

Self vs. Proxy Ratings on the FIM in Traumatic Brain Injury



Jack W. Berry, Ph.D. and Andrea Underhill, Ph.D.

Injury Control Research Center, University of Alabama at Birmingham



Objective

Proxy ratings by caregivers are often used to assess the functional abilities of persons with traumatic brain injuries (TBI). Questions naturally arise about possible response bias of proxy ratings. In this study, we used Rasch scaling, including analysis of differential item functioning (DIF), to compare proxy-ratings versus self-ratings of persons with TBI on the Functional Independence Measure (FIM).

Method

In a longitudinal study, 417 males and 163 females with TBI were evaluated on the FIM either by themselves (52.2%) or a proxy (47.8%) at 12-months post-injury. Subsequent ratings were made at 24, 36, and 48 months post-injury. In 57% of cases, the same source provided ratings on all later assessments; the rest changed or alternated between sources over time. We used the Rasch partial credit model to examine scale reliabilities, item fit, and DIF of the FIM Cognitive and Motor subscales.

Table 1. Reliabilities and Rasch Measures

FIM Scale	Proxy Reports			Self Reports			Pr> t
	Item R	Person R	M (SD)	Item R	Person R	M	
Cognitive							
T1	.98	.82	2.85 (2.8)	.98	.68	3.99 (1.9)	.001
T2	.93	.77	3.21 (2.7)	.90	.68	3.82 (1.9)	.03
T3	.98	.72	2.14 (3.3)	.94	.44	3.91 (1.8)	.001
T4	.98	.71	2.65 (3.1)	.95	.46	3.74 (2.0)	.001
Motor							
T1	.95	.94	5.68 (4.1)	.92	.94	6.43 (3.0)	.001
T2	.90	.91	5.53 (3.9)	.99	.87	5.69 (3.3)	.04
T3	.95	.78	5.34 (4.2)	.92	.56	6.44 (2.9)	.001
T4	.95	.85	5.56 (4.1)	.90	.73	6.58 (2.6)	.001

Results

Table 1 presents Rasch reliability statistics for proxy- and self-reports on the FIM scales assessed across at each assessment time. Also displayed are mean Rasch logit measures, which were equated to a common scales across assessment periods. We used independent-samples t-tests to compare self vs. proxy reports on mean FIM scales at each time. Participants providing self-reports were significantly higher in cognitive and motor functioning at all assessments.

Item separation reliabilities (Item R) were high in both groups, indicating that items were well-separated in difficulties, yielding sufficiently wide “yardsticks” for measuring levels of cognitive and motor functioning. Person separation reliabilities (Person R) were all adequate (>.70) for proxy reports on both FIM scales. For self-reports, person reliabilities were low on the Cognitive scale.

To examine possible differential item functioning (DIF) between the proxy and self-report measures, we compared item difficulties after equating the scales to a common frame of reference. DIF was assessed across all time periods simultaneously. No difference between item difficulties were greater than half a logit (see Figures 1 and 2). In addition, the Cox B statistic (a Mantel-Haenszel type estimator) indicated no serious DIF for any item (B<|.50|).

Figure 1. Motor Scale Item Difficulty Estimates by Rater Source

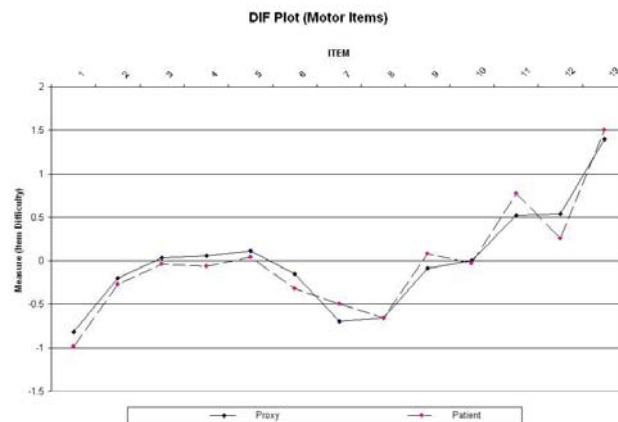
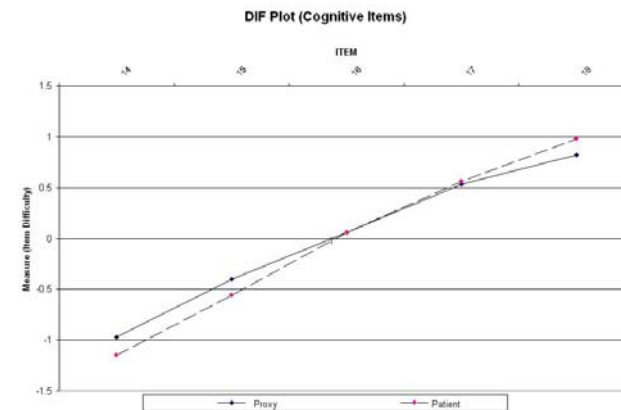


Figure 2. Cognitive Scale Item Difficulty Estimates by Rater Source



Conclusion

Self-report ratings on FIM subscales were significantly higher than ratings made by proxy reports at every assessment occasion. Such a finding might reflect systematic bias in self-reports, perhaps a tendency to overestimate one’s own functional adjustment. However, the DIF analyses revealed no serious systematic bias in item responses between proxy and self-report assessments using the FIM. This suggests, perhaps, that higher functioning TBI patients were simply more likely to be willing and able to complete their own assessments. Compared to proxy reports, self reports on the Cognitive subscale showed substantially lower person reliabilities. This reflects a much narrower distribution of functional ability levels for the self-reporting participants (who were at the high end of the ability continuum): the Cognitive items were unable to separate these participants into an adequate number of strata of ability levels.