| LOG ID | BOOK REFERENCE | RCT FILTER | CONFIDENCE TIER |
|---|---|---|---|
| SEC A.5 | DIRECTORY A: BACKEND SCHEMATIC (Multi-Agent Architecture) | OFF | CONSENSUS |

AUDITED CLAIM

# BARRETT PATCH (CONSTRUCTED EMOTIONS)

SYSTEMS MODEL — AS STATED IN THE BOOK

> Clinically, human emotions are not fixed, innate reflexes; they are dynamically constructed in real-time through the **cognitive appraisal** of **physiological arousal** and environmental context.

VALIDATION QUERY

Are human emotions dynamically constructed through the cognitive appraisal of physiological arousal and contextual factors rather than being innate neurological reflexes?

EMPIRICAL FINDING

A comprehensive review of affective neuroscience establishes that human emotions are not hardwired, innate biological reflexes. Instead, emotions are dynamically constructed in real-time through the **cognitive appraisal** of **physiological arousal** and situational context. The brain predicts and categorizes raw somatic telemetry based on past experiences.

PRIMARY ANCHORS

→ Yeo & Ong, 2024, Psychological Bulletin

→ Buhle et al., 2014, Cerebral Cortex

ABOUT THIS RECORD

Each claim in the book is decompiled from its IT metaphor into a naked, falsifiable scientific claim, then anchored to a **primary peer-reviewed source**. Claim and anchor are queried against the Consensus academic database (200M+ papers) under a fixed protocol — top-tier **Q1/Q2 journals only**, preprints excluded, human studies only. If a hypothesis fails the audit, the build is rejected: the AI generates the syntax; the peer-reviewed grid validates the physics.

CONFIDENCE TIERS

- **CONSENSUS ◀ this log** — broadly established, highly replicated mechanics.
- **EMERGING** — plausible, actively researched; no universal consensus yet.
- **EXPERIMENTAL** — contested, extrapolated, or purely theoretical.

**RCT FILTER** — Controlled Studies is ON for interventions (a forced action must beat a control) and OFF for mechanisms (so foundational neuroscience isn't blocked).

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# Yes, **human emotions are largely constructed** through **appraisal, arousal, and context**, not fixed reflexes.

## 1. Introduction

Across this corpus, the strongest overall conclusion is that human emotions are not best described as hard-wired neurological reflexes that unfold independently of interpretation. Instead, most evidence supports models in which emotions emerge from appraisals of a situation's relevance, controllability, and meaning, together with bodily arousal and contextual information ( Yeo & Ong, 2024; Lazarus & Folkman, 1987; Scherer, 2018). A large 2024 meta-analysis of 309 studies found that 75% of hypothesized appraisal–emotion links were significant, with a mean effect size of r = .33, which is strong evidence that appraisals systematically shape emotional experience ( Yeo & Ong, 2024). Reviews spanning psychology and neuroscience likewise describe emotion as a multistage process in which perception, attention, appraisal, and then experiential, expressive, and autonomic changes unfold over time rather than as a single reflex arc (Buhle et al., 2014; Ochsner et al., 2012; Scherer & Moors, 2019).

The same corpus also shows why purely reflexive theories are incomplete. Experimental work finds that changing appraisals changes reported emotion and often physiology (Gross, 1998; Troy et al., 2017; He et al., 2023). Studies of threat and challenge show that manipulating appraisal can elicit different physiological patterns, whereas inducing physiological patterns alone does not reliably create matching appraisals ( Tomaka et al., 1997). Reviews of physiology further note that discrete emotions do not map cleanly onto unique autonomic signatures; physiology tracks arousal intensity more consistently than emotion category (Scherer & Moors, 2019). Neuropsychological and semantic evidence also indicates that recognizing and labeling emotions depends on conceptual knowledge and context, not only on innate modules ( Bertoux et al., 2020).

**Are human emotions dynamically constructed through the cognitive appraisal of physiological arousal and contextual factors rather than being innate neurological reflexes?**

N = 17

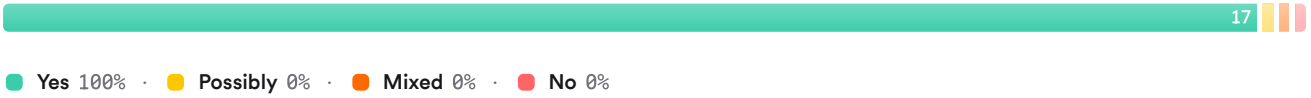


FIGURE 1 Consensus on appraisal-based construction of emotion

## 2. Methods

This Deep Search ran across more than 170 million research papers indexed in Consensus, including Semantic Scholar, PubMed, and related sources. The workflow began with broad human-studies searches on emotion construction, appraisal, arousal, interoception, context dependence, and contrasts with innate or reflexive emotion models. Citation crawling from seed papers expanded the pool, after which machine-learned relevance screening prioritized papers directly addressing appraisal, physiology, context, regulation, interoception, semantics, and competing theories.

The trace identified 13,061 papers in the initial direct search, expanded through targeted search groups and citation crawling, screened 240 papers, judged 172 eligible after relevance filtering, and included the top 50 ranked papers for synthesis. The final set mixes foundational theory, meta-analysis, neuroimaging, psychophysiology, experimental appraisal manipulations, and neuropsychological evidence.

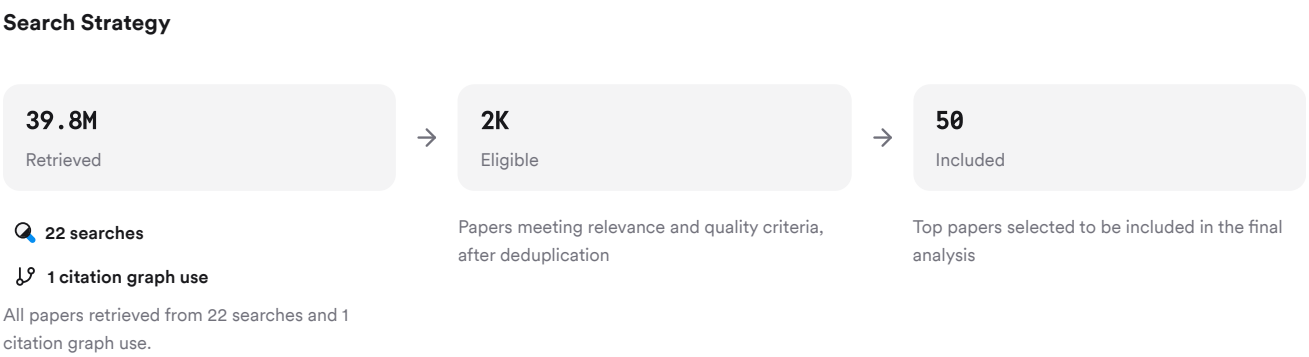


FIGURE 2 Deep search screening and inclusion flow

Six search groups targeted theory, competing models, physiology, context, interoception, and adjacent affective neuroscience literatures.

## 3. Results

### 3.1 Key Papers

A few papers anchor the literature because they either quantify the appraisal–emotion relationship at scale or define the process architecture that later work tests. The strongest anchors are the 2024 appraisal meta-analysis, major reappraisal neuroimaging meta-analyses, and foundational process reviews linking appraisal to physiology, feeling, and action ( Yeo & Ong, 2024; Buhle et al., 2014; Scherer & Moors, 2019).

| Paper | Summary |
|---|---|
| ( Yeo & Ong, 2024) | Appraisal–emotion links significant in 75% of tests ( Yeo & Ong, 2024) |
| (Lazarus & Folkman, 1987) | Reappraisal alters control networks and amygdala activity (Buhle et al., 2014) |
| (Peixoto et al., 2016) | Appraisal differentiates feeling, physiology, and action (Scherer & Moors, 2019) |

FIGURE 3 Foundational papers anchoring the included corpus

### 3.2 Appraisal and Arousal

The best direct evidence favors a constructionist account in which arousal contributes to emotion, but its meaning depends on interpretation and context. Schachter-Singer–style evidence, as reviewed in a modern amygdala review, showed that unexplained physiological arousal was labeled differently depending on the surrounding social context, supporting the idea that emotion results from bodily arousal plus cognitive interpretation (Šimić et al., 2021). More recent stress-appraisal work similarly argues that emotions arise from multiple interacting processes, including bodily sensations, past experience, and situational factors, and that reframing arousal can change affective outcomes ( Jamieson et al., 2017).

Evidence against a simple arousal-first reflex model comes from challenge–threat experiments. Manipulating appraisal changed both subjective threat/challenge and physiology, but manipulating physiology alone did not reliably generate corresponding appraisals, suggesting appraisal is not just a readout of bodily reflexes ( Tomaka et al., 1997).

### 3.3 Neural Evidence

| Dimension | Appraisal-Based Construction | Pure Reflex Model | Citations |
|---|---|---|---|
| Core architecture | Distributed, multi-stage process | Fixed dedicated reflex pathway | ( Ochsner et al., 2012; Salzman & Fusi, 2010) |
| Role of PFC | Assigns value and supports appraisal | Secondary or inhibitory only | (Dixon et al., 2017) |
| Regulation effects | Reappraisal changes amygdala/insula responses | Reflexive responses should resist reinterpretation | (Buhle et al., 2014; He et al., 2023) |
| Network organization | Multiple interacting large-scale networks | One-to-one emotion circuits | (Morawetz et al., 2020) |
| Semantics and context | Semantic systems help shape emotion meaning | Context not constitutive | (Buhle et al., 2014; Morawetz et al., 2016) |

FIGURE 4 Neural predictions of competing emotion models

Neuroscience in this corpus consistently points to distributed appraisal and control networks rather than innate reflex modules for each discrete emotion. Reviews propose that appraisal is a unifying principle for prefrontal contributions to emotion, with different PFC regions assigning value to sensory, bodily, self-related, and social inputs (Dixon et al., 2017). A 2020 network meta-analysis identified four interacting large-scale networks, with separate but connected roles for regulation, appraisal, emotion generation, and physiology (Morawetz et al., 2020). Lower-ranked but important evidence from 2026 suggests hippocampal-prefrontal systems represent emotion concepts in map-like structures and track emotion transitions across time, reinforcing the view that emotion knowledge is organized dynamically and contextually (Yumeng & Kragel, 2026).

### 3.4 Context, Concepts, and Individual Differences

Context and learned concepts appear to be constitutive, not peripheral. Patients with semantic variant primary progressive aphasia show parallel deficits in emotion concept knowledge and emotion recognition, and those deficits correlate with each other, supporting the claim that semantic knowledge helps construct emotional meaning ( Bertoux et al., 2020). Constructionist interpretations in that paper explicitly argue against fixed, specific neural correlates for innate emotion categories ( Bertoux et al., 2020).

Individual differences also fit an appraisal model. Alexithymia is linked to difficulty distinguishing feelings from bodily sensations and to impaired appraisal processes, implying that emotion depends on successful interpretation of internal states (Luminet et al., 2021). Interoception studies show that people with higher interoceptive accuracy respond more strongly to surprising, less predictable emotional expressions in insula and caudate, consistent with contextualized inference from bodily signals rather than reflex alone (Hübner et al., 2022).

### Results Timeline

Emotion research has moved from theory debates to network and construction models.

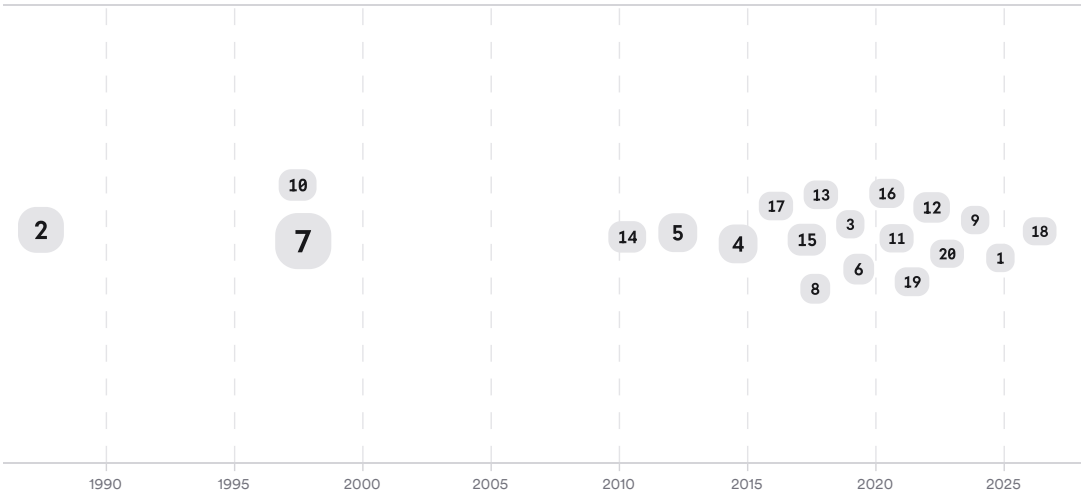


FIGURE 5 Timeline of emotion research; larger markers indicate more citations

The arc runs from foundational appraisal theories and early debates about bodily arousal, through reappraisal experiments and neuroimaging, toward contemporary distributed-network, interoceptive, and semantic-construction accounts (Lazarus & Folkman, 1987; Gross, 1998; ■ Bertoux et al., 2020).

### Top Contributors

Across these included papers, appraisal and regulation research is especially visible through recurring contributions from K. Ochsner, J. Gross, and K. Scherer, and from journals spanning Psychological Bulletin, Emotion, and NeuroImage (Buhle et al., 2014; ■ Gross & John, 2003; ■ Scherer, 2018).

| Type | Name | Papers |
|---|---|---|
| Author | K. Ochsner | [7f16924134f55147b2bf48b2f0152f99][2f0cfd11f7105e8499dbed6e3ec02822] [40880e757207510994994c5bde606f07] |
| Author | J. Gross | [40880e757207510994994c5bde606f07][877af2427bf658fa910b5b761028c46d] [e4455ad51c215d29aff88e4208495cce] |
| Author | K. Scherer | [3fb00e06635d5f9eb0ba3810ae59c623][f75c78a4f0845c8f99af7786f35ef9be] [c913525ddaef539d803bdcd96bf97af8] |
| Journal | *Psychological Bulletin* | [c913525ddaef539d803bdcd96bf97af8][b7b994f6cf4b595e98f0c03d15ed98ab] [2ef13d50182152fba21590d7e6fb71aa] |
| Journal | *Emotion* | [0af942b7c5465cb5b69c169dafa922cd][323d13b6e366516caf184c3d0eb82604] |
| Journal | *NeuroImage* | [8a0856886cf257abbe3c71b9a3eb527d][a53825a0366b5c13a53bc86b936691d8] |

FIGURE 6 Authors and journals appearing most often

## 4. Discussion

The evidence is strongest for three claims. First, appraisals reliably predict emotional experience across many studies and contexts, including a large modern meta-analysis with moderate average effect sizes ( Yeo & Ong, 2024). Second, reappraisal experiments and neuroimaging show that changing interpretation changes emotional experience and brain activity, which is hard to reconcile with a view of emotions as fixed reflexes (Troy et al., 2017; Buhle et al., 2014; He et al., 2023). Third, semantic and contextual knowledge shape both recognition and labeling of emotions, as shown by concept-loss syndromes and constructionist accounts ( Bertoux et al., 2020).

The evidence is weaker on the strongest anti-reflex claim, namely that emotions are never partly innate or never involve fast automatic subcortical responses. Several reviews acknowledge automatic appraisal, subconscious processing, and important amygdala-centered affective functions (Bagozzi et al., 1999; Šimić et al., 2021). The best-supported position is therefore not "cognition replaces biology," but that biology, bodily arousal, learned concepts, and situational appraisal jointly produce emotion (Salzman & Fusi, 2010; Jamieson et al., 2017).

Another limitation is that much of the corpus studies reappraisal or laboratory stimuli rather than naturally unfolding real-world emotions. Several reviews explicitly call for more ecologically valid, dynamic, multicomponent measurement because feeling, physiology, and expression do not always move together ( Ochsner et al., 2012; Scherer & Moors, 2019).

| Claim | Evidence Strength | Reasoning | Papers |
|---|---|---|---|
| Emotions are strongly shaped by cognitive appraisal. | Strong | Large meta-analysis plus convergent theory and experiments. | ( Yeo & Ong, 2024; Scherer, 2018; Tomaka et al., 1997) |
| Reinterpreting meaning changes emotional experience and neural responding. | Strong | Behavioral, fMRI, and causal TMS-fMRI converge. | (Troy et al., 2017; Buhle et al., 2014; He et al., 2023) |
| Physiology contributes mainly to intensity and interacts with appraisal. | Moderate | Good support, but mappings to discrete emotions are incomplete. | (Šimić et al., 2021; Scherer & Moors, 2019; Reisenzein, 1994) |
| Emotion concepts and semantic knowledge help construct recognition and labeling. | Moderate | Neuropsychology and theory align, but datasets remain limited. | ( Bertoux et al., 2020) |
| Emotions are wholly non-innate and never reflexive. | Weak | Corpus does not support this absolute claim. | (Šimić et al., 2021; Bagozzi et al., 1999) |

FIGURE 7 Key claims and evidence across papers

## 5. Conclusion

The literature supports a qualified yes: human emotions are dynamically constructed through appraisal of bodily arousal and contextual meaning much more than they are simple innate neurological reflexes. The strongest evidence comes from large meta-analysis, appraisal manipulations, reappraisal neuroscience, interoception studies, and semantic-concept evidence, all of which converge on a multicomponent, context-sensitive process ( Yeo & Ong, 2024; He et al., 2023; Bertoux et al., 2020).

### Research Gaps

The field still lacks decisive tests that simultaneously measure appraisal, physiology, context, behavior, and felt experience over time. It also needs stronger naturalistic and cross-cultural designs to determine how universal versus learned emotion categories really are (Scherer & Moors, 2019; Šimić et al., 2021).

| Topic/Outcome | RCT or Experimental Causality | Dynamic Physiology | Naturalistic Contexts | Clinical or Lesion Evidence |
|---|---|---|---|---|
| Appraisal causing specific emotions | 10 | 4 | 2 | 1 |
| Arousal-context interactions | 4 | 6 | 2 | 1 |
| Semantic construction of emotion | 2 | 1 | 3 | 4 |
| Network-level neural construction | 6 | 3 | 2 | 2 |

**Open Research Questions**

Future work is moving toward integrated models that treat emotion as inference over bodily, conceptual, and situational signals.

| Question | Why |
|---|---|
| **How do appraisal, interoception, and semantic knowledge interact moment-to-moment during real-world emotional episodes?** | Real-time multicomponent evidence is still sparse, despite theory requiring dynamic causal integration across these systems. |
| **Which parts of emotional responding are universal constraints versus culturally learned conceptual categories?** | Constructionist and reflexive accounts diverge most sharply on universality, but current evidence remains indirect and incomplete. |
| **Can causal modulation of appraisal networks reliably change both felt emotion and physiology in clinical populations?** | TMS-fMRI and regulation studies are promising, but translational causal evidence remains limited across disorders. |

On current evidence, human emotions appear to be dynamically constructed from appraisal, arousal, and context rather than functioning mainly as innate reflexes.

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## References

Y., & Kragel, P. A. (2026). Map-like representations of emotion knowledge in hippocampal-prefrontal systems. *Nature Communications, 17*. https://doi.org/10.1038/s41467-025-68240-z

Bagozzi, R., Gopinath, M., & Nyer, P. U. (1999). The role of emotions in marketing. *Journal of the Academy of Marketing Science, 27*, 184-206. https://doi.org/10.1177/0092070399272005

Bertoux, M., Duclos, H., Caillaud, M., Segobin, S., Merck, C., De La Sayette, V., Belliard, S., Desgranges, B., Eustache, F., & Laisney, M. (2020). When affect overlaps with concept: emotion recognition in semantic variant of primary progressive aphasia. *Brain, 143*, 3850 - 3864. https://doi.org/10.1093/brain/awaa313

Buhle, J., Silvers, J., Wager, T., Lopez, R. B., Onyemekwu, C., Kober, H., Weber, J., & Ochsner, K. (2014). Cognitive reappraisal of emotion: a meta-analysis of human neuroimaging studies.. *Cerebral cortex, 24 11*, 2981-90. https://doi.org/10.1093/cercor/bht154

Dixon, M. L., Thiruchselvam, R., Todd, R., & Christoff, K. (2017). Emotion and the Prefrontal Cortex: An Integrative Review. *Psychological Bulletin, 143*, 1033–1081. https://doi.org/10.1037/bul0000096

Gross, J. (1998). Antecedent- and response-focused emotion regulation: divergent consequences for experience, expression, and physiology.. *Journal of personality and social psychology, 74 1*, 224-37. https://doi.org/10.1037/0022-3514.74.1.224

Gross, J., & John, O. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being.. *Journal of personality and social psychology, 85 2*, 348-62. https://doi.org/10.1037/0022-3514.85.2.348

He, Z., Li, S., Mo, L., Zheng, Z., Li, Y., Li, H., & Zhang, D. (2023). The VLPFC-Engaged Voluntary Emotion Regulation: Combined TMS-fMRI Evidence for the Neural Circuit of Cognitive Reappraisal. *The Journal of Neuroscience, 43*, 6046 - 6060. https://doi.org/10.1523/jneurosci.1337-22.2023

Hübner, A. M., Trempler, I., & Schubotz, R. (2022). Interindividual differences in interoception modulate behavior and brain responses in emotional inference. *NeuroImage*, 119524. https://doi.org/10.1016/j.neuroimage.2022.119524

Jamieson, J. P., Hangen, E. J., Lee, H. Y., & Yeager, D. (2017). Capitalizing on Appraisal Processes to Improve Affective Responses to Social Stress. *Emotion review : journal of the International Society for Research on Emotion, 10*, 30 - 39. https://doi.org/10.1177/1754073917693085

Lazarus, R., & Folkman, S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality, 1*, 141 - 169. https://doi.org/10.1002/per.2410010304

Luminet, O., Nielson, K., & Ridout, N. (2021). Cognitive-emotional processing in alexithymia: an integrative review. *Cognition and Emotion, 35*, 449 - 487. https://doi.org/10.1080/02699931.2021.1908231

Morawetz, C., Riedel, M., Salo, T., Berboth, S., Eickhoff, S., Laird, A., & Kohn, N. (2020). Multiple large-scale neural networks underlying emotion regulation.. *Neuroscience and biobehavioral reviews*. https://doi.org/10.1016/j.neubiorev.2020.07.001

Morawetz, C., Bode, S., Baudewig, J., Jacobs, A., & Heekeren, H. (2016). Neural representation of emotion regulation goals. *Human Brain Mapping, 37*. https://doi.org/10.1002/hbm.23053

Ochsner, K., Silvers, J., & Buhle, J. (2012). Functional imaging studies of emotion regulation: A synthetic review and evolving model of the cognitive control of emotion. *Annals of the New York Academy of Sciences, 1251*, E1 - 24. https://doi.org/10.1111/j.1749-6632.2012.06751.x

Peixoto, F., Sanches, C., Mata, L., & Monteiro, V. (2016). “How do you feel about math?”: relationships between competence and value appraisals, achievement emotions and academic achievement. *European Journal of Psychology of Education, 32*, 385 - 405. https://doi.org/10.1007/s10212-016-0299-4

Reisenzein, R. (1994). Pleasure-Arousal Theory and the Intensity of Emotions. *Journal of Personality and Social Psychology, 67*, 525-539. https://doi.org/10.1037/0022-3514.67.3.525

Salzman, C., & Fusi, S. (2010). Emotion, Cognition, and Mental State Representation in Amygdala and Prefrontal Cortex. *Annual review of neuroscience, 33*, 173 - 202. https://doi.org/10.1146/annurev.neuro.051508.135256

Scherer, K. (2018). Studying appraisal-driven emotion processes: taking stock and moving to the future. *Cognition and Emotion, 33*, 31 - 40. https://doi.org/10.1080/02699931.2018.1510380

Scherer, K., & Moors, A. (2019). The Emotion Process: Event Appraisal and Component Differentiation.. *Annual review of psychology, 70*, 719-745. https://doi.org/10.1146/annurev-psych-122216-011854

Šimić, G., Tkalcic, M., Vukić, V., Mulc, D., Španić, E., Šagud, M., Olucha-Bordonau, F., Vukšić, M., & Hof, P. R. (2021). Understanding Emotions: Origins and Roles of the Amygdala. *Biomolecules, 11*. https://doi.org/10.3390/biom11060823

Tomaka, J., Blascovich, J., Kibler, J. L., & Ernst, J. M. (1997). Cognitive and physiological antecedents of threat and challenge appraisal.. *Journal of personality and social psychology, 73 1*, 63-72. https://doi.org/10.1037/0022-3514.73.1.63

Troy, A. S., Shallcross, A. J., Brunner, A., Friedman, R., & Jones, M. C. (2017). Cognitive Reappraisal and Acceptance: Effects on Emotion, Physiology, and Perceived Cognitive Costs. *Emotion (Washington, D.C.), 18*, 58 - 74. https://doi.org/10.1037/emo0000371

Yeo, G., & Ong, D. C. (2024). Associations between cognitive appraisals and emotions: A meta-analytic review.. *Psychological bulletin*. https://doi.org/10.1037/bul0000452