The Two-Generation Mutual Reinforcement Measurement Tool Appendix B: Technical Approach for the Pilot Study

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Mutual reinforcement is a key concept in the two-generation field and is of interest to both researchers and practitioners. The Next Steps for Rigorous Research in Two-Generation Approaches (NS2G) project, sponsored by the Administration for Children and Families' Office of Planning, Research, and Evaluation (OPRE), developed a tool to measure mutual reinforcement in two-generation initiatives. We, the NS2G project team, described its development in The Two-Generation Mutual Reinforcement Measurement Tool: Development and Pilot Study Findings (Conroy et al. 2023). This technical appendix contains additional information on the small pilot study we conducted.

Pilot Study

Participant selection and recruitment

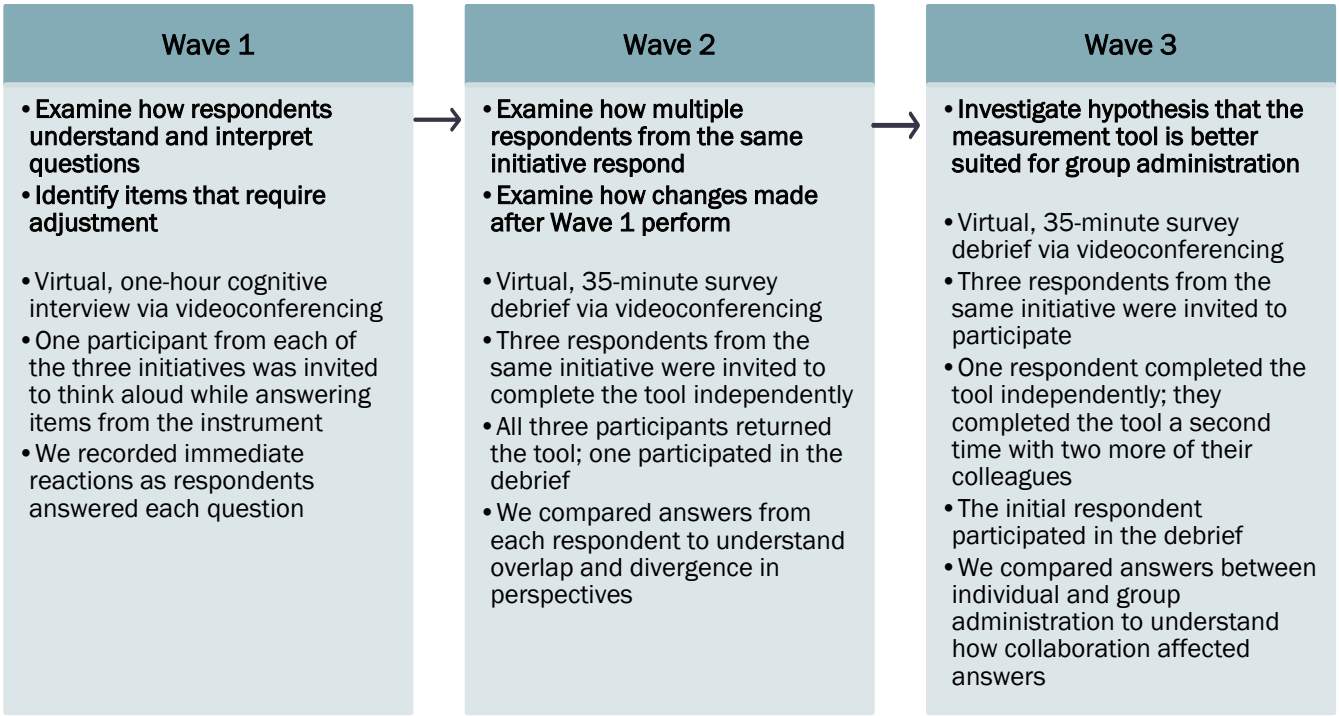
We selected three two-generation initiatives that were already engaged in the NS2G project to participate in the pilot. We asked technical assistance liaisons on the NS2G project team who were meeting regularly with staff from these initiatives to select staff members who they believed would be the best fit for the pilot based on their roles and responsibilities. Once an initiative staff member confirmed their interest in participating, we assigned them to one of two groups: the *cognitive interview* group or the *survey debrief* group. Finally, we emailed pilot participants a description of their assigned activity, the time commitment, and potential interview dates.

Methods

Interview protocol. Each wave had a different purpose and goal that informed key decisions about the tool's function and administration (Figure B.1). Therefore, the NS2G project team developed one semistructured interview guide for each interview method (cognitive and full survey debrief) for each wave to standardize data collection across all interviews. For example, in Wave 1, the NS2G project team used the cognitive interview format to pre-test questions we adapted from existing items in the field or created ourselves. Findings from Waves 1 and 2 suggested respondents needed to collaborate with their colleagues to answer all the questions in the tool; this led us to pilot a group administration format in Wave 3.

Participant interviews. Eight staff participated in the pilot across three waves of data collection (Figure B.1). For each pre-test, two NS2G project team members conducted the discussion via videoconference. Cognitive interviews lasted about one hour. For full debrief interviews, we emailed the paper questionnaire to respondents to complete and return to the N2G project team for review before a 35-minute interview. Regardless of the pre-testing mode, our goal was to require only one hour, in total, of our pilot participants' time.

Figure B.1. Pilot study goals and activities, by wave



Note: Wave 1 included all three initiatives. Waves 2 and 3 included one distinct initiative each. Nearly all respondents were unique, except for one person who participated in Waves 1 and 3.

Analysis

During each pre-testing wave, we created a document that compared pilot participants' responses and comments on each question. After each wave, we reviewed the participants' feedback, comprehension, and responses. For each question, we reviewed the findings and any

recommended modifications. We refined the tool iteratively, based on the findings of each wave, including a total reduction in length (measured by words) of nearly 10 percent due to streamlining and simplifying wording.

Testing summary. Overall, in Wave 1, the NS2G project team pre-tested the definitions and 13 questions and 50 subquestions (out of 14 questions and 56 subquestions) from the first draft of the measurement tool. In Waves 2 and 3, we pre-tested all 14 questions and 63 subquestions from the revised tool.

Expert review. When pre-testing was complete, an expert in survey measures and statistical methods from the NS2G project team conducted a final review of the measurement tool and advised on best practice and methods for rescaling and scoring the tool.

Opportunities for additional testing

These preliminary results indicate that the tool would benefit from additional research involving more participants with more complete response data. Additional steps beyond the scope of the current NS2G project could include a statistical examination of the factor structure of the Two-Generation Mutual Reinforcement Measurement Tool to ensure its validity and reliability. Such an examination would then help confirm the quality of the tool and the data collected for analysis and use.

Statistical methods would be able to detect the measurement tool's constructs, map the items, assess sensitivity, and develop a concrete interpretation of scores. Ideally, an examination of this type would also include an exploratory factor analysis because the field has limited knowledge about the factors that may explain the relationships between the variables. (Factor analysis is a family of statistical methods that can be used to identify the latent factors driving observable variables.) A common result of exploratory factor analysis is that some items are not strongly associated with the other items in that factor (that is, they do not meet loading minimums for a subscale) and are subsequently removed from a survey or tool. This would shorten the length and focus participants' efforts on the most relevant questions. After future investigation into factor relationships and loadings, testing for internal consistency (meaning that items are consistent with one another and measuring the same thing) and validity would be a logical next step.

Obtaining high-quality results from a factor analysis requires adequate statistical power; future analyses would need a large sample size of organizations involved in two-generation initiatives (Comrey and Lee 1992; Yong and Pearce 2013). The factor analysis literature suggests a wide range of sample size minimums from three to 20 observations per variable. However, a widely accepted ratio is 10 cases per variable, which also helps avoid computational difficulties (Nunnally and Bernstein 1967; Everitt 1975). Other statistical theories suggest that the overall size of the sample is sufficient rather than the unique observation. For example, the foundational text "A First Course in Factor Analysis" provides the following advice regarding sample size: 50 cases is very poor, 100 is poor, 200 is fair, 300 is good, 500 is very good, and 1,000 or more is excellent (Comrey and Lee 1992, 2013). Thus, a sample size of at least 300 participants would be sufficient as long as each has at least five to 10 observations. For the purposes of analyzing

the current tool, a single observation would refer to a completed tool from an organization or partner within an initiative, such that it would be possible to survey fewer than 300 two-generation initiatives to get the needed sample size.

Currently, the survey has 63 unique items.[1] A quality factor analysis would require a sample size between 315 (five unique observations per variable) and 630 organizational responses (10 unique observations per variable). However, an important constraint is the number of two-generation initiatives currently operating.[2] Due to this limitation and factoring in participation rates (we assume that we would not achieve 100 percent participation from all two-generation organizations), an achievable target could be between 315 to 378 unique responses (five to six unique observations per variable). This range would satisfy unique observations and sample size recommendations; however, surpassing these targets is preferable as it will strengthen the analysis. The analysis could be completed with a smaller number of responses; however, it would run the risk of various computational errors.

OPRE's Portfolio on Coordinated Services

The Next Steps for Rigorous Research in Two-Generation Approaches (NS2G) project is part of a portfolio of research focused on coordinated services to support children and families. Projects within this research portfolio address the intentional coordination of two or more services. These projects span OPRE's program-specific research portfolios, including child care, Head Start, home visiting, child welfare, and welfare and family self-sufficiency. More information about OPRE's Coordinated Services projects can be found at https://www.acf.hhs.gov/opre/coordinated-services-research-and-evaluation-portfolio.

[1] Excluding Question 1 which is not included in scoring; it is used for priming purposes only.

[2] As of February 2023, the Ascend Network has 485 organizations in all 50 states, the District of Columbia, Puerto Rico, and Ireland: http://ascendaspen.nonprofitsoapbox.com/ascend-network-partners.

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