Approaching Men and Withdrawing Women: Sex-Specific Relationships of Coping Styles to Frontal EEG Asymmetry

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Abstract

❑ Individuals use various strategies to cope with stressful or emotional situations, some associated with positive well-being, and others linked to negative outcomes.

❑ Although it has been argued that frontal electroencephalographic (EEG) asymmetry may index predispositions toward approach- and withdrawal-related responses, particularly during stressful or emotional events, few studies have examined whether individual differences in response to stress are associated with differential patterns of frontal brain activity.

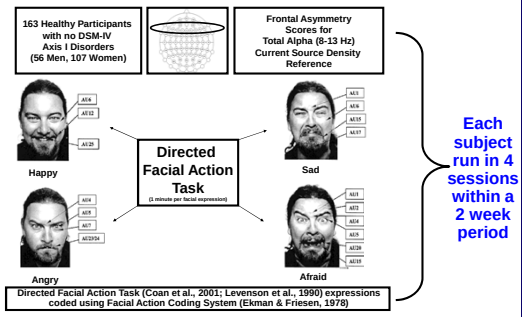
❑ The present study examined whether approach (active coping, planning) and withdrawal (denial, mental disengagement) coping styles that individuals endorsed using in stressful situations predicted differential patterns of frontal EEG asymmetry during emotional challenge.

❑ Current source density-referenced EEG data were assessed during a facial emotion task, wherein 163 psychiatrically healthy participants (34% male) made directed facial actions of approach (angry and happy) and withdrawal (afraid and sad) expressions.

❑ Results indicated that, across all facial expressions, active coping and planning were associated with relatively greater left frontal activity in men but not women, whereas denial and mental disengagement were linked to relatively less left frontal activity in women but not men.

❑ Based on the literature linking frontal asymmetry to risk for depression, these findings suggest approach coping is linked to lower risk of depression in men, and withdrawal coping is related to greater risk of depression in women.

Methods



❑ Participants filled out the COPE questionnaire (Carver et al., 1989) during the first and fourth visit, and scores were averaged together to obtain a trait measure of coping for 15 domains.

❑ Four of the 15 COPE subscales were selected for analysis, two conceptually associated with approach motivation (Active Coping, Planning) and two theoretically linked to withdrawal motivation (Mental Disengagement, Denial).

❑ These subscales were then correlated with behavioral activation (BAS) scores and behavioral inhibition (BIS) scores using the BIS/BAS scale (Carver & White, 1994) to examine whether they were empirically related to approach and withdrawal motivation, respectively. As predicted, Active Coping and Planning correlated with BAS, and Mental Disengagement and Denial correlated with BIS.

❑ Since EEG asymmetry has been linked to depression, the four COPE subscales were also correlated with the Beck Depression Inventory II (BDI-II; Beck et al., 1996) to examine their relationship with current depression symptomatology. As expected, the approach COPE scales were negatively correlated and the withdrawal COPE scales were positively correlated with depression.

Correlations Between COPE Subscales and Relevant Questionnaires (N = 163)

	Active Coping	Planning	Mental Disengagement	Denial
BAS (range 26-52)	.49**	.42**	.09	.14
BIS (range 8.5-27)	-.19*	-.12	.34**	.16*
BDI-II (range 0-23)	-.38**	-.32**	.30**	.23**

Note. *p < .05. **p < .01. BAS = Behavioral Activation System subscale. BIS = Behavioral Inhibition System subscale. BDI-II = Beck Depression Inventory II. Correlations did not differ between men and women.

Approach-Related COPE Subscales

Active Coping
- I concentrate my efforts on doing something about it.
- I take additional action to try to get rid of the problem.
- I take direct action to get around the problem.
- I do what has to be done, one step at a time.

Planning
- I think hard about what steps to take.
- I think about how I might best handle the problem.
- I try to come up with a strategy about what to do.
- I make a plan of action.

Withdrawal-Related COPE Subscales

Mental Disengagement
- I turn to work or other substitute activities to take my mind off things.
- I daydream about things other than this.
- I sleep more than usual.
- I go to movies or watch TV, to think about it less.

Denial
- I say to myself "this isn't real."
- I refuse to believe that it has happened.
- I pretend that it hasn't really happened.
- I act as though it hasn't even happened.

Analysis / Results

COPE Subscales:

❑ Performed t-tests to examine sex differences for each subscale separately

❑ Men and women did not differ in COPE subscale scores.

Sex	Active Coping	Planning	Mental Disengagement	Denial
	Mean (SE)	Mean (SE)	Mean (SE)	Mean (SE)
Men	11.0 (0.3)	11.3 (0.3)	9.4 (0.2)	5.9 (0.3)
Women	10.6 (0.2)	11.4 (0.2)	9.5 (0.2)	5.8 (0.2)

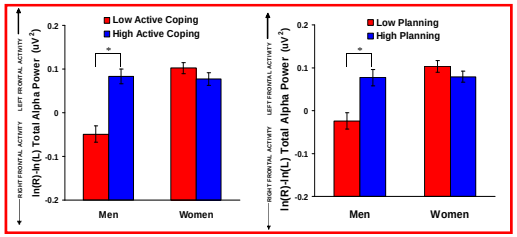
Frontal EEG Asymmetry and COPE Subscales:

Linear Mixed Model Analysis (SPSS)
Run for each COPE scale separately
(Active Coping, Planning, Mental Disengagement, Denial)

Dependent Variable	EEG asymmetry score averaged across all 4 sessions
Between-Subjects Factors	COPE Scale, Sex (Men, Women)
Within-Subjects Factors	Face (Afraid, Angry, Happy, Sad)
	Channel Pair (F2-F1, F4-F3, F6-F5, F8-F7)

❑ Coping by Sex interaction emerged for all subscales

❑ Results consistent across frontal channel pairs and faces

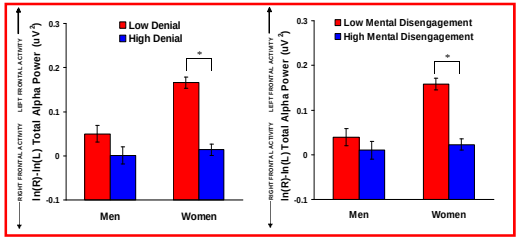


❑ Higher approach subscale scores linked to relatively greater left frontal activity in men but not women.

❑ Higher withdrawal subscale scores linked to relatively less left frontal activity in women but not men.

❑ At low levels of approach and withdrawal coping, men displayed relatively less left frontal activity than women

❑ At high levels of approach and withdrawal coping, men and women did not differ in frontal EEG asymmetry.



Discussion

❑ The present study demonstrated sex differences in the relationship between coping styles and frontal EEG asymmetry in response to emotional challenges:

1. *Higher approach-related* coping was linked to relatively *greater left frontal* EEG activity in men
2. *Higher withdrawal-related* coping was linked to relatively *less left frontal* EEG activity in women

❑ A growing body of research has shown that relatively *less left than right* frontal EEG activity may be a marker of risk for depression (e.g., Allen et al., 2004; Henriques & Davidson, 1991; Stewart et al., 2010).

❑ Given this literature, results of the present study suggest that degree of depression risk is linked to the degree of:

1. *Approach-related* coping skills in men
2. *Withdrawal-related* coping skills in women

❑ Results held across all facial expressions made during the emotional challenge task regardless of the valence (positive or negative) or motivational direction (approach, withdrawal) associated with the facial expression. Thus, frontal EEG asymmetry may be indexing a generalized trait-like capability to respond to emotional events (Coan, Allen, & McKnight, 2006).

❑ Findings suggest that depression prevention and treatment could focus on increasing the use of approach coping in men and reducing the use of withdrawal coping in women in response to emotional stressors.

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The authors wish to thank Jamie Velo, Andrew Bismark, Dave Towers, Dara Halpern, Eliza Ferguson, Craig Santerre, Eynav Accortt, Jay Hegde, and a myriad of research assistants for their efforts in recruiting and testing participants. Portions of the collection of these data were funded by NIMH R01-MH066902 and a grant from the NARSAD foundation.

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