

Wraparound Fidelity Index, version 4

Summary of Relevant Psychometrics, Reliability, and Validity Studies

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This document presents psychometric characteristics of the Wraparound Fidelity Index, version 4, as well as a summary of results from relevant reliability and validity studies conducted on the WFI-4 and previous versions of the WFI. For more information on the WFI and other instruments of the Wraparound Fidelity Assessment System, please go to www.wrapinfo.org, and select the link to the Wraparound Evaluation and Research Team at the University of Washington.

Psychometric data on the WFI-4 are primarily derived from a national sample of 1,478 unique wraparound teams, based in 41 different collaborating sites across North America. Data originate from 1,234 wrap facilitators, 1,006 caregivers, and 221 team members. Reliability and validity results are based on specific validity and reliability studies that have been conducted and published in peer-reviewed publications or presented at national conferences (see citations where appropriate).¹

Variance and Normality of the WFI-4

A key concern for implementation measures is the presence of skewness and “ceiling effects” which are often found in self-report measures; thus a key analysis for the WFAS instruments is to assess individual items against criteria for adequate variance and normality. For the four WFI interview forms, we set criteria that assessed the number of items for which mean scores were $\leq .85$ of total possible score (i.e., 1.70 on the 2-point scale) and/or had adequate normality as assessed by a skewness statistic ≤ 2.0 . Our goal was that 75% of items would meet these criteria. For the Wraparound Facilitator (WF) form, 27 of 40 items met criteria (67.5%); for the Caregiver form, 35 items met criteria (87.5%); for the Youth form, 24 of 32 items met criteria (75%); and for the Team Member form (N=112), 32 of 40 items met criteria (80%). Mean scores for individual items ranged from .69 – 1.95 for the WF form (mean for all items = 1.64); from .61-1.93 for the CG form (mean for all items = 1.5); from .66 – 1.87 for the Y form (mean for all items = 1.46) and from .55 – 1.92 for the TM form (mean for all items = 1.56). Thus, overall WFI-4 scores (total scores) for all four respondent types demonstrate adequate normality and variance (with the CG, Y, and T M forms showing the greatest variation and least “ceiling effect”); however, between 20 and 32 percent of individual WFI items may demonstrate lack of variance and/or skewness, potentially requiring transformation and/or caution in interpretation when used as individual items in analyses. ***Please see Appendix A for a summary of the mean item-level scores for all four forms of the WFI-4.***

Currently, the research team is analyzing WFI data using Item Response Theory (IRT; a contemporary alternative to classical test theory). The goal is to build a test in which all items measure the same construct, but each item adds something to the test which most other items do not measure. In doing so, results may point to items which could be eliminated from the measure with no loss of value to the scale.

Mean WFI-4 Scale Scores by Respondent

A series of paired-sample t-tests indicated that the mean total fidelity score for wraparound facilitators was significantly higher than caregivers, team members, and youth, and the mean score for

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youth was significantly lower than all other respondent types ($M_{WF} = 1.7, SD = .20; M_{CG} = 1.5, SD = .36; M_{TM} = 1.6, SD = .23; M_Y = 1.4, SD = .35$).

Reliability of the WFI

Internal Consistency. The WFI-4 total scale score demonstrates high *alpha* coefficients for all four respondent types, ranging from .83 to .92, indicating a high level of internal consistency. This supports the idea that the WFI as a whole contains items that reliably measure a unidimensional construct. However, *alphas* for the phase subscales were lower, ranging from .51 to .82; hence, these subscales have less internal consistency than the total score. *Alphas* for the 10 principle subscales were even lower, with most scores from .30 to .60. Though the WFI was explicitly developed to include items that tap into all 10 principles of wraparound as well as activities within the four phases, these results indicate that caution is required in research studies that aim to, for example, examine between-group differences in WFI subscale scores (e.g., the four phases or individual principle scores).

Test-retest Reliability. Test-retest reliability of the WFI-4 has not yet been formally conducted. However, test-retest reliability of the WFI-3 has been assessed. In a study conducted in two separate wraparound programs in two different states that were using the WFI-3, N=16 wraparound facilitators, 14 caregivers, and 11 youths completed the WFI-3 twice within two weeks, and were asked to provide ratings of wraparound adherence for the same retrospective six-month period. Pearson correlations were found to be $r=.84$ for the RF form, $r=.88$ for the CG form, and $r=.64$ for the Youth form. The correlations found for the RF and CG forms were both significant at the $p<.05$ level, while the correlation for the Youth form was significant at the $p<.1$ level (Bruns et al., 2005).

A previous study of the WFI-2.1 using a larger sample of $n=60$ families across five sites found two-week test-retest reliability of .73 across all items for CGs ($N = 56$), .86 for RFs ($N=53$), and .76 for Y ($N=36$). These results were all significant at $p<.01$.

Inter-respondent agreement was assessed by calculating the Intraclass Correlation Coefficient (ICC) for agreement between sets of respondents for the national WFI-3 sample of $N=667$ families in 10 sites. Results found moderate ICCs of .58 for all three respondents, .44 for RF-CG agreement, .49 for CG-Y agreement, and .45 for RF-Y agreement. These ICCs indicated good inter-respondent agreement for a scale of this nature. As part of the IRT analyses underway for the WFI-4 (see above), we are currently analyzing inter-respondent agreement using the national WFI-4 sample.

Validity of the WFI

While reliability is concerned with how well a measure's items are related to an underlying variable, *validity* is concerned with whether the variable that is being measured is truly the variable of interest. In the case of the WFI, we are concerned with whether the tool is a valid measure of adherence to the wraparound principles and practice model.

To assess this question, we can look to several types of studies involving different versions of the WFI. These include studies of:

- **Content validity** (how well WFI items measure the domain of interest),
- **Criterion-related validity** (whether scores on the WFI are associated with a different measure of the same construct),
- **Discriminant validity** (whether scores on the WFI discriminate between different types of conditions, such as wraparound vs. non-wraparound programs), and
- **Construct validity** (whether WFI scores are associated with an external variable hypothesized to be related, such as child and family outcomes).

Content validity. Content validity can be measured in several ways. Support for the face validity of the WFI-4 items can be found by reviewing the history of the development and revision of the measure. During these efforts, dozens of stakeholders representing many different perspectives helped

confirm and specify the wording of the 10 principles (Walker, Bruns, & Penn, 2008; Walker et al., 2004). Then, to develop the WFI-4, the research team again engaged dozens of wraparound experts nationally to nominate and select indicators of adherence to the 10 principles, and then to help construct the wording of the items. Before releasing the final WFI-4, a preliminary study of a 49-item WFI-4 was conducted in 2006 with seven collaborating communities (Bruns, Suter, Rast, Walker, & Zabel, 2006). Results from this study, including results of focus groups with evaluators and administrators, as well as analysis of psychometrics, informed the final WFI-4.

Additional support for the construct validity of the WFI comes from confirmatory factor analyses (CFA) of different versions of the measure. CFA seeks to confirm that there is good “fit” between scale items and a proposed set of factors (i.e., wraparound principles) they are intended to measure. Using WLSMV estimation (Dumenci, 2000), a CFA of the Caregiver form of the WFI-3 found a Root Mean Square Error of Approximation (RMSEA) of 0.059 for a 44-item solution. This was an encouraging result, given that a RMSEA of 0.060 or lower indicates a good “fit” of items to a proposed factor structure. This “fit coefficient” was better than was obtained for a one-factor model (parsimony test), which yielded a RMSEA of 0.067.

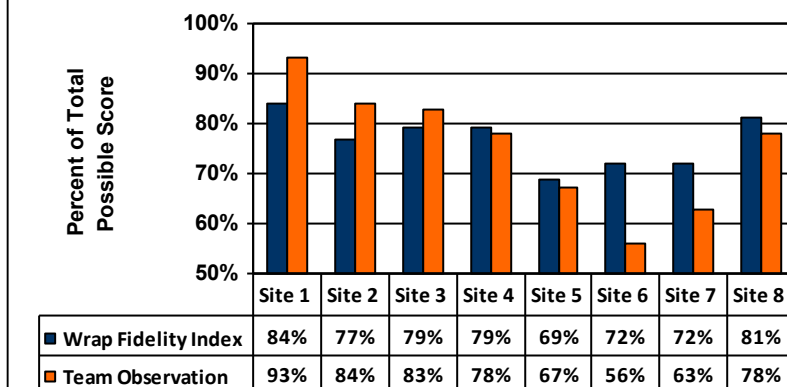
Preliminary assessment of the construct validity of the WFI-4 has been conducted using the national dataset described above and IRT procedures. Preliminary analyses using a Rasch partial credit model (appropriate for ordered polytomous data with varying item threshold sets; Masters, 1982) indicated that the model fit Rasch assumptions. As a whole, the measure had acceptable model-data fit for persons (*REAL RMSE* = .36; *INFIT MNSQ* = 1.0; *OUTFIT MNSQ* = .94) and good level of consistency in ordering of person location estimates (*REAL reliability* = .79). In other words, the ordering of persons’ likelihoods to respond in certain ways fit the data well, with only a few persons who responded surprisingly different than what the model would predict. Additionally, results indicated very good model-data fit for items (*REAL RMSE* = .04; *INFIT MNSQ* = .99; *OUTFIT MNSQ* = .94) and an excellent ordering of item location estimates (*REAL reliability* = 1.0). Items were also examined for possible misfit and were found to generally be within an acceptable range, however most of the items behaved in an essentially dichotomous fashion. Contradictory to the results of the CFA of the WFI-3, however, these results indicate that the items of the WFI-4 best “fit” a unidimensional construct.

Criterion-related

validity. Several studies have been conducted or are underway that have assessed the relationship between scores derived from the WFI and an alternative approach to measuring adherence to the wraparound principles. A series of studies of early versions of the WFI found that an expert’s overall fidelity ratings (based on in-depth interviews and record reviews) for individual families were significantly correlated with WFI Total Fidelity scores.

More recently, we conducted a concurrent validity study whereby we obtained data from N=8 sites that had collected data from both the WFI-4 and the Team Observation Measure (TOM). Data were collected by local evaluators who were trained to criteria using manualized procedures developed for both the TOM and WFI. Results showed a discernable pattern (see Figure 1) whereby sites with higher WFI scores

Figure 1. Mean site-level scores on the WFI and TOM for N=8 sites



also demonstrated relatively higher TOM scores. Exploring this pattern via simple Pearson's correlation revealed a significant association between TOM and WFI mean site-level scores ($r(8) = .857; p < .01$). Thus, even with a small number of sites, the pattern of association between mean TOM and WFI scores for these sites was robust enough ($r = .86$) to reach significance.

Discriminant validity. Some of the most encouraging information about the validity of the WFI has originated from collaborators who have used the tool in the course of conducting evaluation studies. Results of these studies have consistently found that scores from the WFI discriminate between wraparound and other types of service delivery conditions. For example, in studies using the WFI-3, Ferguson (2004) found that WFI-3 scores were significantly different for a sample of youth receiving services through the wraparound process than for a matched sample of youth receiving child welfare services as usual. In addition, Rast and Peterson (2004) found significantly higher WFI-3 scores for a sample of youth receiving wraparound than for a sample of youth receiving child welfare services as usual in a statewide evaluation in Nevada (Bruns, Rast, Walker, Peterson, & Bosworth, 2006). Meanwhile, Bruns, Leverentz-Brady, & Suter (2006) found higher WFI scores for families in communities demonstrating greater administrative and system supports for wraparound than for families in communities that did not feature such supports (e.g., lower caseloads, community collaborative teams, outcomes and fidelity monitoring systems). In addition, Rider et al. (2004) found that wraparound facilitators with more intensive training and coaching on wraparound implementation scored higher on the WFI-3 than did facilitators in a nearby community who were implementing wraparound but had less intensive training and coaching to support their efforts. In an article that summarized results of these types of studies, Bruns, Suter, & Leverentz-Brady (2008) found a pattern of results that supports the hypothesis that the WFI can discriminate between wraparound and non-wraparound interventions for youth with complex needs, and that a programs or systems with greater support for wraparound implementation (such as training, coaching, quality assurance, interagency collaboration, etc.) consistently have teams that achieve higher WFI fidelity scores. These results were also used to propose benchmarks for high, adequate, and poor levels of fidelity as assessed by the WFI.

More recent studies using the WFI-4 have continued to find that the WFI discriminates between wraparound and other interventions, and that sites with better developed supports for wraparound implementation have higher WFI scores. For example, in a recently completed NIMH-funded randomized study of wraparound, WFI scores were significantly higher for wraparound than for intensive case management. This study also found that WFI scores in the study site increased after the introduction of intensive training and coaching (from 72% to 86% of the total possible WFI score), but then declined again (to 73%) when wraparound went to scale and resources for intensive training and coaching were no longer available (Bruns, Denby-Brinson, Ramey, & Sather, 2010). In another recently completed study, Walton and colleagues (2010) found that, across 30 counties implementing wraparound in Indiana, mean WFI-4 scores were significantly higher for teams in counties with better developed systems of care, as assessed by a structured system assessment measure.

Construct validity. Finally, several studies have found positive associations between WFI scores and ultimate child and family outcomes. Because high-fidelity wraparound implementation is hypothesized to result in better outcomes, these findings provide additional support for the validity of the WFI, as well for the wraparound process in general. Specifically, as described in Bruns, Rast, Walker, Peterson, & Bosworth (2006), researchers found that wraparound facilitators in Nevada with higher WFI-3 scores achieved better child and family outcomes (e.g., child behavior and functioning, residential restrictiveness, and family resources) than facilitators with lower WFI-3 scores. In addition, Bruns, Suter, Leverentz-Brady, Burchard, & Force (2005) found a consistent (though weaker) pattern of association between WFI-2.1 scores and outcomes as assessed at the child and family level in a single system of care in Nebraska. More recently, Cox and colleagues (2009) found that several items of the WFI were related to outcomes such as goal attainment and maintenance in community living situations. Finally, Walton &

Effland (2010) found that youth with higher WFI-4 scores were significantly more likely to demonstrate positive behavioral and community functioning outcomes as assessed by improvement in scores on the Child and Adolescent Needs and Strengths (CANS) measure (Lyons, 2008).

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APPENDIX A

Mean Item Scores for the Four Forms of the Wraparound Fidelity Index, Version 4

ITEMS	wrap facilitator	caregiver	team member	totals
1.1 - Was the family given ample time to talk about strengths, beliefs & traditions *and* At first team meeting were their strengths beliefs and traditions w/ all team members?	1.88	1.65	1.75	1.76
1.2 - Before first team meeting did you fully explain wa process and choices family could make?	1.83	1.68	1.72	1.76
1.3 - At beginning of wa process was family given opportunity to say what has worked in past for child?	1.86	1.75	1.76	1.79
1.4 - Did the family select the people who would be on their team?	1.49	0.86	0.91	1.09
1.5 - Is it difficult to get team members to attend meetings?	1.37	1.57	1.67	1.54
1.6 - Before first wa team meeting, did you go through a process of identifying what leads to crises for family?	1.77	1.52	1.54	1.61
2.1 - Did the family plan and team create a written plan of care? & Do they have a copy of the plan?	1.81	1.64	1.69	1.71
2.2 - Did the team develop any kind of written statement about what it is working on with the youth and family?	1.61	1.56	1.62	1.6
2.3- Can you summarize the service, supports, and strategies that are in the family's wa plan?	0.69	0.61	0.55	0.62
2.4- Are the supports and services in the wa plan connected to strengths and abilities of child/family?	1.89	1.74	1.86	1.83
2.5 - Does the wraparound plan include strategies for helping the child get involved with activities in their community?	1.53	1.24	1.44	1.4
2.6 - Are there members of the wa team who do NOT have a role in implementing the plan?	1.71	1.67	1.66	1.68
2.7 - Does the team brainstorm many strategies to address the family's needs before selecting one?	1.9	1.73	1.86	1.83
2.8 - Is there a crisis or safety plan that specifies what everyone must do to respond? & Does this plan also specify how to prevent crises from occurring?	1.82	1.43	1.61	1.62
2.9 - Do you feel confident that in a major crisis the team can keep the child in the community?	1.62	1.5	1.5	1.54
2.10 - Would you say that people other than the family have higher priority than the family in designing their wa plan?	1.58	1.53	1.4	1.5
2.11 - Did the team take enough time to understand the family's values and beliefs? & Is the wa plan in tune with the family's values and beliefs?	1.88	1.73	1.79	1.8
3.1 - Are important decisions ever made about child/family when they aren't there?	1.73	1.64	1.59	1.65
3.2 - When wa team has a good idea for support/services can it find resources to make it happen?	1.81	1.7	1.84	1.78

3.3 - Does the wa team get the child involved w/ activities they like and do well?	1.5	1.2	1.38	1.36
3.4 - Does the team find ways to increase the support family gets from friends and family members?	1.5	1.22	1.42	1.38
3.5 - Do the members of the team hold each other responsible for doing their part in wa plan?	1.86	1.7	1.86	1.81
3.6 - Is there a friend or advocate of the child or family who actively participates on wa team?	0.97	0.95	0.97	0.96
3.7 - Does the team come up w/ new ideas for wa plan when family needs change *and* Does the team come up w/ new ideas for wa plan whenever something is not working?	1.95	1.74	1.91	1.87
3.8 - Are the services and supports in the wa plan difficult for the family to access?	1.63	1.54	1.66	1.61
3.9 - Does the team assign specific tasks to all members at end of meeting *and* Does team review each member's f.t. on tasks?	1.8	1.59	1.68	1.69
3.10 - Do members of the team always use language the family can understand?	1.93	1.93	1.85	1.9
3.11 - Does the team create a positive atmosphere around successes and accomplishments at each meeting?	1.93	1.86	1.87	1.89
3.12 - Does the team go out of its way to make sure ALL members present ideas and participate in decision making?	1.84	1.67	1.68	1.73
WF3.13 - Do you think the wa process could be discontinued before the family is ready for it to end?	1.5	1.35	1.22	1.36
3.14 - Do all family members of your team demonstrate respect for the family?	1.9	1.88	1.91	1.9
3.15 - Does the child have opportunity to communicate their ideas when time comes to make decisions?	1.86	1.71	1.84	1.8
4.1 - Has the team discussed a plan for wa process will end *and* Does the team have a plan for when this will occur?	1.11	0.68	0.82	0.87
4.2 - Has the wa process helped child develop friendships w/ other youth who will have positive influence on them?	1.34	1.2	1.27	1.27
4.3 - Has the wa process helped child solve own problems?	1.52	1.3	1.39	1.4
4.4- Has team helped child prepare for major transitions?	1.74	1.35	1.66	1.58
4.5 - Do you feel like the family will be able to "restart" wa once it has ended?	1.75	1.61	1.49	1.62
4.6 - Has the wa process helped the family develop or strengthen relationships that will support them when wa is finished?	1.65	1.49	1.54	1.56
4.7 - Do you feel like the family will be able to succeed on its own, or w/ just the help of family and friends?	1.31	1.22	1	1.18
4.8 - Will some members of the team be there to support the family when formal wa is finished?	1.68	1.65	1.59	1.64
TOTAL MEAN	1.65	1.49	1.54	1.56

ITEMS	youth
Y1.1 - When you first met your wa facilitator, were you given time to talk about things you are good at and things you like to do?	1.84
Y1.2 - Before your first team meeting, did your wa facilitator fully explain how the wa process would work?	1.68
Y1.3 - At the beginning of the wa process, did you have a chance to tell wa facilitator what things have worked in the past for your family?	1.52
Y1.4 - Did you help pick the people who would be on your wa team?	0.66
Y1.5 - Do you have a friend or advocate who participates actively on your wa team?	0.99
Y1.6 - Would you have different people on your team if you could?	1.2
Y2.1 - Did you help create a written plan that describes how the team will meet your needs? *and* Do you have a copy the plan?	1.22
Y2.2 - During meetings does your team brainstorm many ideas to meet your needs before picking one?	1.74
Y2.3 - Does the team know what you like and things that you do well?	1.8
Y2.4 - Does your wa plan include things that get you involved w/ activities in your community?	1.21
Y2.5 - When your team was making its plan, did you and your family have many changes to talk about what you like and what you believe in?	1.59
Y2.6 - Does your wa plan include mostly professional services?	0.74
Y2.7 - If things go wrong or there is a crisis, is there a plan that says what everyone must do?	1.37
Y2.8 - Do you and your family get the help that you need?	1.75
Y3.1 - Are important decisions made about you and your family when you are not there?	1.19
Y3.2 - When your wa team has a good idea, can it figure out some way to make it happen	1.73
Y3.3 - Does the wa team get you involved with activities in you like and do well?	1.2
Y3.4 - Do people on the team help you do things with your friends and family?	1.47
Y3.5 - When things are not going right, does the team help you talk with friends and other people you like and talk to?	1.49
Y3.6 - Does your team come up with new ideas for you wa plan whenever something isn't working?	1.77

Y3.7 - Are the places you go to for services hard to reach because they are far away?	1.55
Y3.8 - Do members of your team always use lang you can understand?	1.77
Y3.9 - Do your wa team meetings make you feel good about your successes and accomplishments?	1.7
Y3.10 - Does everyone on your team talk and give their ideas during your wa team meeting?	1.9
Y3.11 - Do you think you could get "kicked out" of wa before you or your family is ready for it to end?	1.49
Y3.12 - Do all the members of your team show respect for you and your family?	1.87
Y3.13 - Do you have the chance to give your ideas during the wa team meetings?	1.77
Y4.1 - Has your team discussed a plan for how the wa process will end? *and* Does your team have a plan for when this will occur?	0.66
Y4.2 - Has the wa process helped you and your family to develop relationships with people who will support you when wa ends?	1.46
Y4.3 - Has the wa process helped you become friends with other youth in the community?	1.25
Y4.4 - Has your team helped you prepare for major changes?	1.53
Y4.5 - Will people on your team be there to help you when wa is finished?	1.72
TOTAL YOUTH AVERAGE	1.46

APPENDIX B

Mean Principle & Phase Scores for the Four Forms of the Wraparound Fidelity Index, Version 4

PHASE/PRINCIPLE	wrap facilitator	caregiver	team member	youth	total
Phase 1 Engagement	.85	.75	.78	.65	0.76
Phase 2 Planning	.82	.75	.77	.70	0.76
Phase 3 Implementation	.86	.80	.82	.80	0.81
Phase 4 Transition	.76	.66	.67	.66	0.68
Principle 1 Family Voice and Choice	.88	.82	.82	.78	0.82
Principle 2 Team Based	.79	.71	.74	.60	0.71
Principle 3 Natural Supports	.68	.61	.65	.71	0.73
Principle 4 Collaboration	.91	.85	.88	.74	0.78
Principle 5 Community Based	.76	.69	.70	.69	0.77
Principle 6 Culturally Competent	.95	.90	.91	.89	0.83
Principle 7 Individualized	.76	.64	.71	.67	0.71
Principle 8 Strengths Based	.90	.82	.86	.78	0.64
Principle 9 Persistence	.86	.80	.78	.83	0.85
Principle 10 Outcomes Based	.78	.64	.68	.61	0.71
Total WFI Score	.82				.76