

Predictive validity of the Individual Placement and Support fidelity scale (IPS-25): A replication study

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Abstract.

BACKGROUND: Fidelity scales are used to monitor adherence to evidence-based practices. The underlying assumption is that high fidelity predicts better outcomes. The IPS-25 is a fidelity scale measuring adherence to the Individual Placement and Support (IPS) model. A previous study found a significant association between the IPS-25 and competitive employment outcome. The current study sought to replicate this finding.

OBJECTIVE: We hypothesized that fidelity, as measured by the IPS-25, would predict program-level competitive employment rate.

METHODS: Fidelity was assessed by the IPS-25 fidelity scale in 79 IPS programs in 12 states. The quarterly competitive employment rate was collected as part of quality improvement efforts in the IPS Learning Community. We examined the correlation between these two measures.

RESULTS: Five components of the IPS-25 including vocational generalists, caseload size and rapid job search were successfully implemented in most IPS programs, whereas nine fidelity components, including time-unlimited supports and agency leadership support, were less widely implemented. As hypothesized, the IPS-25 total score was significantly associated with competitive employment rate ($r=0.27, p=0.02$).

CONCLUSIONS: The study demonstrated that IPS programs adhering to good fidelity are more likely to achieve enhanced competitive employment outcomes than the sites that have low fidelity.

Keywords: Individual Placement and Support (IPS) model, IPS fidelity scale, predictive validity, competitive employment, supported employment

1. Introduction

Fidelity, the most widely measured implementation outcome (Powell, Proctor, & Glass, 2014), assesses whether an intervention is implemented as intended (Rabin, Brownson, Haire-Joshu, Kreuter, & Weaver, 2008). Continuous monitoring on fidelity can help

successful implementation and intervention sustainability (Powell et al., 2014). Increasingly, program leaders are using fidelity scales as guides for program development seeking to implement evidence-based practices (McHugo et al., 2007; Stefancic, Tsemberis, Messeri, Drake, & Goering, 2014). The underlying assumption for using fidelity scales is that achieving high fidelity helps ensure improvement in outcomes associated with an evidence-based practice (Bond, Evans, Salyers, Williams, & Kim, 2000).

The prediction of outcome from fidelity has been extensively examined for one evidence-based practice, the Individual Placement and Support (IPS) model of

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supported employment for clients with severe mental illness (Bond, Becker, & Drake, 2011). Proposed by Becker and Drake in 1993, the IPS model is based on eight core principles: program focus on competitive employment; eligibility based on the client's desire to work without exclusions due to client characteristics such as diagnoses, substance use history, and legal system involvement; integration of rehabilitation and mental health services; priority on client preferences; personalized benefits counseling; rapid job search; systematic job development; and time-unlimited and individualized support (Drake, Bond & Becker, 2012). Accumulating evidence from randomized controlled trials has shown robust effectiveness of IPS programs, relative to traditional vocational rehabilitation strategies, in achieving high employment rates, longer time worked, and greater earnings (Marshall et al., 2014).

The IPS Learning Community was established in 2002 to promote access to IPS and to enhance implementation processes and outcomes of IPS programs (Becker, Drake, & Bond, 2014). By 2015 it had grown to include participation by 19 states/regions in the US and three European nations. Throughout the IPS Learning Community, Dartmouth researchers work closely with state mental health authorities and state vocational rehabilitation partners to plan implementation of IPS. As part of their participation in the learning community, state leaders agree to conduct periodic fidelity reviews using a standardized IPS fidelity scale.

In 2008, Dartmouth researchers and field experts developed a revised fidelity scale called the IPS-25, consisting of 25 essential components to the model (Becker, Swanson, Bond, & Merrens, 2011). The IPS-25 was designed to improve the IPS-15's narrow scope in concept coverage as well as providing more concrete criteria for model components. To enhance reliability, Becker and colleagues also developed a manual for conducting fidelity reviews and coding items (2011). The IPS-25 scale measures an array of staffing-, organization-, and service-related characteristics of IPS-implemented programs. Scores on each fidelity component help identify essential ingredients in the program model, whereas the total score for the IPS-25 reflects an overall measure of adherence to the IPS model. Given the purpose of fidelity measures, it is plausible to expect higher total scores of the IPS-25 should predict better client outcomes. Bond, Peterson, and colleagues (2012) found this association between the IPS-25 and client outcome: IPS-scale was

predictive of client outcomes (i.e., program-level competitive employment rate) in a sample of 79 sites in the IPS Learning Community. If further studies replicate this finding, this would strengthen the practical utility of the IPS-25, especially in study settings that involve complex designs and longitudinal interventions. Thus, the primary goal of the current study is to test whether the positive correlation between IPS-25 total scores and competitive employment rates would replicate in a different set of IPS sites. Prior to testing the predictive validity of IPS-25 total scores on employment rate, we first conduct item-level descriptive statistics on the IPS-25 measures, and item-level correlations to employment rate to assess how successfully each component is implemented and predictive of employment rate (RQ1). Next, we examine whether the total scores of the IPS-25 scale demonstrate a positive relationship with competitive employment rate, the primary purpose of the study (RQ2). Lastly, we compare the current study's IPS-25 item-level mean scores to those reported in the earlier IPS-25 study (Bond, Peterson, Becker, & Drake, 2012) to evaluate the item-level performance as well as reliabilities over time (RQ3).

RQ1: What are the mean scores of each IPS-25 item and how is each component related to employment rate?

RQ2: Do IPS-25 total scores have a positive association with competitive employment rate?

RQ3: Will IPS-25 items with high mean scores in the reference study be likely to have high mean scores in the current study?

2. Methods

2.1. Sample

The sample in the parent study (Bond et al., 2013) consisted of 129 sites in 13 states providing outcomes data to the learning community in February, 2012. One state with 17 sites was excluded because state leaders used an earlier IPS fidelity scale. In addition, 33 other sites were excluded because they either did not report fidelity ratings or did not have a fidelity review during 2011 or 2012. The final sample consisted of 79 sites from 12 states; 47 (59%) had not been sampled in the earlier IPS-25 study (Bond, Peterson et al., 2012). On average, programs had an active caseload of clients ($M = 67.9$, $SD = 72.4$), ranging from 13 to 407 clients per site. The interquartiles of the active caseload varied from 27 to 78 clients (Median = 45 clients).

2.2. Measures

2.2.1. Fidelity

Degree of adherence to the evidence-based model of supported employment was assessed by the Supported Employment Fidelity Scale (IPS-25). All 25 items in the scale were measured on a 5-point behaviorally anchored scale, ranging from 1, which indicates lack of adherence to the model, to 5, which reflects close adherence to the model. Thus, the total score of the IPS-25 ranges from 25 to 125. The fidelity scale used in the current study follows the convention of the McHugo study (McHugo et al., 2007). A benchmark score of 100 or more on fidelity is considered good fidelity (Becker et al., 2011). The standard of 100 is a practically useful standard for practitioners and program leaders, and is used in several states for determining Medicaid billing rates for program services.

According to the reference work led by Bond, Peterson, et al. (2012), fidelity components such as vocational generalists, disclosure of disability to employers, individualized supports, time-unlimited supports, IPS team forms a vocational unit, employer

diversity, occupational diversity, and assertive outreach to clients, have shown significantly positive correlations with employment rate (see Table 1 for the list of IPS-25 items). Bond, Peterson, et al. (2012) also found some aspects of fidelity, such as exclusively vocational services, caseload size, focus on competitive employment, and rapid job search, were widely implemented components (mean scores >4.50), whereas other components, such as frequency of job development, community-based services, zero exclusion of clients, and contact with the treatment team, were less widely implemented (mean scores <4.00). The internal consistency of IPS-25 in the reference study was high, Cronbach's alpha = 0.88. Note that the decision of 4.5 at the item level was an arbitrary cutoff point so as to highlight the most commonly achieved fidelity domains.

2.2.2. Competitive employment rate

As part of their participation in the learning community, every 90 days IPS site supervisors submitted a quarterly employment outcome report (available at <http://www.dartmouthips.org>) to the learning community leadership. The quarterly competitive employment

Table 1
Mean scores of Supported Employment Fidelity Scale (IPS-25) at 79 individual placement and support program sites and the item-level correlations with employment rate

Item number and descriptor	Item score		Item distributions (N of sites)			Pearson correlation of item with employment rate
	M	SD	Low	Moderate	High	
1. Caseload size	4.78	0.47	2	13	64	0.02
2. Exclusively vocational services	4.73	0.69	6	7	66	-0.01
3. Vocational generalists	4.82	0.42	1	12	66	0.14
4. Integration of IPS with treatment team	4.13	1.16	22	13	44	-0.12
5. IPS team contact with treatment team	3.73	1.03	27	33	19	0.16
6. State vocational rehabilitation agency involvement	4.57	0.86	10	10	59	0.10
7. IPS team forms a vocational unit	3.92	1.45	33	14	42	0.02
8. Supervisory role of IPS team leader	3.91	1.00	23	31	25	0.18
9. Zero exclusion of clients	4.18	0.86	19	25	35	0.15
10. Agency focus on work	3.89	1.18	22	28	29	0.24*
11. Agency leadership support	3.72	1.11	29	26	23	0.15
12. Benefits counseling	4.11	1.05	19	23	37	0.15
13. Disclosure of disability to employers	4.29	0.74	11	33	35	0.02
14. Individualized assessment	4.01	0.82	20	35	24	-0.09
15. Rapid search	4.58	0.57	3	27	49	0.26*
16. Individualized job search	4.14	0.81	16	34	29	0.30**
17. Job development, frequency	3.84	1.21	29	17	33	0.19
18. Job development, quality	4.38	0.82	8	29	42	0.32**
19. Occupational diversity	3.68	1.15	34	39	17	0.12
20. Employer diversity	4.11	1.21	17	21	41	0.02
21. Competitive jobs	4.49	0.89	12	12	55	-0.11
22. Individualized supports	4.16	0.88	19	25	35	0.00
23. Time-unlimited supports	3.97	0.96	24	27	28	0.15
24. Community-based services	4.03	1.12	20	25	34	0.28**
25. Assertive outreach to clients	3.95	1.08	23	26	30	0.05

Note: * $p < 0.05$, ** $p < 0.01$.

rate is defined as the number of clients who had at least one day of competitive employment during a quarter in which program fidelity was assessed, divided by the total number of active clients served on the caseload during the specified quarter. Competitive employment rate has been widely used as one of the primary employment outcome measures in the many randomized controlled trials of IPS (Burns et al., 2007). Also, the competitive employment rate has demonstrated strong correlations with other outcome measures and indices across four controlled IPS trials, such as total weeks worked, tenure in longest-held job, total hours worked, and hours worked per week (Bond, Campbell, & Drake, 2012). Benchmarks were established using outcome data from the IPS learning community (Drake et al., 2012). The median competitive employment rate for employment outcomes for a sample of 129 sites was 41%.

2.3. Data collection

Although the procedures varied slightly across states, following the fidelity review manual (Becker et al., 2011), the fidelity assessments were performed by two or more trained fidelity assessors during 1.5-day site visits. Assessors compared their independent fidelity ratings and resolved discrepancies through consensus scoring.

Fidelity reviewers sent fidelity reports to the state leaders. In 2012, as part of an ongoing study of sustainability (Bond et al. 2013), the Dartmouth research team requested from state leaders the most recent fidelity ratings for active sites in the learning community. In the current study we obtained fidelity assessments completed between January 1, 2011 and August 29, 2012. We used the outcome data from the second quarterly employment reports in 2012. Except one site, all the sites reported their fidelity reviews prior to June 2, 2012.

2.4. Data analysis

First, descriptive statistics at the item level were conducted for each fidelity component. A series of correlational analysis was performed to identify the predictive validity of each fidelity component with employment rate. The next step examined the main hypothesis, testing the association between the total IPS-25 score and site-level competitive employment rate, using a Pearson correlation. Third, guided by benchmark levels documented in Drake et al. (2012) competitive employment rates and fidelity total scores

were dichotomized: Sites with a quarterly competitive employment rate of 41% or higher were classified as achieving “above-average employment”; and sites with lower than 41% of competitive employment rates were classified as achieving “below-average employment.” Similarly, sites were classified as attaining “good” fidelity if they achieved a fidelity total score of 100 or above, and sites with a fidelity total score of 99 or below were categorized into “low” fidelity sites. These two dichotomized variables were then entered into a two by two crosstabulation with a Fisher’s exact test to examine whether sites reporting close adherence to the model (i.e., good fidelity sites) are more likely to produce better competitive employment rates than sites with poor adherence to the model (i.e., low fidelity sites). Finally, the mean values for the IPS-25 fidelity items reported in the previous IPS-25 validation study (Bond, Peterson, et al., 2012) were plotted against the 25 fidelity items in the current data set to visually examine the differences between each fidelity item across these two time points.

3. Results

3.1. Item-level descriptive and correlational analyses

Table 1 presents descriptive statistics for the IPS-25 items and their item-level correlations with competitive employment rate. The reported mean values indicated that five components (vocational generalists, caseload size, exclusive vocational services, state vocational rehabilitation agency involvement, and rapid job search) were successfully implemented in most IPS programs (mean scores >4.50). On the other hand, nine fidelity components had poor mean fidelity (<4.00), indicative of being less widely implemented criteria. Those nine components were time-unlimited supports, assertive outreach to clients, IPS team formation of a vocational unit, a supervisory role of the IPS team leader, agency focus on work, job development frequency, IPS team contact with the treatment team, agency leadership support, and occupational diversity.

As shown in Table 1, an item-level correlational analysis with competitive employment rate indicated that five fidelity items were positively correlated with the competitive employment rate ($p < 0.05$): quality of job development, individualized job search, community-based services, rapid search, and agency focus on work.

The item-level IPS-25 correlations with competitive employment rates did not cross validate with the previous IPS-25 study (Bond, Peterson, et al., 2012); none of the items that were significantly correlated in the early study replicated.

3.2. *IPS-25 total score and its predictive validity in employment rate*

The grand mean of the IPS-25 total score was 104.09 (SD = 9.56), with an interquartile range from 99 to 110. Fifty-nine sites (75%) achieved a fidelity score of 100 or higher and 20 sites (25%) received a fidelity score between 74 and 99. The grand mean \pm SD competitive employment rate was 41.29% \pm 15.37%, leading to a range of 25.92% to 56.66%. Internal consistency (Cronbach's alpha) for the IPS-25 was 0.77. The IPS-25 summated total scores were significantly correlated with competitive employment rates (Pearson's correlation coefficient = 0.27, $p = 0.02$), supportive of the main hypothesis. This finding confirms that a total score of the IPS-25, relative to its item-level measures, is a useful and reliable indicator of employment outcomes.

3.3. *Crosstabulation of the IPS-25 total score and employment rate*

The result indicates that when good fidelity was achieved (i.e., equal to or greater than 100, $n = 59$, see Table 2), 57.6% of sites achieved above-average employment rates. When site had relatively low fidelity score (i.e., less than 100, $n = 20$), only 25.0% achieved above-average employment rates. Fisher's exact test revealed a significant dependence between fidelity and employment outcomes (two-tailed, $p = 0.019$).

3.4. *Comparison of the mean IPS-25 item scores in the two studies*

Figure 1 displays a scattergram with mean scores for the IPS-25 items in the two studies on the x and y axes. The three most highly rated fidelity items in both studies were identical in the two studies (caseload size, exclusive vocational services, and vocational

generalists). Conversely, the nine fidelity items with mean scores below 4.0 (i.e., items that were generally more difficult to implement) were also identical in the two studies. The correlation between the two sets of mean items scores from the two studies was 0.89, $p < 0.01$.

4. Discussion

This study replicates Bond et al. (2012) who found a significant positive association between IPS fidelity and competitive employment outcomes. The association found in the present study was also statistically significant (Fisher's exact test $p = 0.019$). While more replications are needed, including studies conducted by different research groups and in different settings, the evidence base is growing for a robust association between IPS fidelity and competitive employment outcome (Bond et al., 2011). Not all fidelity measures have shown such consistent associations with outcome (Chandler, 2011). As in most previous studies, the correlation between fidelity and outcome was modest,

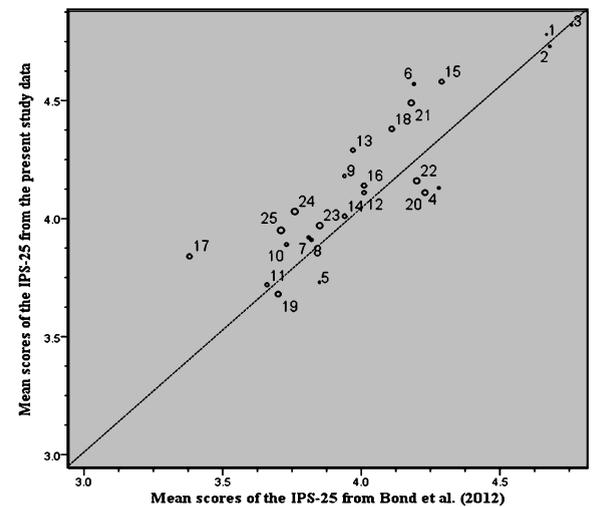


Fig. 1. Comparisons of The IPS-25 Scales between Bond et al. (2012) and The Current Study. Notes: The numbers refer to the items' identification numbers. See Table 1 for the item descriptors.

Table 2
Comparison of fidelity with employment outcome

	Below-average employment rate	Above-average employment rate	Total
Low fidelity	15 (75.0%)	5 (25.0%)	20
Good fidelity	25 (42.4%)	34 (57.6%)	59
Total	40 (50.6%)	39 (49.4%)	79

accounting for less than 10% of variance in employment outcome, suggesting that many other factors influence outcome (Drake, Bond, & Rapp, 2006). Other possible factors not measured in the current study include laws and policies within a jurisdiction (Burns et al., 2007), the local unemployment rate (Burns et al., 2007; Cook et al., 2006), employment specialist competencies (Corbiere, Brouwers, Lanctot, & van Weeghel, 2014), and client characteristics (Tsang, Leung, Chung, Bell, & Cheung, 2010). One difference between fidelity and many of these other factors is that fidelity is modifiable by an employment team and agency leadership, whereas other factors are harder to influence. To further establish the predictive validity of the IPS-25 for employment outcome, we argue that a series of replications as well as further examination on other potential predictors for employment rate should be considered in the future studies.

Several key findings emerge from this replication study. First, we examined the mean scores of each IPS-25 item, and its association with employment rate (RQ1). The results that some fidelity domains are more difficult to implement do not imply that they should be given lower priority. Quite the contrary: studies have shown that some frequently lower-rated items are strongly associated with better outcomes (Cook et al., 2005; Leff et al., 2005). This suggests that IPS teams need to devote special efforts to address these critical areas. Note that the IPS-25 scale has little focus on management and process related factors, such as whether an IPS supervisor follows up with clients who are not reaching their goals.

Of the 25 fidelity items, five were significantly correlated with employment. This pattern of item-level correlations did not cross-validate from the reference study (Bond, Peterson, et al., 2012), suggesting caution in interpreting these findings. We conclude that the predictive validity of the total scale score is supported, but that we cannot be confident in the predictive validity of any individual item. This conclusion is consistent with the principle from test theory that scales are more reliable than individual items (Nunnally, 1978). As a pragmatic quality improvement tool, IPS teams should focus on individual areas for improvement in developing their corrective plans, but from a research perspective, the total scale score is more a dependable guide to overall program functioning.

Second, we investigated whether IPS-25 total scores have a positive correlation with competitive employment rate (RQ2). In the current study, a reanalysis dichotomizing both fidelity and employment support

that IPS programs that met standards for high fidelity were significantly more likely to meet benchmark employment standards. The most striking finding from this reanalysis was that less than 10% of programs not meeting IPS fidelity standards attained the employment benchmark. We interpret these results to imply that *meeting fidelity standards is usually a necessary but not sufficient condition for achieving good employment outcomes.*

Third, the comparison between mean item ratings in the initial and current validation studies documented that the relative difficulty in achieving item fidelity was highly consistent (RQ3). Some aspects of fidelity are relatively easy to achieve, such as ensuring a low caseload, limiting employment specialist duties to vocational services, and ensuring rapid job search. Other fidelity domains are consistently less fully implemented, such as integration with the treatment team and maintaining a high rate of employer contacts. Implementation projects often have found that integration of IPS and mental health services is the most difficult area in which to achieve adequate fidelity (Bond, McHugo, Becker, Rapp, & Whitley, 2008; Craig et al., 2014; van Erp et al., 2007; Waghorn, Stephenson, & Browne, 2011). Implementation studies also have suggested that “structural” fidelity items that concern organizational policies or staffing patterns are easier to achieve than are “clinical” fidelity items that require mastery of skills (Bond et al., 2008). The findings appear to be consistent with this distinction.

In terms of generalizability, the sampling approach for this study is both a strength and a weakness. The selected sites were participants in an IPS learning community devoted to achieving high fidelity IPS services and competitive employment outcomes (Becker et al., 2014). Fidelity reviewers received rigorous training in conducting fidelity reviews through several mechanisms, including multi-day training seminars and by shadowing experienced fidelity reviewers. Whether these findings would generalize to a more heterogeneous sample of employment programs is unknown. On one hand, the deliberate effort to achieve high fidelity led to a more homogeneous sample on the measure of fidelity, which may have resulted in restriction of range, consequently suppressing the correlation between fidelity and outcome. On the other hand, it might be hypothesized that programs adhering to other vocational models might achieve competitive employment outcomes through other mechanisms. The findings for this study generalize to programs aspiring to high IPS fidelity.

Another finding from the study was that three-fourths of the participating sites achieved good fidelity. This rate compares favorably to the 55% good-fidelity rate achieved over two years in a national study of implementation of evidence-based practices (McHugo et al., 2007). To promote good fidelity, the IPS learning community encourages annual fidelity reviews and ongoing supervisory attention to fidelity (Becker et al., 2014). We presume that systematic strategies are responsible for wide scale adherence to fidelity standards in the learning community. Without such fidelity monitoring in place, practices typically vary widely across programs (Corbiere et al., 2014).

Study limitations include selection biases in the use of fidelity reviewers who may not be completely blind to employment outcomes. The reliability and validity of both the fidelity and outcome data were not independently verified. States varied in their fidelity review procedures, and no data were collected on inter-rater reliability between fidelity reviewers. Another issue concerns quality control at the state level for the collection of competitive employment outcomes. Despite bimonthly teleconferences with state leaders aimed at reinforcing consistency of data collection methods, the accuracy data at the site level may have been imperfect. Another limitation was the time latency within the fidelity reviews and outcome assessment. For pragmatic reasons we chose a specific time period for collecting outcome, while the timing of the fidelity assessments varied over a longer period. This study had the usual statistical limitations of a cross-sectional design with single measures for the predictor and outcome measure. Finally, controlling for a myriad of confounding variables was beyond the scope of the study, but could have influenced the associations between fidelity and outcome. In summary, most of these study limitations appear to work against finding a significant association between fidelity and outcome, increasing the confidence that this correlation is substantive.

5. Conclusion

IPS sites adhering to high fidelity are more likely to achieve good employment outcomes, whereas sites that have low fidelity are unlikely to achieve good outcomes. Fidelity is an important goal in program quality improvement, although program leaders should also emphasize other key elements of quality services.

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