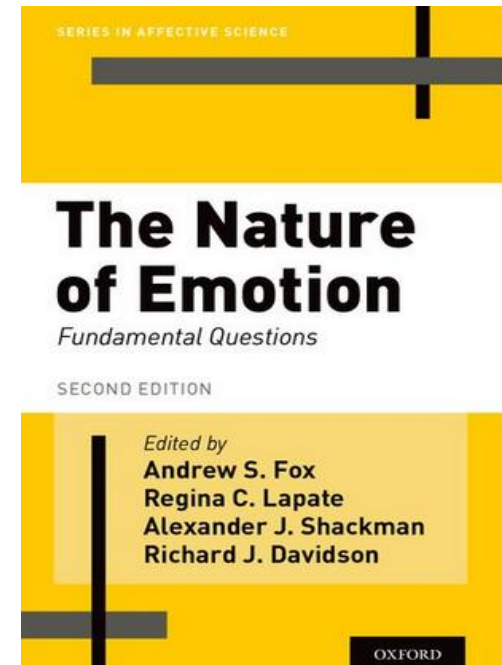
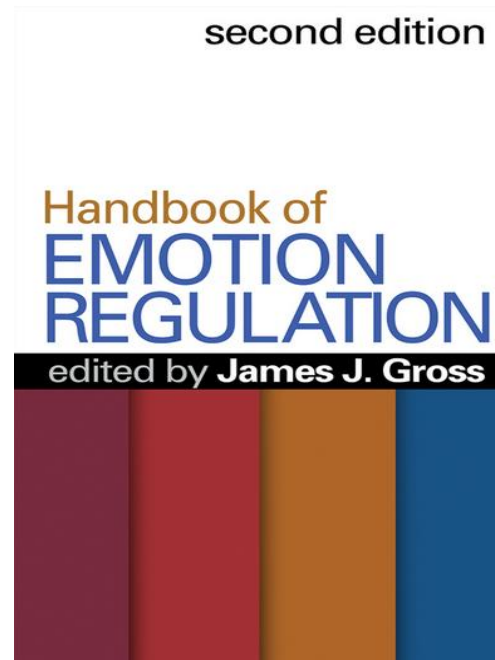
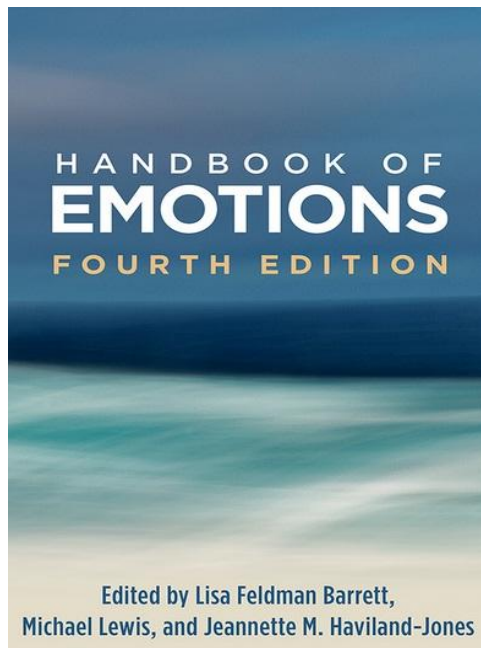


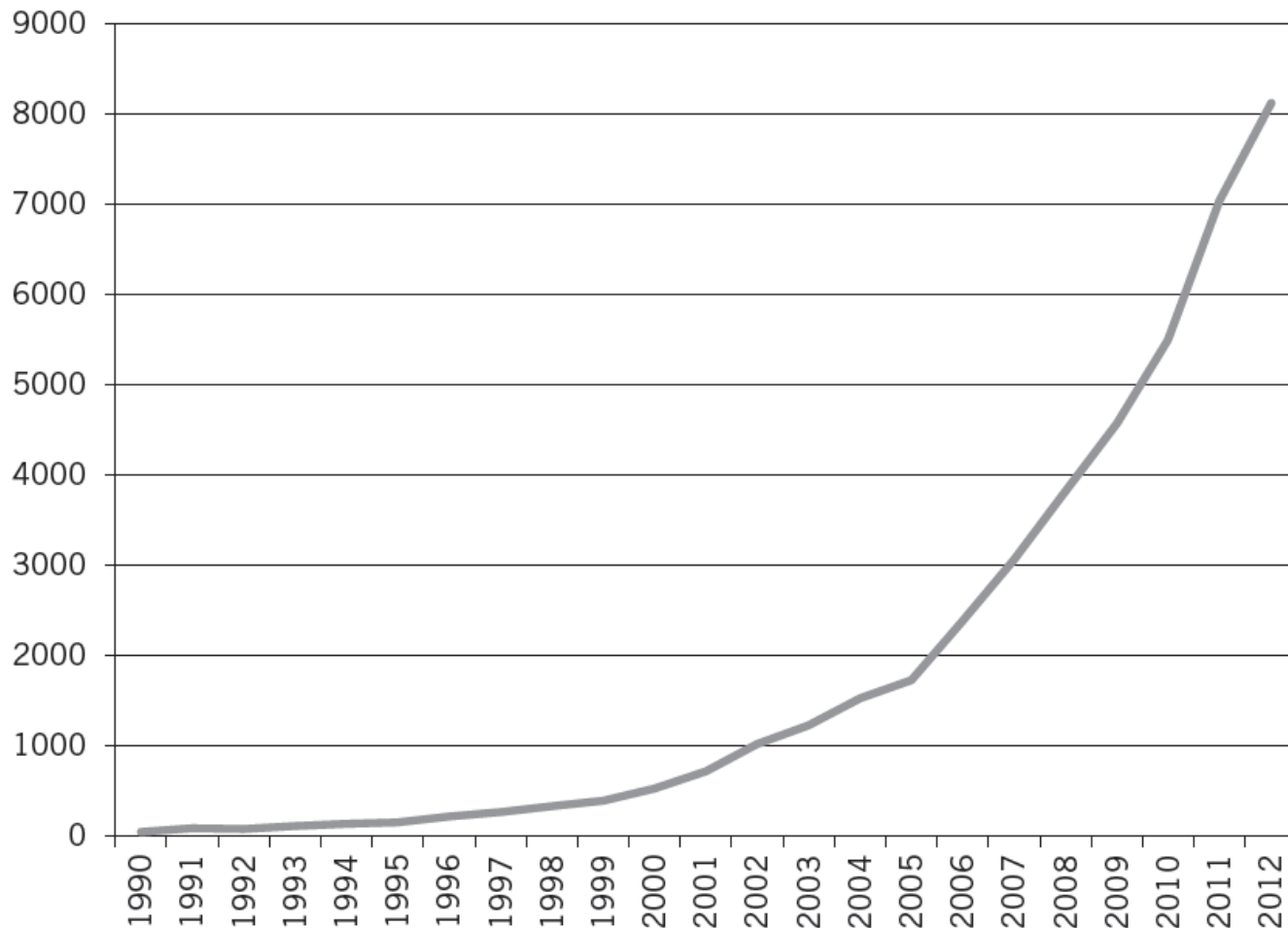
EMOTION REGULATION

Dr. Hassan Farrahi

Books Recommended for Study



Number of publications containing the term *emotion regulation* in Google Scholar from 1990 to 2012




A Good Start to the Discussion

What is Emotion?

- To understand the process of emotion regulation, one must first understand what regulatory processes are targeting.
- Numerous theories about emotion have created an exciting and challenging period.



- 
- Emotions can direct attention to key features of the environment, optimize sensory intake, tune decision making, ready behavioral responses, facilitate social interactions, and enhance episodic memory.
 - However, emotions can harm as well as help, particularly when they are of the wrong type, intensity, or duration for a given situation.

Core Features of Emotion

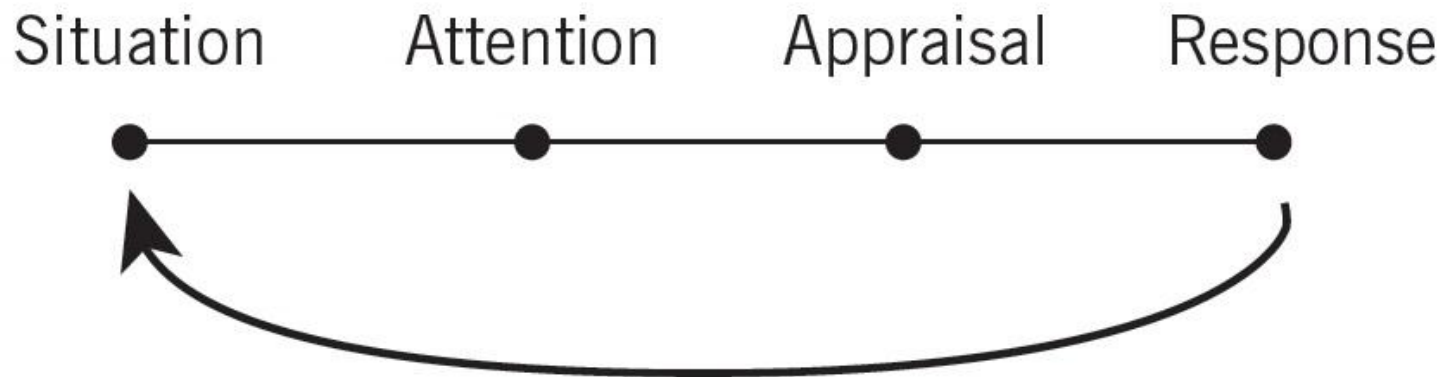
1. when it occurs

- Emotions arise when an individual **attends** to and **evaluates** (**appraises**) a **situation** as being relevant to a particular type of currently active goal. It is this meaning that gives rise to emotion. As this meaning changes over time, the emotion will also change.
- The **goals** that underlie this evaluation may be enduring or transient , conscious and complicated or unconscious and simple, widely shared or highly idiosyncratic.

2. multifaceted nature of emotion

- Emotions occur in whole of body (i.e. involve loosely coupled changes in the domains of subjective **experience**, **behavior**, and **central and peripheral physiology**)

Modal Model of Emotion



Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review.
Review of General Psychology, 2, 271–299.

What is Emotion Regulation?

- Emotion regulation occurs when we modify the nature, intensity, or duration of our emotional response



Core Features of Emotion Regulation

1. *Emotion regulation goal*

- Emotion regulation goals can include efforts to decrease or increase either the magnitude or duration of negative or positive emotion.
- **Decreasing negative emotion** appears to be the most common regulation goal in everyday life, followed by increasing positive emotion.
- Emotion regulation may be either **intrinsic** (Int) or **extrinsic** (Ext).

- Motives for **up-regulating negative emotions** include promoting a focused, analytic mindset; fostering an empathic stance; and influencing others' actions.
- Motives for **down-regulating positive emotions** include maintaining a realistic mindset; being mindful of social conventions; and concealing one's feelings from others

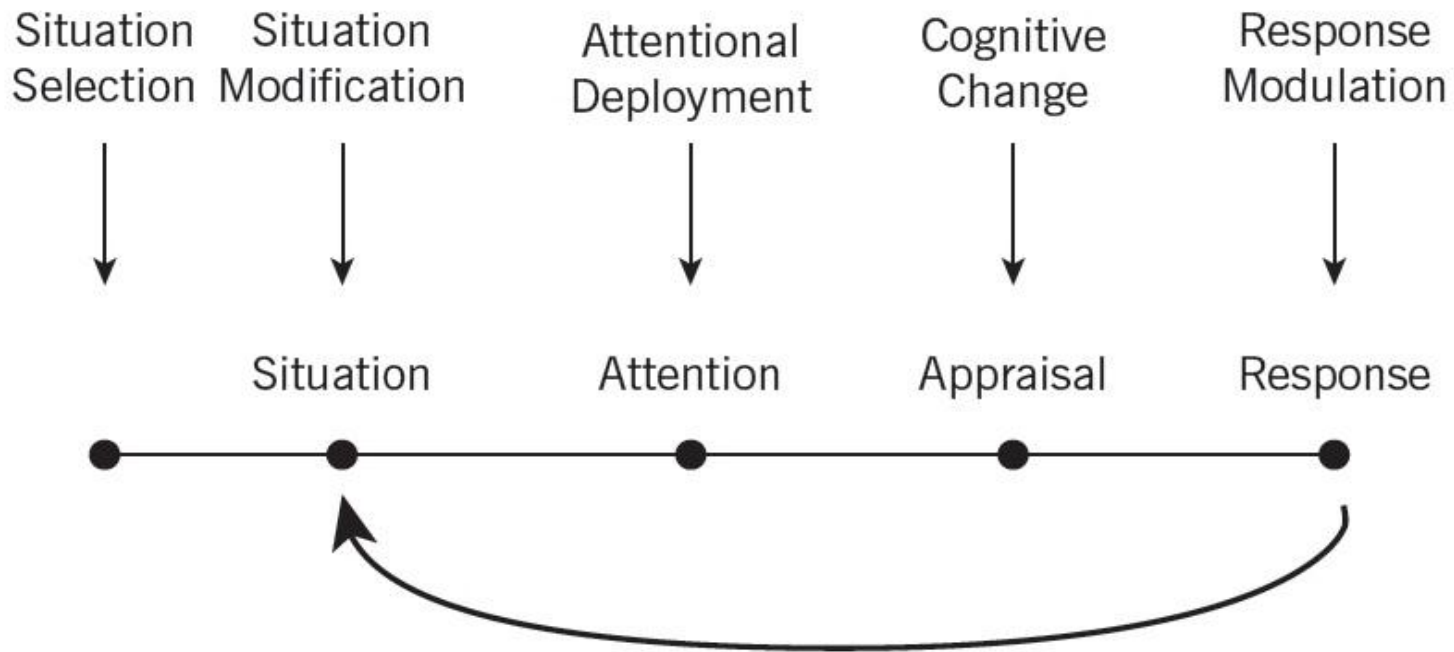
2. Emotion regulation strategies

- Continuum of emotion regulation possibilities ranging from explicit, conscious, effortful, and controlled regulation to implicit, unconscious, effortless, and automatic regulation

3. *Emotion regulation outcomes*

- Depending on the individual's goals, emotion regulation may increase or decrease the latency, rise time, magnitude, duration, or offset of the emotional response (in experiential, behavioral, or physiological domains)

The Process Model of Emotion Regulation



Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2, 271–299.

Attention Deployment

- To use control processes to modify emotional responses by devoting less conscious attention to the emotional content of a given stimulus.
- It has been shown to promote decreases in reported emotion, as well as decreases in activity in areas associated with the processing of affective responses, such as the amygdala and the anterior insula.

Three Types of AD



- Distraction
- Selective Attention
- Selective Construal

Cognitive Change

- To regulate emotional responses usually focuses on changes in emotional experience brought about by either the cognitive manipulation of current emotional states or the cognitive generation of new emotional states.
- More dependent upon higher cognitive faculties like mental imagery, memory, and response selection

Three Types of Cognitive Changes



- Reappraisal
- Reinterpretation
- Distancing

Response Modulation

- **Suppression**
- Relaxation
- Mindfulness
- Exercise
- Some Habits


Not all strategies have the same result




- Different forms of emotion regulation might have different consequences, both immediately and over the long term

Example: reappraisal vs Suppression

- **Affectively**, suppression leads to decreased positive but not negative emotion experience, increased sympathetic nervous system responses, and greater activation in emotion-generative brain regions such as the amygdala.
- Reappraisal leads to decreased levels of negative emotion experience and increased positive emotion experience, has no impact on or even decreases sympathetic nervous system responses, and leads to lesser activation in emotion-generative brain regions such as the amygdala.

- 
- **Cognitively**, suppression leads to worse memory.
 - Reappraisal either has no impact on subsequent memory or actually improves it, and can enhance performance on standardized exams

- 
- *Socially*, suppression leads to less liking from social interaction partners, and to an increase in partners' blood pressure levels.
 - Reappraisal has no detectable adverse consequences for social affiliation in a laboratory context.

Context Specificity of the Effects of Emotion Regulation Strategies

- Effects of emotion regulation vary by context.
- The adverse social consequences of suppression are not evident in individuals with **bicultural European–Asian values**.
- If emotional intensity is already high when reappraisal is engaged, it no longer has the experiential or physiological benefits seen in other contexts.

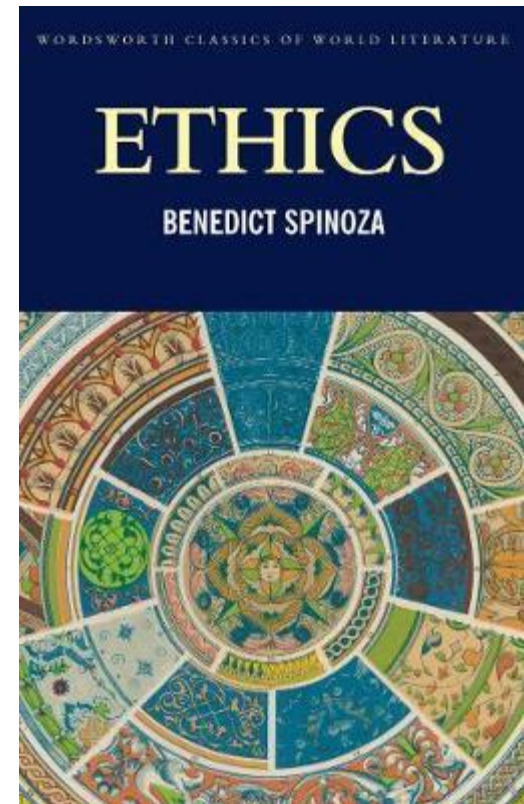
Special Focus

Affect Labeling



Affect Labeling from the Theorists' View

- **Spinoza**: “an emotion, which is a passion, ceases to be a passion, as soon as we form a clear and distinct idea thereof.”



قضیه: عاطفه که انفعال است به محض اینکه آن را به طور واضح و متمایز تصور کنیم از انفعال بودن متوقف می شود.

برهان: بنابراین، اگر این عاطفه را به طور واضح و متمایز تصور کنیم، این تصور از این عاطفه، از این حیث که این عاطفه فقط به نفس مربوط است تنها به واسطه عقل تمایز خواهد یافت لذا عاطفه از انفعال بودن متوقف خواهد شد.

نتیجه: بنابراین، هرچه شناسایی ما نسبت به عاطفه بیشتر باشد به همان اندازه عاطفه بیشتر در تحت قدرت ما خواهد بود و نفس کمتر از آن منفعل خواهد شد.

Expressive Writing



□ جیمز پنه بیکر: روی هم رفته، آنچه

نوشتید ممکن است کمک کند که

حوادث دلخراش را در متن گسترده تر

زندگی تان ادغام کنید.

دستورالعمل نوشتن ابرازی پنه بیکر

- چهار روز متوالی بنویسید.
- بی وقفه بنویسید. نگران نقطه و ویرگول و غلط املائی و دستور زبان نباشید.
- فقط برای خودتان بنویسید و پس از نوشتن، آنچه را نوشته اید از بین ببرید یا مخفی کنید.
- قاعده خیلی ناراحت شدن: اگر نوشتن باعث می شود به هم بریزید دست از نوشتن بردارید.
- ممکن است پس از نوشتن ابرازی، کمی احساس افسردگی یا غمگینی کنید که معمولاً یکی دو ساعت بعد کاهش می یابد. نسبت به خودتان شکیباً و مشفق باشید.
- در دو روز اول حداقل ۲۰ دقیقه بنویسید و پس از نوشتن حتماً چند دقیقه استراحت کنید و درباره آنچه نوشته اید بیندیشید. در روز سوم موضوع را از دیدگاه متفاوتی ملاحظه کنید و براساس آن بنویسید. در روز چهارم، درباره رویدادها، مسائل، افکار و احساساتی که ابراز کردید بیندیشید.

Research Domains on Emotion Regulatory Effects



- Experiential Consequences
- Autonomic Consequences
- Behavioral Consequences
- Neural Consequences

Experiential Consequences of Affect Labeling

- ▶ Self-report or subjective experience findings.
- ▶ Affect labeling can diminish feelings of both and **negative** affect
- ▶ these reductions within individuals correlate with similar reductions from **reappraisal**.
- ▶ This may not always be the case.

Autonomic Consequences of Affect Labeling

- ▶ **Measures:** decreased heart rate, decreased cardiac output, decreased skin conductance, ...
- ▶ Immediate effects
- ▶ delayed effect
- ▶ Exposure studies

Behavioral Consequences of Affect Labeling

- decreased observed levels of anxiety by the **parents** (Morelen, Jacob, Suveg, Jones, & Thomassin, 2013)
- increased **test performance** for students who wrote about their test-related anxieties before taking a math test (Ramirez & Beilock, 2011).
- greater progress through **exposure therapy** for patients with a clinical fear of spiders (Kircanski et al., 2012)



Neural Consequences of Affect Labeling

Study 1

MOTIVATION, EMOTION, FEEDING, DRINKING

NEUROREPORT

Modulating emotional responses: effects of a neocortical network on the limbic system

Ahmad R. Hariri, Susan Y. Bookheimer^{CA} and John C. Mazziotta

Brain Mapping Division, UCLA School of Medicine, Ahmanson-Lovelace Brain Mapping Center, 660 Charles E. Young Dr., Rm. 205, Los Angeles, CA 90095, USA

^{CA}Corresponding Author

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Acknowledgements: We thank N. Sicotte for assistance with neurological examinations, and J. Quintana and R.M. DuBois for comments on earlier versions of this manuscript. This study was supported in part by a National Institutes of Health grant to M. Sigman and a grant from the National Center on Research Resources, as well as donations from The Ahmanson Foundation, the Pierson-Lovelace Foundation, the Tamkin Foundation, the Jennifer Jones Simon Foundation, and the Brain Mapping Medical Research Organization. A.R.H. is supported by a fellowship from the Achievement Rewards for College Scientists (ARCS) Foundation, Inc.

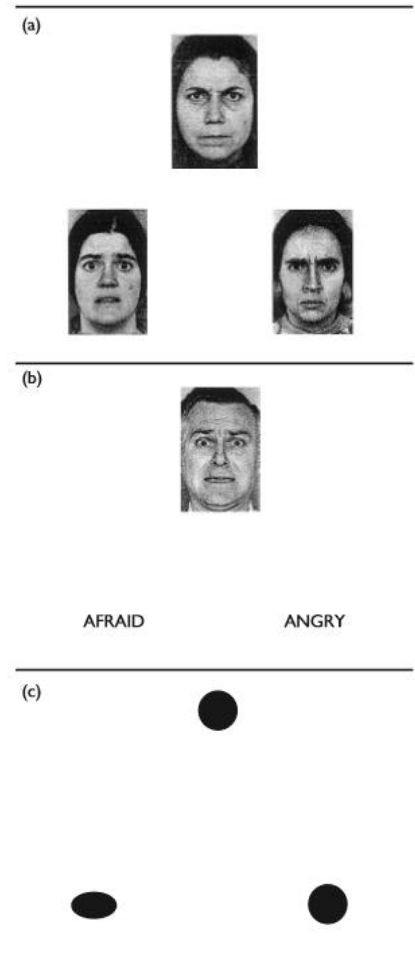
Humans share with animals a primitive neural system for processing emotions such as fear and anger. Unlike other animals, humans have the unique ability to control and modulate instinctive emotional reactions through intellectual processes such as reasoning, rationalizing, and labeling our experiences. This study used functional MRI to identify the neural networks underlying this ability. Subjects either matched the affect of one of two faces to that of a simultaneously presented target face (a perceptual task) or identified the affect of a target face by choosing one of two simultaneously presented linguistic labels (an intellectual task). Matching angry or frightened expressions was associated with increased

regional cerebral blood flow (rCBF) in the left and right amygdala, the brain's primary fear centers. Labeling these same expressions was associated with a diminished rCBF response in the amygdalae. This decrease correlated with a simultaneous increase in rCBF in the right prefrontal cortex, a neocortical region implicated in regulating emotional responses. These results provide evidence for a network in which higher regions attenuate emotional responses at the most fundamental levels in the brain and suggest a neural basis for modulating emotional experience through interpretation and labeling. *NeuroReport* 11:43–48 © 2000 Lippincott Williams & Wilkins.

Key words: Amygdala; Emotions; fMRI; Modulation; Prefrontal cortex



- A total of **9** experimental blocks
- two blocks each of matching and labeling affect interleaved with five control blocks
- each block lasting **32.5s**
- a total scan length of **4:53**min
- six images per block, three of each gender
- Images were presented for a period of **5s** in a randomized fashion for all conditions and the paradigm was counterbalanced across subjects



Results

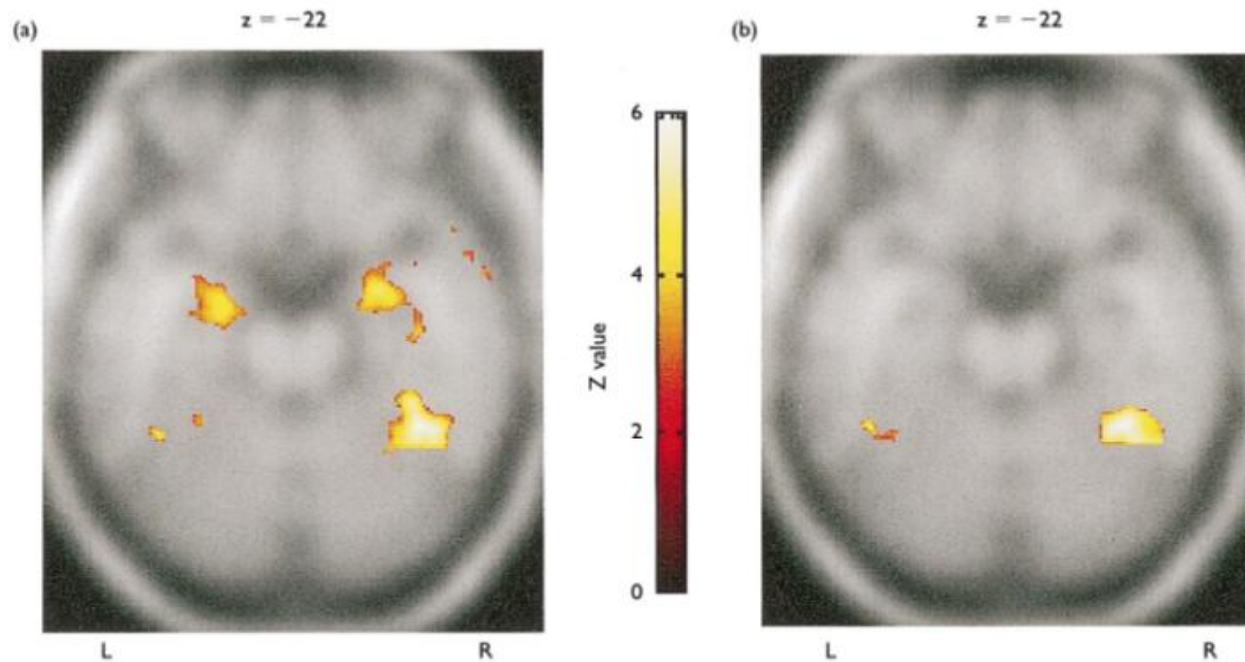


Fig. 2. Activations associated with matching and labeling affect. (a) Statistical parametric map (SPM) for contrast of 'match' with control illustrating activation in the FFA and bilateral activation of the amygdalae. (b) SPM for contrast of 'label' with control illustrating activation in the FFA and absence of amygdalae activation. Coordinates of these activations are presented in Table I.

Study 2

nature
neuroscience

An fMRI investigation of race-related amygdala activity in African-American and Caucasian-American individuals

Matthew D Lieberman¹, Ahmad Hariri², Johanna M Jarcho¹, Naomi I Eisenberger¹ & Susan Y Bookheimer³

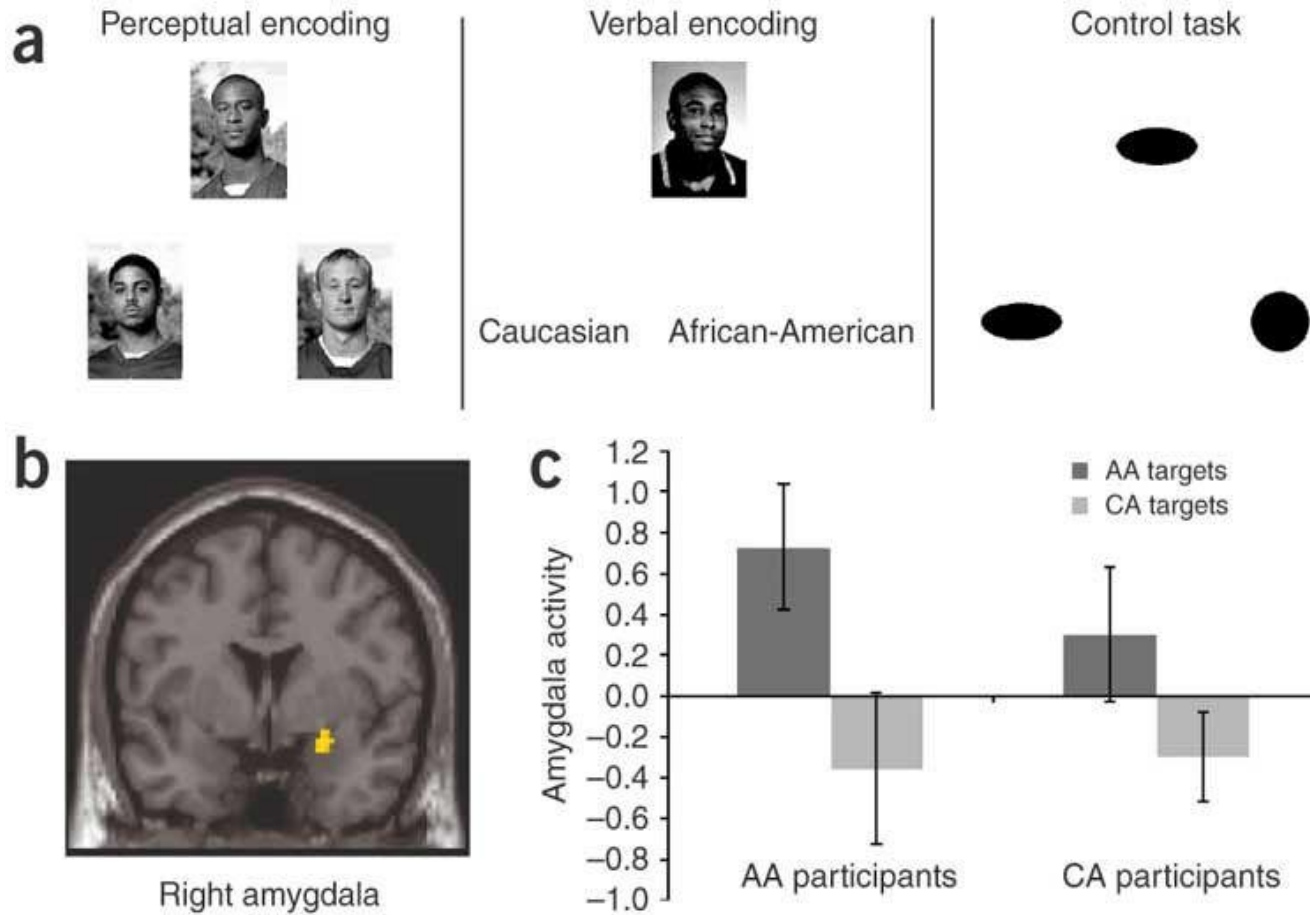
Functional magnetic resonance imaging (fMRI) was used to examine the nature of amygdala sensitivity to race. Both African-American and Caucasian-American individuals showed greater amygdala activity to African-American targets than to Caucasian-American targets, suggesting that race-related amygdala activity may result from cultural learning rather than from the novelty of other races. Additionally, verbal encoding of African-American targets produced significantly less amygdala

targets allows attention and thought to be focused on any number of target characteristics such as gender or age, whereas verbal encoding focuses attention and thought primarily on race⁵. Alternatively, a second possibility is that verbal processing of the race of African-American targets should result in less amygdala activity than perceptual processing because of the general role of language and resource-limited cognitive abilities, known as controlled processes, in correcting and overriding automatic impulses, such as those generated by the amygdala^{6–8}.

The current study examined, for both African-American and Caucasian-American participants, the consequences of both perceptual and verbal processing of race on the amygdala. On perceptual encoding trials, participants chose the face (from a pair of faces at the bottom of the screen) that was of the same race as the target face at the top of the screen (see Fig. 1a and Supplementary Note for methodological details). On verbal encoding trials, participants chose the race label (from a pair of labels at the bottom of the screen) that indicated the race of the target at the top of the screen. Half of the verbal and perceptual encoding trial blocks had predominantly African-American targets and half had predominantly Caucasian-American targets.



Task & Results



Study 3

PSYCHOLOGICAL SCIENCE

Research Article

Putting Feelings Into Words

Affect Labeling Disrupts Amygdala Activity in Response to Affective Stimuli

Matthew D. Lieberman, Naomi I. Eisenberger, Molly J. Crockett, Sabrina M. Tom, Jennifer H. Pfeifer, and Baldwin M. Way

University of California, Los Angeles

ABSTRACT—*Putting feelings into words (affect labeling) has long been thought to help manage negative emotional experiences; however, the mechanisms by which affect labeling produces this benefit remain largely unknown. Recent neuroimaging studies suggest a possible neurocognitive pathway for this process, but methodological limitations of previous studies have prevented strong in-*

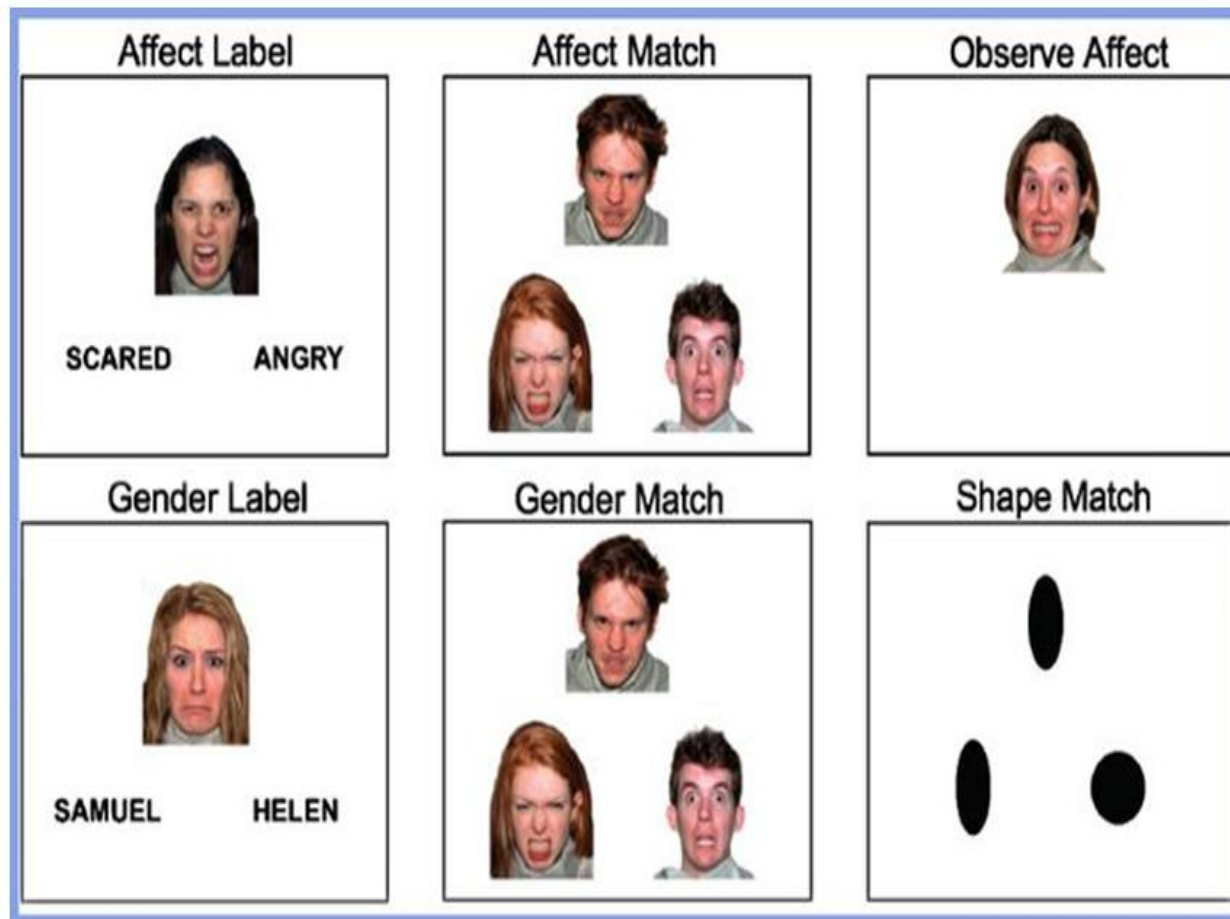
physical health (Hemenover, 2003; Pennebaker, 1997). Although conventional wisdom and scientific evidence indicate that putting one's feelings into words can attenuate negative emotional experiences (Wilson & Schooler, 1991), the mechanisms by which these benefits arise remain largely unknown.

Recent neuroimaging research has begun to offer insight into a possible neurocognitive mechanism by which putting feelings

Limitations of previous affect-labeling studies

- The stimulus displays differ in the two conditions.
- The dampening effect of affect labeling could be a result of general effects of labeling and cognitive processing, rather than a result of affect labeling per se.

fMRI Task



Results

Putting Feelings Into Words

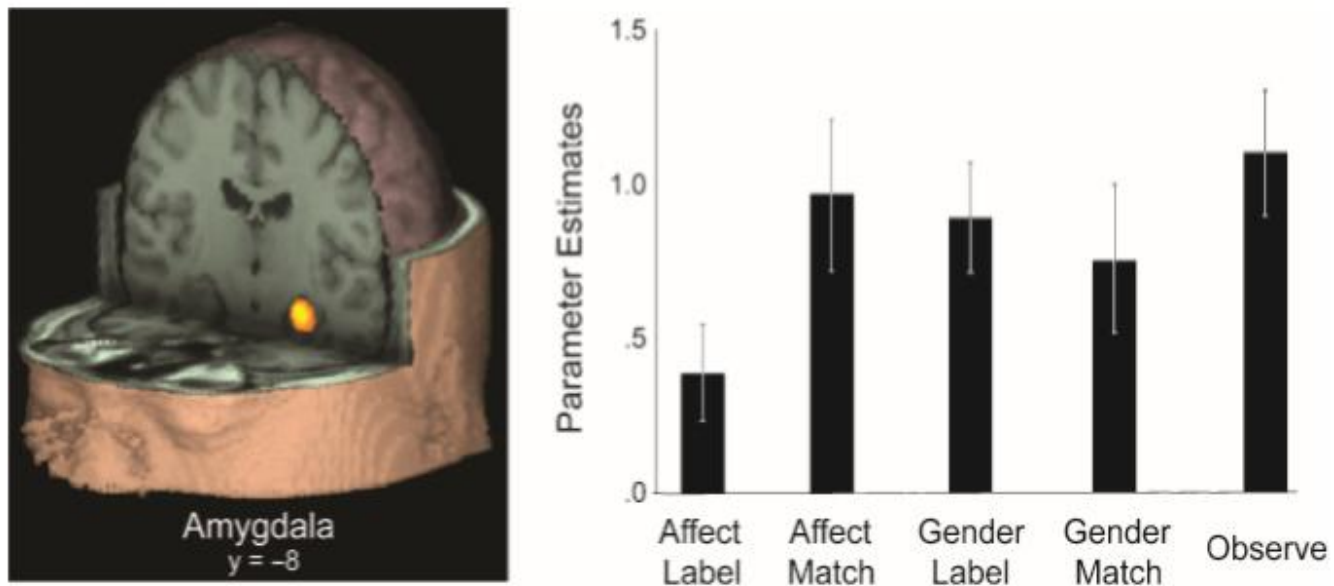


Fig. 2. Parameter estimates of activity during five conditions (relative to activity in the shape-match control condition) in an amygdala region of interest (ROI). The ROI was identified by comparing activity in the observe condition and activity in the shape-match condition. The illustration on the left shows an axial slice indicating the extent of the ROI.

Overview of Recent Research in Iran

- Predictors of treatment response based on affect labeling in individuals with generalized anxiety disorder
- Case-control design

fMRI Task

Matching Negative Emotion



|



Labeling Negative Emotion

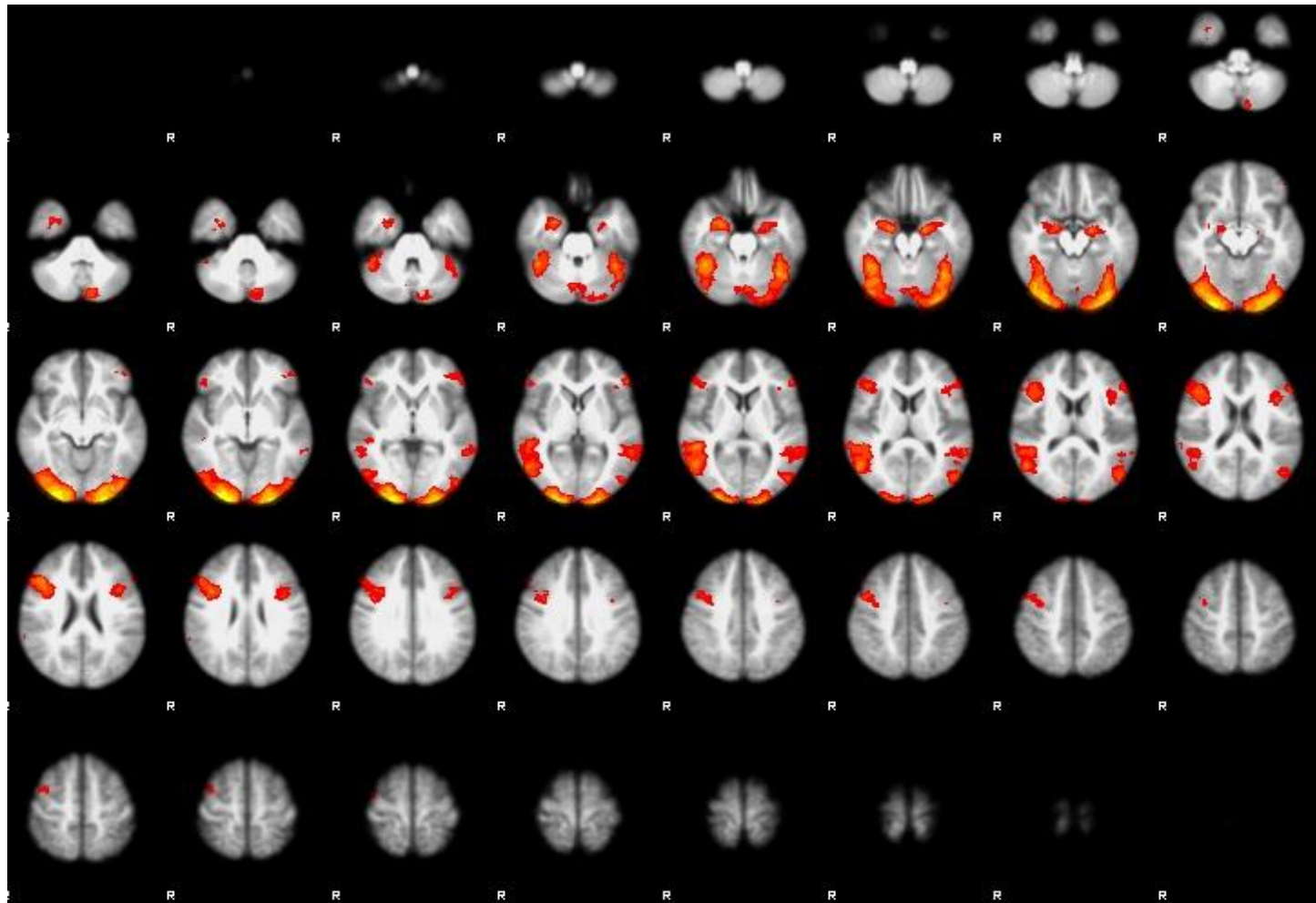


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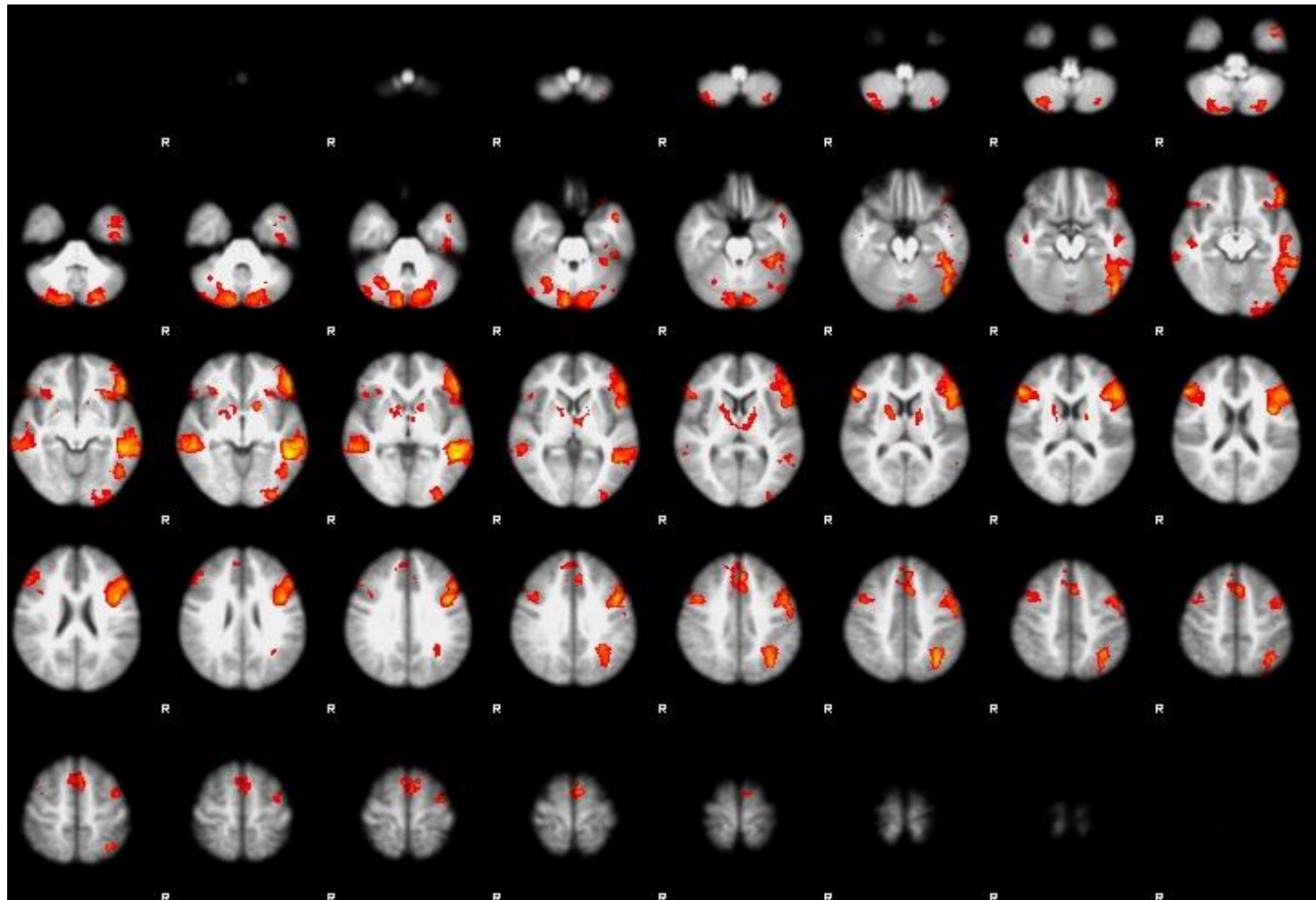
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Group Mean of Neural Activation Matching Negative Affect



Group Mean of Neural Activation Matching Negative Affect





Possible Mechanisms of Affect Labeling

Distraction

For several reasons, this account seems unlikely:

- ▶ Gender labeling does not show the same regulatory effects as affect labeling.
- ▶ emotion words have been shown to activate the amygdala
- ▶ affect labeling was significantly more effective than distraction during exposure therapy
- ▶ the time-delayed effects of affect labeling

Self-Reflection

- Being aware of and observing our own experiences, especially emotional experiences → **dispositional mindfulness**
- The translation of feelings into language may only serve to initiate the introspection process

Reduction of Uncertainty

- By applying a label to emotional stimuli we may be reducing our uncertainty about them by categorizing them.
- The amygdala responds to uncertainty of stimuli.
- Uncertainty as the cause of an emotion seems likely for emotions like **fear and anxiety**, but less likely for other emotions such as **anger or sadness**.

Symbolic Conversion

- Affect labeling may also operate through abstraction by using language to convert stimuli into a symbolic representation.
- Abstract “content labels” (e.g., “object,” “animal,” “human,” “landscape”)
- Abstract thinking has been linked to activity in vIPFC.

Some Considerations

- ▶ When participants are required to **self-generate** the affect labels, emotion regulation effects are delayed and may even serve to temporarily increase reaction to the emotionally evocative stimulus.
- ▶ When participants **are provided** affect labels to use, emotion regulation effects from affect labeling are observed immediately.
- ▶ **Expressive writing** demonstrates **long-term benefits** up to months later, though it may also leave individuals **feeling more negative** affect immediately after writing sessions.

- ▶ Differences among applying labels to our own feelings, the feelings of others, or emotionally evocative objects ?
- ▶ overusage of affect labeling?
- ▶ levels of intensity?
- ▶ Are some individuals better suited to using affect labeling than others?
- ▶ would individuals with less understanding and awareness of their emotional states benefit more?



Thank
you!!