Theories of Behavior Change & Behavior Researcher Surveys: Methods

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HARC is building a standard framework and language – the Precision Paradigm – to promote cross-model, precision home visiting research. The framework focuses on the interventions within home visiting and includes the mediators and moderators of intervention effects. Our foundation is the work of Michie et. al.[1] and we are using input from those with an interest in home visiting to specify details of the Paradigm to make sure it is useful and relevant. One such group, and the focus of this brief, is intervention researchers.

A defining purpose of research is to create generalizable knowledge. Many interventions within home visiting aim to promote or reduce specific behaviors. For these interventions, this means grounding intervention design and research in theories of behavior and behavior change. HARC is developing resources to support the use of relevant, high-quality theories.

This brief details the methods we used to identify theories from the literature and construct two surveys to elicit input from intervention researchers to inform HARC resources: Survey 1 – Theories of Behavior Change Survey (Section I) (view results) and Survey 2 – Theories of Behavior Survey (Section II) (view results).

SECTION I: SURVEY 1 – THEORIES OF BEHAVIOR CHANGE

I.A. Identifying Theories of Behavior Change (Appendix A)

To identify a comprehensive list of theories of behavior change, we drew from three sources:

1. Seminal textbooks on health and parenting theory that specified clear methods and criteria for theory inclusion[2-4]
2. Course curricula from the Bloomberg School of Public Health at the Johns Hopkins University (JHU)
3. Literature search for systematic reviews and additional textbooks focused on behavior change theory

First, the HARC research team generated a list of all the theories described or mentioned in the seminal textbooks on health and parenting theory. We identified a total of 107 theories from these textbooks.

Second, we contacted faculty who teach 12 courses in the JHU Bloomberg School of Public Health or the School of Medicine which focus on behavioral interventions and behavior change. Examples of course titles include *'Entertainment Education for Behavior Change and Development'*, '*Program Planning for Health Behavior Change*', and '*Health Behavior Change at the Individual, Household, and Community Levels'*. We asked them about explicit theories of behavior change that are covered in their course. We received faculty responses and/or course syllabi for nine of the 12 courses. From these materials, we identified a total of 24 theories, seven of which were not previously identified in the first step.

Lastly, to identify additional theories, we conducted two SCOPUS searches for systematic reviews, books, and book chapters related to human behavior change and parenting behavior change theories using the following search terms:

- *behavior change OR behaviour change; human behavior OR human behaviour; intervention; theories*
- *behavior change OR behaviour change; parenting behavior OR parenting behaviour; intervention; theories*

A total of 950 citations were returned from both searches. We identified and removed 701 duplicate citations for a total of 249 unduplicated citations. Two HARC research team members independently reviewed the titles to determine whether to keep the citation for abstract review or drop it from further consideration as a possible source for information on theories of behavior change. Responses were compared and of the 249 citations, the two reviewers reached 81% agreement on the first pass (194 to discard, 8 to keep for abstract review). For the 47 titles where the team members differed, they reviewed the title together and either achieved consensus or defaulted to keep the citation for abstract review. After consensus on the title review, 24 citations were kept for abstract review.

Two HARC research team members independently reviewed the abstracts for these 24 citations and determined whether each should be kept for full review or dropped from further consideration. Responses were compared and of the 24 citations, the two reviewers reached 42% agreement (eight to discard, two to keep for full review). The two citations where the reviewers agreed and the 14 citations where the reviewers differed were kept for full review.

A HARC research team member reviewed each of the 16 citations kept for full review and identified all the behavior change theories described or mentioned. Across all 16 citations, we identified 5 theories not previously identified and added these to our master list of theories.

We identified a total of 119 theories across all the resources reviewed.

Section I.B. Selection of Theories for Survey 1 (Appendix A)

Three members of the HARC research team independently reviewed descriptions of each of the 119 identified theories of behavior change to determine whether the theory should be included in Survey 1. They based decisions on the following criteria:

Inclusion Criteria

- Theories of behavior change, which incorporate mechanisms of action and moderators to explain why, when, and how a behavior does or does not occur, and the important sources of influence to be targeted to alter behavior; and
- Theories relevant for designing individual- and interpersonal-level interventions.

Exclusion Criteria

- Grand theories that *explain* human behavior, personality, or development;
- Theories related to behaviors outside of the context of home visiting, such as pro-environmental behavior and criminal/deviant behavior; and
- Theories relevant for community-level rather than individual- or interpersonal-level interventions.

After completing their independent reviews, the three reviewers met to compare results. They:

- Included theories where all three team members agreed the theory should be kept;
- Excluded theories where all three team members agreed the theory could be excluded; and
- Discussed each theory for which their independent decisions differed. If they reached unanimous agreement to exclude the theory, it was excluded. Otherwise, it was included in the researcher survey.

We included a total of 48 of the 119 theories in Survey 1, the Theories of Behavior Change Survey. (Appendix B)

I.C. Survey 1 Content

The HARC research team developed a survey to assess researcher familiarity with each of the 48 theories, use of each theory in their own work, ratings of theory relevance to home visiting and ratings of theory quality. **(Appendix C)**

Questions on theory familiarity and relevance to home visiting were developed by the HARC research team and were answered on Likert-type scales. Questions regarding researcher use of each theory were developed by the HARC research team and answered on a binary scale.

Questions on theory quality were developed based on criteria identified in the literature as indicative of high quality theories[6-10]. We identified five articles that described defining features, or criteria, for assessing theory quality. Seven criteria were common across three or more of the articles reviewed: generalizability, clarity, coherence, empirical adequacy/evidence base, parsimony, testability, and explanatory. To minimize burden, the HARC research team created questions based on four of these seven criteria (generalizability, clarity/consistency, coherence, and evidence-base). Respondents answered each of these questions on a 4-point Likert scale.

Lastly, the survey asked respondents to list any other theories of behavior change that they felt might be useful to the field.

See **Appendix C** for the survey questions and response options.

I.D. Survey 1 Administration & Response

Survey 1 was administered online using Qualtrics and took about 45 minutes to complete. Survey respondents were recruited from HARC's national consultant pool of 119 researchers. Survey links were emailed in early November 2021 to 100 researchers who agreed to consult on the Precision Paradigm. Respondents were given two weeks to complete the survey.

Of the 100 researchers invited, 85 (85%) completed the survey. Of the 85, 63% had primary or secondary expertise in child development, 56% in maternal functioning, 23% in cardiovascular health, 17% in birth outcomes, and 17% in family economic well-being. Seventy-four percent reported having a great deal of experience designing interventions and/or conducting research on existing interventions. Seventy-two percent had been involved in home visiting research, and 69% of those had been involved in home visiting research for over five years.

SECTION II: SURVEY 2 – THEORIES OF BEHAVIOR

II.A. Identifying Theories of Behavior (Appendix A)

To identify a list of general theories of behavior relevant for home visiting intervention design and research, we drew from three sources:

1. Home Visiting Evidence of Effectiveness (HomVEE) website[5];
2. Write-in responses from Survey 1; and
3. Theories excluded in the consensus review process for Survey 1 because they reflected general, or explanatory theories of behavior rather than theories of behavior change.

The HARC research team identified a total of 76 theories from these three sources. Seventeen theories were identified from descriptions of the theoretical backgrounds of evidence-based models of home visiting on the HomVEE website. Twenty-five theories were listed by researchers in Survey 1 as potentially relevant to home

visiting. The remaining 34 theories were excluded from Survey 1 but were potentially relevant for inclusion in Survey 2.

After removing 7 duplicates, we identified a total of 69 theories across these three sources combined.

II.B. Selection of Theories for Survey 2 (Appendix A)

Three members of the HARC research team independently reviewed descriptions of each of the 69 identified theories of behavior to determine whether the theory should be included in Survey 2. They based decisions on the following criteria:

Inclusion Criteria:

- Grand and explanatory theories that explain human behavior or development; and
- Theories relevant for designing individual- and interpersonal-level interventions.

Exclusion Criteria:

- Grand and explanatory theories that explain personality traits or other non-modifiable individual
- Theories related to behaviors outside of the context of home visiting, such as pro-environmental behavior and criminal/deviant behavior;
- Theories relevant for community-level rather than individual- or interpersonal-level interventions; and
- Research frameworks and general/therapeutic approaches (not singular theories).

After completing their independent reviews, the three reviewers met to compare results. They:

- Included theories where all three team members agreed the theory should be kept;
- Excluded theories where all three team members agreed the theory could be excluded; and
- Discussed each theory for which their independent decisions differed. If they reached unanimous agreement to exclude the theory, it was excluded. Otherwise, it was included in the researcher survey.

We included a total of 34 of the 69 theories in Survey 2, the Theories of Behavior Survey. (Appendix B)

II.C. Survey 2 Content

The HARC research team developed a survey to assess researcher familiarity with each of the 34 theories, use of each theory in their own work, ratings of theory relevance to home visiting and ratings of theory quality. **(Appendix C)**

Questions on theory familiarity and relevance to home visiting were developed by the HARC research team and were answered on Likert-type scales. Questions regarding researcher use of each theory were developed by the HARC research team and answered on a binary scale.

Questions on theory quality were developed based on criteria identified in the literature as indicative of high quality theories[6-10]. We identified five articles that described defining features, or criteria, for assessing theory quality. Seven criteria were common across three or more of the articles reviewed: generalizability, clarity, coherence, empirical adequacy/evidence base, parsimony, testability, and explanatory. To minimize burden, the HARC research team created questions based on four of these seven criteria (generalizability, clarity/consistency, coherence, and evidence-base). Respondents answered each of these questions on a 4-point Likert scale.

Lastly, the survey asked respondents to identify any other theories of behavior that they felt might be useful to the field.

See **Appendix C** for the survey questions and response options.

II.D. Survey 2 Administration & Response

Survey 2 was administered online using Qualtrics and took about 45 minutes to complete. Survey respondents were recruited from HARC's national consultant pool of 119 researchers. Survey links were emailed in March 2022 to 112 researchers who agreed to consult on the Precision Paradigm. Respondents were given two weeks to complete the survey.

Of the 112 researchers invited, 55 (49%) completed the survey. Of the 55, 67% had primary or secondary expertise in child development, 56% in maternal functioning, 22% in cardiovascular health, 20% in birth outcomes, and 11% in family economic well-being. Seventy-six percent reported having a great deal of experience designing interventions and/or conducting research on existing interventions. Sixty-seven percent had been involved in home visiting research, and 67% of those had been involved in home visiting research for over five years.

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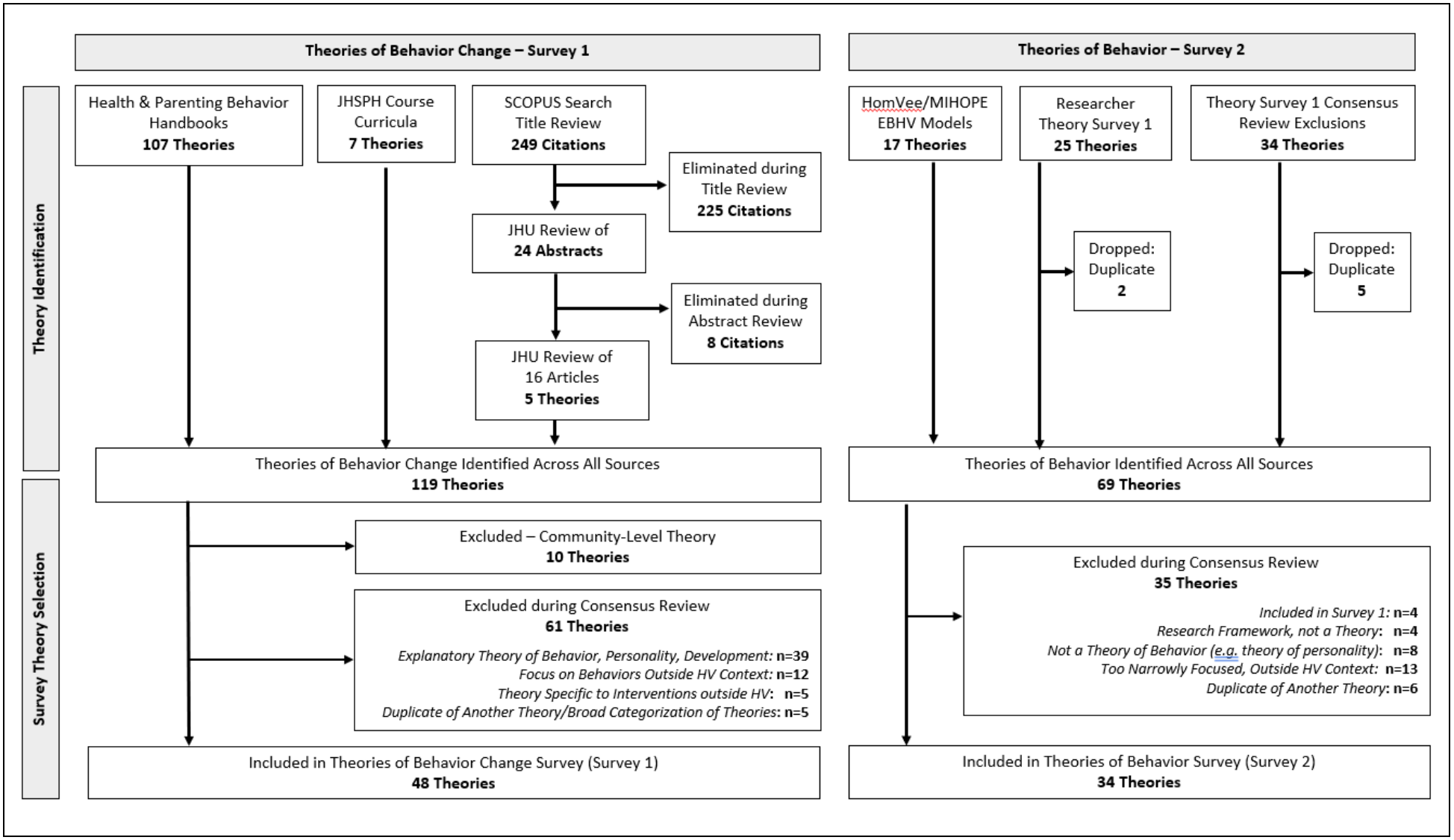
APPENDIX A: IDENTIFICATION AND SELECTION OF THEORIES FOR SURVEY 1 AND SURVEY 2



APPENDIX B: THEORIES INCLUDED IN SURVEY 1 AND SURVEY 2

Survey 1 – Theories of Behavior Change

- AIDS Risk Reduction Model
- Attribution Theory
- Behavioral-Ecological Model of Adolescent Aids Prevention
- Breastfeeding Self-Efficacy Theory
- Capability, Opportunity, Motivation-Behavior System
- Change Theory
- Cognitive Behavioral Theory
- Context, Executive, and Operational Systems Theory
- Control Theory
- Ecological Model for Preventing Type 2 Diabetes in Minority Youth
- Expectancy-Value Theory
- Feedback Intervention Theory
- Focus Theory of Normative Conduct
- Goal Directed Theory
- Goal Setting Theory
- Health Action Process Approach
- Health Behavior Goal Model
- Health Behavior Internalization Model
- Health Belief Model
- Health Promotion Model
- I-Change Model
- Integrated Behavior Model
- Integrated Theoretical Model for Alcohol & Other Drug Abuse Prevention
- Integrated Theory of Drinking Behavior
- Integrated Theory of Health Behavior Change
- Integrative Model of Behavioral Prediction
- Message Framing Theory
- Operant Learning Theory
- Plans, Responses, Impulses, Motives, and Evaluation Theory
- Precaution Adoption Process Model
- Pressure System Model
- Regulatory Fit Theory
- Self-Determination Theory
- Self-Efficacy Theory
- Self-Management Model
- Self-Regulation Theory
- Social Cognitive Theory
- Social Ecological Model of Behavior Change
- Social Ecological Model of Walking
- Social Learning Theory
- Systems Model of Health Behavior Change
- Theory of Interpersonal Behavior
- Theory of Planned Behavior
- Theory of Reasoned Action
- Theory of Triadic Influence
- Transactional Model of Stress/Coping
- Transcontextual Model of Motivation
- Transtheoretical Model/Stages of Change

Survey 2 – Theories of Behavior

- Adult Learning Theory
- Attachment Theory
- Behavioral Economics
- Capability Approach
- Classical Conditioning
- Coercion Theory
- Cognitive Dissonance Theory
- Ecological Model of Health Behavior
- Ecological Systems Theory
- Evolved Developmental Niche
- Family Systems Theory
- Habit Formation Theory
- Lifecourse Approach
- Locus of Control Theory
- Maslow's Hierarchy of Needs
- Parent Investment Model
- Problem Solving Model
- Prospect Theory
- Protection Motivation Theory
- Reflective Impulsive Model
- Regulation Theory
- Relational Regulation Theory
- Risk as Feelings Theory
- Social Ecological Theory of Resilience
- Social Ecology Model for Health Prom
- Social Ecology Theory
- Social Network Theory
- Social Norms Theory
- Stress Theory
- Temporal Self-Regulation Theory
- Terror Management Theory
- Theory of Mind

APPENDIX C: SURVEY QUESTIONS (SURVEY 1 AND SURVEY 2)

Familiarity (Asked for each theory included in the survey)

1. How familiar are you with the theory?
   Response options: Not at all, Familiar with its name only, Somewhat familiar with its details, Very familiar with its details
2. Have you used it yourself in intervention design or research in the context of home visiting?
   Response options: No, Yes
3. Have you used it yourself in intervention design or research in any context outside of home visiting?
   Response options: No, Yes
4. Are you aware of any research, other than your own, that has used this theory for intervention design or research in the context of home visiting?
   Response options: No, Yes
5. Are you aware of any research, other than your own, that has used this theory for intervention design or research in any context outside of home visiting?
   Response options: No, Yes

Quality (Asked for each theory where responded answered *Somewhat* or *Very Familiar* to the familiarity question #1 above)

Below is a list of statements regarding the overall quality of this theory. Please rate your level of agreement with each. We encourage you to rate each to the **best of your understanding** of the theory. Indicate 'Not Sure' if you feel that you are unable to rate the statement fairly based on your knowledge of the theory.

1. The theory can be applied to a broad range of outcomes, behaviors, settings, and populations. **(Generalizability)**
   Response options: *Disagree, Somewhat disagree, Somewhat agree, Agree, Not Sure*
2. The theory's constructs are clear, well-defined, and distinct. **(Clarity/Consistency)**
   Response options: *Disagree, Somewhat disagree, Somewhat agree, Agree, Not Sure*
3. The theory's assertions about associations among constructs make sense, are logical, and do not contradict each other. **(Coherence)**
   Response options: *Disagree, Somewhat disagree, Somewhat agree, Agree, Not Sure*
4. The theory's assertions about associations among constructs are supported by robust empirical evidence. **(Evidence Base)**
   Response options: *Disagree, Somewhat disagree, Somewhat agree, Agree, Not Sure*

Relevance (Asked for each theory where responded answered *Somewhat* or *Very Familiar* to the familiarity question #1 above)

Below are statements regarding the relevance of this theory to home visiting. Please rate your level of agreement with each. Indicate 'Not Sure' if you feel that you are unable to rate the statement fairly based on your knowledge of the theory or of home visiting.

1. The theory is useful for developing or testing interventions that can be used in the context of home visiting.
   Response options: *Disagree, Somewhat disagree, Somewhat agree, Agree, Not Sure*
2. The theory is useful for understanding or testing what works best, for which families, in which contexts, why and how.
   Response options: *Disagree, Somewhat disagree, Somewhat agree, Agree, Not Sure*

Other Theories

Are there additional Theories of Behavior Change that you feel are relevant to the Precision Paradigm? If so, please list the name of the theory below. If possible, please include some basic information about the theory (e.g., theory description, theory developers, and theory uses). The information that you provide will help to guide our selection of the Theories of Behavior Change that are best suited for the Precision Paradigm. [OPEN ENDED RESPONSE]