

Validating the accuracy of the Demands and Abilities Transforming Algorithm (DATA) for Systematic Job Matching



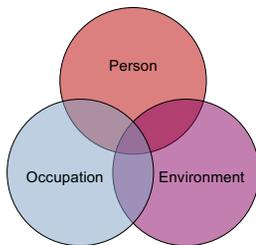
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Background

- “Job matching is the collaborative, data-based decision-making process used by transition teams to determine the best fit between an individual’s abilities and preferences and the job’s environmental and occupational demands”¹
- Optimal vocational performance occurs when workers’ abilities are well matched to job demands²



- Systematic Job Matching³ includes:
 - Vocational Fit Assessment (VFA)⁴
 - Demands and Abilities Transforming Algorithm (DATA)³
 - Job Matching Reports (JMR)³
- The Vocational Fit Assessment (VFA) was developed in an effort to operationalize this process

VFA -Worker		VFA – Job
High ability	2	High demand
Some ability	1	Some demand
Low ability	0	Low demand

- Traditionally, a professional must evaluate each individual combination of abilities and demands, each and every time they engage in the job matching process
- The Demands & Abilities Transforming Algorithm (DATA) makes evaluative judgments for each of the 9 possible combinations of abilities and demands, which enables increased:
 - Accuracy
 - Consistency
 - Efficiency
- The purpose of this study was to validate the accuracy of the Demands and Abilities Transforming Algorithm (DATA)

VFA-J Data	VFA-W Data	Evaluative Judgment	JMR Output	DATA Output
2	2	This is a great match of abilities and demands	Pros	Support
1	2	This is a good match of abilities and demands.	Strengths	Support
2	1	Match may be improved by modifying abilities/ demands.	Areas for Intervention	Support
1	1			
1	0	This is not a good match of abilities and demands	Needs	Oppose
2	0	This is not a match of abilities and demands	Cons	Oppose
0	2, 1, 0	Jobs that have low demand are not modeled		

Figure. Demands and Abilities Transforming Algorithm

Methods

Study Design:

- Clinical simulation

Participants & Setting:

- Academic medical center research lab. Participants were professional key stakeholders involved in the job matching process, including teachers and job coaches

Procedures:

- Studies were simulated decision making scenarios.
- Participants were presented with single data points from the VFA-J and from the VFA-W and asked to make an evaluative judgment. That is, given these data alone, would they choose to support or oppose a job match?
- Responses that aligned with the comparative algorithm were recorded as successful trials. Responses that did not support the comparative algorithm were recorded as trial failures.

Consider the following VFA data. Based on this data alone, would you support or oppose matching this worker to this job? (Circle your decision)

VFA-Jobs Data: The job has high demand for the ability to deal with unpleasant, angry, or discourteous individuals	Support Oppose
VFA-Worker Data: The worker has some ability to deal with unpleasant, angry, or discourteous individuals	

Results

Study 1

- 246/335 trials supported the DATA, a 73.4% accuracy rate
- 81 of 89 failed trials occurred when:
 - Job demands were high (VFA-Job=2)
 - Workers demonstrate some ability (VFA-Worker=1)

Study 2

- 185 trials, targeted the extremes of the DATA, in which job demands and worker abilities were either perfectly matched (i.e., high demand & high ability) or job demands greatly exceeded worker abilities (i.e., high demand & low ability), and resulted in a 100% accuracy rate.

Study 3:

- 291/360 successful trials
- Accuracy = 80.8%
- Odds ratio = 20.5

Study 4:

- 100% of teachers who use the DATA responded that they trusted the Demands and Abilities Transforming Algorithm (DATA).

Study 5:

- Accuracy = 79.8%
- Sensitivity = 89%
- Specificity = 66.2%
- False negative rate = 11%
- False positive rate = 33.8%
- Odds ratio = 15.8

Predicted Condition	True Condition	
	Condition Positive	Condition Negative
Predicted Condition Positive	True Positive 89	False Positive 23
Predicted Condition Negative	False Negative 11	True Negative 45

Discussion

- When an individual demonstrates some ability (VFA-W=1) and a job has at least some demand (VFA-J≥1), then the match between abilities and demands may be improved through intervention:
 - Direct instruction to develop workers’ abilities
 - Job accommodations provided under the Rehabilitation Act or the ADA
 - Modifications of the work environment.
- The DATA functions with perfect accuracy at its extremes
- These data strongly support the basic logic of the Demands and Abilities Transforming Algorithm

References and Resources

- Persch, A. C., Cleary, D. S., Rutkowski, S., Malone, H. C., Darragh, A. R., & Case-Smith, J. D. (2015). Current practices in job matching for individuals with intellectual and developmental disabilities. *Journal of Vocational Rehabilitation, 43*(3).
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- Persch, A. C. (2014). *The model of systematic job matching* (Unpublished doctoral dissertation). The Ohio State University, Columbus.
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Resources:

- For a digital copy of this poster, visit go.osu.edu/tetlab
- To access the VFA, visit vocfit.com

VocFit.com
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