

Chemotherapy and Cognition: The Effect of Chemotherapy on Encoding and Recall



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Background

- Cognitive impairment is often associated with chemotherapy, known as chemotherapy related cognitive impairment (CRCI) or chemobrain
- Patients often report more cognitive decline than is confirmed through cognitive testing¹
- Encoding and recall have been found to be impacted in chemotherapy patients²⁻⁴
 - Encoding: Perceiving and comprehending stimuli⁵
 - Recall: Retrieving encoded memories⁵

Sample

20 Breast Cancer Survivors (BCS)

- Female
- Early-stage breast cancer (stages I-IIIa)
- Chemotherapy within the last 12 months
- Average age: 53.05 (SD = 9.89)

19 Healthy Controls (HC)

- Female
- No history of cancer
- No previous chemotherapy
- Average age: 50.26 (SD = 13.91)

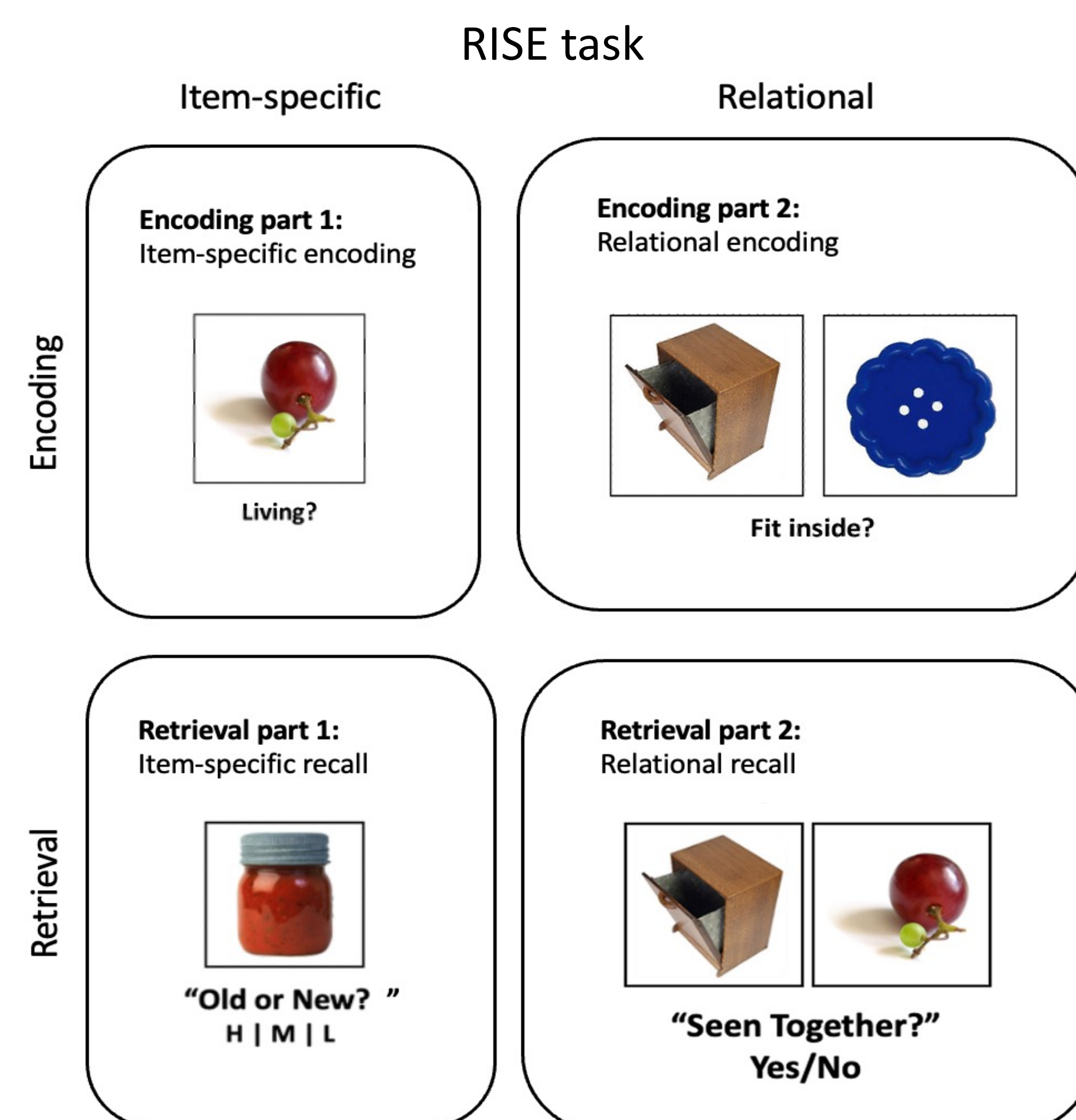
Measures

1. Broadbent Cognitive Failures Questionnaire (CFQ)

- Likert Scale (0-4)
- Forgetfulness questions used to assess self-reported memory

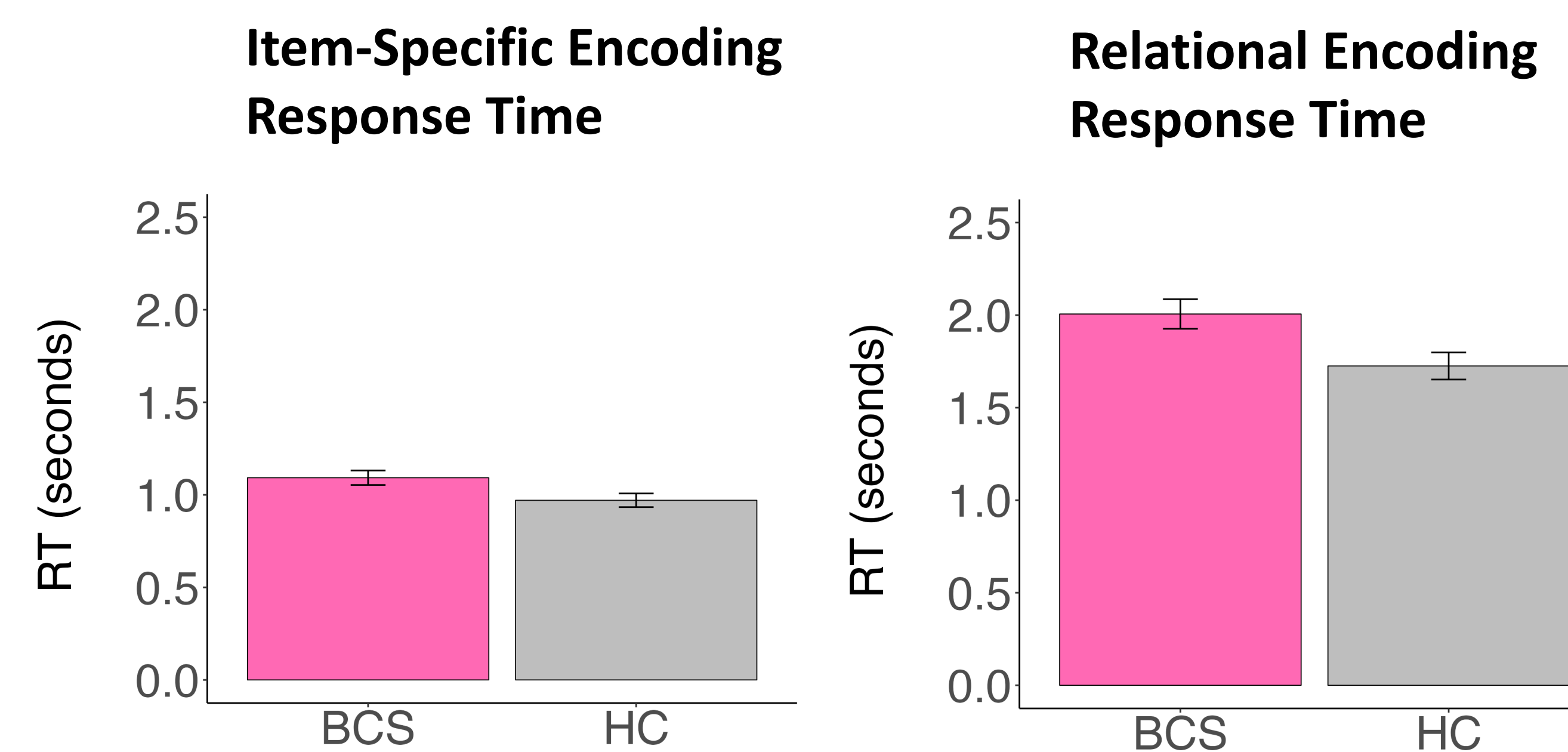
2. Relational and Item Specific Encoding Task (RISE)

- Accuracy
- Response Time



Results

Is there a difference in objective cognitive performance between the BCS group and HC group during encoding and/or retrieval for item-specific or relational stimuli?

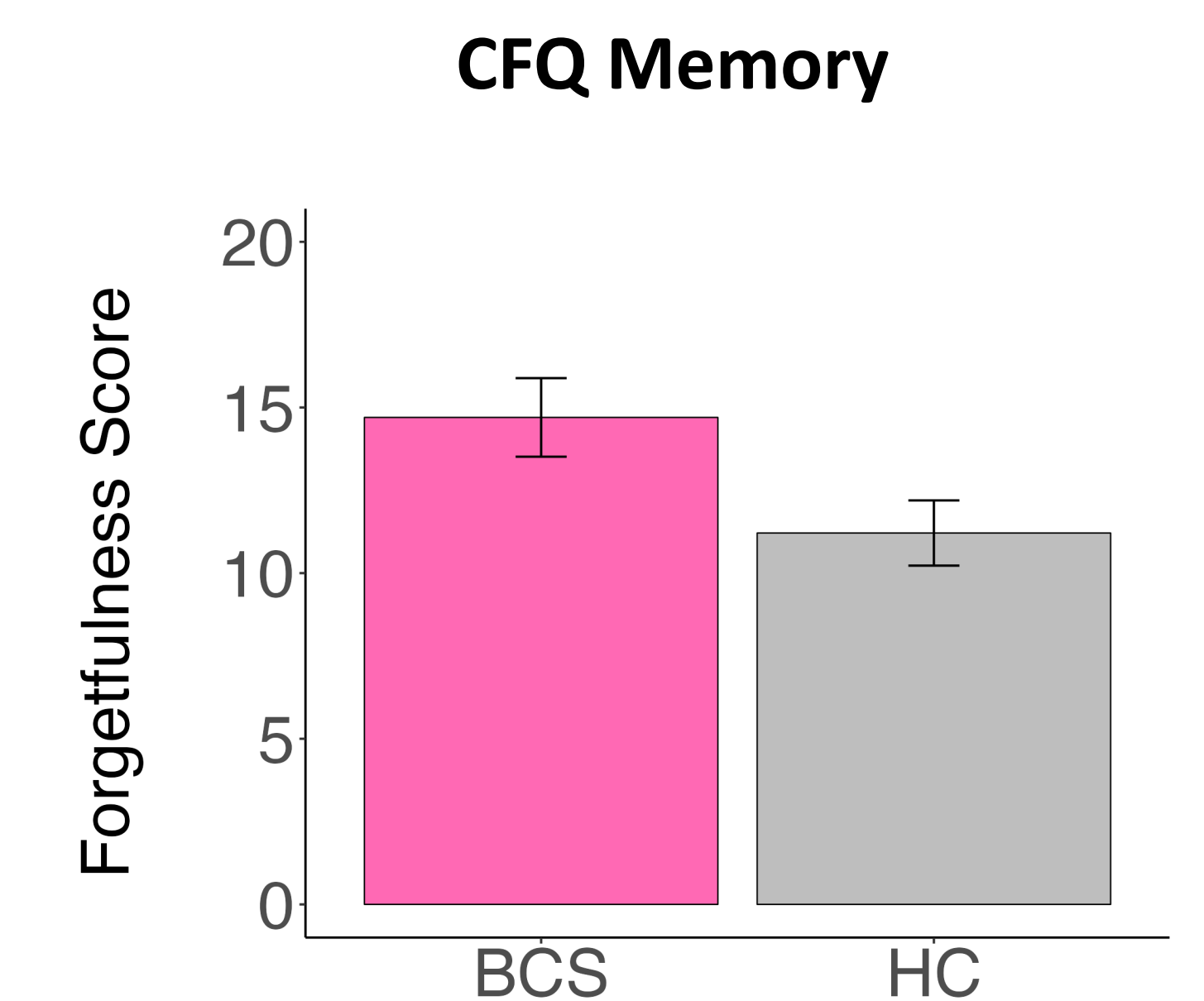


$t(37) = 2.27, p = 0.029,$
 $p\text{-adjusted} = 0.117$

$t(37) = 2.59, p = 0.014,$
 $p\text{-adjusted} = 0.109$

- Significant difference in response time during encoding for item-specific and relational stimuli when left *uncorrected*
- No difference in response time during recall
- No difference in accuracy across all measures

Is there a difference in BCS and HC self-report?



$t(36) = 2.26, p = 0.030,$
 $p\text{-adjusted} = 0.030^*$

- Significant difference in CFQ scores between BCS and HC
- No correlation between BCS CFQ score and all measures of the RISE

* = significant, RT = response time

Discussion

RISE

- A nonsignificant response time delay in the BCS group was found during encoding and no response time difference was found during retrieval
 - The nonsignificant slower response time during encoding could potentially be explained by a difficulty with attention
- There was no overall difference in accuracy between the BCS group and HC group
- There are inconsistent findings on both accuracy and response time prior to this study

CFQ

- Replicated previous findings of higher self report in chemotherapy patients than healthy controls⁶
- Replicated previous findings of little to no relation between self-report and objective decline⁶
- Potential explanations:
 - BCS group arrived at correct answer, but may have felt they were working harder
 - Increased levels of fatigue, depression, anxiety⁷
 - Self-reported cognitive deficits may not have been captured by this study