

Steps in Intervention Research: Designing and Developing Social Programs

Mark W. Fraser and Maeda J. Galinsky

Prepared by Casey Rubenstein
University of North Carolina
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PURPOSE STATEMENT:

The purpose of this presentation is to summarize an article which outlines a five-step model of intervention research

Interventions

- Purposively implemented change strategies
 - Can be simple or complex
- Can be developed at the individual, family, group, organizational, community, and social levels
- Simple interventions can easily become multiplex in the implementation stage
 - Policy and practice strategy interventions can become complex in the implementation stage

Social Work Interventions

- Range from single techniques (motivational interviewing) to multielement programs (assertive community treatment)
- Practice was historically influenced by well-known clinicians and through experience
 - Led to the development of repertoires of techniques
- Authority-based schools of thought (Freudian, Gestalt, Rogerian) organized practice into theory-based camps with competing claims of effectiveness
- Intervention research originated from the debate of the effectiveness of these alternative strategies, advances in research design, and the desire to improve practice

Intervention Research

- The systematic study of purposive change strategies
 - Characterized by the design and development of interventions
 - Design: determining the extent to which an intervention is defined by explicit practice principles, goals, and activities
 - *Dynamic interventions*: less distinct and more dialogical in nature
 - *Prescriptive interventions*: based on manuals that specify practice activities and guide the exchange between intervention agents and participants

Intervention Manuals

- Initially developed to illuminate the change strategies used by practitioners who subscribed to particular schools of thought
- Joseph Wolpe (1969) is credited for designing some of the first manuals in his work with anxiety disorders
- Today intervention manuals are a core feature of cognitive behavioral interventions

Intervention Research

- Distinguished by its emphasis on design and development
 - Specifying social and health problems to inform practice activities
- Designing an intervention involves delineating a *problem theory*
 - Potential malleable risk factors are identified
- *Program theory* then matches these risk factors with change strategies
- The internal logic of an intervention can be assessed as the extent to which malleable risk factors are paired with change strategies of sufficient strength to produce positive outcomes

Intervention Research

- Process of designing an intervention is evaluative and creative
- Requires blending existing research and theory with other knowledge to create intervention principles and action strategies
 - Action strategies include providing responsive feedback and support to engaging in relatively structured activities detailed in a manual or protocol
- Creating interventions is generative and requires ability to form learning activities that have a cultural and contextual metric
- Interventions are developed in a series of pilots studies that lead to larger studies of efficacy and effectiveness

Roots of Intervention Research

- Draws upon traditions of program evaluation and also applied sciences
 - More than evaluation: it produced products - interventions – to be evaluated
- Intervention research originated from early evaluations doubting the effectiveness of social services
 - Early difficulties arose with replicating interventions
 - *Black box problem* became apparent due to the lack of specificity in articulating the processes leading to outcomes
- Intervention research grew to have two complementary processes
 - Design of a program
 - Development of a program over time in a series of studies

Roots of Intervention Research

- Rothman and Thomas (1994) were the first to propose an intervention research model in social work
 - They outlined the systematic development of interventions, which included six phases:
 1. Problem analysis and project planning
 2. Information gathering and synthesis
 3. Design of the intervention
 4. Early development and pilot testing
 5. Experimental evaluation and advanced development
 6. Dissemination

Roots of Intervention Research

- Others have contributed to the development of intervention research outside of social work
 - Carroll and Nuro (2002) increased emphasis on the development of treatment manuals
 - Greenwald and Cullen (1985). Flay (1986), and Collins, Murphy, and Stecher (2007) refined the concept of development by calling for serial experimentation of program components in sequenced efficacy trials

Development Programs for Children

- Authors' work to design and develop interventions stemmed from interest in intervention research and from public health programs
- Public health research helped authors identify risk, promotive, and protective factors related to social problems
 - Developed program theories in which malleable risk and protective factors were matched to change strategies (Fraser, 2004; Fraser, Richman, & Falinsky, 1999; Jenson & Fraser, 2006)
- Authors decided to focus research on the design and development of interventions

Development Programs for Children

- Authors have been designing and developing universal and selective prevention programs to address antisocial, aggressive behaviors in childhood since 1994
 - Extends beyond previous intervention research
 - Primarily focused on children's social skills and peer relationships
 - Work ranges from small pilot tests to larger control-group trials (Abell, Fraser, & Galinsky, 2001; Fraser et al., 2005; Nash, Fraser, Galinsky, & Kupper, 2003)

Findings for Making Choices

- Authors determined the provision of an intervention called *Making Choices* reduces aggressive behavior, builds social competence, and improves the cognitive concentration of school children (Fraser et al., 2005; Fraser, Nash, Galinsky., & Darwin, 2000; Smokowski, Fraser, Day, Galinsky, & Bacallao, 2004)
- *Making Choices* is a comparatively simple intervention that can be delivered in schools to promote social development of children
 - Including those with aggressive behavior which may put them at risk for poor developmental outcomes
- Also found that by augmenting *Making Choices* with an in-home family intervention program designed to improve parenting skills of higher risk children increased effect sizes (Fraser, Day, Galinsky, Hodges, & Smokowski, 2004)

Making Choices

- Mostly tested in school settings
- Also tested in child welfare and mental health settings
- Used in private nonprofit organizations such as churches, Boys and Girls Clubs, and YMCAs
 - Funding is received from the Centers of Disease Control and Preventions, the Institute of Education Sciences, the National Institutes of Health, foundations, and state agencies

Lessons Learned About the Design and Development of Interventions

- Authors' work was rooted in child development research
 - Empirically based theories
 - Social information processing theory and coercion theory
- Developmental and etiological research
 - Prior intervention studies
 - These provided few practical clues about the conduct of intervention research

Design Intervention Content to Fit Environmental Contingencies

- Solid interventions ideas can be compromised by poor implementation
- Discretionary authority and organizational support are likely to produce implementation with fidelity
- Interventions must be implemented by certain people in particular settings to reduce failures
 - Present interventions in familiar mediums
 - Collaborate with intended intervention agents during design process
 - Helpful to include the knowledge that is nuanced by a deeper understanding of the organizational and other contingencies affecting practice

Provide Supervision and Training for Intervention Agents

- Supervision for intervention agents should be considered a routine element of research under intent-to-treat
- Use of manuals alone is insufficient to ensure implementation fidelity
- Faithful implementation requires ongoing support and training

Research Design Trumps Statistical Analysis

- *Research design* refers to the structural features of studies
 - Use of control conditions and the timing of follow-up measurement
- Design of a study is usually the most important factor to determine a causal inference regarding the effect of an intervention
- Other designs may approximate randomized experiments in their capacity for making a causal inference (Shadish, Cook, & Campbell, 2002)
 - Important to randomize when feasible
 - Use of a randomized design trumps all other measurement and data analysis issues

Research Design Trumps Statistical Analysis

- Random assignment of participants to experimental and control groups is more effective than statistical methods
- Randomization balances groups on unobserved similarities and permits an unbiased estimate of treatment effects within sampling limits
- Using a randomized group design in which participants are randomly assigned to treatment and control or comparison groups produces the best estimates of an interventions' effects

Refine Interventions Over Time in Sequenced Experimentation

- *Experimentation* used to emphasize the exploratory nature of intervention development and the value of control groups
 - Research design should complement research question
- Authors have used focus groups throughout pilot studies to collect information from participants and intervention agents
- Intervention development occurs over a series of sequenced studies
 - From less-controlled pilot tests to more-controlled efficacy and effectiveness tests
 - Negative findings may cause reconceptualization of design
 - A non-linear process
 - Revision and retesting iteratively of intervention until a benchmark for efficacy is advised

Measure Potential Sources of Selection Bias

- Randomization, post-assignment attrition, compensation rivalry in alternative conditions, and other factors can compromise the balance between experimental and control groups (Shadish, et al., 2002)
 - Anticipating and measuring selection biases can be controlled in statistical analysis (i.e., variables on which intervention and control groups may differ)
 - If sources of biases are unmeasured it is near impossible to fully test for group balance and to make statistical adjustments

Use Multiple Methods of Analysis

- Studies suggest routine covariance control may produce fallacious treatment estimates when the assignment mechanism is correlated with the error term (Berk, 2004)
 - A variety of analyses should be undertaken to test the sensitivity of findings to alternative methods
 - Alternative methods include routine regression models, matching estimators, Heckman models, and propensity score matching or weighting (Guo & Fraser, 2010)
- With newly acquired knowledge from existing research authors revised the intervention research model originally formulated
 - Began to conceptualize, design, and develop activities in five steps rather than the six steps outlined by Rothman and Thomas (1994)

Steps in Intervention Research

- Authors' research models emphasizes use of program theory to design treatment manuals
- Use of successive refinement of intervention content in a sequence of studies with control or comparison groups
- The five-step model clearly links the problem theory and program content
 - Typically linking composed or risk, promotive, and protective factors
- Model articulates this link by requiring the development of a program theory
 - Must specify malleable risk and protective factors and links them in logic models and theories of change to program components
 - Specifies processes in developing treatment manuals

Five-Step Model

- Stages embedded in the development of treatment manuals within the steps in intervention research
 - For a descriptions of these stages, see Fraser et al., 2009
- Although the model may appear linear, it was conceptualized on the authors' experience in iteratively developing programs
 - New data, at any point, may necessitate reconceptualization
 - This corrective loop was encountered on several occasions during development
 - Thus, the model has recursive features that are not evident in the simple stepwise figure

Step 1: Develop Problem and Program Theories

- Define the problem and develop a program theory
 - Examine literature to identify risk, promotive, and protective factors related to the problem (Fraser, 2004)

- Identify malleable mediators
 - Mediators confer conditional risk
 - Core activity in developing a theory-based intervention

- Define key features of the intervention
 - Specify the intervention level, setting, and agent(s)

- Lastly, a practical theory of change and a logic model must be developed

Step 2: Specify Program Structures and Processes

- Develop initial draft and submit for expert review
 - Practice principles and manuals are created
 - Tend to be composed of an overview and session-by-session content explaining session goals, essential content, and elective activities which may be used to reinforce core content (Fraser et al., 2000)
- Specify essential program elements and fidelity criteria
 - Addresses the core risk mechanisms on which the intervention is based
- Test program and measures
 - Assess the outcome and fidelity measures
- Look to expand the content of intervention
 - Training and implementation

Step 3: Refine & Confirm Program Components in Efficacy Tests

- Maintain control and test intervention components
- Estimate effect sizes and test for moderation and mediation
- Develop rules for adaption
 - Based on moderation and mediation tests, community values and needs, and other issues
 - Keystone risk mechanisms vary by race/ethnicity, gender, community values, organizational context, and other factors

Step 4: Test Effectiveness in a Variety of Practice Settings

- Effectiveness tests are experimental studies in which the researchers have substantially less control in implementing interventions
- Effectiveness studies test interventions under scale, in vivo conditions
- Researchers remain in charge of training, data collection, and analysis during intervention effectiveness trials
- Core idea of effectiveness studies is to estimate a treatment effect when a program is implemented
 - Estimate effects on efficacy subsets

Step 5: Disseminate Program Findings and Materials

- Publish findings in academic journals, read by practitioners, consumers, and policy makers
 - Can be difficult to publish treatment manuals, guides, and training materials
 - High costs of publication versus low profits presents barriers
- Publish program materials
- Develop training materials and certification

Cultural and Contextual Adaptation of Interventions

- Refers to the practice of alternating the content of a proven program to improve its relevance to a population
 - Sociodemographic characteristics, risk status, or place
- Sometimes program activities need to be adapted for cultural relevance
 - Children in China rarely play baseball, so they may find activities involving baseball hard to understand
- Addition of content to address culturally or contextually based risk factors may interfere with the uptake of intervention content
 - Example: adding content on acculturation stress for a parenting training program for Latino immigrant parents
- Authors recommend that adaption should be a collective process undertaken at the agency level not by individual practitioners

Conclusion

- The design and development of interventions is a vital aspect of evidence-based practice
- It is a vital aspect of evidence-based practice and social work
- Identified research issues in this article evolved from authors' experience in developing the *Making Choices* program
 - Addresses matching research questions to research designs, sequential testing and revising program materials, and anticipating environmental contingencies affecting implementation
- Process of creating and refining interventions is crucial for social work
 - Test of a profession is its ability to generate knowledge for practice
 - Social work must continue to broaden and strengthen intervention research to make it a higher priority of practice

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