Checking for Convergence

Convergence refers to the degree to which one measure is correlated with other measures that purportedly measure the same construct (Spector & Jex, 1998). In the case of the WRQ, constructs predicted to are jobs in the PAQ database that are rated on 150 job elements. When two independent methods of job-matching generate the same lists of jobs, it constitutes a true test of convergent validity. The WRQ convergence check counts the number of jobs that appear in common on both reports. When item ratings or item limits are changed, counting the number of jobs that appear in common on two reports measures the effect of the change, whether material or immaterial.

To begin a convergence check, click **Open an existing case** on the opening page below.

Clicking on **Open an existing case** points to a page like the one below, where individuals' names or case names appear as hotlinks.

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Clicking on the John Doe hotlink above points to the **Setup/Open Case** screen below that shows two reports have been saved to this case: **Evaluation of individual** and **Supervisor, Paint Department**. Check boxes to the left of the reports have been checked.

Worker Rehabilitation Questionnaire

You are currently logged in as: **David Robinson**   Account Settings   Start   Exit

| 1 Choose an Evaluation Method | 2 Setup / Open Case | 3 Select Database | 4 Rate Capabilities and Tolerances | 5 Ratings Summary | 6 Run Job Matching Analysis and Generate Reports |

Setup / Open Case

Personal Information

Name:	John Doe	Insurance Carrier:	ABC
Birth Date:	August 22, 1961	Claim #:	12345
Telephone #:	(000) 000-0000	Diagnosis:	Closed head injury Chronic neck pain and upper extremity pain and weakness

Current Evaluator:

Case Reports

	Report	Date	Status	Data Source	Evaluator	Action
☑	Evaluation of individual	06/14/2004	Complete	On Individual	David Robinson	Rename Edit Copy Delete
☑	Supervisor, Paint Department	06/15/2004	Complete	From Database	David Robinson	Rename Edit Copy Delete

Click on two boxes to compare two reports
Compare two reports

Case Notes

This paint shop supervisor was rear-ended in traffic. He sustained a mild closed head injury and pain and weakness in his upper extremities.

Save Information

Continue (Select Database)

Clicking on the hotlink to **Compare two reports** points to the **Compare Reports** screen below.

Worker Rehabilitation Questionnaire

You are currently logged in as: **David Robinson**   Account Settings   Start   Exit

1 Choose an Evaluation Method	2 Setup / Open Case	3 Select Database	4 Rate Capabilities and Tolerances	5 Ratings Summary	6 Run Job Matching Analysis and Generate Reports

Compare Reports

Comparison Type: ⊙ Compare Ratings ○ Compare Jobs

Personal Information

Name:	John Doe	Insurance Carrier:	ABC
Birth Date:	August 22, 1961	Claim #:	12345
Telephone #:	(000) 000-0000	Diagnosis:	Closed head injury Chronic neck pain and upper extremity pain and weakness
Case Notes:	This paint shop supervisor was rear-ended in traffic. He sustained a mild closed head injury and pain and weakness in his upper extremities.		

Report Information

Report Type(s):	On Individual and From Database
Reports Compared:	Report 1 = R1 = Evaluation of individual Report 2 = R2 = Supervisor, Paint Department
Report Date:	21 August 2008 12:00:17 pm
Administrator(s):	David Robinson and David Robinson

Comparison of Ratings

Intraclass correlation: $r = 0.83$
The proportion of ratings in which R1 < R2 equals the proportion in which R2 < R1: $z = -3.83$

Item #	Description	R1	R2	R1 < R2	R1 > R2	Absolute Diff.
1	Reading words	3	3			0
2	Using numbers	2	1.7		+	0.3
3	Using graphics	5	1.5		+	3.5
4	Using patterns	3	0.5		+	2.5
5	Using information displays	4	1.5		+	2.5
6	Using measuring devices	4	1.5		+	2.5

Directly under **Compare Reports** is the label, **Comparison Type** and radio buttons: **Compare Ratings** and **Compare Jobs**. The **Compare Ratings** button is the default, which is the one we do not want. So to check for convergence, click on **Compare Jobs**, which generates a screen like the one below. Presumably, the greater the number of jobs listed in common between two independent methods of measurement, the greater the size of the validity effect. In this case, the **Compare Jobs** function listed 47 jobs in the first section of that report. Only a few of these are shown on the **Compare Jobs** report below.

Worker Rehabilitation Questionnaire

You are currently logged in as: **David Robinson** Account Settings Start Exit

| 1 Choose an Evaluation Method | 2 Setup / Open Case | 3 Select Database | 4 Rate Capabilities and Tolerances | 5 Ratings Summary | 6 Run Job Matching Analysis and Generate Reports |

Compare Reports

Comparison Type: ○ Compare Ratings ● Compare Jobs

Personal Information

Name:	John Doe	Insurance Carrier:	ABC
Birth Date:	August 22, 1961	Claim #:	12345
Telephone #:	(000) 000-0000	Diagnosis:	Closed head injury Chronic neck pain and upper extremity pain and weakness
Case Notes:	This paint shop supervisor was rear-ended in traffic. He sustained a mild closed head injury and pain and weakness in his upper extremities.		

Report Information

Report Type(s):	On Individual and From Database
Reports Compared:	Report 1 = R1 = Evaluation of individual Report 2 = R2 = Supervisor, Paint Department
Report Date:	21 August 2008 12:07:50 pm
Administrator(s):	David Robinson and David Robinson

CAUTION: This information represents statistical estimates only, and should not be over-interpreted. The list of occupations produced by the WRQ should not be used in a rigid, formal, mechanistic way to classify the client into occupational categories; but should be used in combination with medical, historical, labor market and other information to guide job development and job placement decisions. The WRQ provides statistical matching of the client to occupations for which requirements most closely match estimates of client capabilities and tolerances.

WRQ and PAQ items represent generic, 'worker-oriented', types of job behavior, not job or task specific work activities. The listing of occupations that match a client's WRQ profile represent generic kinds of work activities for which the client is most likely to have the potential to learn to perform. The WRQ output report should not be interpreted to say that the client is fitted for the occupations on the list, just that the client might be fitted for the types of occupations shown on the list.

Jobs With No Requirements in Excess of Item Limits

Listed below are jobs that are likely within the individual's capabilities and tolerances. The Rank of these jobs represents closeness of match between ratings on the individual and ratings of the jobs in the PAQ database. A Rank of '50' indicates that the job is the 50th closest match. The higher the rank, the less suitable may be the job. The score expresses rank on a scale of 0-99.

These jobs appear in both of the selected evaluation reports, Evaluation of individual and Supervisor, Paint Department. Ranks and scores are shown as they appear in report Supervisor, Paint Department.

DOT Code	Job Title	Rank
749.131-014	Supervisor, Paint Department	1
222.137-030	Shipping-And-Receiving Supervisor	2
929.137-022	Warehouse Supervisor	3
921.137-010	Coal-Yard Supervisor	4
921.133-018	Material-Handling Supervisor	6
222.137-034	Stock Supervisor	10
899.131-018	Utilities-And-Maintenance Supervisor	11
619.132-030	Supervisor, Plate Heating, Rolling, And Finishing	12

On the **Compare Jobs** report above, the field directly under the **Comparison Type** buttons is **Personal Information**, which comes from the case setup page. The next field is **Report Information** that shows that the two **Report Type(s)** are **On Individual** and **From Database. Reports Compared** are **R1, Evaluation of Individual** and **R2, Supervisor, Paint Department**, along with the date of the report and the name(s) of the administrators. Next is a

caveat that warns against over-interpretation of test results. A list of **Jobs With No Requirements in Excess of Item Limits** follows. As it says above, "**These jobs appear in both of the selected evaluation reports**, **Evaluation of the Individual** and **Supervisor, Paint Department**." **Rank**s are shown as they appear in **Supervisor, Paint Department** report. The choice of that report to reflect **Ranks** is arbitrary. The next field, shown below, lists **Jobs With Requirements in Excess of Item Limits** (see how to read a report.)

Jobs with Requirements in Excess of Item Limits

This is a list of jobs with requirements that exceed item limits. Each job is listed by Dictionary of Occupational Titles code and Job Title. The number just to the right of the job title represents the number of job elements that exceeded item limits. Further to the right are pairs of numbers that represent item numbers (Item) and the sizes of differences (Dif) between item limits and job characteristics (expressed in rating scale points or decimal fractions of a point). Jobs on this list may be appropriate for this individual when differences are small or when reasonable accommodation can be made.

These jobs appear in both of the selected evaluation reports Evaluation of individual and Supervisor, Paint Department. Near misses and ranks are shown as they appear in Supervisor, Paint Department.

DOT Code	Job Title	Num Limits	1st Item	Dif	2nd Item	Dif	3rd Item	Dif	4th Item	Dif	5th Item	Dif	Rank
952.382-018	Power-Plant Operator	1	14	0.1	0	0	0	0	0	0	0	0	120
649.130-010	Supervisor, Paper Products	1	14	0.1	0	0	0	0	0	0	0	0	85
185.167-046	Manager, Retail Store	1	45	0.1	0	0	0	0	0	0	0	0	108
619.130-030	Supervisor, Line	1	101	0.1	0	0	0	0	0	0	0	0	22
638.131-022	Maintenance-Mechanic Supervisor	1	53	0.2	0	0	0	0	0	0	0	0	53
829.131-014	Electrician Supervisor	2	150	0.1	53	0.1	0	0	0	0	0	0	5
950.131-014	Stationary-Engineer Supervisor	1	101	0.4	0	0	0	0	0	0	0	0	31
631.131-010	Powerhouse-Mechanic Supervisor	1	150	0.5	0	0	0	0	0	0	0	0	66
955.130-010	Supervisory Wastewater-Treatment-Plant Operator	2	101	0.5	146	0.1	0	0	0	0	0	0	25
168.264-014	Safety Inspector	2	101	0.5	53	0.2	0	0	0	0	0	0	17
372.167-014	Guard, Chief	1	101	0.9	0	0	0	0	0	0	0	0	49
406.134-014	Supervisor, Landscape	1	101	0.9	0	0	0	0	0	0	0	0	27
891.137-010	Maintenance Supervisor	3	53	0.4	101	0.4	150	0.2	0	0	0	0	44
869.137-010	Traffic-Maintenance Supervisor	2	101	1.1	150	0.1	0	0	0	0	0	0	21
182.267-010	Construction Inspector	2	101	1.1	150	0.2	0	0	0	0	0	0	102
909.127-010	Safety Coordinator	1	101	1.7	0	0	0	0	0	0	0	0	149
184.167-154	Superintendent, Distribution II	2	101	1	53	0.8	0	0	0	0	0	0	19
620.131-014	Supervisor, Garage	3	101	1	53	0.8	89	0.1	0	0	0	0	37
952.131-010	Substation Operator, Chief	2	101	1.8	150	0.1	0	0	0	0	0	0	26
862.137-018	Water-And-Sewer-Systems Supervisor	2	101	1.7	53	0.2	0	0	0	0	0	0	72
899.131-010	Labor-Crew Supervisor	3	101	1.2	53	0.7	89	0.1	0	0	0	0	106
182.167-026	Superintendent, Construction	1	101	2.1	0	0	0	0	0	0	0	0	23
168.167-030	Inspector, Building	3	101	1.5	53	0.9	25	0.2	0	0	0	0	181
829.131-010	Cable Supervisor	2	101	2.4	150	0.3	0	0	0	0	0	0	145
862.137-010	Mains-And-Service Supervisor	1	101	2.7	0	0	0	0	0	0	0	0	76

The number of jobs listed on this **Compare Jobs** report provides evidence of convergent validity. Given the existence of 2,491 jobs in the master PAQ database, the probability that any one job would appear on both reports purely by chance = 1/2,491*1/2,491. The probability of the number of jobs that are listed in the two sections of this report appearing purely by chance is virtually zero, and it demonstrates the construct validity of jobs in the PAQ database and the predictive power of the WRQ.

A different kind of convergence check shows the extent to which changing item ratings or item limits materially changes WRQ results. In a legal case, a WRQ report results was ordered and prepared. A month or so later, an FCE was structured to evaluate performance on job elements on which limits were set. The FCE produced information that justified adjusting item limits. The **Compare Jobs** report showed the extent to which these adjustments affected WRQ results. If the same jobs showed up on both administrations, the effect of the adjustment would be assessed as negligible. If few jobs were listed in common between the two reports, it would show that the effect of the adjustment was material.

Reference

Spector, P. E. & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: Interpersonal Conflict at Work scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. *Journal of Occupational Health Psychology, 3*, 356-367.