a more personal level, my own journey to becoming an emotion researcher played out during this same period; thus, I will include some of my own experiences when appropriate.

### Origin stories

Although the “cognitive revolution” was already well established in psychology in the 1970s, neither emotion nor the relationship between cognition and emotion were major foci. As a graduate student in psychology during that decade, I am hard pressed to

recall any major consideration of emotion in my coursework. The one exception was in my applied clinical psychology training, where blocked/repressed emotions were viewed as causes of certain troublesome symptoms in psychiatric and psychosomatic illnesses and served as targets of several therapeutic interventions (e.g. the cathartic release of repressed emotions in psychodynamic psychotherapy).

The 1970s also saw a great deal of research on stress, which was viewed in a fairly global and undifferentiated way (Rahe & Arthur, 1978) and was not yet concerned with specific emotions. Emotion did take centre stage in one area of research, which was concerned with the “universality” of facial expressions of emotion. Although Darwin (1872) had written quite extensively about similarities in emotional expression across species a century earlier, the dominant viewpoint in the social sciences was more in line with cultural relativism (e.g. Mead, 1935). Thus, the pioneering studies demonstrating cross-cultural consistency in the recognition and production of emotional facial expressions (Ekman & Friesen, 1971; Izard, 1971) opened the door for research that considered the role of particular emotions. Several other developments in this period were important for the subsequent growth of emotion research. A slim volume entitled “Emotion

in the Human Face" (Ekman, Friesen, & Ellsworth, 1972) provided a comprehensive review of research on facial expression since Darwin. In addition, the Facial Action Coding System (FACS; Ekman & Friesen, 1978) was published, providing an objective anatomically-based tool for precisely describing the activity of the muscular actions responsible for facial expressions.

During this period, I was an erstwhile stress researcher who was using film stimuli to study disease-related autonomic nervous system (ANS) changes in individuals with asthma (Levenson, 1979). Taking advantage of the newly available video recording technology I vividly remember being struck by the diversity of behavioural responses displayed by participants in our experiments in response to our film stimuli. Shoe-horning all of this expressive heterogeneity into a single-term ("stress response") seemed misguided. I devoured a copy of *Emotion in the Human Face* and in 1981 was headed to San Francisco to spend my first sabbatical in the laboratory of Paul Ekman and Wallace Friesen. My intent was to learn FACS and hopefully to become a competent emotion researcher.

## Cognition and emotion

Research on the relationship between cognition and emotion came into prominence in the 1980s. And, as is often the case, it benefitted from a riveting controversy carried out between highly articulate and charismatic proponents of two very different positions. On the one hand, Richard Lazarus (e.g. Lazarus, 1982) envisioned cognitive activity as a necessary precondition for emotion. More specifically, he argued that for an emotion to occur in a given situation there must be some appraisal of that situation as having consequences for the individual's well-being. In contrast, Robert Zajonc (e.g. Zajonc, 1980) envisioned affect and cognition as separable and partially independent systems. More specifically, he argued that affect could sometimes be generated without prior cognitive processing and could at times precede cognition. A few years before the first issue of *Cognition & Emotion* appeared, the two gladiators restated their positions in bookend articles entitled "On the Primacy of Cognition" (Lazarus, 1984) and "On the Primacy of Affect" (Zajonc, 1984) that were widely read and discussed.

As almost always is the case with "either/or" controversies, the final resolution included a healthy helping of "both". Predictably, in this particular debate, definitional issues as to what constitutes "cognition" and

what constitutes "emotion" ended up being critically important. I will not try to re-litigate the relative merits of the two positions, but will note that the debate served to stimulate a great deal of interest in this research area and undoubtedly attracted a number of young scientists to research on emotion in general and on the relationship between cognition and emotion in particular.

## Thirty years of research on cognition and emotion: what has changed?

Thirty years is approximately the lifespan of an academic generation. It is a sad reality that the galvanising, seemingly unforgettable debates of our youth are often treated somewhat badly by history and its cruel dustbin. What is clear about these particular 30 years is that emotion research has gone from a position of relative obscurity to one of seeming ubiquity. A personal example may be illustrative. In 1987, I was part of a small group of emotion researchers who began planning what would become a prominent long-lived NIMH-funded training programme in Affective Science (the programme has continued in various forms from 1989 through the present). Our plan was to train a new generation of emotion researchers who would be conversant with biological and behavioural approaches, human and non-human animal models, and basic and applied research. To staff the programme we struggled to find a dozen faculty in the US and abroad who had active emotion research programmes that were appropriate for this kind of training. Three decades later it would be quite feasible to have a single-campus version of this kind of programme at many universities and medical centres.

Many things have contributed to the dramatic increase in emotion research, but here I will mention a few that seem particularly important.

### Refinement of appraisal theory

One of the keystones of modern affective science has been the elaboration of appraisal theory. Early stress research often found connections between life stress and more distal outcomes (health) but did not elaborate on or explore the mediating pathways. This arguably began to change with Arnold's appraisal theory (e.g. Arnold, 1960) and Lazarus' distinction between primary (i.e. significance) and secondary (i.e. ability to cope) appraisals (Lazarus & Folkman, 1984;

Lazarus, Averill, & Opton, 1970). Importantly, modern appraisal theories (e.g. Lazarus, 1991; Roseman, Antoniou, & Jose, 1996; Scherer, 1988, 2001; Smith & Ellsworth, 1985) link particular appraisals and appraisal sequences with the elicitation of particular emotions (or emotion dimensions). Because the predictions are well-specified, these modern elaborations of appraisal theory can be tested using both correlational and experimental designs. An additional level of specificity is found in recent theoretical and empirical work that combines ideas about the elements in the appraisal sequence with the appearance of particular facial actions (e.g. Scherer, Mortillaro, & Mehu, 2013). Moreover, because the temporal characteristics of these appraisal sequences are well-specified, future research may be able to leverage improvements in the spatial and temporal resolution of physiological measures (e.g. magnetoencephalography, intracranial electroencephalography) to provide additional empirical tests of these appraisal models.

### ***Emphasis on the influences of emotion on cognition***

Most theories in affective science envision cognitive processing (e.g. appraisal) as preceding the occurrence of emotion. However, important exceptions to this rubric are found in peripheralist views that allow for the possibility that emotions can arise from “pure” sensory processing, interoception of ANS activity, or proprioception of somatic activity (e.g. James, 1884; Levenson, 1999; Zajonc, 1984). Regardless of the role that cognitive processes play in producing emotion, there can be little doubt that once an emotion occurs it can have profound influences on our thoughts, our judgments, and the ways we communicate these thoughts and judgments to others (Bolte, Goschke, & Kuhl, 2003; Isen, 1990; Reber, Schwarz, & Winkielman, 2004).

There are several prominent areas of contemporary research where emotions may critically influence cognitive processes, including the role that: (a) fear plays in the loss aversion that underlies a number of irrational biases in decision-making (Tversky & Kahneman, 1974); (b) fear and anxiety play in the altered self-appraisals and performance that accompany stereotype threat (Steele & Aronson, 1995); and (c) emotions such as anger, fear, and disgust play in shaping implicit cognitions (Greenwald, McGhee, & Schwartz, 1998) and implicit prejudices (Glaser & Knowles, 2008; Tapias, Glaser, Keltner, Vasquez, & Wickens,

2007). In each of these areas, emotions were not a primary focus of the original theories and research but rather represent potentially fruitful avenues for future inquiry.

### ***Importance of emotion in psychopathology and psychotherapy***

Disruptions in emotional functioning occur in a large number of psychiatric disorders (Keltner & Kring, 1998) whether diagnosed using traditional syndromic approaches (American Psychiatric Association, 2013) or newer symptom-based approaches (Insel et al., 2010). Historically research in psychopathology and psychotherapy has been the province of clinical psychologists and psychiatrists who had limited training in affective science. Affective science has the potential to revolutionise clinical research and practice, introducing powerful tools for measuring changes in emotional functioning that have not traditionally been used in clinical research or practice. These tools hold great promise for improving diagnosis, precisely monitoring changes in symptomatology, evaluating the effectiveness of psychological and pharmacological treatments, and uncovering mechanisms of psychopathology that can become the targets for new interventions. Changes in grant funding policies at the National Institute of Mental Health that emphasize mission-critical and translational research have inspired many basic affective scientists to begin to investigate mental health related issues. With the huge societal burden of mental illness worldwide and the slow rate of progress in reducing that burden (Levenson, 2017), I expect that clinical affective science will continue to grow in importance.

### ***New opportunities in neuroscience and computational approaches***

Neuroimaging has opened up new opportunities for affective scientists to explore the neural correlates of emotional functioning (Lindquist, Wager, Kober, Bliss-Moreau, & Barrett, 2012; Phan, Wager, Taylor, & Liberzon, 2002; Wager, Phan, Liberzon, & Taylor, 2003). As with any new technology, there are the inevitable false starts and growing pains. Moreover, the physical constraints and unusual environmental characteristics associated with neuroimaging methodology (e.g. loud repetitive noises, recumbent posture, problems with movement artifacts) create significant challenges for studying emotional states.

Studies using neurological patients provide another important methodology for examining brain–behavior relationships. Although historically this approach has often been used with single-subject case studies or very small samples (e.g. Harlow, 1848), we have recently been conducting studies of emotional functioning using relatively large samples of neurological patients with well-characterized areas of neural loss (Levenson, Sturm, & Haase, 2014; Sturm & Levenson, *in press*). Studies with neurological patients can provide invaluable data concerning brain–behavior relationships without the kinds of methodological constraints associated with neuroimaging studies.

Measures of emotion, especially when obtained repeatedly over time in multiple modalities (e.g. subjective experience, facial expression, ANS) across many individuals provide ideal data sets for machine learning and other large-data computational approaches. Because of the commercial value of being able to monitor emotional states remotely there are many companies in the private sector that are already working in this area. Both in collaboration with these companies and in traditional university-based research, there will be numerous opportunities for affective scientists to participate in this emerging area in the coming years.

### ***Challenges and advice for young researchers***

Although I am not a great fan of advice-giving, in keeping with the charge given contributors to this special section, here are three things to consider.

#### ***Decide whether you want to study emotion or emotion-related processes***

Emotion research can be immensely rewarding and interesting, but it is difficult to do well. Many laboratory procedures and measures work best when participants are calm, cool, collected, and still; many emotions make participants aroused, hot, discombobulated, and animated—definitely not a good match. One common solution to the problem of wanting to study emotion but not wanting subjects to be overly emotional is to have subjects reflect on, judge, opine about, or imagine their own emotions or those of others. These “emotion once removed” approaches arguably make the researcher’s life much easier and create fewer concerns for human subjects’ committees. However, it is important not to assume that a person thinking about how often

she is angry or observing anger in another person is a reasonable proxy for a person who is in the throes of intense anger resulting from having been cheated out of something that is theirs or frustrated in an interaction with a difficult person. Absent strong evidence to the contrary, the default assumption should be that results do not generalise across this methodological divide. If you are really interested in emotion per se; it is best to face the challenges and find a way to study actual emotion responding.

#### ***Avoid turf (and associated wars)***

Perhaps it’s the subject matter or perhaps it’s the kinds of people who get drawn to the subject matter, but too often in the last 30 years of emotion research there has been a scientific style in which: (a) prior positions based on opinions and/or on past research were hardened and defended rather than tested and challenged with data from new, critical experiments; (b) ad hominem characterisations of other camps increasingly became a standard part of the discourse; and (c) multi-generational “camps” were formed in which disciples were more committed to proving the veracity of their founder’s theoretical position than pursuing a more progressive scientific strategy of rejecting alternative hypotheses and discovering boundary conditions that delimit the areas where theories are and are not supported. In addition to the attendant lack of civility and collegiality, defending turf in these ways can effectively halt scientific progress.

#### ***Embrace the interpersonal***

It’s generally accepted that emotion is inherently interpersonal. We recognise emotions in other people; regulate our own emotions because of their effects on others; and rely on emotions to communicate our needs, intentions, desires, and likely behaviours to others. With this in mind, does it really make sense to build a research programme on emotion that is solely intrapersonal? Thirty-five years ago when we (Levenson & Gottman, 1983) did our first studies of emotion during social interaction they were very unusual, difficult to publish, and filled with data analytic “gotcha’s”. The situation is now much improved and should only get better. I think a serious research programme aimed at almost any imaginable aspect of emotion would benefit greatly from having a strong interpersonal component.

## Concluding thoughts

The past 30 years have witnessed meteoric growth in affective science. We all owe a huge debt to the founders of *Cognition & Emotion* for their vision in seeing the need for a new journal in what was to become such an important and vibrant area for theory and research. New methodologies, a spate of new and enduring research questions, and the increasing relevance for other areas of research all augur well for the future of this journal and the important research area it has chronicled so ably.

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