

COMPARING THE PREDICTIVE POWER OF COGNITIVE PATIENT REPORTED OUTCOMES FOR EVERYDAY COGNITIVE FUNCTIONING USING ECOLOGICAL MOMENTARY ASSESSMENTS

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Introduction:

- Gaps in knowledge related to the ecological validity of cognitive patient reported outcomes (PROs) to measure cancer-related cognitive impairments (CRCI), and scant evidence directly comparing cognitive PROs limit cross study comparisons and guideline development for research and practice.
- The objective of this study was to determine which cognitive PRO measure best represents self-reported cognitive and everyday functioning in real-world environments using ecological momentary assessments (EMA).

Methods:

- Prospectively enrolled 124 breast cancer survivors
- EMA protocols: 1X/day, every other day X 8 weeks; 1-item ratings for cognitive symptoms, cognitive abilities, social role satisfaction, and well-being (administered via NeuroUX)
- FACT-Cog PCI, PROMIS Cog, Cognitive Failures Questionnaire, and EORTC-CF administered after EMA protocols (T2)
- Person-specific means and standard deviations (within-person variability) calculated for all EMAs
- Pearson's correlations were calculated for cognitive PROs and person-specific EMA variables
- Linear regression model fit parameters (adjusted R2, AIC, BIC) for person-specific means in all EMAs (DV) were compared for all T2 cognitive PRO measures (IVs)

Results:

- Sample characteristics are displayed in Table 1.
- Correlation patterns were similar among all cognitive PROs and EMAs (Figure 1).
- Model parameters for linear regression models of EMA cognitive symptoms, social role satisfaction, and wellbeing revealed that the FACT-Cog PCI measure best fit the data. See Table 2 for all models parameters.

Table 1. Demographic and Clinical Characteristics of the Sample (N=124)	
Demographic Characteristic	Mean (SD) or Frequency (Percentage)
Age in Years	51.4(11.9); range 24-88
Ethnic Minority	15 (12.1%)
Racial Minority	33 (26.6%)
Partnered	87 (70.2%)
Have dependents	63 (50.8%)
Employed (part time or full time)	84 (67.7%)
Years of Education	17.1 (2.8); range 4-27
Clinical Characteristic	Mean (SD) or Frequency (Percentage)
Years since treatment ended	2.2 (1.6); range 0.01 – 5.8
History of stage 0-I breast cancer	54 (43.5%)
History of stage II-III breast cancer	65 (52.4%)
Post-menopausal	79 (63.7%)

Table 2: Linear regression models predicting person specific- average cognitive functioning and social functioning across 8 weeks as (dependent variables) from cognitive PROs (independent variables) (N=124)			
Dependent Variable for Models 1-4: CRCI Symptoms (EMA)			
T2 independent variables	adjR2	AIC	BIC
Model 1: FACT-Cog PCI	0.49***	361.32	377.01
Model 2: PROMIS Cog 8a T score	0.47***	365.61	381.30
Model 3: Cognitive Failures	0.30***	390.30	413.47
Model 4: EORTC-CF	0.34***	397.78	405.99
Dependent Variable for Models 5-8: Cognitive Abilities (EMA)			
T2 independent variables	adjR2	AIC	BIC
Model 5: FACT-Cog PCI	0.49***	355.19	371.11
Model 6: PROMIS Cog 8a T score	0.51***	351.26	367.18
Model 7: Cognitive Failures	0.40***	375.47	391.39
Model 8: EORTC-CF	0.42***	371.39	387.31
Dependent Variable for Models 9-12: Social Role Satisfaction			
T2 independent variables	adjR2	AIC	BIC
Model 9: FACT-Cog PCI	0.45***	356.68	372.61
Model 10: PROMIS Cog 8a T score	0.43***	362.92	378.85
Model 11: Cognitive Failures	0.39***	370.81	386.73
Model 12: EORTC-CF	0.45***	357.72	373.65
Dependent Variable for Models 13-16: Overall Well-being (EMA)			
T2 independent variables	adjR2	AIC	BIC
Model 13: FACT-Cog PCI	0.23***	273.65	289.58
Model 14: PROMIS Cog 8a T score	0.19***	279.57	295.49
Model 15: Cognitive Failures	0.19***	279.78	295.70
Model 16: EORTC-CF	0.21***	277.73	293.65
Footnote: Included age, time since treatment, and ethnic minority status as covariates in models 1-4, but none were significant predictors. Included age, education and time since treatment as covariates in models 5-8, but none were significant predictors. Age, education and time since treatment were covariates in models 9-12, and age approached significance in Model 12 (p = 0.055). Age, education and time since treatment were covariates in models 13-16, but none were significant predictors. ***p < 0.0031 (Bonferroni adjusted p value)			

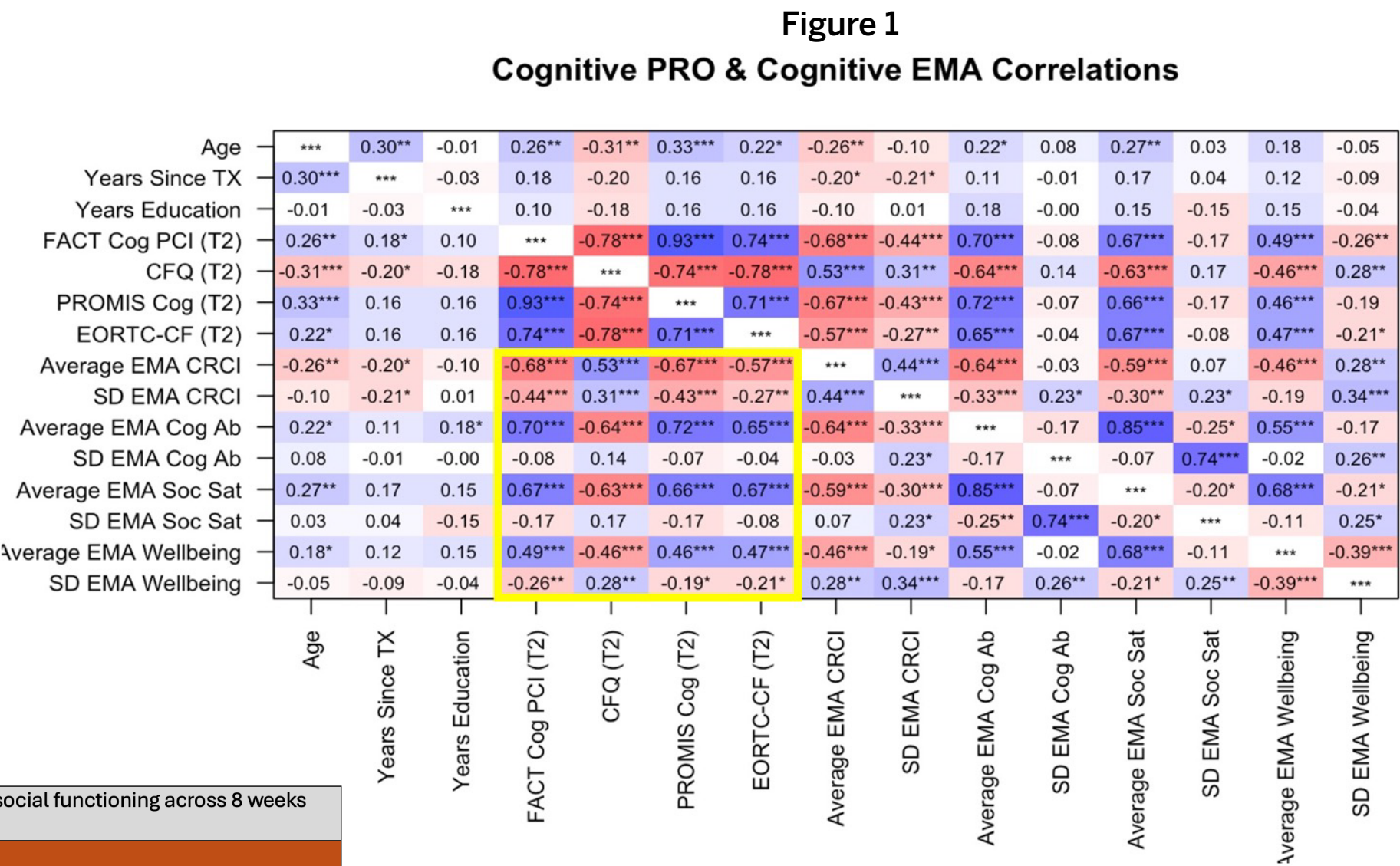


Figure 1. Correlation plot of Cognitive PROs from Time 2 and EMAs (person-specific averages and variability (SD). EMA question for CRCI symptoms— “I have cancer-related cognitive or brain symptoms” (0-7, higher is more symptoms); EMA for Confidence in cognitive abilities— “I am confident in my cognitive abilities (thinking, memory, concentration)” (0-7; higher indicates more confidence); EMA for Social Role Satisfaction—“ I feel satisfied with my ability to perform my daily routine and responsibilities”(0-7; higher indicates more satisfaction); EMA question for Wellbeing- “Overall I feel (Excellent (7), Very Good (6), Good (5), Neutral (4), Poor (3), Very Poor (2), Terrible (1)). Significant FDR corrected correlations indicated * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Conclusions:

Findings indicate that the FACT-Cog PCI subscale best reflects average cognitive symptoms, social role performance, and overall well-being across time when directly compared to the PROMIS Cog, Cognitive Failures Questionnaire, and EORTC-CF, however the PROMIS Cog was second best for everyday cognitive functioning, and the EORTC-CF second best for social role satisfaction and general well-being.

These findings provide evidence to inform future recommendations/guidelines for regarding which cognitive PROs to use to assess CRCI in research and/or practice.

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