

Mathematical Model Depicting Social Reward Mismatch

Explanation:

$f, f(0) = (0, 0)$	Reflective of social motivational need for social reward match-No perceived stress
$f(1) = (a, b)$	Reflective of mismatch-Perceived stress Where: a is physiological arousal with social reward mismatch Where: b is emotion with social reward mismatch
$f: \{0,1\} \rightarrow \{(0, 0), (f_a, f_b)\}$	Where: 0,0 reflects response match Where: f_a, f_b reflects response mismatch
$f_a: \mathbf{R}^{n+1} \rightarrow \mathbf{R}$ $f_b: \mathbf{R}^{n+1} \rightarrow \mathbf{R}$	Where: n reflects the number of <i>inputs</i> in environment and +1 reflects time Where: \mathbf{R} reflects response <i>output</i>
$f_a: (\vec{x}, t) = a; a \in \mathbf{R}$	Where: \vec{x} is n dimensional vector; t denotes time, & a is a member of the response

Equations:

$m: \mathbf{R} \rightarrow \{0, 1\} m(t)$	Where: mathematical model represents both mismatch response and the variable of time
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$$f_a: \mathbf{R}^{n+1} \rightarrow \mathbf{R} \quad f_a(\langle x_1, x_2, \dots, x_n \rangle, t) = a$$

$$f_b: \mathbf{R}^{n+1} \rightarrow \mathbf{R} \quad f_b(\langle y_1, y_2, \dots, y_n \rangle, t) = b$$

$$g_d: \mathbf{R}^{n+3} \rightarrow \mathbf{R} \quad g_d(\langle x_1, x_2, \dots, y_n \rangle, \langle a, b \rangle, t) = d$$

$$g_e: \mathbf{R}^{n+3} \rightarrow \mathbf{R} \quad g_e(\langle y_1, y_2, \dots, y_n \rangle, \langle a, b \rangle, t) = e$$

Where: a is dependent on x 's values, e.g. primary appraisal-induced responses of acute physiological arousal components of increased heart rate, skin conductance, blood pressure, etc.

Where: b is dependent on y 's values, e.g. primary appraisal-induced (rated) responses of vulnerable emotion of sadness, shame, self-blame, guilt, etc.

Where: d is dependent on x 's values, e.g. secondary appraisal-induced physiological arousal components of increases in heart rate, skin conductance, blood pressure, neurohormone secretion, e.g. ACTH, relating to anger and sadness induced increases in blood pressure, cortisol, etc., responses that are dependent on x, y of $\langle a, b \rangle$ when it reaches a certain threshold (n+1). \mathbf{R}^{n+3} includes a,b into its function. This is because the primary appraisal is necessary and sufficient for the secondary appraisal to occur.

Where: e is dependent on y 's values, e.g. secondary appraisal-induced anger, enrage, and other-blame defensive emotions relating to goal persistence and sadness relating to goal abandonment; responses that are dependent on x, y of (a, b) when it reaches a certain threshold (n+1).

$$f_t = \sum_{i=1}^t f(\vec{x}, \vec{y}, i)$$

Where: The above sequences are repetitive and cumulative and whose effects need to be understood within context of time and number of occurrences.

$$h(\vec{x}, \vec{y}) = \sum_{i=1}^t (m(i) (f_a(\vec{x}, i) \bullet f_b(\vec{y}, i) + g_d(\vec{x}, f_a(\vec{x}, i), f_b(\vec{y}, i), i) \bullet g_e(\vec{y}, f_a(\vec{x}, i), f_b(\vec{y}, i), i)))$$

Where: The sum of responses for mismatched (m) events (t) allows expression of the previous sequences. Initial output responses reflected in f_a and f_b , and goal adaptive defense responses, g_d and g_e , cumulatively allow expression of genetically predetermined arousal and emotional components relating to the chronic stress response. This process's threshold is dependent on inborn genetic vulnerability and duration and intensity of response of the above sequences. This process also allows for genetically determined symptom expression. Finally cumulatively experienced input variables relating to \mathbf{R}^{n+1} and \mathbf{R}^{n+3} comprise, in total, the theory of mind. Each event reexperience of primary and secondary reappraisals strengthens the theory's viability through consolidation processes.

In such a model exposure to a stimulus, which evokes primary appraisals (with experiential reminders and monitoring) and associated responses as well as secondary appraisals with their associated responses can help researchers to better understand their role in self-concept formation and decision making during social interactions. Both primary and secondary appraisal emotion may be monitored by ratings. Associated physiological arousal may be monitored by usual medical means as noted in an earlier section, i.e. autonomic arousal methods monitoring heart rate, blood pressure, and skin conductance or the nature of circulating neurohormones. i.e. adrenocorticotropin hormone or cortisol levels.