The Indiana Sexual and Affective Word Set: Incorporating sexual emotions into basic and dimensional theories of emotion

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Background

1) While it is generally acknowledged that the sexual response includes an emotional component, it is still unclear whether these expressions are specific to the sexual response. Indeed, many theories of emotion do not incorporate specific emotional responses to the sexual response even though these brain regions associated with emotional responses have been shown to respond differently to sexual emotional stimuli than to non-sexual emotional stimuli.

2) The dimensional theories of emotion describe an emotional space defined by a bipolar dimension of valence (negative to positive), a dimension of arousal (low to high energy or arousal), and a dimension of dominance. Many stimulus sets have been created and utilized according to this theory, including pictures (AIPS), words (ANEW), and sounds (SADS).

3) The theory of basic emotions considers a small set of emotions to be categorically universal and biologically driven, with more complex and culturally-specific emotional expressions combinations of these basic emotions. Most prominently, studies of emotion through facial expressions have focused on the theory of basic emotions, although distinct neural correlates of these basic emotions have not been described, and stimulus sets are characterized accordingly.

Research Goals

1) Create a publicly accessible database of written word stimuli that have been described according to both the dimensional and basic theories of emotion, as well as specifically sexual emotions.

2) Determine how each emotional theory contributes to the overall emotional responses to words within the database, and particularly if one theory can account for the variability within the other.

3) Determine the variability within the sexual-emotion ratings can be accounted for by non-sexual emotional ratings.

The Indiana Sexual and Affective Word Set (IASWS)

1) 135 words were selected from the ANEW database across the entire range of both valence and arousal in order to insure reliability with previous stimuli-set ratings.

2) 1315 additional words were included, incorporating a range of categories including, among others: familial relationships (brother), romantic relationships (girlfriend), sexual relationships (lover), reproductive biology (vagina), sexually transmitted diseases (herpes), sexual activities (intercourse), sex-related personal adjectives (slut) and non-sex-related personal adjectives (trust worthy).

Emotional Scales & Ratings

1) Participants: Approximately 60 ratings were collected per word, per emotional scale (30 male, 30 female). Participants consisted of native-English speaking undergraduate students receiving credit for participation (Age range: 18-45, Race: 94% white, 4% black, 2% other).

2) Scales: All scales ranged from 1-9 as follows:

- Sexual Valence: 1 = Sexually negative, 5 = Sexually neutral, 9 = Sexually positive
- Sexual Arousal: 1 = Not at all sexually arousing, 9 = Extremely sexually arousing
- Sexual Energy: 1 = No sexual energy, 9 = Extreme sexual energy
- Valence: 1 = Extremely negative, 5 = Neutral, 9 = Extremely positive
- Arousal: 1 = Not at all arousing, low energy, 9 = Extremely arousing, high energy
- Dominance: 1 = Not at all dominating, 9 = Extremely dominating
- Happiness: 1 = Not at all happy, 9 = Extremely happy
- Fear: 1 = Not at all fearful, 9 = Extremely fearful
- Anger: 1 = Not at all angry, 9 = Extremely angry
- Disgust: 1 = Not at all disgusting, 9 = Extremely disgusting
- Sadness: 1 = Not at all sad, 9 = Extremely sad

Reliability of Emotional Ratings

1) To ensure reliability of the dimensional emotional ratings, current ratings of the 135 words chosen from the ANEW database were compared to the original ratings on these same 3 scales. All ratings were significantly reliable (p < 0.001).

2) To ensure reliability of the basic emotional ratings, current ratings of the 135 words chosen from the ANEW database were compared to the original ratings on these same 5 scales. All ratings were highly reliable (p < 0.001).

Creating Word Categories

1) Ratings were collapsed across participants, and a factor analysis was run to determine which word's ratings clustered together. Altogether, almost all factors were needed to account for the variability in emotional ratings and how those factors loaded onto each word were assessed.

2) Factors were extracted accounting for 91.5% of the total variance within the dimensional ratings.

3) Loading values for each word were used to create 4 word categories that loaded heavily onto one and only one component. These groups were defined by 3 criteria:

- Primary-factor score > 0.76
- Secondary-factor score < 0.50
- Primary-factor score - Secondary-factor score > 0.30

Emotional Ratings Predicting Word Category

1) A logistical regression was then run to determine which emotional ratings contributed to each of the four word categories, using the fifth null category as the reference category.

2) Multiplicative beta weights for each emotional ratings' contribution to category affiliation are shown below, with the 95% confidence intervals represented as error bars.

Discussion

1) The sexual emotions of sexual arousal and sexual energy were the sole positive predictors of the first word category, suggesting that neither the basic, nor the dimensional theories of emotion can account for participants subjective measures of sexual emotion. Indeed, the basic emotions were mainly negative predictors of this category, and the dimensional emotions made no significant contribution in either direction. This suggests that there are emotions specific to the sexual response, and that these emotions should be controlled in sexual stimulus sets.

2) Basic emotions, or combinations thereof, accounted for the other three categories of words. Happiness and disgust were the non-positive predictors of 2 categories. The final category was positively predicted by fear and sadness, as well as dominance. These results indicate that the basic emotions can account for a wide range of the emotional response.

3) The basic emotion of anger was not a significant predictor of any word category, though it trended towards significance in the negative basic-emotion word group. This is in line with previous findings that categorization of emotional stimuli rarely include anger-only stimuli.

4) Dimensional emotions accounted for very little of the variability in the word categories. Dominance was the only positive predictor of any category, while arousal was only a negative predictor of the happiness category. Importantly, valence was not a significant predictor of any word category, suggesting that the dimensional theory's emotional space cannot account for variability in subjective measures of emotion not accounted for by the basic- and sexual-emotion ratings.

5) Overall, this word set provides a well-characterized set of stimuli that will allow researchers to control for non-sexual emotional responses, and will be fully released to the public for use in such endeavors.

References