Supplemental Information (SI) for
Purpose in life and conflict-related neural responses during health decision-making
Yoona Kang, Victor J. Strecher, Eric Kim & Emily B. Falk

SI 1. Association between purpose and health messages ratings across endorsement types. All analyses control for ethnicity as in the primary analyses. t and p values are displayed.

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SI 2. Self-relevance processing. To test whether health-related conflict processing might directly alter self-related processing of health information, we used a standard self localizer task to create group-level functional ROIs (fROIs) associated with self-related processing. Functionally defined ROIs in the medial prefrontal cortex (MPFC) and posterior cingulate cortex (PCC) were identified. Participants were presented with 32 personality traits, selected from a list of 120 based on ratings they provided during the baseline assessment (Kang et al., 2018). Participants made binary judgments about a series of personality traits on their self-relevance (me/ not me); as a within-subject control trial, valence (good/bad). The task also included trials in which participants judged the case of the lettering (upper/lower) which is not the focus of the current report. Thirty-two personality traits were presented once for each type of judgment, for a total of 96 trials across one run. Trial types were blocked, so that participants always saw four trials of the same type consecutively. This resulted in eight blocks of each judgment type. Each block consisted of an initial screen showing the block type (2s), followed by four consecutive personality trait words and judgment ratings (3.2s each). Blocks were separated by fixation rest periods (4s, range 2-12s).

Activity in the neurosynth map of conflict was positively correlated with activity in the functionally defined self-relevance processing regions of interest (ROIs) during how (MPFC: r=.274, p=.0002; PCC: r=.208, p=.006) and why (MPFC only: r=.181, p=.017) messages, but not with other message types (ps>.10), which is partially consistent with the idea that conflict experienced may be in relation to self-views. However, we found no evidence that purpose was associated with neural activity in our functionally defined self-related processing ROIs (See SI 3).

SI 3. Associations between purpose and activity in neural ROIs relevant to conflict, reward, self, salience, and executive processing during exposure to why, how, and risk health messages. All analyses controlled for ethnicity as in the primary analyses. t and p values are displayed. Meta-analytically defined ROIs associated with reward processing were identified by (Bartra, McGuire, & Kable, 2013), functionally defined ROIs (fROIs) associated with self-relevance processing were identified by a self-localizer task in the current study (SI.1), and
salience and executive fROIs were defined by (Shirer, Ryali, Rykhlevskaia, Menon, & Greicius, 2012). R = right; L = left; (d)ACC = (dorsal) anterior cingulate cortex; AI = anterior insula; DLPFC = dorsolateral prefrontal cortex; PCC = posterior cingulate cortex; VLPFC = ventrolateral prefrontal cortex; (V)MPFC = (ventro)medial prefrontal cortex; VS = ventral striatum.

\[ p < 0.05^{*} \]

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### All
- t = 2.14, p = 0.03
- t = 2.01, p = 0.05
- t = 3.47, p = 0.02

### dACC
- t = 2.94, p = 0.04
- t = 3.12, p = 0.01
- t = 0.04, p = 0.73

### L AI
- t = 1.24, p = 0.22
- t = 1.42, p = 0.16
- t = 3.47, p = 0.02

### R AI
- t = 1.24, p = 0.22
- t = 1.42, p = 0.16
- t = 3.47, p = 0.02

### R DLPFC
- t = 2.06, p = 0.04
- t = 2.94, p = 0.04
- t = 0.04, p = 0.73

### R VLPFC
- t = 3.12, p = 0.01
- t = 0.04, p = 0.73
- t = 3.47, p = 0.02

### ACC
- t = 1.24, p = 0.22
- t = 1.42, p = 0.16
- t = 3.47, p = 0.02

### PCC
- t = 3.12, p = 0.01
- t = 0.04, p = 0.73
- t = 3.47, p = 0.02
SI 5. Neural activity during health messages task across message types. Contrasts were computed focusing on within-subjects activation for each message type, and then comparing across the message types ($n=177$). All health message trials are compared to respective everyday activity (control) trials. Clusters in occipital poles, cerebellum, and white matter are not reported. ($p<.005$, uncorrected)

Note: L = left; R = right; (d)ACC = (dorsal) anterior cingulate cortex; DLPFC = dorsolateral prefrontal cortex; PCC = posterior cingulate cortex; VLPFC = ventrolateral prefrontal cortex; VTA = ventral tegmental area.

* Clusters surviving correction based on 3dClustSim ($p<.005$, $k=236$, corresponding to $p<.05$, corrected)

*Clusters near our focal ROIs within the ‘reverse inference map of conflict’

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<th>size</th>
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**Risk > Control**

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**All messages (How + Why + Risk) > Control**

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SI 6. Slice views of neural activity during health messages task across message types. (p<.005, uncorrected)

**How vs. Control**

**Why vs. Control**
Risk vs. Control

All messages (How + Why + Risk) vs. Control
How (vs. Control) > Why (vs. Control)

Why (vs. Control) > Risk (vs. Control)
SI 7. Neural regions associated with purpose during health messages task across message types. Contrasts were computed focusing on within-subjects activation for each message type, and then comparing across the message types (n=177). All contrasts are compared to everyday activity (control) trials. (p<.005, uncorrected) Note: L = left; R = right; (d)ACC = (dorsal) anterior cingulate cortex; DLPFC = dorsolateral prefrontal cortex; PCC = posterior cingulate cortex; VLPFC = ventrolateral prefrontal cortex; VTA = ventral tegmental area.

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**Why > Control**

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**SI 8. Neural activity associated with purpose during how vs. control messages.** Regions shown are less active for people with greater purpose. The top panel highlights results consistent with our main ROIs, and the bottom panel illustrates that little else in the brain was related to purpose during this contrast. (p<.005, uncorrected)
References

