

Cognitive bias for cancer words was not revealed during an emotional Stroop task in women with a family history of breast cancer



Introduction

- Women with a family history of breast cancer (FH+) are at greater risk for developing breast cancer and have elevated levels of psychological distress.
- Distress may bias the cognitive processing of cancer information.
- Integrating information about risk is crucial to making informed decisions about preventive care.
- To our knowledge, only one study found bias in cognitive processing among FH+ women using a cancer version of the emotional Stroop task (Erblich et al. 2003).
 - Chronic distress was not related to color-naming times so mediation criteria were not met.
- That study did not address two important issues:
 - selection of participants with elevated levels of distress
 - measures of acute distress that may be associated with task performance

Aim

- Compare performance on a cancer-word Stroop task by FH+ and family history negative (FH-) women to:
- confirm the emotional Stroop bias for cancer words
- explore potential mediating factors such as chronic distress, cancer-specific distress and acute distress

Methods

Testing

- Participants completed chronic distress questionnaires, then attended one testing session:
- acute stress before and after the Stroop task
 - cancer-word Stroop task
 - North American Adult Reading Test (NAART)

Measures

Measures	Chronic Distress
Cancer Stroop task	Profile of Mood States (POMS-SF), Center for Epidemiological Studies Depression scale (CES-D), Impact of Events Scale (IES), Perceived Stress Scale (PSS), Perceived Breast Cancer Risk, Breast Cancer Worry (BCW)
Verbal ability	General chronic distress composite score: mean of the z-scores for the POMS-SF, CES-D, and PSS
Acute Stress Reactivity	Cancer-specific distress score: mean of the z-scores for the IES and the Positive and Negative Affect Scale
North American Adult Reading Test (NAART)	BCW

Analysis

- Repeated measures ANOVA: list (cancer, cardiovascular, positive, negative and neutral) by family history
 - control for verbal ability and age
- Compare psychological measures by FH status

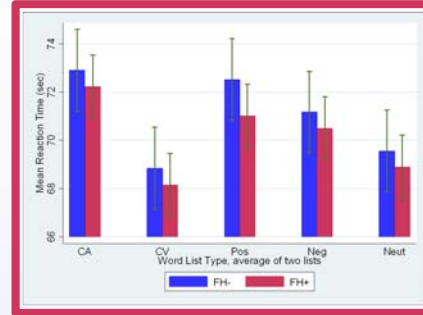
- Test for associations between color naming times and distress measures to satisfy the requirements of mediation:
 - family history related to reaction time
 - family history related to distress or perceived risk
 - distress or perceived risk related to reaction time

Data

- FH+ women recruited from the Seattle area as part of a larger study testing stress reduction and immune function.
- FH- women recruited from the Seattle area
- Both groups selected for elevated levels of distress
- Exclusion: depression, schizophrenia, autoimmune

Age	FH- (n=59)			FH+ (n=82)		
	Range	Mean	SD	Range	Mean	SD
	18-61	43.53	13.09	22-60	43.41	10.54
Education						
Completed	Frequency	%		Frequency	%	
At least H.S. or GED	3	5.08		3	3.66	
Some/grad college	31	52.53		33	40.24	
Graduate/ professional	25	42.37		46	56.10	
Race						
Category	Frequency	%		Frequency	%	
White	49	83.05		69	84.15	
Black or African Amer.	3	5.08		4	4.89	
Asian or Pacific Island.	2	3.39		3	3.66	
Native Amer., AK, A.I.	1	1.69		0	0.00	
Total Family Income						
Range	Frequency	%		Frequency	%	
≤\$50,000	24	40.67		12	14.64	
\$51,000 or greater	26	44.07		25	30.49	
Prefer not to answer, missing, or n/a	9	15.25		45	54.88	
Marital Status						
Category	Frequency	%		Frequency	%	
Single, div. or sep.	28	47.45		37	45.13	
Married or partnered	29	49.15		44	53.66	
Employment Status						
Category	Frequency	%		Frequency	%	
FT/self-employed	43	72.88		60	73.17	
PT	10	16.95		11	13.41	
Unempl/student /retired	4	6.78		10	12.20	

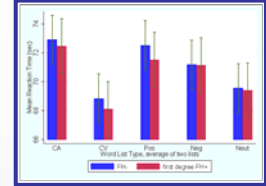
Results



- No interaction, no effect of FH
- Significant main effect of list $p < 0.001$, verbal ability $p < 0.001$, and age $p < 0.001$
- Chronic distress measures
 - FH+ > FH-
- Acute distress reactivity to the Stroop task
 - FH+ = FH-
- Perceived risk, chronic, and acute distress were not associated with color naming times ($-0.16 < r^2 < 0.11$)
- Because neither FH nor the proposed mediators were related to the outcomes, the conditions for mediation were not met and the analyses were not performed.

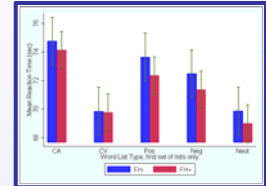
Exploratory analyses

- Only first-degree relative FH+ compared to FH-
- No significant interaction, no effect of FH or age
 - Significant main effect of list ($p < 0.001$), verbal ability, ($p < 0.05$)
 - Chronic distress measures
 - FH+ > FH-
 - Acute distress reactivity measures
 - FH+ = FH-



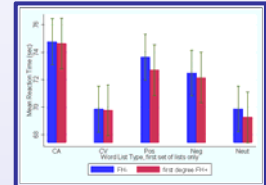
Only first set of lists

- No significant interaction, no effect of FH
- Significant main effect of list ($p < 0.001$), verbal ability ($p < 0.001$) and age ($p < 0.01$)



Only first set of lists, only first-degree relative FH+ compared to FH-

- No significant interaction, no effect of FH, verbal ability or age
- Significant main effect of list ($p < 0.001$)



Conclusions

- We were unable to confirm that FH+ women exhibit a bias in cognitive processing for cancer words.
- Our results did not support the associations of chronic or acute stress with cognitive processing of cancer words.
- FH+ > FH- for chronic stress measures but not acute stress measures.
- Limitations:
 - Our timing of the NAART administration varied from that of Erblich et al. (2003).
 - We were unable to recruit the full 80 participants per arm required to see an effect with 80% power. We will continue to recruit participants until we have reached the full sample size.