



# Approach, avoidance and weight-related testing: An investigation of frontal asymmetry

Mark D. Faries, Wesley Kephart, & Eric J. Jones

Stephen F. Austin State University, Department of Kinesiology & Health Science

LIFESTYLE MEDICINE  
& BEHAVIOR LAB

## ABSTRACT

**PURPOSE:** Two motivational systems underlie behavior and affective responses – an inhibition/avoidance system and an activation/approach system. The purpose of the present study was to explore if individual differences in these motivational systems would occur in response to common weight and body composition testing in adult women. **METHODS:** Electroencephalogram (EEG) was used to distinguish approach or avoidance orientations via frontal asymmetry before and after testing sessions. Data were analyzed to determine relative increases in left or right frontal activity (i.e. approach motivation or avoidance motivation, respectively). **RESULTS:** Clear distinctions in motivational responses were found, with 65% of the sample responded with an approach motivation, while 35% responded with an avoidance motivation. Overall, participants experienced a negative affective response ( $2.45 \pm 1.76$  to  $.95 \pm 2.09$ ,  $p < .05$ ) with no interaction of time and motivational group. However, an interaction in arousal occurred with the avoidance group experiencing greater arousal ( $1.57 \pm .79$  to  $2.86 \pm 1.35$ ) than the approach group ( $2.08 \pm 1.44$  to  $2.56 \pm 1.26$ ). Subsequently, the avoidance group self-reported an increase in 'comfort food' consumption of desserts and snacks the week following the testing session, to approximately 1.5x per week before the study, to 3-4 times the week following the study. There was no change in general physical activity or dietary behavior in avoidance and approach groups. **CONCLUSIONS:** As shown with other stressors, clear individual differences exist in motivational responses to common weight and body composition testing. Such testing produced a general negative affective response, however, the individual differences in motivational responses might produce different behavioral choices. Future research and interventions in primary care, public health, and fitness settings should be considerate to this variation in motivational responses to help explain changes in both healthy and unhealthy behaviors following interactions involving one's body weight and/or body composition.

## AVOIDANCE APPROACH



## RESULTS

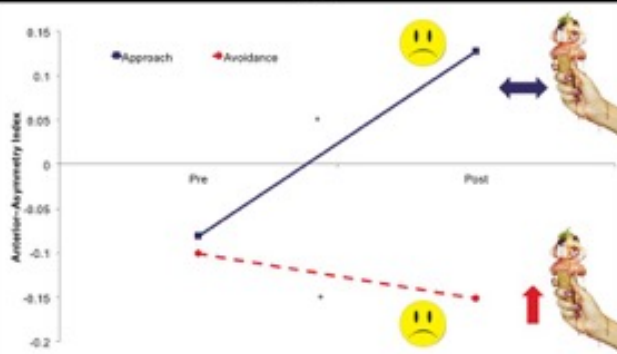


Figure 1. Change in anterior-asymmetry index (log right alpha power minus log left alpha power) from pre- to post-treatment between motivational orientation groups (approach' (n = 13) or 'avoidance' (n = 7)). \* significant change from pre- to post-treatment ( $p < .05$ ).

Table 2. Pre- and Post-means(SD) for affective, physical activity and dietary variables.

Variable	Total (n = 20)		Approach (n = 13)		Avoidance (n = 7)	
	Pre	Post	Pre	Post	Pre	Post
Feeling Scale*	2.45(1.76)	.95(2.09)	2.54(1.90)	1.46(1.56)	2.29(1.60)	0.00(2.71)
Felt Arousal Scale†	1.99(1.25)	2.38(1.31)	2.08(1.44)	2.08(1.26)	1.57(1.79)	2.86(1.35)
Physical activity index	33.71(5.33)	35.78(5.49)	31.67(3.11)	34.78(5.24)	33.71(5.33)	35.78(5.49)
Dietary index*	6.20(2.97)	5.55(2.56)	6.54(2.82)	5.23(2.80)	6.20(2.97)	5.55(2.56)
Fruit/vegetable index	2.65(.99)	2.17(.98)	2.77(.73)	2.45(1.04)	2.65(.99)	2.17(.98)
Desserts/sweets index‡	.87(.59)	.94(.87)	.73(.65)	.63(.67)	.87(.54)	1.43(.87)

\*Lower index represent more healthy diets

†Significant main effect of time ( $p < .05$ ); ‡Significant interaction with group (approach versus avoidance;  $p < .05$ )

Table 1. Means(SD) for participant descriptive measures.

Variable	Approach (n = 13)	Avoidance (n = 7)
Age (yrs)	21.54(1.20)	21.86(1.07)
Body fat (%)	21.58(3.17)	23.33(4.15)
BMI (kg/m <sup>2</sup> )	22.63(1.88)	24.06(2.53)
WHR	.75(.02)	.76(.04)
Weight dissatisfaction	2.15(.55)	2.43(1.13)
Weight controllability	4.15(.90)	4.00(1.18)
Weight changeability	3.54(1.33)	3.57(.98)
BIS	19.38(2.10)	20.00(2.65)
BAS	42.00(2.89)	39.71(4.07)

## METHODS

After providing informed consent, participants completed the BIS/BAS scales, and were fitted with the EEG electrode cap and seated in large, comfortable chair with a headset inside a private, sound-attenuated room. A 5-minute control video of scenic running water was used to stabilize mood, and then 2-minutes of resting EEG were recorded. During all EEG recordings, participants were provided with a neck pillow and sleep mask, and asked to keep their eyes closed, refrain from any eye movement, and relax their head into the headrest. Affective and descriptive measures were completed immediately following the 2-minutes of resting EEG. Next, each participant was measured and informed of her weight (in lbs), body mass index (BMI), BMI category (normal weight or overweight), and total body fat (in lbs). Affective states were reassessed, and participants immediately completed another 2-minutes of resting EEG. After the final EEG, participants were asked to complete physical activity and dietary behavior measures (7-day recall). One week after their lab visit, participants were contacted via email to re-assess physical activity and dietary behavior for the previous week.

## SUMMARY & CONCLUSIONS

- This is the first study to discover, via frontal asymmetry, distinct individual differences in motivational response (i.e. approach or avoidance) to common weight-related testing in young, adult women.
- In general, both approach and avoidance groups experienced an increase in negative feeling states following testing.
- The avoidance group had a significant increase in their consumption of desserts and sweets (i.e. comfort food).
- Future research should examine the potential moderators and determinants to frontal asymmetry in response to weight-related stimuli, in hopes of better elucidating our understanding of the difficulties in body weight regulation and weight-related counseling.