

**Inside the Black Box of
Interactions Between
Programs and Participants:
Re-conceptualizing
Subgroups for Fatherhood
Program Evaluation**

Final Report

November 19, 2012

Sharon McGroder
Pia Caronongan
Andrea Mraz Esposito
Subuhi Asheer
Ji-Hyeun Kwon-Min



MATHEMATICA
Policy Research

Contract Number:
HHSP23320095642WC/HHSP23337027T

Mathematica Reference Number:
06972.460

Submitted to:
DHHS/PSC/SAS/DAM
Parklawn Building, Room 5C-18
5600 Fishers Lane
Rockville, MD 20852
Project Officer: Kimberly Clum

Submitted by:
Mathematica Policy Research
1100 First Street NE, 12th Floor
Washington, DC 20002-4221
Telephone: (202) 484-9220
Facsimile: (202) 863-1763
Project Director: Sharon McGroder

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Disclaimer: This paper was produced by Mathematica in the performance of task order number HHSP23320095642WC for the Office of the Assistant Secretary for Planning and Evaluation. Any opinion, findings, and conclusions, or recommendations expressed in this report, are those of the authors and do not necessarily reflect the views of U.S. Department of Health and Human Services-Office of the Assistant Secretary for Planning and Evaluation.

ACKNOWLEDGMENTS

This report would not have been possible without the insights and assistance of many individuals. We would like to thank our Federal Project Officer, Kimberly Clum, in the Office of the Assistant Secretary for Planning and Evaluation (ASPE) at the U.S. Department of Health and Human Services (DHHS) for her thoughtful guidance and enthusiasm throughout this project.

We also appreciate the helpful feedback from a number of staff at Mathematica, including Diane Paulsell, Robin Dion, Alan Hershey, Pamela Holcomb, Pamela Winston, and Rob Wood. Thanks also to Jan Watterworth and library staff who assisted with the literature review; and Alfreda Holmes for her assistance in formatting and producing this report and the previous deliverables incorporated into this report.

Many of the insights regarding implications for fatherhood programs reflect numerous conversations and meetings on fatherhood, including expert panel meetings for the Parents and Children Together (PACT) Evaluation sponsored by the Office of Planning, Research, and Evaluation (OPRE) at the Administration for Children and Families (ACF) at DHHS and organized by Mathematica (**Sheena McConnell** and **Robin Dion**, Co-Project Directors); the Fathers & Fathering in Contemporary Contexts conference sponsored by ASPE-DHHS and organized by The National Center for Family and Marriage Research (**Wendy Manning** and **Susan Brown**, Co-Directors); and conversations with “Pathways to Responsible Fatherhood” grantees, including **Halbert Sullivan** from the Fathers’ Support Center-St. Louis.

Finally, we are grateful for the contributions of the federal and non-federal experts who participated in the roundtable discussion of the implications of study findings for future research on fathers and fatherhood programs. Federal experts included **Vicki Turetsky** (Commissioner, Office of Child Support Enforcement); **Earl Johnson** (Director, Office of Family Assistance, OFA); **Robin McDonald** (Division Director, State and Territory TANF Management, OFA); **Frank Fuentes** (Senior Advisor to the Assistant Secretary, ACF); **John Tambornino** (Division Director, Economic Support for Families, ASPE); **Nancye Campbell** (Senior Research Analyst, OPRE); **Linda Mellgren** (Senior Social Science Analyst, ASPE); **Seth Chamberlain** (Research Analyst, OPRE); and **Kimberly Clum** (Social Science Analyst, ASPE). Non-federal experts included **Héctor Cordero-Gúzman** (Baruch College, City University of New York); **Robin Dion** (Mathematica Policy Research); **Derek Griffith** (Vanderbilt University); **Joe Jones** (Center for Urban Families); **Charles Michalopoulos** (MDRC); **Ron Mincy** (Columbia University); **David Pate** (University of Wisconsin–Milwaukee); **Elaine Sorensen** (Urban Institute); **Matthew Stagner** (Chapin Hall, The University of Chicago); and **Brett Theodos** (Urban Institute).

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I. INTRODUCTION

Fathers are critical to their children's well-being and development. Unfortunately, some fathers are not able to provide the consistent care and financial support their children need. Low-income fathers, in particular, are less likely to live with and have contact with their children (Nelson 2004) and may have greater difficulty providing for their children emotionally or financially.

In reauthorizing the TANF program, the Deficit Reduction Act of 2005 (DRA) created the Healthy Marriage and Responsible Fatherhood (HMRF) grant program to promote healthy marriages and foster responsible fatherhood among low-income individuals and couples. DRA authorized \$150 million in each of fiscal years 2006 through 2010 for these programs, up to \$50 million of which could be used for responsible fatherhood programs. Five-year grants were awarded in 2006 to 94 responsible fatherhood (RF) and 122 healthy marriage (HM) grantees. The Claims Resolution Act of 2010 (CRA) re-authorized this grant program, increasing the focus on economic stability by allowing healthy marriage programs to offer job and career advancement services and broadening its reach by allowing grantees to provide marriage and relationship education to any low-income individual (not just unmarried pregnant women and expectant fathers). CRA also strengthened the emphasis on fatherhood, requiring that funding be equally split between healthy marriage and responsible fatherhood programs. Three-year grants were awarded in 2011 to 55 RF and 60 HM grantees.

The U.S. Department of Health and Human Services (DHHS) is interested in learning more about the effectiveness of such programs, including those aimed at promoting responsible fatherhood and economic self-sufficiency among low-income and noncustodial fathers. In particular, there is growing interest in ascertaining “what works for whom”—that is, in examining program impacts among meaningful subgroups of fathers in order to foster better program design and provide a basis for targeting program services. Toward that end, DHHS's Office of the Assistant Secretary for Planning and Evaluation (ASPE) seeks to learn more about evidence-based strategies for defining subgroups of low-income men to inform future evaluations of fatherhood programs, thereby maximizing the information that can be gleaned from these evaluations.

In September 2011, ASPE engaged Mathematica to “look inside the black box” and identify psychosocial predictors of behavior change that may be used to create baseline subgroups for use in future evaluations of fatherhood programs. Project tasks include:

- A scan of innovative approaches that have been used in other fields to examine subgroups.
- A review of theories of behavior change and of fathering behavior, and a review of the empirical literature on low-income fathers to examine whether and how these theoretically relevant predictors of behavior and behavior change have been studied and found to be predictive of fatherhood-related outcomes.
- Synthesizing findings in a written report.
- Convening a roundtable of federal and nonfederal experts to review findings, identify gaps in our knowledge, and discuss effective strategies for incorporating project findings into evaluations of fatherhood programs and initiatives.

We summarize and synthesize study findings in this report. After this brief introduction, in Chapter II, we discuss the utility of studying subgroups in program evaluation research, present an overview of typical approaches to creating subgroups, and propose alternative hypotheses regarding subgroups of individuals for whom programs may be more or less effective. In Chapter III, we provide an overview of study methods. In Chapter IV, we present findings from our scan of subgrouping approaches, providing details on the key concepts and innovative approaches for defining subgroups in other fields of study. In Chapter V, we present findings regarding the theoretical psychosocial determinants of behavior change and integrate these concepts into a coherent framework relevant to the study of fathers. In Chapter VI, we use this framework to present findings from our review of the literature examining these psychosocial factors in samples of low-income fathers. In Chapter VII, we summarize findings from Chapters V and VI. In Chapter VIII, we discuss how these concepts and approaches to subgrouping might be applied to fatherhood program evaluations. And finally, in Chapter IX, we present our conclusions.

II. WHY STUDY SUBGROUPS?

This section provides background on why subgroups are important to study in program evaluation. In Section A, we present a rationale for studying subgroups and clarify what is being tested in evaluations of impacts that use experimental methods. In Section B, we provide an overview of key approaches to studying subgroups and present some general hypotheses regarding whether one might expect positive, negative, or no impacts in low-, medium-, and high-risk subgroups.

A. Subgroups in Program Evaluation Research

The most rigorous test of a program’s impacts is an experimental evaluation in which enrollees are randomly assigned either to a program group or to a control group, and outcomes are compared at one or more points post-random assignment. Randomization yields groups expected to be identical, on average, in every way except exposure to the program. Therefore, any differences in outcomes between the treatment and control group post-random assignment can be attributed to the program as a “program impact.”

Although such rigorous tests of a program’s average impact in a given sample are enormously informative, average impacts tell only part of the story. A fuller understanding of the impacts of social programs requires a thorough understanding of impacts in meaningful subgroups. The goal of subgroup analyses in program evaluation research is to identify whether a program is equally or differentially effective for various subgroups of participants. For example, even if no impacts are found in the full sample, there may be impacts in some subgroups but not others (masked subgroup impacts), or positive impacts in one subgroup and negative impacts in another (offsetting subgroup impacts). Even when impacts are found in the full sample, they may not be equally strong in all subgroups (non-uniform subgroup impacts), or they may be driven by impacts in a single subgroup, with no impacts in the complementary subgroup (isolated subgroup impacts). Addressing this more nuanced impact question can help inform the design and more cost-effective targeting of program services.

When subgroups of individuals are provided services that meet their needs, and when these services would not otherwise be accessible to them, it is reasonable to expect positive program impacts in these subgroups. It is important to be clear, however, that *outcomes* are not the same thing as *impacts*. Outcomes reflect the status or well-being of sample members, whereas impacts reflect the effect of an intervention. Oftentimes, changes in outcomes pre- and post-intervention are interpreted as impacts of that intervention. However, outcomes can naturally change over time, so it is important to understand *what would have happened in the absence of the intervention*. Failure to distinguish outcomes from impacts can lead to faulty conclusions regarding a program’s effectiveness.

Likewise, examining whether *experimental impacts* differ in subgroups is not the same as examining whether *outcomes* differ in subgroups. Examining outcomes entails comparing levels on outcomes in, say, low- versus high-risk subgroups; we would expect that low-risk individuals fare better than high-risk individuals. For example, the employment rate may be 80 percent for low-risk fathers but only 50 percent for high-risk fathers—a 30 percentage point difference in outcomes by risk status. However, in the context of an experimental evaluation, examining subgroup impacts entails comparing outcomes for program and control group members *within* each subgroup. For example, among low-risk fathers, those in the program group might have an employment rate of 83 percent compared to the 80 percent employment rate in the control group—an impact of 3 percentage points. And among high-risk fathers, those in the program group may have an

employment rate of 60 percent compared to the 50 percent employment rate in the control group—an impact of 10 percentage points. Thus, in this example, low-risk fathers do better than high-risk fathers on employment outcomes, but the program had a larger impact for high-risk fathers (assuming this difference is statistically significant). The question addressed by subgroup impact analyses is whether a program improves outcomes for a subgroup *compared to what subgroup members could do on their own*. One can also examine whether a program is *equally or differentially effective* across complementary subgroups.

B. Approaches to Characterizing Subgroups

Grouping and classifying entities is a hallmark of scientific inquiry. The goal of any subgrouping method is to divide a single population into meaningful subpopulations, each consisting of members who are as similar as possible to each other along one or more dimensions and who are as different as possible from all other subpopulations. In statistical terms, subgrouping methods seek to “minimize within-group variance while maximizing between-groups variance” (Bailey 1994). Therefore, an effective subgrouping strategy is one that produces subgroups that differ on the outcome of interest or, in the context of program evaluation, one that produces subgroups in which different levels of program impacts may be expected.

Defining subgroups for use in impact evaluations using an experimental design involves selecting one or more variables along which groups will be subdivided, and assigning individuals to a subgroup based on baseline (pre-random assignment) scores on these variables. For example, if impacts are hypothesized to differ according to whether or not an individual has a high school diploma (or its equivalent), then educational attainment must be collected at baseline and dichotomously coded as “diploma/GED” and “no diploma/GED”—individuals are then assigned to either the “diploma/GED” or “no diploma/GED” subgroup. The choice of variables and decisions regarding how to assign individuals to subgroups based on their scores on these variables will have major implications for the validity and predictive utility of the resulting subgroups.

In program-evaluation research, demographic factors reflecting qualitatively different statuses (such as custodial/non-custodial fathers) or characteristics (such as whites/Hispanics/African-Americans) have traditionally been used to create subgroups. Increasingly, however, variables reflecting an individual’s risk level and/or service needs are being used to create low-risk and high-risk subgroups. The underlying assumption is that those with certain characteristics or with greater risks and needs may require more intensive services, or a wider array of services, or a certain package of services—and that a program tailored to particular characteristics and needs will be more effective. But which characteristics, needs, and risks are likely important for distinguishing subgroups who may respond differently to intervention? Is it useful to define low risk versus high risk on one or more dimensions? Does it also make sense to think about moderate risk? How can conceptually-relevant characteristics, risks, and service needs be adequately captured with valid and reliable measures? When defining valid and reliable subgroups for impact analyses, a critical first step is making sure that individuals are being grouped together according to the correct characteristics.

Once key constructs have been identified and measured, researchers need to decide how they will assign individuals to subgroups based on these characteristics.

1. The **single-factor approach** uses a single variable to divide individuals into mutually exclusive subgroups. Subgroups may reflect degree of risk (such as high school graduates and non-graduates) or may simply be qualitatively different (such as whites, Hispanics, and African-Americans).

2. The **additive-risk approach** sums across multiple variables then divides individuals into mutually exclusive subgroups according to the number or severity of cumulative risks. For example, risks across multiple domain—such as education, employment, and family relationships—may be summed, and impacts examined for those with few risks and those with many risks (however operationalized). This approach relies on variables conceptualized specifically as risk factors.
3. The **interactive approach** also considers multiple variables, but it focuses on the co-occurrence of certain factors, and these factors may or may not reflect risks. Individuals sharing similar profiles on these variables are then assigned to the same subgroup.

Below we describe these approaches in greater detail, discussing the implicit assumption underlying each approach and the mechanics involved in creating subgroups for each approach, providing additional examples. We also pose some general hypotheses regarding program impacts that may be expected among low-, moderate-, and high-risk subgroups defined using either the single- or additive-risk approach. (Because hypotheses regarding program impacts in subgroups defined using the interactive approach are specific to the variables used, no generic hypotheses are presented.)

1. Single-Factor Approach

Researchers often use single categorical variables to create subgroups. For example, it may be of interest to learn whether a fatherhood program is effective for both custodial and non-custodial fathers. Custodial status would be the subgrouping variable, and subgroup impact analyses would examine whether custodial fathers invited to participate in the program group fare better than custodial fathers who were not offered the program, and whether non-custodial fathers invited to participate in the program group fare better than non-custodial fathers who were not offered the program.

Researchers have also defined subgroups using continuous variables that naturally lend themselves to meaningful categorization. For example, years of schooling is often categorized into high school graduates versus non-graduates because the distinction predicts important outcomes, such as employment and earnings, and may therefore serve to differentiate who may benefit (or benefit most) from program intervention. Even for some non-demographic characteristics, empirically meaningful cut-offs may be available. For example, scores on a clinically validated checklist of depressive symptoms (Center for Epidemiological Studies-Depression Scale; Radloff 1977) is often used to categorize individuals at low, moderate, or high risk for clinical depression (Devins and Orme 1985). For continuous variables in which theoretically or empirically meaningful cut-offs are not immediately obvious, researchers either select what they view as cutoffs with face validity (for example, those who agree or strongly agree with a statement) or use data-driven considerations (such as median splits, or upper and lower quartiles) to create subgroups.

2. Additive-Risk Approach

Researchers using multiple variables to define subgroups have the added task of deciding how to combine these variables to yield meaningful subgroups. The implicit assumption underlying the additive-risk approach is one of cumulative risk—that is, those with a greater number and/or severity of risks are at greater overall risk for poorer outcomes than those with fewer and/or less severe risks.

The additive-risk approach and the single-factor approach to examining a variable conceptualized as a risk factor involve assigning individuals to low-, high-, and—if a trichotomy of risk is considered—moderate-risk subgroups. For example, researchers may count up the number of barriers to employment faced by low-income parents (for example, limited education and work history, physical or mental health problems, and logistical barriers, such as lack of child care and transportation), then assign individuals to either a “many-barriers” or a “few-barriers” subgroup (or even a “no-barriers” subgroup). Program impacts are then examined within each complementary subgroup—for example, “Is the program effective among those with many barriers to employment and for those with few barriers to employment?” Differential impacts can also be examined—for example, “Is the program more effective among those with many or few barriers to employment?” Program evaluators typically examine one or more of the following hypotheses regarding the nature of impacts found in low-, moderate-, and high-risk subgroups.

a. Low risk

- Hypothesis 1. *Creaming*. Creaming refers to skimming the best clients off the top in an effort to produce better outcomes. However, it does not necessarily follow that the best clients will benefit most from intervention (for the reasons described in Section A above). Despite a relatively low need for services, it is possible that those with fewer and/or less severe risks may still benefit from program services and may therefore fare better than those in the low-risk control group. In this case, there may, in fact, be positive impacts among a low-risk subgroup.
- Hypothesis 2. *Irrelevant*. On the other hand, those with fewer or less severe risks may not need the program and, if they do participate, the low-risk program group may do no better than a low-risk control group. Thus, there may be few, weak, or no impacts among a low-risk subgroup.
- Hypothesis 3. *Counterproductive*. Those with fewer or less severe risks may do better on their own, or the program may have unintended negative impacts. In either case, a low-risk control group might actually do better than a low-risk program group, resulting in negative impacts among a low-risk subgroup.

b. High risk

- Hypothesis 1. *Compensatory*. This refers to the assumption that program services help compensate for client risks. High-risk individuals who need and are offered program services may do better than what a high-risk control group could do on its own. Thus, the most or strongest program impacts may be among high-risk subgroups.
- Hypothesis 2. *Poor program match*. If the program does not meet the needs of high-risk individuals, then a high-risk program group may do no better than what a high-risk control group could manage to do on its own. Thus, no impacts may be expected.
- Hypothesis 3. *Overwhelmed*. If risks are so numerous or severe that high-risk individuals cannot participate fully in program services designed to meet their needs, then a high-risk program group may do no better than what a high-risk control group could manage to do on its own. Thus, no impacts may be expected.
- Hypothesis 4. *Exacerbate risks*. If the program inadvertently exacerbates existing problems and, as a result, a high-risk program group actually does worse than what a high-risk

control group would do on its own, then the program may have negative impacts among high-risk subgroups.

c. Moderate risk

- Hypothesis 1. *Goldilocks hypothesis*. This refers to program benefits for those with just the right amount of risk—not so much that individuals cannot participate or that program services cannot meet their many needs, but not so few that services are irrelevant. It may be that those with a moderate number or severity of risks have the most to gain from program participation. With the benefit of program services, a moderate-risk program group may do better than what a moderate-risk control group could do on its own. Thus, we might expect the most and/or the strongest program impacts among a moderate-risk subgroup.
- Hypothesis 2. *Poor program match*. As with high-risk individuals, if the program does not meet the needs of moderate-risk individuals, then such a program group may do no better than what a moderate-risk control group could do on its own. Thus, no impacts may be expected among moderate-risk individuals.
- Hypothesis 3. *Exacerbate risks*. As with high-risk individuals, a program may inadvertently exacerbate whatever problems may exist among moderate-risk individuals. If so, then such a program group might do worse than what a moderate-risk control group would do on its own, resulting in negative impacts among moderate-risk subgroups.

3. Interactive Approach

The interactive approach does not seek to create low-, medium-, or high-risk subgroups a priori but, rather, it seeks to identify subgroups of individuals who share certain characteristics hypothesized to shape if and how they benefit from a program. For example, it may be that only those individuals who both need and want the program may benefit. Because the interactive approach examines the constellation of a number of factors, researchers can simultaneously consider not only risk factors or service needs, but also protective factors—individual or family strengths and supports—that may buffer the negative effect of the “deficits” reflected in risk factors and service needs. The interactive approach posits that the meaning of any single factor depends upon the presence and constellation of other factors. For example, in developing a typology of parenting in a sample of African American single mothers receiving welfare, McGroder (2000) employed cluster analysis and found four distinct patterns of parenting distinguished by mothers’ levels of cognitive stimulation, nurturance, and aggravation in the parenting role—including a pattern characterized by both high aggravation and high nurturance, a combination not typically thought to co-occur, but whose unique combination predicted differential outcomes for children.

Researchers adopting an interactive approach may have an idea of which variables are important to consider, but they may or may not have a priori hypotheses about which combination of variables might matter or matter most. These researchers may adopt a more data-driven approach, selecting variables hypothesized to matter (as above) but then allowing a clustering algorithm to identify naturally occurring subgroups of individuals who share similar profiles of scores across clustering variables but whose profiles differ from those of individuals in the other subgroups. For example, McGroder and colleagues (2003) found that employment outcomes among single, welfare-receiving mothers were as problematic in the subgroup characterized by health problems but no other barriers as in the subgroup characterized by multiple barriers to employment, including depressive symptoms and limited education, literacy, and employment experience.

Data-driven approaches to defining subgroups require identifying baseline characteristics hypothesized to influence the likelihood that fathers benefit from program services, then subjecting these variables to a clustering algorithm that combines individuals who are similar along each of these dimensions. This approach is especially fruitful when there is little or no theory or empirical evidence to suggest exactly how these variables should be categorized or combined into subgroups.

4. Summary

Variables selected for creating subgroups in program evaluation research should be expected to differentiate who will benefit, or benefit most, from intervention. Single variables can be used to define subgroups, but a more differentiated view of individuals can be obtained if multiple variables are used. In addition, while demographic variables can prove fruitful in identifying subgroups of individuals who may especially benefit from intervention, there likely remains important differences among demographically similar individuals—differences in psychosocial characteristics (such as motivation and readiness to change) and life circumstances (such as access to social support)—that may affect the likelihood they benefit from intervention. Additive-risk approaches produce subgroups that differ in the quantity of risk, so these approaches are warranted if the number or severity of risks is hypothesized to shape program impacts. Under various scenarios, program impacts may be positive, negative, or neutral in each risk subgroup. Interactive approaches produce qualitatively different subgroups. Interactive approaches are warranted if a particular combination of risks (needs) or risk and protective factors are expected to matter in shaping if, how, and how much an individual benefits from a program, compared to what his or her similarly situated counterparts would do on their own. As with single-factor and additive-risk approaches, impacts can also be positive, negative, or neutral in subgroups derived using interactive approaches. In Section VIII, we discuss how these approaches may be applied to examining subgroup impacts of fatherhood programs.

III. OVERVIEW OF STUDY METHODS

In this section, we describe our methods for (1) conducting the environmental scan of innovative approaches to creating subgroups and (2) reviewing theories of behavior change and the empirical literature on predictors of fatherhood-related outcomes among low-income fathers.

A. Environmental Scan of Innovative Approaches to Creating Subgroups

The environmental scan consisted of three types of searches: (1) audience segmentation methods used in public health,¹ (2) service-user typology methods used to study homeless and public housing populations, and (3) subgrouping methods used in evaluations of fatherhood programs. We deemed eligible and therefore reviewed 14 studies (of 63 found) on audience segmentation, 8 service-user typology studies (of 95 found), and the 12 high quality impact studies identified by a recent review of evidence-based family strengthening programs (Avellar et al. 2011; Avellar et al. 2012). (For greater detail on our approach to searching, screening, selecting, and reviewing research, see Appendix A.) The project team developed a standard study review template designed to capture key data from each study. The template was piloted and refined according to feedback from all team members before its use for the reviews. For each study reviewed in the scan, in addition to any identifying information, we documented the following:

- Conceptual approach to defining subgroups
- How subgroups were created
- Specific constructs and variables used to create subgroups

In addition, in preparing for our upcoming review of the literature on psychosocial determinants of behavior change (in general, and specifically relating to outcomes targeted by fatherhood programs), we identified psychosocial variables that may be used in creating subgroups potentially relevant to fathers and fatherhood programs.

B. Literature Review

The literature review proceeded in two stages. The first stage entailed identifying psychosocial factors at the individual, interpersonal, and contextual levels that theories suggest are predictive of behavior change in general. The second stage involved searching the fatherhood literature for research that examined these psychosocial factors as predictors of key fatherhood outcomes.

In Stage 1, we consulted a variety of sources to identify psychosocial factors. For key constructs articulated by health behavior change theories, we relied on a recent review by Glanz and colleagues (2008), which identified the most-often-cited health behavior change theories in the last decade. We also reviewed selected articles describing the key tenets of behavioral economics (for example, Bertrand et al. 2004; Jabbar 2011) and included these concepts in our development of search terms. To get a sense of both the broad domains and specific constructs that we would need to consider in the review of the fatherhood literature, we identified major psychological and developmental theories on determinants of fathering, and we consulted review articles examining predictors of

¹ A key principle in social marketing, audience segmentation refers to the division of a target audience into homogeneous subgroups according to an individual's constellation of knowledge, beliefs, social norms, and behaviors pertaining to the outcome or behavior targeted for change (Slater 1996).

fatherhood-related outcomes. (We describe these theories in Appendix B.) Finally, we revisited findings from the environmental scan of subgroup approaches to make sure we captured psychosocial factors used in audience segmentation research. We then integrated all these concepts pertaining to psychosocial determinants of behavior change and/or predictors of fathering outcomes into a unified framework, which we used to develop search terms and search the fatherhood literature in Stage 2.

In Stage 2, we developed search terms pertaining to the theoretically relevant psychosocial predictors of behavior change identified in Stage 1, as well as search terms pertaining to the following outcomes targeted by fatherhood programs: (1) parenting and co-parenting, (2) marital/couple relationship, (3) employment and economic stability, (4) child support, and (5) father well-being. We then searched academic databases in the behavioral sciences to identify research examining any of these psychosocial factors and one or more of these fatherhood outcomes. After applying exclusion criteria and screening for relevance, we ended up with 64 studies eligible for inclusion in this review. (For greater detail on our approach to searching, screening, selecting, and reviewing research, and for our list of search terms used, see Appendix C.)

IV. KEY CONCEPTS AND INNOVATIVE METHODS FOR DEFINING SUBGROUPS

Below we present our findings regarding the kinds of variables used to create subgroups in service-user typology research and research on audience segmentation, providing illustrative examples of how these variables have been used to create subgroups in their respective fields.

A. Service- User Typologies

Practitioners and social scientists alike realize that not all members of a target population—though they may share some characteristics (for example, low-income unemployed fathers)—have the same service needs. The underlying premise of service-user typologies is that groups of individuals have different constellations of service needs that require a different package and/or intensity of services.

In identifying subgroups, service-user typology research examines variables reflective of service needs. Variables used to create service-user typologies typically include:

- **Demographic characteristics reflective of service needs**, for example, lack of high school diploma (Cheng et al. 2003; Freedman et al. 2000; McGroder et al. 2003; Rog et al. 1995)
- **Past service utilization**, such as number of stays in a homeless shelter (Kuhn et al. 1998), frequency of doctor visits (Leopold 1974), and time on welfare (McGroder 2003; Cheng et al. 2003)
- **Service needs and challenges**, such as unemployment and underemployment (Cheng et al. 2003; Freedman et al. 2000; Rog et al. 1995), physical and mental health (Leopold 1974; McGroder et al. 2003; Rog et al. 1995), family challenges (Leopold 1974), and issues with substance abuse, suicide, and domestic violence (Rog et al. 1995)
- **Logistical barriers to service receipt**, such as lack of transportation or child care (McGroder et al. 2003)
- **Attitudes and beliefs** that may affect the likelihood an individual participates in and/or benefits from services, including parenting beliefs (Hagelskamp et al. 2011)

Service-user typologies have used both the additive risk approach and the interactive approach to defining subgroups. For example, Leopold (1974) adopted the additive risk approach to classify poor, urban families in Philadelphia into low- or high-need groups based on their responses to a survey of about seven aspects of family functioning: (1) physical health status; (2) mental health status; (3) home conditions and household practices; (4) economic status and practices; (5) use of community resources; (6) social and community involvement; and (7) family unity and child care practices. Sample families scored between 1 and 45, with lower scores indicating fewer and less serious problems and high scores reflecting several and more serious family problems. The author selected the 27 families with the lowest scores (1 through 10) and labeled them “low need” and selected 27 families with the highest scores (36 through 45) and labeled them “high need.” She then compared use of health services provided through a neighborhood community program for the 54 families and found significant differences between the two family types on a number of health care utilization indicators such as completed health examinations, follow-through on referrals, and appointments kept.

Kuhn and colleagues (1998) adopted an interactive approach to verify the existence of three types of homeless shelter users typically defined in the homelessness literature based on anecdotal observations: transitional, episodic, and chronic. As is common with the interactive approach, these researchers used cluster analysis, an exploratory data-driven analytic method that identifies naturally occurring subgroups in a sample by grouping individuals who are most similar to each other (and most different from those in other clusters) based on their configuration of scores on numerous dimensions. Specifically, Kuhn and colleagues used public housing data from New York and Philadelphia to examine the number of times (episodes separated by 30 days) a user stayed in a public shelter and the number of days per episode. The cluster analyses confirmed the existence of the three hypothesized clusters: transitional (fewest episodes and fewest days of homelessness), episodic (most episodes and a moderate number of days of homelessness), and chronic (few episodes but the greatest number of days of homelessness). The Transitionally Homeless accounted for 80 percent of shelter users and tended to be younger, White, and have few mental health, substance abuse, or medical problems. The Episodically Homeless, comprising 10 percent of the sample, were also relatively young but more likely to be non-White and to have mental health, substance abuse, and medical problems. The Chronically Homeless, accounting for half of all shelter days despite the fact that they comprised only 10 percent of shelter users, tended to be older, non-White, and have the most mental health, substance abuse, and medical problems.

A more detailed example illustrating the added insights and potential utility of a cluster-analytic approach to service user typology research can be found in Appendix D.

B. Audience Segmentation Methods in Public Health Education

More than 20 years ago, public health researchers began calling for the application of social marketing principles in the design and implementation of public health education interventions (Lefebvre and Flora 1988; Slater and Flora 1991). These principles include the following:

- The segmentation of a target audience into homogeneous subgroups.
- An examination of knowledge, beliefs, social norms, and behaviors pertaining to the outcome or behavior targeted for change.
- The identification of communication channels relevant to each audience segment.
- The development and targeting of messages and interventions relevant to the particular constellation of knowledge, beliefs, social norms, and behaviors in each audience segment.
- Piloting material or programs with each audience segment to confirm its applicability.

The goal of audience segmentation is “to identify population subgroups that are homogeneous with respect to certain variables associated with a given outcome or behavior” (Boslaugh et al. 2005). The underlying premise of audience segmentation is that product marketing is most effective when messages are meaningfully tailored to certain segments of the population (Slater 1996). In the context of health and social service interventions, audience segmentation research seeks to identify sectors of a target population who, given their unique circumstances, may need tailored outreach and/or service delivery.

Public health researchers posit that the kinds of variables and subgrouping methods used in audience segmentation research are applicable to, and should therefore be used in, designing and

targeting public health education programs (Boslaugh et al. 2005; Slater and Flora 1991). They argue that reliance on demographic variables such as age, gender, and marital status for segmenting audiences is insufficient when seeking to describe or predict health behaviors, because meaningful variability with respect to individuals' psychosocial characteristics remains within demographically homogenous subgroups (Kreuter et al. 2003; Slater and Flora 1991). In fact, in their sample of 1,090 adults ages 18 to 65, Boslaugh and colleagues (2005) found that the five subgroups that maximally distinguished levels of physical activity were defined by intrinsic motivation to exercise and current health status. Demographic characteristics (age, race, gender, education, and income) played no role in distinguishing more and less physically active subgroups.

Social marketers consider the following “psychographics,” or variables reflecting consumers' interests, activities, and opinions (Grier and Bryant 2005):

- **Needs.** Consumers who perceive a need for a product or service are more likely to seek out and purchase these products or services. Service providers target services depending on the nature or severity of individuals' needs.
- **Wants.** Consumers who want a particular product (whether or not they perceive a need for it) are more likely to seek out and purchase these products or services. Service providers use different marketing messages and recruitment strategies to make their service appealing to the target audience.
- **Values and lifestyle.** Consumers with certain values and lifestyles are likely to want, need, and/or benefit from certain products or services more than others. Service providers seek to accommodate these values and lifestyles—for example, by articulating how program services align with participants' goals, and by making their services available at a time and place of convenience to the target audience.
- **Knowledge.** Consumers who know what they want and need, and who are well-informed about what products or services can meet these wants and needs, are more likely to seek out and purchase the most appropriate products or services. Public health interventions provide information about healthy and unhealthy behaviors and the consequences of unhealthy behaviors.
- **Current behavior.** Consumers already engaging in certain behaviors (for example, jogging) may be more likely to purchase a complementary product or service (for example, join a gym), whereas consumers engaging in unhealthful behaviors (for example, smoking) may need to have these behaviors addressed (for example, through a smoking cessation program) before they can effectively participate in and/or benefit from the primary product/service being offered.
- **Readiness to change and future intentions.** Consumers who are ready and plan to make a purchase in the near future may be more likely to do so, compared to those who are not ready or who have no such plans. Service providers may need to tailor program messages and services based on the target audience's readiness and/or plans for change.
- **Social norms.** Consumers are more likely to purchase products or services that align with the norms of their family, peers, culture, and community. Service providers may need to take these norms into account when developing and targeting services.

In creating audience segments, public health researchers rely almost exclusively on interactive approaches. For example, in predicting who were more and less likely to receive a flu vaccine,

Lemon and colleagues (2003) used classification and regression tree analysis and a handful of key discriminating predictor variables (past pneumonia vaccination, checkup in the past year, and race/ethnicity). Findings revealed that those least likely to have received a flu vaccine had never had a pneumonia vaccine and did not have a checkup in the prior year. The authors noted that this information could help public health officials better target vaccination campaigns.

Also adopting an interactive approach but using an expanded set of variables including psychosocial factors, BeLue et al. (2010) used latent class analysis to explore why some men had low take-up rates of colorectal cancer screenings. In a sample of male African American patients at a health center run by the U.S. Department of Veterans Affairs, the researchers assessed each participant's knowledge (of screening guidelines, prevalence of colon cancer, and typical treatments), perceived susceptibility to cancer, benefits of screening, barriers to screening, and self-efficacy/confidence in following screening procedures, and trust in his or her primary care provider. Four psychosocial risk classes emerged: (1) prepared; (2) unprepared; (3) high perceived barriers/low self-efficacy; and (4) low perceived benefits, barriers, and self-efficacy. Authors concluded that veterans who are nonadherent to colorectal cancer screening recommendations are not a homogenous group and may thus need different outreach and education strategies.

A more detailed example illustrating how the interactive approach of cluster analysis (termed "lifestyle analysis" by audience segmentation researchers) can be informative for targeting messages and services in health interventions can be found in Appendix D.

C. Key Findings and Conclusions

Service-user typology research illustrates the value of examining individual and family challenges, service needs, and attitudes/beliefs pertaining to the program-targeted outcomes, and the value of adopting clustering methods to identify relatively homogeneous subgroups reflecting distinct constellations of service needs, to identify subgroups of individuals that may warrant differential intervention strategies. Audience segmentation approaches to defining subgroups in public health research illustrates the potential value of examining psychosocial factors reflecting knowledge, attitudes, beliefs, and norms when examining behavior change, and the value of adopting cluster-analytic methods to identify relatively homogeneous subgroups reflecting distinct lifestyles that may warrant differential intervention strategies.

In sum, research on service-user typologies and audience segmentation approaches to creating subgroups suggests that researchers evaluating fatherhood programs should:

- **Look beyond demographic characteristics.** Research on service-user typologies and on audience segmentation in public-health intervention suggests the potential utility of variables reflecting fathers' past and current behavior, including service use, remaining service needs, and psychographics reflecting fathers' goals, lifestyles, beliefs about the importance, likelihood, and ability to change outcomes targeted by fatherhood programs.
- **Consider multiple variables.** To more fully capture the needs, readiness, and circumstances of fathers enrolling in fatherhood programs, numerous variables may need to be considered to maximally distinguish fathers with distinct service needs or who are likely to respond differently to fatherhood programs.
- **Select a subgroup approach that reflects the underlying theory of the impacts of subgroups.** An additive risk approach is appropriate if evaluators theorize that fatherhood program impacts may differ for fathers at higher versus lower levels of

cumulative risk, whereas an interactive approach is appropriate if evaluators theorize that fatherhood program impacts may differ depending on the particular constellation of risk and protective factors experienced by fathers.

V. FINDINGS: PSYCHOSOCIAL DETERMINANTS OF BEHAVIOR CHANGE

Behavior change theories seek to explain how the cognitive psychology of individuals influences behavior, alone or in concert with the social environment (Nigg et al. 2002). Individual-level theories focus on “cognitions” (that is, what an individual believes and how he thinks about things) such as knowledge, attitudes, motivations, perceptions, expectations, and behavioral intentions. Contextual theories go beyond such individual factors and also include social influences, such as social norms and relationships with important others. Interest in these “psychosocial factors” stems from their presumed utility as necessary (though not sufficient) “determinants” of health behavior. Recently, economists have integrated aspects of cognitive psychology into traditional economic frameworks to better understand individuals’ decision-making processes. Research on fatherhood does not focus narrowly on behavior change or decision making, but rather, draws from psychological and sociological theories to examine how individual, interpersonal, and contextual factors influence a broad range of fatherhood-related behaviors. (See Appendix B for a summary of these theories.)

Our review of the theoretical determinants of behavior change, psychological and developmental theories of fathering behavior, and concepts from audience segmentation research revealed that although each theory has its distinct elements, there is considerable overlap in terms of factors hypothesized to be key determinants of behavior change (Table V.1). For example, self-efficacy is a central tenet in virtually all health behavior change theories and is considered a “psychological barrier” to change in behavioral economics theory. In some cases, different terms are used for the same or similar concepts. For example, identity theory suggests that the more central the role of “father” is to a man’s identity, the more he will engage in a fatherhood-related behaviors and the more open he may be to improving his fathering. Similarly, behavioral economics suggests that behaviors that are congruent with how an individual views himself are more likely to occur than behaviors that are incongruent with these views. Though health behavior change theories do not typically address identity per se, many of these theories emphasize the important role of outcome salience in shaping an individual’s behavior, and the desirability of an outcome could, at least in part, stem from the degree to which it resonates with the individual’s views of himself.

We therefore found it useful first to integrate the relevant concepts from these key theories into a common framework; these concepts then guided our review of the literature on predictors of fathering among low-income men and served as the organizing framework for presenting our findings in Section VI. Below we present this framework, organizing these concepts into major categories, defining each concept, and offering hypotheses pertaining specifically to fathers and fatherhood.

1. Personal History

- **Family of origin (“Where I came from”):** The nature of the parenting/caregiving received by the father as a child, as well as his past and current relationship with his parents. Fathers who received adequate care as a child are better equipped to care for their own children.

Table V.1. Psychosocial Determinants of Behavior and Behavior Change Addressed in Key Theories

Theories	Predictor Categories								
	Personal History	Identity	Values and Lifestyle	Stress and Coping	Knowledge	Cognitions	Social norms	Relationship with child's mother	Social Support
Health Behavior Change Theories									
Theory of Reasoned Action/ Theory of Planned Behavior						X	X		X
Health Beliefs Model			X			X			
Transtheoretical Model/Stages of Change					X	X			
Social Learning/Social Cognition Theory						X	X	X	X
Social Networks and Social Supports							X	X	X
Transactional Model of Stress and Coping				X	X	X		X	X
Ecological Models	X	X	X	X	X	X	X	X	X
Social Marketing			X		X	X	X		
Behavioral Economics Theory									
		X	X			X	X		
Psychological and Developmental Theories									
Personality Theories		X		X					
Attachment Theory	X					X		X	X
Life Course/Life Stage Theory	X	X	X	X					
Developmental/Generativity Theory	X	X							
Identity Theory		X					X	X	
Motivation Theory				X		X		X	
Parental Investment Theory		X				X			
Social Scripting Theory							X	X	
Audience Segmentation									
		X	X		X	X	X	X	

2. Identity

- **General (“Who I am”):** Personality characteristics (openness, conscientiousness, extraversion, agreeableness, neuroticism), and dispositions/emotional states (for example, anger/resentment, hopeful/optimistic). Fathers with personality traits conducive to more positive parenting (such as emotional stability) and/or to positive behavior change (such as openness to change) may be more responsible and effective fathers and, when faced with the opportunity to improve (their parenting, their economic circumstances), they are more likely to take advantage of the opportunity.
- **Identity-related (“Who I am as a...”):** The father’s concept of self as a father/parent and co-parent, provider, worker, and spouse/partner. Fathers will engage in behaviors in direct proportion to the salience of that role to their overall identity.

3. Values and Lifestyles

- **Values (“What’s important to me”):** Life goals and values pertaining to the father as a father/parent and co-parent, provider, worker, and spouse/partner. Fathers will engage in behaviors (and in programs seeking to change these behaviors) in direct proportion to the degree that they value the behavior and/or its likely outcome.
- **Lifestyle (“How I live”):** Behaviors and life choices reflected in how the father spends his time and his preferred activities, including his work schedule, family routines, family activities, and religious/civic activities. Fathers will engage in behaviors (and in programs seeking to change these behaviors) in direct proportion to the degree that align with (or at least do not contradict) how they live their lives. Programs that address what’s important to the father—in both program content and service delivery—may be more effective. Programs that seek explicitly to change fathers’ lifestyles (for example, reduce antisocial and criminal activity) may face strong resistance unless or until the fathers are ready to embrace the change and have formal and informal networks to support the change.

4. Stress and Coping

- **Stressors (“Things that cause me stress”):** Things that cause an individual stress and include major life events as well as daily hassles, sometimes deriving from roles as a father/parent and co-parent, provider, worker, and spouse/partner. Fathers with many and/or acute stressors may find it more difficult to change unless or until the stressors and the fathers’ response to them is addressed.
- **Stress (“How I am affected by stressors”):** The subjective state (psychological distress, depression) resulting from exposure to and ineffective management of stressors, and occurring in various domains, such as parenting stress, financial stress, and work stress. Fathers with greater psychological distress may find it more difficult to change unless or until the stress is reduced.
- **Coping (“How I manage stress”):** Strategies used to reduce and manage the emotional reactions to stress, including seeking social and instrumental supports and adopting positive dispositions (such as optimism, hope, and religiosity). Fathers with fewer coping skills may especially need the assistance of a program to address life challenges and engage in behavior change.

5. Knowledge

- **Factual knowledge (“What I know”):** Knowledge about child development, effective discipline strategies, rights and responsibilities of noncustodial parents, and how to establish paternity and have child support and visitation orders adjusted. Fathers with limited knowledge or misinformation in these areas are less likely to make well-informed decisions and make positive changes in their behavior.

6. Cognitions

- **Perceived risk for negative outcomes (“Am I at risk?”):** Beliefs about vulnerability to various negative outcomes, such as, for noncustodial fathers, the perceived likelihood of losing visitation rights if they engage in risky and/or illegal activity. Fathers who do not perceive the consequences of their behavior to be negative do not perceive a need to change; they are less likely to engage in behavior change.
- **Salience of outcome (“How important is this outcome to me?”):** The value fathers place on a specific outcome. Fathers who desire the outcome may be more willing to engage in behaviors likely to achieve the outcome.
- **Outcomes expectancies (“What will happen if I change?”):** What fathers expect will happen, both directly and indirectly, as a result of behavior change. Fathers will engage in behavior in direct proportion to their expectations that it will yield a desired outcome.
- **Willingness to change (“Am I open to change, and am I willing to do what’s necessary to change?”):** Fathers’ openness to change in general, as well as their desire to change in specific ways. Fathers will engage in new behavior only if they possess a willingness to do so.
- **Responsibility for change (“Is it up to me to do something about this?”):** The degree to which fathers accept responsibility for their behavior and for the consequences of their behavior. Fathers who tend to blame others for their shortcomings are less likely to feel the need to change their behavior.
- **Deservingness (“Do I deserve better?”):** The extent to which fathers feel they deserve to achieve their goals. Fathers with low self-worth in general or who feel they do not deserve to achieve fatherhood-related goals are not likely to take steps toward goals. On the other hand, fathers who have a sense of entitlement may not feel they should have to change their behavior to get what they perceive to be rightfully theirs (for example, visiting their child).
- **Self-efficacy/locus of control (“Can I change?”):** Fathers’ confidence in their ability to change. Fathers who do not believe they can do what it would take to change, or who believe that the factors requiring change are not within their control, are less likely to try to change.
- **Motivation to change (“Why do I want to change?”):** The perceived rewards of change (for example, “being there” for their child) and the perceived punishments from failing to change (for example, sanctions from the child support agency). Fathers who perceive few rewards and/or few punishments from failing to change may not be adequately motivated.

- **Readiness to change (“Am I ready to change?”):** A psychological disposition and functional readiness to take steps toward behavior change. Fathers who are ready to be involved and engaged with their children, take on additional household and child care responsibilities, engage in employment activities, and work on the relationship with a spouse/partner/co-parent are more likely to take steps toward change in these areas.
- **Intentions to change: General goals (“I intend to change”) and specific plans (“I have plans to change”).** Fathers who have committed to change and have devised action steps necessary to achieve that change are more likely to actually follow-through and take steps toward change.

7. Social Norms

- **Social/peer norms (“What we believe and do”):** The messages and expectations regarding “responsible” behavior that fathers are exposed to. Fathers exposed to positive messages about fatherhood may be more likely to embrace fatherhood and engage in positive fatherhood behaviors.

8. Relationship with Child’s Mother

- **Relationship with child’s mother (“How I feel about and interact with my child’s mother”):** The structural/residential status of the relationship; the quality of the relationship and interactions; and the expectations of, support/encouragement for, and appraisals of the father as a parent, partner, provider, and worker by the child’s mother. Fathers living apart from their child’s mother, or who have a poor relationship with their child’s mother, or perceive the child’s mother as unsupportive or even openly hostile to them and their efforts to be good fathers may have greater difficulty making desired changes.

9. Social Support

- **Kin and social networks/support (“Who helps me when I need it”):** The extent to which fathers have access to friends, family, and service agencies that provide emotional and instrumental support. Fathers who receive support from informal and formal networks, such as encouragement, parenting advice, and assistance with child-support orders, are better able to effect the sought-after change.

There are three common themes reflected in this framework. First, determinants of behavior can originate within individuals, through interpersonal relationships, and from external forces. Second, individuals are more likely to engage in behaviors if the perceived benefits outweigh potential costs and consequences; thus, perceptions and expectations play an important role in determining behavior. Finally, individuals’ desire and readiness to change behavior, as well as their beliefs and confidence in their ability to change, are theorized to be necessary prerequisites of behavior change.

VI. FINDINGS: PSYCHOSOCIAL PREDICTORS OF FATHERHOOD- RELATED OUTCOMES

In this section, we present findings from the second stage of the literature review on the extent to which theoretically informed psychosocial determinants of behavior change have been examined in research on low-income fathers, and what studies show. In Table VI.1, we summarize the number of studies that examined predictors in each of the categories from our conceptual framework and the number of studies that yielded statistically-significant results.

Table VI.1. Number of Studies Examining Each Set of Psychosocial Variables (and the Number Finding Statistically Significant Associations): Total, and by Fatherhood Outcome¹

Predictor Categories	Total Studies	Number of studies examining outcomes (Number with significant associations ²)				
		Parenting	Partner Relationship	Employment	Child Support	Well-Being
Personal history	18	17 (13)	2 (1)	0	0	4 (2)
Identity	21	17 (11)	5 (4)	1 (1)	0	7 (6)
Values and lifestyle	14	9 (6)	2 (1)	1(1)	2(1)	2(1)
Stress and coping	26	21 (13)	5 (5)	0	0	7 (7)
Knowledge	1	1 (1)	0	0	0	0
Cognitions	15	10 (5)	3 (2)	1(1)	0	5 (2)
Social norms	3	3 (1)	0	0	0	0
Relationship with child's mother	36	27 (19)	5 (4)	2 (1)	1(1)	7 (3)
Social support	14	6 (4)	2 (2)	0	1 (1)	5 (5)
Total studies	64	51	11	2	1	15

Notes: 1. Some studies examined multiple predictors and/or multiple fatherhood outcomes.
2. We define results as statistically significant if the author reported a p-value less than or equal to 0.05.

In Appendix Tables E.1 to E.9, we present findings at the variable level for each category of predictors. We document whether a statistically significant association (that is, a p-value less than or equal to 0.05) was reported between each variable and the fatherhood outcome shown. We note whether studies utilized multivariate methods, such as multiple regression or structural equation modeling (as opposed to bivariate methods such as bivariate correlations or comparisons of unadjusted means). Although these methods are not sufficient for establishing a causal relationship, multivariate analyses provide stronger evidence of the relationship between a predictor and outcome because such methods help to minimize (though not eliminate) omitted variable bias; that is, controlling for other variables that are correlated with both the predictor and outcome of interest

helps to isolate each predictor’s unique effects.² We also note whether analyses were longitudinal; that is, whether the predictor was measured in a time period before the outcome was observed (prospective) or if information about a predictor was collected at the same time as the outcome but refers to a time period preceding it (retrospective). Evidence of prediction is stronger in longitudinal studies because the direction of the effect is clearer. Findings from prospective longitudinal studies provide especially strong evidence of prediction given recall errors that can plague retrospective longitudinal studies.

When presenting findings, we discuss all findings from studies using both multivariate and longitudinal methods because such studies provide stronger evidence of relationships between predictors and outcomes. Studies using only multivariate methods are discussed selectively due to space limitations; however, in providing illustrative examples of findings from multivariate studies we are careful to place these findings in context of other studies’ findings (or non-findings) to reflect the weight of the evidence across all studies. Studies using only bivariate methods (including longitudinal studies with no statistical controls) are not discussed, as these findings may overstate the importance of the predictor or, worse, may reflect spurious associations reflecting the effects of another variable altogether. In discussing cross-sectional studies, we typically describe findings as “associations” or “correlations,” even as we continue to refer to the psychosocial factors examined as “predictors” of fatherhood outcomes.

A. Personal History

Personal history refers to the father’s past experiences that may have a bearing on his current functioning as a father. Personal history variables uncovered in our review include the nature of the father’s relationship with his parents and the parenting he received as a child, the quality of his parents’ relationship during childhood, and the father’s behavioral adjustment as a child.

Just over one-quarter of all reviewed studies examined variables reflecting a father’s personal history as predictors of one or more key fatherhood outcomes (see Table VI.1).

- The most common outcome examined was parenting, assessed in 17 of the 18 studies. Thirteen studies found a significant association.
- Four studies examined the relationship between fathers’ personal history and their well-being in adulthood; two found a significant association.
- Two studies estimated the effect of personal history on fathers’ partner relationships; one found a significant association.
- We found no studies that estimated the effects of fathers’ personal histories on their employment or child support outcomes in adulthood.

Appendix Table E.1 provides a list of the personal history variables examined in each study, and indicates which variables were predictive of which outcome(s). Findings are summarized below.

² Multivariate methods may still be subject to omitted variable bias if, even with the inclusion of covariates, there are other unobserved variables that are correlated with both the predictor and outcome.

1. Predictors of Parenting Outcomes

Quality of parenting. Results from two multivariate, longitudinal studies showed that the quality of the parenting fathers received as a child predicted the quality of their own parenting. Kerr et al. (2009) used data from a prospective, intergenerational study to investigate whether fathers who received “*constructive parenting*” (monitoring, discipline, warmth, and involvement) in childhood were more likely to engage in constructive parenting with their own children. Using path modeling, they found that the constructive parenting a father received in late childhood directly predicted the quality of his own parenting of his 2- to 3-year old child. In addition, the constructive parenting fathers received also influenced their own parenting indirectly by affecting adjustment during the adolescent years. Fathers who received constructive parenting were better adjusted in adolescence and subsequently provided higher quality parenting as adults. Capaldi et al. (2008) examined whether fathers’ reports regarding the *quality and effectiveness of discipline* they received from their parents were related to their current disciplinary practices with their children. Using structural equation models, they found a direct link between the discipline fathers received from their own parents and their current disciplinary practices, even with SES, age at first birth, and risky behaviors also entered as predictors in the model. Jaffee and colleagues (2001) also conducted longitudinal analyses but did not find a link. However, using longitudinal data on a cohort of children from New Zealand followed from age 3 to age 26, they tested whether fathers who experienced *harsh or inconsistent discipline* from their own parents during childhood spend less time with their own children, and did not find a statistically significant link. Three other studies examined the quality of parenting received as a child using multivariate but not longitudinal methods; two of the three yielded statistically-significant results.

Residence with parents or caretakers in childhood. Two studies used multivariate and longitudinal analyses to examine whether living arrangements with parents or caretakers in childhood is related to parenting. Jaffee et al. (2001) did not find significant associations between the *number of caretaker changes* and *number of years living with a single mother* and the amount of time fathers spend with their own children. In contrast, Shields (1998) found that fathers who spent a greater *number of years living with biological father* in childhood demonstrated higher levels of involvement with their own children.

Quality of relationship with parents during childhood. Three studies used multivariate and longitudinal methods to analyze the quality of a father’s relationship with his parents growing up. Jaffee et al. (2001) found that fathers who experienced poor *parent-child relationship quality* with their own parents growing up subsequently spent less time with their own children, controlling for other risk factors such as socioeconomic status, being born to a teenage mother, high school dropout status, and age at birth of first child. However, *family conflict* was not found to be a statistically-significant predictor. Shields (1998) tested the relationship between fathers’ *perceived similarities with their own father* and paternal involvement in parenting and found a statistically significant positive relationship, controlling for demographic characteristics. Five studies used multivariate methods—three of which documented significant associations. For example, Wright (2004) found, in a sample of 101 married African American fathers, that fathers with higher *quality relationships with their own fathers* and who reported greater *perceived similarities between their fathers’ and their own parenting styles* demonstrated higher levels of father role salience and father role satisfaction, controlling for age, level of education, and the quality of their relationship with their child’s mother.

Adult attachment. Two multivariate studies examined whether fathers’ attachment style in adulthood is related to their parenting. Paquette et al. (2000) found that fathers with more *secure attachment* in their social relationships were more likely to be stimulative parents. Roggman et al.

(2002) tested whether fathers' *relationship anxiety* (measured with the Adult Attachment Scale prior to enrollment in Early Head Start) was related to father involvement while in the program. They did not find a statistically significant association after controlling for education, depression, social support, and religious activity.

Psychological well-being and adjustment as a child. Two studies examined and found that childhood well-being and adjustment predicted fathers' parenting as an adult. Jaffee and colleagues (2001) found that fathers with a *history of conduct disorder* (diagnosed between the ages of 11 and 15) spent less time living with their children; however, *history of depression* was not a significant predictor. Temcheff (2008) used data from a longitudinal study of children from inner-city schools in Montreal and determined that fathers who exhibited high levels of *childhood aggression* were subsequently more likely to use violence toward their own children. By contrast, *childhood withdrawal* was not a significant predictor.

2. Predictors of Partner Relationship Outcomes

Psychological well-being and adjustment as a child. Temcheff (2008) found that fathers with higher levels of *childhood aggression* reported higher levels of physical violence toward their spouses as adults. In the same study, *childhood withdrawal* was not a significant predictor.

3. Predictors of Father Well-Being Outcomes

Quality of parenting. Patterson and Capaldi (1991) found that fathers who reported that their parents used *abusive and explosive discipline practices* exhibited more antisocial behaviors (for example, arrests, driver's license suspensions, and substance abuse) in adulthood. In contrast, Locke and Newcombe (2004) did not find a statistically significant relationship when they tested whether fathers' self-reported *history of child maltreatment* predicted fathers' current substance abuse.

Quality of relationship with parents during childhood. Dechman (1994) found that fathers' *relationship with their own mothers* predicted their well-being as adults—specifically, fathers who reported a positive relationship with their mothers were happier and had higher levels of self-esteem as adults. In contrast, Boyce et al. (2007) did not find a significant association between a father's perceptions of their *relationship with his father or mother* or parental *overprotection* and his current levels of psychological distress.

B. Identity

Identity refers to who an individual is as a person—his personality characteristics, sense of self, and the importance placed on various roles. Reviewed studies included identity variables pertaining to the father's personality, self-esteem, antisocial behavior, psychiatric health, and variables reflecting his identity as a parent and as a provider.

About one-third of studies reviewed (21 of 64) examined predictors pertaining to the father's identity (see Table VI.1). Thirteen studies examined general aspects of the father's identity (specifically, his personality, self-esteem, antisocial behaviors, and psychiatric health), and eight studies examined his role-related identity.

- A majority of these studies (17 of 21) examined parenting as an outcome; 11 found a significant association.
- Seven studies examined father well-being, with six finding significant associations.

- Five examined partner relationship outcomes, and four showed significant associations.
- One examined whether a measure of identity predicted employment outcomes and found a significant association.
- None of the studies examining identity predictors looked at child-support outcomes.

Appendix Table E.2 provides a list of the variables examined in each study and indicates whether statistically significant associations were found with key fatherhood outcomes. Findings are summarized below.

1. Predictors of Parenting Outcomes

Personality. None of the four studies that examined fathers' personality as a predictor of parenting used longitudinal designs but all conducted multivariate analyses. Of the four multivariate studies, only one found a significant result. Jaffee and colleagues (2001) compared the personality profiles of fathers who spent little or no time living with their child to fathers who lived with their children full time and found that non-residential fathers had higher scores on *negative emotionality*, controlling for marital status, and exhibited more concurrent mental health problems and antisocial behaviors. However, in the same study, *positive emotionality* and *constraint* were not significant predictors.

Self-esteem. Four studies examined whether fathers' self-esteem was related to their parenting. Two studies of fathers of children in Head Start found statistically significant associations between self-esteem and parenting—but in opposite directions. In the first study, conducted with 33 African-American fathers of Head Start children, greater *self-esteem* was associated with more time spent by fathers in play interactions with their preschoolers, controlling for the father's personality, employment status, education, residential status, and relationship with the mother (Fagan 1996). However, in a second study of 85 African American and Puerto Rican fathers, those with lower *self-esteem* spent more time interacting and playing with their children, controlling for fathers' ethnicity, employment status of both mother and father, family income, and fathers' nurturance (Fagan 1998). The direction of this association was contrary to the author's hypothesis, who surmised that a lower sense of social adequacy may lead these fathers to choose to spend more time with their children. A third study (Dechman 1994) found that fathers with higher *self-esteem* were more likely to have positive relationships with their 5- to 11-year-old children, controlling for fathers' age education, and average number of hours spent at work.

Antisocial behavior. Only one study examined indicators of fathers' antisocial behavior as predictors of parenting using multivariate and longitudinal methods. Combining information from state records of fathers' arrests and license suspensions, self-reported substance use, and scores on a personality test, Patterson and Capaldi (1991) did not find a link between fathers' *antisocial behavior* when their child was in fourth grade and their discipline and monitoring practices two years later. Jaffee et al. (2001) conducted multivariate analysis and found a significant association between antisocial behavior and parenting—specifically, fathers who spent less time living with their children reported more *criminal convictions* and *types of criminal offenses*, controlling for marital status.

Psychiatric health. One study examined associations between fathers' psychiatric health and parenting behaviors. Johnson et al. (2004) used data on 782 families followed during the childhood and adolescent years of their offspring. Mothers reported on fathers' past and current psychiatric symptoms when children were 14 years old. Using this information, the researchers determined which fathers met the diagnostic criteria for particular disorders. The researchers then compared the

frequency of maladaptive paternal behaviors of fathers (based on maternal reports) with and without a history of psychiatric disorders, controlling for maternal education, family income, and offspring psychiatric disorders. Results showed that *history of conduct disorder, anxiety disorder, depressive disorder, antisocial personality disorder, and substance use disorder* were each independently related to a higher frequency of maladaptive paternal parenting behaviors.

Identity as a parent. Freeman and colleagues (2008) found that fathers who believed that part of their *role as a parent includes preparing child for school* played more frequently with their children and participated in caregiving tasks, controlling for demographic and risk factors. LeBourdais et al. (2002) found that nonresidential fathers' *satisfaction with their custody arrangements* and *satisfaction with the amount of time they spent with their children* was associated with greater time spent with their children post-divorce, but they did not find a significant association between these fathers' *perceptions as a father compared to his own father* and the amount of time he spent with his children post-divorce.

Identity as a man. Ferrari (1999) found that fathers reporting higher *machismo* were more likely to use physical punishment with their children, controlling for ethnicity, strong orientation toward family ("familism"), and history of childhood abuse and neglect. Coltrane et al. (2004) found, in a study of 167 couples of Mexican descent, that a *stronger identification with their Mexican heritage* predicted fathers' greater supervision of their children.

2. Predictors of Partner Relationship Outcomes

Antisocial behavior. Florsheim et al. (1999) analyzed data on expectant adolescent fathers from two cities and found that *antisocial behavior* prior to the birth of their first child was significantly related to poorer quality relationships with their partners (in both cities) 12 to 18 months after birth, controlling for socioeconomic status and interpersonal hostility.

Identity as a man. Caputo (2006) did not find a significant association between unmarried fathers' *attitudes about gender roles* in the household when their child was born and their living arrangements (for example, married, cohabiting) with their partner after one year.

3. Predictors of Employment Outcomes

Identity as a parent. Bialik (2011) coded interviews conducted with fathers in Early Head Start about their role in their child's life and found that fathers who strongly *identified with a "procreative" role* (characterized by nurturance, guidance, sacrifice, and commitment) were more likely to be continuously employed, controlling for poverty, residential status, education and race/ethnicity.

4. Predictors of Father Well-Being Outcomes

Personality. Boyce et al. (2007) found that expectant fathers exhibiting higher levels of *neuroticism* also had higher levels of psychological distress, controlling for other personality traits and attachment to their own parents in childhood. Sloper and Turner (1993) found a similar relationship between *neuroticism* and psychological distress in a sample of fathers of children with disabilities.

Self-esteem. Frost (1997) found that expectant fathers with higher self-esteem before their child's birth were less likely to experience postpartum distress (controlling for concurrent parenting stress and infant irritability, pre-birth marital concerns, and depression of the father and his wife). Dechman (1994) found that fathers with higher self-esteem were more likely to report being happy (controlling for fathers' age, education, and average number of hours spent at work).

Antisocial behavior. Florsheim et al. (1999) found a significant association between fathers' *antisocial behavior* prior to the birth of their first child and parenting stress post-birth. This significant association was found in only one of two groups of fathers examined in the study.

C. Values and Lifestyles

How a father spends his time can shape his behavior as a father. Studies reviewed included variables pertaining to family routines and activities, activities with the child, religious and civic involvement and activities, and characteristics of the father's job.

Twenty-two percent of reviewed studies (14 of 64) examined predictors reflecting values and lifestyle (see Table VI.1).

- Nine studies examined parenting outcomes, and six found significant associations.
- Two examined partner relationship outcomes, and one found a significant association.
- Two examined child support, with one study finding a significant association.
- One examined both employment and found a significant association.
- Two studies examined well-being outcomes, with one study finding a significant association.

Appendix Table E.3 provides a list of the variables examined in each study and indicates whether a statistically significant relationship was found with the fatherhood outcomes examined. Findings are summarized below.

1. Predictors of Parenting Outcomes

Family activities. In a sample of 167 low- to moderate-income two-parent Mexican American families, Coltrane et al. (2004) found that fathers who reported that their families engaged in *family rituals* (such as eating meals together and participating in weekend activities together) with more frequency also reported more frequent interactions with their children at other times and higher levels of parental monitoring, controlling for child and family demographic characteristics and fathers' perception of gender roles.

Activities with child. Using latent growth curve models, Holmes (2010) found that teen fathers' participation in prenatal behaviors such as going to the doctor with the child's mother and birth behaviors such as being present at the birth and visiting the child in the hospital were positively associated with fathers' involvement when the child was 14-, 24-, and 36-months controlling for fathers' age, residence after birth, employment, school status, child's gender, parents' race, mothers' age, and coparental relationship.

Religious and civic activities. Only one study used multivariate and longitudinal analysis to examine religious activities as a predictor. Using data on 72 predominantly white fathers participating in Early Head Start (EHS), Roggman et al. (2002) did not find a significant association between the frequency of participating in *religious activities* and fathers' subsequent involvement with their infant children while in Early Head Start, controlling for education, depression, relationship anxiety, and social support. Using multivariate analysis, Wilcox et al. (2001) studied whether *religious involvement* and *civic participation* were related to fathers' involvement with their school-aged children. The frequency of participation in church organizations and civic organizations (such as sports,

professional, service, or cultural groups) was associated with higher levels of father involvement in one-on-one activities with the child, eating dinner with the child, and participating in such youth activities as the boy scouts or youth sports teams, controlling for child age and father age, education, race/ethnicity, marital status, and income.

Job characteristics. Six multivariate studies explored whether *paternal job characteristics* relate to fathers' parenting; three of the six found significant associations. For example, Goodman and colleagues (2008) analyzed data from 446 low-income rural families and found that the type of work that fathers engaged in was related to their parenting, as measured through interviews and videotaped interactions with their infant children. However, results varied, depending on degree of rural isolation and paternal education levels. Specifically, fathers in occupations characterized by low levels of *occupational self-direction* demonstrated lower levels of parenting engagement if they were living in a more isolated area (but not if they lived in less rural areas). Moreover, fathers whose *jobs involved caregiving and dealing with angry or physically aggressive individuals* were found to have lower parental engagement if they had lower levels of education. In contrast, fathers with higher education levels in these types of jobs demonstrated higher levels of engagement with their infants. Three multivariate studies did not find a significant association. For example, in a sample of 115 low-income Mexican American families, Formoso et al. (2007) tested whether fathers' *work hours* was related to the quality of their relationship with their 11- to 14-year-old children. They did not find a statistically significant association after controlling for child and family demographics and the quality of the relationship between the parents.

2. Predictors of Partner Relationship Outcomes

Religious and civic activities. Caputo (2006) analyzed data on 600 families from the Fragile Families and Child Well-Being study. The author found that fathers who reported higher levels of *religious activity* before their child's birth were more likely to be married to their children's mothers one year after their child was born, controlling for demographic characteristics, pre-birth relationship status, and concurrent quality of relationship. *Religious affiliation* was also examined as a predictor but was not found to be statistically significant.

3. Predictors of Employment Outcomes

Activities with child. Knoester et al. (2007) examined whether father's *change in frequency of engagement with child* from the time of the child's birth to one year post-birth was related to hours of paid labor. Results indicated that increased engagement with their children from birth to age 1 predicted reductions in hours of paid labor one year after birth. Contrary to the authors' hypothesis, they surmised that the reduction in hours of paid labor may be due to time constraints experienced by the fathers after the birth of their child.

4. Predictors of Child Support Outcomes

Activities with child. In two studies, Castillo (2009, 2010) used data on nonresidential fathers from the Fragile Families and Child Well-Being study to examine whether fathers' *frequency of activities* (such as playing, reading, and showing affection) with their preschool children was related to child support outcomes. The frequency of activities was not found to be related to the probability of having a currently established child support order nor to the current establishment of paternity, controlling for race/ethnicity, education, employment, income, age, quality of relationship with the child's mother, and involvement with social networks.

5. Predictors of Father Well-Being Outcomes

Activities with child. Knoester et al. (2007) analyzed data on 2,494 new fathers from the Fragile Families study to examine whether father *engagement at birth* (that is, whether he was present at the birth, whether he held the baby) and one year after birth (that is, how often he played games or read stories to the child) predicted substance use one year after the birth. They found that fathers who were more engaged at the time of their child’s birth had reduced substance use one year later. In addition, *change in engagement* was also a significant predictor: Fathers whose engagement increased from birth to age 1, reported reductions in substance use and improvements in subjective health.

Job characteristics. Whitbeck and colleagues (1997) conducted multivariate, longitudinal analysis to investigate whether fathers’ *occupational complexity* was related to levels of emotional distress. They did not find a statistically significant relationship.

D. Stress and Coping

An individual’s behavior can be affected by the presence of stressors in the environment, and whether those stressors are perceived as threats and are a source of distress (Glanz and Schwarz 2008). Reviewed studies examined objective measures of stressors experienced by fathers and families as well as subjective measures of fathers’ psychological states, parenting stress, financial stress, overall distress, and measures of coping strategies.

About 40 percent of the studies (26 of 64) reviewed examined predictors related to stress and coping (see Table VI.1).

- Most studies (21 of 26) examined parenting outcomes, and 13 found a significant association.
- Seven studies investigated father well-being outcomes, and all seven found significant associations.
- Five examined partner relationship outcomes, and all five found significant associations.
- None of the studies we reviewed examined the effects of fathers’ stress and coping on employment or child support outcomes.

Appendix Table E.4 provides a list of the specific variables examined in each study and whether a statistically significant relationship was found for each fatherhood outcome. Findings are summarized below.

1. Predictors of Parenting Outcomes

Life stressors. Only one study examined the association between life stressors and parenting using multivariate analysis. Rienks (2011) examined whether experiencing *stressful events* in the past year was related to father involvement but did not find a significant association.

Other specific stressors. Goodman et al. (2008) conducted multivariate analysis to test whether “*role overload*” or the feeling of having too many demands on one’s time could partially explain associations between work environments and parenting, but did find any evidence to support their hypothesis.

Financial stress. A statistically significant association between *financial or economic stress* and parenting was found in four multivariate studies. For example, Gonzales et al. (2011) found that fathers with higher levels of *perceived economic hardship* demonstrated lower levels of warm parenting, controlling for concurrent measures of family income and neighborhood risk. However, one multivariate study did not yield a significant result. Flouri and Buchanan (2003) used data on a sample of more than 7,000 intact families from England, Scotland, and Wales to examine whether family *financial difficulties* as measured by reliance on free school meals or a health visitor's assessment of the family's financial condition was related to teachers' reports of father involvement (that is, how often the father spent time with the child or took an interest in the child's education) at ages 7, 11, and 16. Controlling for child and family demographic characteristics, child behavioral problems and math achievement, and earlier father involvement, the authors found that financial difficulties were not significantly associated with concurrent father involvement in any of the time periods.

Parenting stress. Two multivariate studies examined parenting stress as a predictor of parenting. In a sample of 468 French Canadian families, Paquette (2000) found that higher levels of *parental stress* were more typical of authoritarian fathers (who were unresponsive to children's needs and wishes and frequently resorted to control to ensure obedience and respect for authority) or authoritative fathers (who were generally sensitive and responsive to children's needs, were affectionate and set clear limits while also allowing children to be autonomous), compared to permissive or stimulative fathers. Bronte-Tinkew and colleagues (2010) used data from the Fragile Families and Child Well-Being study and found that *parenting stress and aggravation* was inversely related to concurrent father engagement, controlling for several demographic characteristics, including father's age, race, depression, marital and employment status, substance use, education, and poverty level. Additional analyses revealed that the negative association between parenting stress and parenting was particularly pronounced for fathers with household incomes below the poverty line.

Depressive symptoms or psychological distress. The relationship between depression or distress and parenting was examined in five multivariate studies. Three of the five found a statistically significant association. In a sample of 215 families, Conger and colleagues (1995) found that *stress-related paternal depression* was significantly associated with poor disciplinary practices by fathers of sixth and seventh grade boys. Cabrera et al. (2009) analyzed data from a sample of Mexican American families with 9-month-olds in the Early Child Longitudinal Study-Birth Cohort and found that fathers with higher levels of *depressive symptoms* were less engaged in such caregiving activities as feeding or bathing their children. Coley and Hernandez (2006) found a direct association between father's *psychological distress* and less father involvement with their preschool-aged child, as well as an indirect relationship through a significant association between father psychological distress and elevated father-mother conflict which was also negatively related to father involvement. Two other studies conducted multivariate analyses but did not find a statistically significant association. Rienks et al. (2011) did not find a significant difference in the involvement of fathers with *anxiety and depression*. Similarly, Bronte-Tinkew and colleagues (2010) did not find evidence of differences in father engagement of fathers with more *depressive symptoms* compared to those with fewer symptoms.

Well-being. One multivariate study explored the relationship between fathers' feelings of well-being and parenting. Dechman (1994) found that fathers who reported *being happy* were more likely to have a warmer and less directive relationship with their 5- to 11-year-old child, controlling for fathers' age, education, and average number of hours spent at work.

Coping. Our review uncovered one study that used multivariate and longitudinal analysis to investigate the association between fathers' coping strategies and parenting. Roggman and colleagues

(2002) found that fathers who reported using a wider array of *coping strategies* (“talk to relatives” or “participate in church or other spiritual activities,” for example) when they have a problem were rated as more highly engaged with their infant child based on subsequent assessments conducted by home visitors while the family was enrolled in Early Head Start. Two studies used multivariate methods to assess coping as a predictor. Sloper and Turner (1993) found that fathers of children with disabilities whose *coping strategies* were less reliant on wishful thinking demonstrated better adaptation to their child’s disability. Rienks et al. (2011) examined whether fathers’ perceptions of their *coping efficacy* (i.e., how well they cope with stress) was related to how well they felt they performed parenting tasks (“encouraging your children to succeed in school,” “spending time with your children doing things they like to do,” for example) over the past 12 months but did not find a statistically significant relationship.

2. Predictors of Partner Relationship Outcomes

Parenting stress. Bronte-Tinkew and colleagues (2010) found that *parenting stress and aggravation* was inversely related to relationship supportiveness, controlling for several demographic characteristics, including father’s age, race, depression, marital and employment status, substance use, education, and poverty level. This negative association was particularly pronounced for fathers with household incomes below the poverty line.

Depressive symptoms or psychological distress. Two multivariate studies examined the relationship between depression or psychological distress and the quality of couple relationships. For example, Bronte-Tinkew et al. (2010) found that fathers with more *depressive symptoms* exhibited lower levels of relationship supportiveness.

3. Predictors of Father Well-Being Outcomes

Life stressors. Four multivariate studies found a statistically significant association between life stressors, such as problems with housing, unemployment, substance abuse, health problems, crime, or other family crises, and father well-being. For example, in a sample of low-income nonresidential fathers participating in a Responsible Fatherhood program, Anderson et al. (2005) found that those who reported more *stressors* also reported more concurrent depressive symptoms, controlling for urban versus rural residence, social support, and co-parenting conflict. Using a slightly different measure of father well-being, Boyce et al. (2007) found that expectant fathers who experienced more *stressful life events* were more likely to be distressed, controlling for personality traits and personal history (attachment to own parents in childhood).

Financial stress. Whitbeck and colleagues (1997) found a significant concurrent relationship between *economic pressure* and emotional distress. Specifically, fathers who reported facing more economic pressures in the form of difficulties paying their bills or covering expenses had higher levels of emotional distress as rated by an independent observer.

E. Knowledge

Our search yielded only one study that examined knowledge as a predictor of fatherhood outcomes—specifically, parenting (see Table VI.1). Appendix Table E.5 displays this finding. Guzell (2001) analyzed data from a sample of 66 dual-earner families with 1-year-old children and found that, controlling for socioeconomic status, infant difficulty, and perceived control over caregiving outcomes, fathers with more *knowledge about infant development* demonstrated lower levels of detached behavior during play with their children.

F. Cognitions

Cognitions refers broadly to an individual's beliefs and how he thinks about things, and includes his attitudes, expectations, attributions, self-beliefs, and behavioral intentions. Psychosocial predictors found in this category include parenting attitudes, gender-role attitudes, attitudes toward marriage or relationships, and work-related attitudes, as well as self-efficacy and beliefs about individual control over fatherhood-related outcomes.

Of the 64 studies we reviewed, 15 examined predictors related to these cognitions (see Table VI.1).

- Most of these studies (10 of 15) examined parenting outcomes, and 5 found significant associations.
- Five studies examined links to father well-being, and two found significant associations.
- Three explored partner relationship outcomes, and two found significant associations.
- One examined employment outcomes and found a significant association.
- None of these studies of cognition-related predictors examined child-support outcomes.

Appendix Table E.6 is a description of the variables examined in each study, and indicates which variables were found to be related to key fatherhood outcomes. Findings are summarized below.

1. Predictors of Parenting Outcomes

Parenting attitudes. Three studies used multivariate methods to investigate the relationship between fathers' parenting attitudes and actual parenting practices. Two studies found a significant association, although one result was contrary to the author's hypothesis. Ferrari (1999) found that fathers who had higher scores on a measure of "*valuing children*" rated child maltreatment scenarios more severely, but also used verbal punishment at significantly higher rates. The author posits that fathers who value children more may view verbal punishment as less harmful to children compared to physical punishment. LeBourdais and colleagues (2002) examined cross-sectional data from the Canadian General Social Survey and found that nonresident fathers who reported that they were *happy to have had a child* tended to spend more time with their children post-divorce, controlling for a range of demographic characteristics of both the child and father. Coohey (2000) tested whether physically abusive fathers had different *attitudes toward the use of harsh discipline* compared to a group of non-abusive fathers but did not find a statistically significant result.

Gender role attitudes. The relationship between gender role attitudes and parenting was examined in three multivariate studies but only one found a statistically significant result. Coltrane and colleagues (2004) analyzed data on 167 low- to moderate-income two-parent Mexican American families and found that fathers with *more traditional views about gender roles* shouldered fewer hours of household labor and child supervision/monitoring, and also engaged in less interaction with their children, controlling for child gender, family income, and employment. Shields (1998) did not find a significant association between attitudes towards *sex role egalitarianism* and parenting. Similarly, LeBourdais and colleagues (2002) did not find evidence that beliefs about *whether tasks related to children are men's responsibility* are related to the time nonresident fathers spend with their children.

Work-related attitudes. Paquette and colleagues (2000) examined whether fathers with different parenting styles had different levels of *job satisfaction* and *job involvement* but did not find significant results.

Self-efficacy. Two multivariate studies examined self-efficacy as a predictor of parenting. Freeman et al. (2008) found that *father efficacy* was significantly associated with fathers' engagement with their children. In contrast, Guzella and colleagues (2001) did not find a significant association between *parental self-efficacy* and parenting interactions.

Responsibility or perceived control. Freeman et al. (2008) conducted multivariate analysis and found that fathers who perceive greater *responsibility for their child's learning* tended to interact with their children and participate in caregiving tasks more frequently. In contrast, in a sample of 66 dual-earner families, Guzella (2001) did not find a significant link between fathers' *perceived control over caregiving outcomes* and observed interactions with their 1-year old children during a play activity, after controlling for infant difficulty and fathers' knowledge of infant development.

2. Predictors of Partner Relationship Outcomes

Attitudes toward marriage or relationships. Caputo (2006) used data from the Fragile Families Study to examine whether unmarried fathers' *attitudes toward marriage* and *distrust of the opposite sex* assessed when their child was born predicted their living arrangements (married, cohabiting, and so on) with their partner after one year; neither of the predictors was found to be statistically significant.

3. Predictors of Employment Outcomes

Parenting attitudes. Knoester et al. (2007) analyzed data on 2,494 new fathers from the Fragile Families study to examine whether paternal attitudes toward parenting at the time of their child's birth and subsequent changes in attitudes³ were related to changes in hours of paid labor one year after birth. Results showed that fathers who had more *positive attitudes toward fathering* at birth had increased work hours one year post birth. Moreover, *change in positive attitude toward fathering* was also related to employment. Specifically, fathers whose parenting attitudes became more positive after a year had reduced substance use and more paid work hours, whereas fathers whose parenting attitudes became less positive had increased substance use and lower work hours.

4. Predictors of Father Well-being Outcomes

Parenting attitudes. Knoester et al. (2007) found that *change in positive attitude toward fathering* was related to father well-being. Fathers who demonstrated improvements in parenting attitudes one year after their child was born had reduced substance use whereas fathers whose attitudes became less positive had increased substance use.

Self-efficacy. Frost (1997) found that fathers' *feelings of incompetence* postpartum was associated with elevated levels of postbirth depression, anxiety, and anger, even after controlling for pre-birth levels of well-being.

³ The attitude measures consisted of different items in each time point. Change in attitudes over time was assessed by standardizing the attitude variables at each time point and calculating the difference between the standardized scores.

G. Social Norms

Social norms are the customs and expectations for behavior among a peer group. The three studies that examined social norms as predictors of fatherhood among low-income men focused exclusively on parenting outcomes; none of these studies examined the link between social norms and fathers' partner relationships, employment, child support, or well-being. We did not find any articles that estimated the effects of social norms on partner relationships, economic outcomes, child support, or father well-being (see Table VI.1). Appendix Table E.7 provides a list of the social norms variables examined in the articles, and indicates which variables were predictive of parenting outcomes.

Acceptance of negative stereotypes about African American men was not significantly associated with fathers' involvement in child care in a multivariate study of 50 African-American married fathers of preschool-age children (Shields, 1998). Gonzalez and colleagues (2011) found that *neighborhood familism* (that is, a strong sense of family in the neighborhood), assessed as respondents' beliefs regarding the importance of family closeness, one's obligation toward family, and the role family should play in one's actions and decisions, predicted greater paternal warmth.

H. Relationship with Child's Mother

The relationship with child's mother category includes measures reflecting the status of the relationship (for example, married or no longer a couple), the amount of warmth or level of conflict within the romantic or platonic relationship, and the quality of the co-parenting partnership specific to raising their child.

Just over half of all reviewed studies (36 of 64) examined the association between the father's relationship with their child's mother and key fatherhood outcomes (see Table VI.1).

- The vast majority of studies (27 of 36) examined parenting outcomes, and 19 of these studies found a significant association.
- Seven studies examined father well-being, with three studies finding significant associations.
- Five studies examined partner relationship outcomes, and four found significant associations.
- Two studies explored employment outcomes, and one found a significant association.
- One study looked at child support outcomes, and it found a significant association.

Appendix Table E.8 provides a list of the variables related to fathers' relationship with their child's mother that were examined in each article, and indicates which variables were associated with which outcomes. Findings are summarized below.

1. Predictors of Parenting Outcomes

Negative partner characteristics. Coohy (2000) used multivariate methods to examine whether negative partner characteristics are related to parenting behaviors but did not find a significant association.

Conflict. Two multivariate and longitudinal studies examined the association between level of conflict in the father's relationship with his child's mother and parenting behaviors. Florsheim and colleagues assessed the *level of hostility* displayed by adolescent expectant fathers toward their partners and found that a higher level of hostility predicted a lower level of nurturing behaviors when their children were 12 to 18 months old. In a study of 7,802 married-couple families from England, Scotland, and Wales, Flouri and colleagues (2003) found that the level of *domestic tension* measured when the child was 7 years old predicted a greater likelihood of fathers taking the child on outings at age 11; however, this predictor did not predict fathers' involvement in managing the child at age 11 or their interest in the child's education at age 11 or 16. Three multivariate studies also found significant associations between conflict and parenting.

Communication. Rienks and colleagues (2011) did not find a significant association between the presence of *communication danger signs* and fathers' *negative communication* with their child's mother and fathers' involvement with their children.

Relationship quality. Eight studies examined whether the quality of fathers' relationships with their child's mother is related to parenting. None of these studies were longitudinal in design but all used multivariate methods. Three of the studies documented a significant association. For example, in a sample of 735 low-income Mexican American fathers, Cabrera and colleagues (2009) found that fathers who reported higher levels of *overall happiness* in their relationship with their wife or partner demonstrated more displays of affection and engagement with their infants in literacy and caregiving activities. The remaining five studies yielded results that were not statistically significant.

Relationship satisfaction. Two multivariate studies examined whether fathers' *relationship satisfaction* was associated with parenting but neither one found a significant association.

Quality of co-parental relationship. One multivariate and longitudinal study documented a significant association between *coparental relationship status* and fathers' involvement with their children (Holmes, 2010). Six multivariate studies also examined the quality of the co-parental relationship as a predictor of parenting and documented significant results. For example, Coley and colleagues (2006) found that among a sample of 239 low-income resident and nonresident fathers, the level of *father-mother conflict surrounding parenting* was negatively associated with fathers' involvement with their preschool-age children.

Nature or status of relationship. The association between the *nature or status of the father's relationship with his child's mother* and various parenting outcomes was investigated in nine studies, five of which found a significant link. For example, in a study of 416 Early Head Start teen fathers, Holmes (2010) found that a father's romantic attachment to his child's mother predicted his continued involvement with his child over time. However, the nature of the couple's relationship was confounded with the father's residential status because the romantic involvement variable included couples who were married or cohabitating as well as couples not living together. Thus, it is unclear whether findings would hold equally for married, cohabitating, and non-residential fathers.

2. Predictors of Partner Relationship Outcomes

Conflict. Two multivariate, longitudinal studies examined conflict as a predictor of partner relationship outcomes. In a sample of 600 unmarried couples, Caputo (2006) found that fathers who reported *areas of conflict* over the amount of time the couple spent together at the time of the child's birth were less likely to be married to their child's mother one year later. In contrast, among a sample 70 adolescent first-time fathers, Florsheim and colleagues (1999) found that the *level of hostility*

expectant fathers displayed toward their pregnant partners was not predictive of the quality of the relationship when the child was between 12 and 18 months of age. Two multivariate studies also documented significant associations between conflict and partner relationship outcomes.

Relationship quality. The quality of the father's relationship with his child's mother was examined in two multivariate, longitudinal studies. In a study of more than 1,600 low-income couples, Kamp Dush and colleagues (2011) found that high *relationship quality* was significantly associated with a positive co-parental relationship although fathers' supportive co-parenting declined after the couple relationship ended. In contrast, Caputo (2006) did not find a significant association between *relationship quality* and partner relationship status one year later.

Nature or status of relationship. Only one study examined relationship status as a predictor of partner relationship outcomes using multivariate and longitudinal methods. Kamp Dush and colleagues (2011) found that the *nature of the relationship* – that is, the initial level of commitment within a couple's relationship (dating, cohabitating, or married) was positively associated with the quality of the co-parenting relationship shortly after the couple broke up, and, to a lesser degree, the quality of the relationship over time. Fathers who had been in committed relationships reported lower levels of supportive co-parenting immediately following the dissolution of the relationship, but the quality of co-parenting relationship eventually increased over time. Two multivariate studies also examined relationship status predictors but neither one found a significant association.

3. Predictors of Employment Outcomes

Relationship quality. In Knoester's study of low-income new fathers, the *relationship quality* between fathers and mothers was positively associated with an increase in paid labor (Knoester et al. 2007). On the other hand, Bialik (2011) conducted a multivariate study and found no evidence of an association between couples' *parenting alliance* and employment outcomes.

4. Predictors of Child Support Outcomes

Relationship quality. Nonresident fathers with a positive *relationship with their partner* were more likely to establish paternity (Castillo 2010); however, they were less likely to establish formal child support orders (Castillo 2009). The author hypothesized that perhaps some parents with a healthy relationship may decide that they would rather not have the child support enforcement system involved in their lives and choose to make informal child support arrangements.

5. Predictors of Father Well-being Outcomes

Conflict. Two multivariate and longitudinal studies examined partner conflict as a predictor of father well-being. Frost (1997) found that fathers' *marital concerns* during pregnancy predicted fathers' anger and depressive symptoms, but not anxiety, one month after the child's birth, controlling for baseline well-being. In contrast, the *level of hostility* in the father-mother relationship was not predictive of the father's level of parenting stress one year in Florsheim and colleagues (1999) study of 70 adolescent expectant fathers.

Relationship quality. The association between relationship quality and father well-being was examined in two multivariate and longitudinal studies. In a sample of 2,494 low-income, new fathers, Knoester and colleagues (2007) found that higher father-mother *relationship quality* at the birth of the child was associated with better physical health, lower depressive symptoms, and reduced substance use one year later. On the other hand, expectant fathers' self-reported *marital happiness* did not

moderate fathers' depressive symptoms, anxiety, or anger following the birth of the child (Frost, 1997).

Quality of co-parental relationship. Only one study examined the association between the quality of the co-parenting relationship and fathers' well-being. In a sample of 127 predominantly African American fathers, Anderson and colleagues (2005) found that *co-parenting conflict* over how the child is raised was not associated with fathers' depressive symptoms.

Nature or status of relationship. Two multivariate and longitudinal studies examined the association between parents' relationship status and father well-being. Knoester et al. (2007) found that low-income fathers who resided with their child upon but subsequently reported *breaking up with their child's mother* were more likely to report depressive symptoms. However, changes in relationship status were not associated with fathers' health or substance abuse. Florsheim and colleagues (1999) found that expectant couples' *living arrangements* did not moderate the effects of various risks factors on fathers' level of parenting stress.

I. Social Support

Social support refers to the functional and/or emotional support fathers received from various sources, including kin and peer networks. Our literature review revealed predictors in this category pertaining to the constellation of kin networks, broad supports from many sources and across type (instrumental, emotional), as well as specific forms of support from particular sources, such as kin emotional support, supportive work environment, and involvement with formal networks (for example, community services).

Just over one-fifth of the studies reviewed (14 of 64) examined variables related to fathers' extended family and/or their social networks and supports as predictors of one or more key fatherhood outcomes (see Table VI.1). Altogether, 14 studies examined either kin or social networks; 10 estimated the effects of fathers' kin networks on fatherhood outcomes, and 10 estimated the effects of fathers' social networks. (Six studies examined both kinds of networks/support.)

- Six studies examined the predictive role of kin or social networks on fathers' parenting, four of which found statistically significant associations.
- Five studies estimated effects of kin or social networks on fathers' well-being, and all found statistically significant associations.
- Two studies examined marital/partner relationships, both of which found significant associations.
- One study examined the link between fathers' social support and child support outcomes and found it predictive.
- We found no articles that estimated the effects of fathers' kin or social networks/supports on employment outcomes.

Appendix Table E.9 provides a list of the kin and social network variables examined in each article and indicates which variables were predictive of which outcome(s). Findings are summarized below.

1. Predictors of Parenting Outcomes

Quality of kin relationships. Three multivariate studies explored the association between the quality of kin relationships and parenting outcomes, two of which documented significant results. Sloper and Turner (1993) found that for 72 fathers of children with a severe physical disability, a *cohesive family relationship* with minimal conflict was associated with fathers' successful adaptation to having a child with disabilities. Conversely, less cohesive family relationships predicted higher levels of paternal distress. A study of 109 young disadvantaged, nonresidential fathers found that fathers with more positive *relationships with their child's maternal grandmother* demonstrated greater father involvement in his infant's life (Gavin et al. 2003). One multivariate study yielded non-significant results. Mitchell (2008) found that the *quality of extended family relationships* did not predict fathers' parenting among a sample of 49 low-income predominantly African American fathers whose children were attending Early Head Start.

New partner status. A father's formation of a new family or relationship was not found to significantly affect parenting outcomes in the one article that explored the relationship. In a sample of 268 non-residential fathers of infants through teens, LeBourdais and colleagues (2002) found that the amount of time fathers spend with children from a previous relationship did not differ significantly among fathers who had a *new partner or child* compared to fathers who had not formed new relationships.

Kin support. The amount of kin support fathers receive was examined as a predictor of parenting in one multivariate study. Coohy (2000) found, in his study of 35 physically abusive fathers, that abusive fathers received less *instrumental support from extended family* than a matched sample of non-abusive fathers. This study also found that abusive fathers received less *emotional support from friends*, despite desiring the same level of support as non-abusive fathers.

Support from networks. The relationship between support from other networks and parenting was examined in one multivariate study. Goodman and colleagues (2008) found that a *non-supportive work environment* was related to lower quality father-infant interactions in a sample of 446 low-income married or cohabitating fathers living in rural areas.

2. Predictors of Partner Relationship Outcomes

Quality of kin relationships. In a study of 49 Early Head Start families, the average *quality of extended family relationships* experienced by fathers was not associated with the quality of their marital or partner relationships (Mitchell, 2008).

New partner status. Among 1603 nonresidential fathers, Dush and colleagues (2011) found that fathers whose *former partners were involved in a new romantic relationship* consistently reported having a less supportive co-parenting relationship with their child's mother across multiple follow-up interviews.

3. Predictors of Child Support Outcomes

Kin support. In a study of 3,225 nonresident fathers, found that fathers' *involvement with family and friends* was not significantly associated with the establishment of paternity (Castillo, 2010).

Support from other networks. In two related multivariate studies, fathers' *involvement with public welfare institutions* was significantly associated to the establishment of child support orders (Castillo 2009), but not with the establishment of paternity (Castillo, 2010).

4. Predictors of Father Well-being Outcomes

Quality of kin relationships. Sloper and Turner (1993) found that a *cohesive family relationship* was associated with fathers' life satisfaction among fathers of children with a severe physical disability.

New partner status. Knoester and colleagues (2007) examined whether a father's formation of a new relationship affected his well-being. They did not find evidence of a significant association.

General support across networks. Four multivariate studies examined the relationship between the support that fathers received from across their social networks and their well-being. Two of the studies documented significant associations consistent with authors' hypotheses. In a sample of 312 first-time fathers living in Australia, Boyce and colleagues (2007) found that fathers' who reported lower *satisfaction with the social support* they receive also reported significantly higher levels of psychological distress. However, the actual *amount of social support* fathers reported receiving was not significantly associated with fathers' psychological distress. In a large Canadian sample, Wade et al., (2011) found that the availability of *social support* predicted fewer mood disorders among unmarried but not married fathers. This result led the authors to conclude that social support may be an especially important protective factor for unmarried fathers. Two articles used the same analytic sample of low-income, nonresidential fathers and found unexpected results. Higher levels of *support from family, friends, and community workers* (including professionals such as teachers and doctors) were associated with higher levels of depressive symptoms, even after controlling for life stressors and resource challenges (unemployment, inability to pay child support, lack of permanent housing, criminal history, health problems or disability, or problems with alcohol or drugs, for example). In interpreting these counterintuitive findings, the authors speculated that accepting social support may contribute to fathers' depression because they may not feel they are able to return the favor, as is customary in their communities.

VII. LITERATURE REVIEW - KEY FINDINGS AND CONCLUSIONS

This literature review was conducted in two stages. In the first stage, we reviewed theories from a range of disciplines to identify psychosocial characteristics that have been hypothesized to affect behavior change in general or fathering behavior in particular. In the second stage, we conducted a literature search to find studies that empirically tested the relationships between such psychosocial predictors and fatherhood-related behaviors and outcomes. In this section, we summarize key findings and conclusions from the two stages of our review.

Our review of applicable theories suggests that a number of psychosocial factors pertaining to fathers, their relationships, and their broader community context merit consideration in order to understand whether and how the impacts of fatherhood programs may vary.

- Fathers who recognize a need to change and are able to identify goals and execute action steps based on accurate information about what constitutes responsible parenting may be more likely to benefit from services that fatherhood programs provide.
- Fathers who believe that they can change, that change will yield benefits that outweigh perceived costs, and that they are deserving of such benefits may also differentially be affected by fatherhood programs.
- The father's views of himself as a father, the importance he places on the father role, his lifestyle, and his age and/or life stage may motivate him to make necessary changes in his fathering behavior and, thus, may be more likely to benefit from fatherhood programs.
- Personality characteristics such as openness to change, emotional stability, and reactivity to stress are dispositional factors that may influence fathers' behavior and/or their willingness to change.
- Relationships with "important others" in the father's life and the broader community context can also shape his fathering behavior and his inclinations to change. The mothers of his children, his friends, and his extended family can support (or thwart) a father's efforts to become better parents, providers, and partners by providing (or withholding) positive appraisals and various forms of support (informational, instrumental support, and/or emotional).
- Contextual factors such as community and peer norms around what it means to be a man and a father and the extent to which fathers have positive role models in their peers or in their own fathers may shape a father's attitudes toward fatherhood, his father-related behaviors, and his inclination toward changing (improving) these behaviors.

Our search of the literature on low-income fathers yielded 64 studies that examined the role of our psychosocial characteristics in predicting one or more key fatherhood-related outcomes. We found considerable variation in the extent to which studies examined and found evidence of relationships between certain predictors and outcomes. Even among predictors that have been examined more extensively in empirical studies, variations in research design and a disproportionate focus on parenting behaviors as outcomes means that much remains to be learned about psychosocial predictors of fathering behavior.

- By far, the most common outcome examined across these studies was fathers' parenting behavior. Less frequently examined were fathers' well-being and their relationship with the mother of the children, examined in about 20 percent of studies reviewed.

Interestingly, despite the critical importance of the economic and child-support outcomes for low-income fathers, few studies examined links between fathers' psychosocial characteristics and these outcomes. (Though substantial research exists on the links between fathers' *demographic* characteristics and these economic outcomes.)

- Categories of predictors most often examined pertained to the father's relationship with his child's mother (in 56 percent of all studies), his stress and coping (in 41 percent of studies), aspects of the father's general or role-related identity (in 33 percent of studies), and aspects of the father's personal history (in 28 percent of studies).
- Even among the categories of predictors most often examined, we found a limited number of studies that used both multivariate and longitudinal designs.
- In operationalizing psychosocial constructs within predictor categories, study authors used a variety of measures to create a wide range of variables, which made it difficult to assess the state of knowledge.

Some psychosocial predictors have an extensive theoretical basis but few studies have empirically tested their relationships with fatherhood-related behaviors and outcomes.

- The lack of studies examining fathers' knowledge as a predictor was somewhat surprising, given that most fatherhood programs seek to improve fathers' knowledge (about parenting, child development, and the child-support system) as a means of improving parenting, relationship, economic, and child-support outcomes. The paucity of studies examining knowledge may stem in part from our decision to exclude program evaluations from this review.
- It was also somewhat surprising that few studies examined social norms, given the theoretical relevance of this construct even among fatherhood researchers. It may be that social norms are more often examined in ethnographic and other qualitative research on fathers, which was excluded from this review if small samples precluded researchers from conducting statistical analyses on the link between social norms and fatherhood-related outcomes.
- Although cognitions are widely theorized in public health education to affect behavior, few studies examined predictors in this category.

Additional research on the extent to which theoretically relevant but empirically understudied psychosocial factors predict fatherhood-related outcomes would be illuminating. But more importantly from a program evaluation perspective, research is needed on the extent to which psychosocial factors shape fatherhood program *impacts*—that is, whether program impacts differ in subgroups defined by psychosocial factors. We also need to better understand how best to operationalize these constructs with measures that have been validated for use with fathers, especially low-income and culturally diverse samples of fathers. Methodological research is needed on how best to categorize and combine such variables to create meaningful subgroups. Such information would be useful for identifying subgroups of fathers with various constellations of needs and who are more (and less) ready, willing, and able to participate in and benefit from fatherhood programs, allowing program providers to better target and serve low-income fathers and allowing program evaluators to test whether the program is effective (and equally effective) in these subgroups.

VIII. HOW MIGHT THESE CONCEPTS AND SUBGROUPING APPROACHES BE APPLIED TO FATHERHOOD PROGRAM EVALUATION?

Our scan of innovative approaches to creating subgroups and our reviews of behavior change theories, psychological theories of fatherhood, and empirical research on psychosocial predictors of fatherhood-related outcomes point us in some potentially useful directions for future evaluations of fatherhood programs. But before exploring new ways of thinking about subgroups in fatherhood program evaluations, it is useful to review what we already know about subgroups of low-income fathers that have been studied in program evaluations. In Section A, we discuss subgroups that have been examined (and those for which impacts have been found) in high quality impact evaluations of fatherhood and other family-strengthening programs. In Section B, we discuss variables that could be considered in creating baseline subgroups. In Section C, we discuss various approaches to creating these subgroups as well as some implications for data collection, and in Section D, we highlight some implications for data collection.

A. Subgroups Examined in Rigorous Fatherhood and Family-strengthening Program Evaluations

In the Strengthening Families Evidence Review (SFER), researchers at Mathematica conducted a systematic review of research on programs serving low-income fathers (Avellar et al. 2011) and programs serving low-income couples (Avellar et al. 2012). For research examining program impacts, the review examined the strength of the evidence and provided information on outcomes examined and average impacts found. While not focused exclusively on fathers, couples-based family-strengthening programs contain many of the same relationship services—and, increasingly, economic stability services—as fatherhood programs. These programs also target low-income families. Therefore, it could be instructive to consider the subgroup impacts examined in these programs as well.

For the present study, we selected impact studies rated high quality then reviewed the original impact reports to see the extent to which subgroup impacts were examined and, if so, which subgroups were considered and any impacts found. We summarize these findings below—first for high quality impact evaluations of programs serving low-income fathers, then for high quality impact evaluations of programs serving low-income couples.

1. High Quality Impact Evaluations of Employment and Family-strengthening Programs Serving Low-income Fathers

The review of research on programs serving low-income fathers identified 12 impact evaluations that employed designs deemed strong enough to detect program impacts. Of these, eight were rated as meeting high quality standards of evidence (Avellar et al. 2011). In four of the eight studies—evaluations of Filial Therapy (Landreth and Lobaugh 1998), Information and Insights about Infants (Pfannenstiel and Honig 1991), Men As Teachers (Fagan and Stevenson 2002), and the NCP Choices PEER pilot program (Schroeder et al. 2011)—subgroups were not examined, likely due to the small sample sizes. Subgroup impacts were examined in each of the four remaining high quality evaluations, and impacts were found in all four of these studies.

Supporting father involvement. Cowan and colleagues (2009) examined whether impacts of the father-only version of the Supporting Father Involvement program differed for higher- versus lower-income fathers, for married versus cohabiting fathers, for Mexican American versus European American fathers, and for fathers who were satisfied versus those dissatisfied with their couple

relationship. No impacts were found in these subgroups. Because the sample sizes were small and most likely did not provide sufficient statistical power to detect effects, it is not clear whether there truly were no impacts for these groups or differences existed but sample sizes were too small to detect them.

Jobs-First GAIN. A traditional mandatory welfare-to-work program, the Jobs-First GAIN (Greater Avenues for Independence) program provided job club, job placement, case management, and an earnings disregard. The Los Angeles Jobs-First GAIN Evaluation examined whether employment and earnings were greater for program fathers than fathers who could receive welfare and food stamps and participate in other work programs obtained on their own (Freedman et al. 2000). They hypothesized that impacts on employment and earnings would be strongest among fathers who could benefit most from participation, defined as those who were the most educationally or economically disadvantaged. The researchers found strongest impacts for those lacking a high school degree or GED at baseline and for the most disadvantaged, defined as high school dropouts who did not recently work for pay and who had received welfare for at least two years.

Wisconsin's child support earnings disregard policy. This policy, enacted in the late 1990s, allowed custodial parents to continue to receive their full Temporary Assistance for Needy Families (TANF) amount even if they received child support. (Standard policy was to subtract the amount of child support paid by noncustodial parents from the custodial parent's TANF check.) The Child Support Demonstration Evaluation examined whether payment of child support was higher for families receiving the full disregard compared to families who received only a partial disregard (Cancian et al. 2008). The researchers hypothesized that the policy would be more effective for fathers with a current child support order (because changes in child support would be most salient to them). They also sought whether the policy was effective for families with no recent welfare experience (on the premise that estimated effects for new cases would better approximate long-term effects of the policy). Cancian and colleagues found that, by the third year, the policy did in fact increase the likelihood of payment and the average amount paid among fathers with a child-support order at study entry and among families with no recent welfare experience.

Parents' Fair Share (PFS). PFS was a mandatory program that sought to increase employment, earnings, child-support payments, and father involvement among low-income non-custodial fathers by providing employment and training, curriculum-based peer support, voluntary mediation with the custodial parent, and short-term modifications of child-support orders (<http://familyreview.acf.hhs.gov/ProfileDetails.aspx?prID=153>). In their evaluation of PFS, Miller and Knox (2001) explored whether the program was effective for fathers with and without a high school diploma. They found that the program increased earnings among non-graduates but did not affect earnings among high school graduates. The program also increased employment rates only for the most disadvantaged fathers (those without a high school diploma or GED or with little work experience).

2. High Quality Impact Evaluations of Family-strengthening Programs Serving Low-income Couples

A parallel review of family-strengthening programs serving low-income couples found that only four impact evaluations met high quality standards of evidence (Avellar et al. 2012). In one of these four studies—the evaluation of Fatherhood, Relationship, and Marriage Education (FRAME) (Wadsworth et al. 2010)—subgroups were not examined, likely due to the small sample sizes.

Subgroup impacts were examined, and found, in each of the three remaining high quality impact evaluations.

Building Strong Families (BSF). The BSF program was developed by a team of researchers under contract to the U.S. DHHS to test the effectiveness of curriculum-based relationship skills education and support, case management, and service referrals provided to low-income unmarried, romantically involved couples who were expecting or recently had a baby (Dion et al. 2006; Dion et al. 2008; Dion et al. 2010). The multi-site evaluation of BSF examined program impacts at 15 months in a number of subgroups defined by socio-demographic characteristics (parental age, race/ethnicity, educational attainment, religiosity), economic circumstances (couple earnings), and psychological distress. Researchers also explored impacts in subgroups defined by attitudes toward marriage and by the nature and quality of the couple relationship at study entry (including whether either member of the couple had a child by a previous partner) (Wood et al. 2010). The strongest and most consistent set of subgroup impacts were found for African-American couples, who experienced improvements on four of the five measures of relationships quality and on a composite relationship index. Wood and colleagues also found positive impacts on relationship quality for couples with less than a high school education and for couples who entered the study with relatively higher levels of relationship quality, and that BSF decreased the likelihood of marriage and continued romantic involvement among couples experiencing multiple partner fertility (that is, at least one member had a child by another partner as of study entry). BSF produced offsetting impacts on the composite relationship index depending on partners' ages: Couples in which at least one partner was younger than 21 experienced positive impacts on the relationship index, whereas couples in which both partners were 21 or older experienced negative impacts on the relationship index. BSF also decreased the likelihood of marriage and continued romantic involvement among these "older" couples.

Family Expectations (FE). FE was the BSF program in Oklahoma City. FE provided information on infant development, self-care, the importance of fathers in the lives of children, and co-parenting, as well as curriculum-based communication and problem-solving skills to low-income married and unmarried couples who were parents of infants or expecting a baby. Devaney and Dion (2010) conducted additional analyses beyond what was conducted for the BSF cross-site evaluation report and likewise found a consistent pattern of positive impacts for African American parents, including fewer maternal depressive symptoms and increases in relationship quality, co-parenting, father involvement, and in the percentage of fathers providing substantial financial support to their child. Favorable impacts were also found for couples with less than a high school education, including increases in relationship quality, partner fidelity, fathers' substantial financial support, mothers' parenting, and reductions in mothers' depressive symptoms and the percentage of mothers reporting physical assault. (These impacts were not found among more educated parents.) Devaney and Dion also found positive impacts for couples entering the program with lower levels of relationship quality, and a few, smaller positive impacts for couples with better quality relationships at baseline.

Supporting Healthy Marriage (SHM). Like BSF, SHM was developed for the express purpose of testing the effectiveness of a research-based set of family-strengthening services. But rather than targeting unmarried couples (as in BSF), SHM served low-income married couples with children. SHM provided relationship and marriage education workshops, complementary activities designed to reinforce workshop material and to allow couples opportunities to interact with other married couples, and family support services including links to community services and one-on-one coaching on topics addressed in the workshops. The multi-site evaluation examined impacts for subgroups defined by race/ethnicity, income (relative to the poverty level), and baseline levels of

marital distress. Relatively few subgroup impacts were found. SHM impacts were slightly larger for Hispanic couples and for couples who entered the study at higher levels of marital distress (Hsueh et al. 2012).

3. Summary

When subgroups have been examined in high quality impact evaluations of fatherhood and couples-based family-strengthening programs, variables used for creating subgroups typically involve *demographic characteristics* such as race/ethnicity, educational attainment, and marital/relationship status. Using these subgrouping variables (or examining impacts among homogeneous subpopulation of fathers within a single study), programs were found to be effective for more economically disadvantaged fathers (Parents' Fair Share), for African American fathers (Men as Teachers), for African American couples (FE), and for Hispanic couples (Supporting Healthy Marriage). All these findings support the compensatory hypothesis of subgroup impacts.

In some cases, variables reflecting baseline levels on *outcomes sought for program participants* were used as subgrouping variables. Outcomes typically sought in fatherhood programs include improved parenting and co-parenting, more stable and better quality partner relationships, economically viable employment, increased child support, and improved father well-being. Outcome variables used in these high quality impact evaluations for creating subgroups were limited to the nature and/or quality of the partner relationship, and involvement with child support. Using these subgrouping variables, programs were found to be effective for fathers already involved in the child-support system (Wisconsin's Child Support Earnings Disregard Policy), for couples entering the program with lower relationship quality (Supporting Healthy Marriage; FE), and for couples entering the program with higher relationship quality (BSF). There were also a few instances in which programs were found to have unintended negative impacts—specifically, increasing intimate partner violence among couples in “on again/off again” relationships (Baltimore's BSF program), and reducing marriage and romantic involvement among couples experiencing multiple partner fertility and among young couples over the age of 21 (BSF). Overall, there were numerous instances of impacts found in subgroups that did not hold for the sample as a whole, and one example of offsetting impacts in complementary subgroups, illustrating the value of exploring impacts in theoretically meaningful subgroups.

Only two of these high quality impact evaluations examined subgroups defined by *psychosocial predictors of fatherhood outcomes*: BSF's examination of impacts for couples with more and less favorable attitudes toward marriage (Wood et al. 2010), and the Supporting Father Involvement program's exploration of impacts among fathers who were satisfied versus dissatisfied with their couple relationship (Cowan et al. 2009). None of these high quality impact evaluations examined subgroups defined by psychosocial characteristics reflecting a father's personal history (such as experiences in the family of origin), his personality and identity (such as openness to change and salience of the father role), his values and lifestyle (such as work ethic and criminal activity), the nature and degree of stress (such as financial stress and parenting stress) and his means of coping (such as avoidance or seeking out information), his fatherhood-related knowledge (for example, pertaining to effective discipline), social and peer norms to which he is exposed (such as expectations that he be an involved father), or supports available to him (including informational, emotional, instrumental, and financial support from friends, family, and community institutions). Moreover, none of these high quality impact evaluations examined subgroups defined by psychosocial characteristics conceptualized by behavior change theories as *determinants or prerequisites of behavior change*—such as, readiness, willingness, and commitment to change. It is therefore unclear whether impacts of these

family-strengthening programs for low-income fathers and couples might differ in subgroups defined by these psychosocial predictors of behavior and determinants of behavior change.

Regarding subgrouping approaches used, these high quality impact evaluations typically used single categorical variables, reflecting demographics (such as high school graduation status and race/ethnicity) or family-related status (such as marital status and multiple partner fertility). Wood and colleagues (2010) used multiple variables and an additive approach to create a relationship index prior to categorizing and assigning couples into “high quality” and “low quality” subgroups. Only the Jobs-First GAIN program evaluation (Freedman et al. 2000) adopted a multiple-variable interactive approach to defining subgroups, relying on demographic characteristics reflecting service needs (educational attainment, work history, time on welfare) rather than psychosocial factors predictive of behavior change. None of these impact evaluations used data-driven interactive approaches, such as cluster analysis, to create distinct profiles (subgroups) of individuals.

B. Baseline Variables to Consider in Creating Subgroups

Study findings indicate that research on the psychosocial determinants of behavior change among low-income fathers is in its infancy, and there is scant empirical evidence to suggest that these factors shape a father’s ability to benefit from a fatherhood program. As such, there is not enough evidence to make concrete recommendations regarding baseline measures of psychosocial factors that should be included in future fatherhood evaluations. However, although the empirical evidence in the fatherhood field is limited, the theoretical basis for considering these factors, as well as empirical evidence from other fields of research (for example, health behavior change), suggest that certain psychosocial factors may predispose some individuals to participate in and benefit from interventions. Building this research base will take years, but the Black Box study findings suggest possible fruitful areas of exploration in an effort to help move the field forward.

A fatherhood program may be differentially effective for fathers who enter the program with different levels or constellations of needs and challenges. One way to assess needs is to examine baseline levels on outcomes targeted by the program. Thus, program evaluators may want to examine variables reflecting the following fatherhood-related outcomes:

- **Employability.** A father who lacks the knowledge, skills, and dispositions necessary for viable employment may especially benefit from services designed to make him more employable. Does the father have a high school diploma or GED? What is his employment history? Does he know how to develop a resume and conduct an effective interview? Does he have “soft skills” necessary for employment success, such as the ability to get along with others?
- **Residential status, marital/relationship status, and relationship with child’s mother and current partner.** The nature and complexity of the father’s relationship with his biological children, their mothers, and any current romantic partner and non-biological children with whom he is involved could have implications for services he may need and/or his ability to participate in and benefit from a fatherhood program. Is the father married and living with his biological and adopted children? Or is he in a “fragile family”—unmarried but cohabiting with his biological children and their mother? Or is he a non-custodial parent, living apart from one or more biological children? Is he a “social father,” co-residing with unrelated children and their mother? Is he romantically involved, uninvolved, or in an “on-again-off-again” relationship with someone who may or may not be the mother of his children? How well does the father get along with his

child's or children's mother(s)? How well does the father get along with his current spouse/partner? What is the quality of these relationships—for example, are they mutually supportive with positive regard, or are they contentious?

- **Parenting and co-parenting.** A father who lacks knowledge and skills regarding positive, engaged parenting and cooperative co-parenting may especially benefit from services designed to improve these skills. What are the father's attitudes, knowledge, and skills related to parenting and co-parenting? What are his views of fatherhood—for example, what it means to be a “good father,” and the importance he places on the parenting role? How much does the father know about child development and effective parenting strategies? How well does he teach and otherwise support his child's learning? How well does he support his child emotionally? To what extent does the father collaborate or disagree with his child's mother about child-rearing?

In addition, individual and interpersonal factors shown and/or hypothesized to predict outcomes among low-income fathers may serve as good subgrouping variables because these, too, reflect potential service needs. Even if these factors are not directly targeted by a fatherhood program, these realities in men's lives may shape their inclination or ability to fully engage in services, which, in turn, could affect the likelihood that the program is effective. Such individual and interpersonal factors include:

- **Personal history.** Did the father receive sufficient care and attention as a child, or was he abused or neglected? What was the nature of his relationship with his parents, perhaps especially his father?
- **Identity.** How central is being a good father, co-parent, provider, worker, and spouse/partner to the father's identity? Is the father's personality conducive to making positive changes in his life? That is, is he open to change, conscientious, social, cooperative, and even-tempered? Or is he resistant to change, irresponsible, less social, antagonistic, and impulsive?
- **Values and lifestyles.** What are the father's goals regarding employment, parenting, and relationships with past, current, and/or future romantic partners? Is the way he lives his life—how he spends his time and his preferred activities—conducive to achieving his fatherhood-related goals?
- **Stress and coping.** What is the father dealing with in his life—such as major life events, chronic or acute health conditions, mental health issues, substance abuse problems, legal problems, family challenges, and daily hassles with parenting, employment, and partner relationships? What strategies does he use to manage parenting stress, financial stress, and work stress?
- **Fatherhood-related knowledge.** To what extent are fathers knowledgeable about child development, effective discipline strategies, and emotionally and cognitively supportive parenting? Do fathers understand the rights and responsibilities of noncustodial parents, how to establish paternity, and procedures for requesting adjustments to child-support and visitation orders? Do fathers know effective communication, conflict resolution, and effective co-parenting strategies? Do fathers understand how to find, secure, and retain stable employment?
- **Social and peer norms.** What messages and expectations regarding responsible fathering behavior is the father exposed to? How many of his friends are fathers? How

many are employed, are actively involved in their children's lives, and have positive relationships with their child's or children's mother(s) or their current partner?

- **Supports.** To what extent does the father have access to, and make use of, social, emotional, financial, or instrumental support from a spouse or partner, friends, and extended family? What is the nature and quality of the support received? To what extent does he utilize community services? Has he ever used community one-stops and workforce development centers? Has he accessed food stamps or other public assistance, substance abuse treatment, mental health services, or other fatherhood/parenting programs in the community? Has he previously enrolled in a fatherhood or parenting program?

Some fathers may not perceive a need to change, or may not be ready or willing to make changes in their lives, rendering a fatherhood program virtually powerless to effect change—unless it is expressly designed to move fathers through the stages of change (Prochaska et al. 1992). Behavior change theories and public health research employing audience segmentation methods suggest that the following cognitions may be critical or even necessary psychosocial prerequisites of any behavior change:

- **Attitudes and beliefs.** Does the father believe that he is not important to his children, or that his relationship with his child's mother has no bearing on his relationship with his child? Does he have confidence he will find stable employment, or has he given up hope? More generally, does he view the world as dangerous and unfair, or in a more positive light? Is he pessimistic or optimistic about his future?
- **Salience of current or expected outcomes.** What does the father perceive to be the consequences of his current behavior as a parent, provider, worker, and partner? Does he perceive any of these consequences as undesirable? Does he believe he will better off if he changes his behavior? Are the expected outcomes of change important to him?
- **Responsibility for change.** Does the father make excuses and blame others for his circumstances, or does he accept responsibility for his behavior and for the consequences of his behavior? To what does he attribute his successes and failures in life?
- **Self-efficacy and locus of control.** Does the father believe that change is possible? Does he believe that he can make the necessary and desired changes in his life?
- **Willingness and motivation to change.** Is the father willing to commit the time and effort to making the necessary and desired changes in his life? What is motivating his desire for change—achieving positive outcomes, or avoiding punishment and negative outcomes? Is he intrinsically or extrinsically motivated?
- **Deservingness.** Does the father feel unworthy and undeserving of greater involvement in his child's life and achieving other fatherhood-related goals? At the other extreme, does he have a sense of entitlement, believing he shouldn't have to change to get what he perceives as rightfully his (for example, child visitation)?
- **Readiness to change.** Is the father ready psychologically to change his behavior regarding involvement with his child, engagement in work, and fostering a positive relationship with the mother of his child and/or current spouse/partner?

- **Intentions to change.** Does the father express an intention to make necessary and desirable changes? Is he committed to making changes? Has he devised a plan or taken any action steps toward change?

In sum, the same fatherhood program may have different impacts for different subgroups of men depending on how well the intervention identifies different constellations of service needs and targets services accordingly. In addition, differential impacts may occur for fathers who enter the program at different stages of readiness to change and with different constellations of psychosocial factors at both the individual and interpersonal levels that can influence their ability to engage in and benefit from the program. Therefore, in creating subgroups, it may be important to consider the number, nature, and severity of challenges reflective of service needs, as well as psychosocial factors reflective of the individual father’s characteristics and social influences—both positive and negative—that may facilitate or serve as barriers to long-term change.

C. Subgrouping Approaches to Consider

In addition to selecting the “right” characteristics for creating subgroups, evaluators need to decide how they will assign individuals to subgroups based on these characteristics. These decisions should be informed by the underlying subgroup theory that makes the most sense, given the program or the characteristics of fathers being served. In Section II.B., above, we present three general approaches to defining subgroups:

1. The single-factor approach is appropriate if an evaluator theorizes that fatherhood program impacts may differ for fathers at higher versus lower levels of risk on a single dimension (such as those using more and less coercive discipline strategies), or for fathers in a qualitatively important circumstance (such as being in an “on again/off again” relationship).
2. An additive-risk approach is appropriate if an evaluator theorizes that fatherhood program impacts may differ for fathers at higher versus lower levels of cumulative risk across multiple dimensions (such as those lacking employment, conflict resolution skills, and non-coercive discipline strategies).
3. An interactive approach is appropriate if an evaluator theorizes that fatherhood program impacts may differ depending on the particular constellation of risk and protective factors experienced by fathers (such as those facing personal challenges but also with access to social supports and with effective coping strategies).

Below we draw upon study findings to describe how these approaches may be used to evaluate subgroup impacts in fatherhood programs. We address single-factor and additive-risk approaches together because the overall strategy is the same; only the number of variables used to create the subgroups differs.

1. Single- and Additive-risk Approaches to Defining Subgroups

Whether a single variable or multiple variables are used to define subgroups, both the single- and additive-risk approaches entail dividing a sample into subgroups based on the degree of risk on one or more dimensions. The “compensatory” hypothesis posits that subgroups defined at program entry as “higher risk” may experience the strongest impacts (assuming, of course, that the services received are of sufficient quality and sufficiently different from what equally high-risk control group members would receive). This is consistent with findings from Parents’ Fair Share, which was found

to increase earnings among fathers lacking a high school diploma but did not affect earnings among high school graduates (Miller and Knox 2001). Findings from the Devaney and Dion 2012 evaluation of FE also support the compensatory hypothesis: Among couples whose relationship quality scores placed them in the bottom half of the distribution at baseline, FE increased relationship stability, relationship quality, the quality of the co-parenting relationship, and the likelihood that fathers financially supported their children. Couples entering the program with higher relationship quality scores did not experience these impacts. In contrast, the “creaming” hypothesis appears to have held for BSF: This program improved relationship quality among couples whose relationship quality scores placed them in the *top* half of the distribution at baseline but not among their higher-risk counterparts (Wood et al. 2010).

The Goldilocks hypothesis posits that subgroups defined at program entry as moderate risk may experience the strongest impacts (again, assuming a strong treatment-control contrast). For example, fatherhood programs may be effective at improving relationships among couples in distress (moderate risk)—as found in the SHM evaluation (Hsueh et al. 2012)—but not among couples experiencing intimate partner violence or otherwise in a tumultuous relationship (high risk)—as found in the BSF evaluation (Wood et al. 2010).

Which variables are best suited for single- and additive-risk approaches to creating subgroups? Because these approaches focus on risks or needs for services, variables reflecting program outcomes (regarding employment, father involvement, and relationship with child’s mother) and variables reflecting content explicitly addressed in the program (such as experiences in the family of origin) may be especially fruitful to explore for creating baseline subgroups using these approaches.

Practically speaking, single- and additive-risk approaches to defining subgroups requires selecting one or more baseline variables and creating a high-risk subgroup reflecting a large number or risks or high level of severity along these dimensions. For example, one could define as high risk or high need those fathers who are considered high risk on employment (for example, currently unemployed, lacking a high school diploma or GED, and little or no employment history), parenting (for example, those endorsing or using harsh discipline practices), and in their partner relationship (for example, coercive and aggressive conflict tactics). Key to this approach is deciding how to define “high risk/need” for each individual variable, and how to combine these variables to produce a “high cumulative risk/need” subgroup. These decisions should be informed by where on the risk/need continuum subgroup impacts are hypothesized to occur.

2. Interactive Approaches to Defining Subgroups

Rather than focusing on the degree or number of risks, the interactive approach to creating subgroups entails dividing a sample into subgroups based on the particular constellation of risk (and potentially) protective factors present at baseline. Some interactive approaches are theory-driven, whereby evaluators specify co-occurring conditions that are expected to shape program impacts. Theory-driven approaches to defining interactive subgroups requires identifying the conditions under which program impacts are most likely, selecting variables reflective of these favorable conditions, then coding and combining these conceptually relevant variables in a way that effectively reflects these conditions. For example, evaluators may create a subgroup comprising individuals who both need and are likely to benefit from program services, hypothesizing that impacts are most likely among those who are committed to change and who are likely to show up at program services. In fact, some fatherhood programs seek to learn this up front in order to enroll only fathers who are “ready, willing, and able” to engage in the program (H. Sullivan, personal communication, May 14, 2012).

Other interactive approaches to defining subgroups are data driven. Service-user typology research and audience segmentation research typically use cluster analysis or latent class analysis to identify naturally occurring subgroups based on individuals' profiles of scores along multiple dimensions. Data-driven approaches to defining subgroups require identifying baseline characteristics hypothesized to influence the likelihood that fathers benefit from program services, then subjecting these variables to a clustering algorithm that combines individuals who are similar along each of these dimensions. This approach is especially fruitful when there is little or no theory or empirical evidence to suggest exactly how these variables should be coded or combined into subgroups because the data effectively identify where the important cut-points are for each subgroup.

Interactive approaches can be used to develop baseline subgroups of individuals with a certain constellation of service needs, in which case, variables reflecting program outcomes or program content are good candidates. In addition, it may be fruitful to explore constellations of factors that could facilitate or hamper participation in fatherhood programs. These could be logistical factors such as transportation and child care, circumstantial factors such as stressful life events and social supports, and psychological factors such as readiness to change and beliefs that change is possible. As noted above, however, fatherhood program evaluations typically do not adopt interactive approaches to creating baseline subgroups for use in impact analyses.

D. Implications for Data Collection

Creating subgroups for use in program impact evaluations requires collecting information on fathers' demographic and psychosocial characteristics, their interpersonal relationships, and their circumstances prior to random assignment (baseline). A key implication is that critical information must be collected by programs during the application and enrollment process, and by evaluators during the study sample intake process. In this section, we highlight key considerations for both programs and evaluators regarding baseline data collection.

Fatherhood program providers need information that allows them to (1) identify fathers who may benefit from program services, and (2) identify which services each father needs. Our study findings suggest that providers may want to assess readiness to change when screening for eligibility for program services to gauge a father's commitment to the program and to behavior change in general. Such a measure would need to be short and simple to administer, and its wording and response options should lend themselves to easily identifying fathers who are especially good candidates—and also perhaps fathers who are especially poor candidates—for the program. Such a readiness measure could be included on a self-assessment filled out by the father, or it could be a rating by program staff based on their informed judgment and years of experience working with fathers whose demeanor and attitudes signal likely program success.

Once enrolled in the program, fathers typically fill out a needs assessment prior to engaging in services to identify service needs and challenges. Our study findings suggest it may be important to identify not only what services the father may *need* but also what services he *wants*, based on his goals relating to employment, parenting, co-parenting, and his current or future partner relationships. Baseline needs assessments should also identify the strengths and supports available to him that he can capitalize on in his efforts to change, including barriers that may or may not be addressed with services but that may nevertheless shape the likelihood of success. These may especially be psychosocial in nature, such as counterproductive attitudes and beliefs.

Program providers have few resources and little time to develop measures prior to including them on intake forms. Program evaluators can help the fatherhood field in this regard by developing and pilot-testing items suitable for use on intake forms that are effective at identifying fathers with distinct service needs or fathers who may and may not benefit from program services. These items could tap the theoretically relevant but empirically untested psychosocial variables suggested by this study, or they could be other psychosocial factors not examined in this study but that program providers' perceive as important given their insights and experience working with fathers.

For the purpose of creating subgroups for exploration in impacts analyses, program evaluators have more flexibility. They may have the time to pilot test new and innovative measures, or existing measures that have not typically been used in social service research or with low-income and culturally diverse samples of fathers. Lengthier measures can be used (given that evaluation sample respondents are often compensated for their time completing surveys or interviews), and psychometric analyses can indicate whether briefer versions are equally valid and reliable. Finally, program evaluators can employ more sophisticated methods to create subgroups, such as latent class analysis, cluster analysis, and other methods allowing a constellation of factors to be considered simultaneously. With larger samples to support more rigorous statistical tests, program evaluators can develop and explore the utility of developing profiles of fathers most and least likely to benefit from fatherhood programs. Such findings would not only provide needed research on the effectiveness of fatherhood programs, but it would help fatherhood program providers better target scarce program resources.

IX. CONCLUSIONS

Fatherhood programs are designed to support fathers and foster positive behavior change in their roles as parent, partner, and provider. Service-user typology research suggests that the same fatherhood intervention might have differential impacts depending on how well the intervention addresses the number, nature, and severity of challenges that individual fathers face. Behavior change theories and public health research employing audience segmentation methods suggest that the same fatherhood intervention might have differential impacts for fathers who are more versus less ready, willing, and able to effect changes in their lives.

These hypotheses are largely untested. Research is needed on the extent to which theoretically relevant but empirically understudied psychosocial factors are important predictors of behavior change among low-income fathers enrolled in fatherhood programs, and if and how these factors shape the likelihood of their benefiting from these programs. Measurement research is also needed to better understand how best to (1) operationalize these constructs with measures that have been validated for use with fathers, especially low-income and culturally diverse samples of fathers; (2) code these variables (including defining cut-points for continuous variables) for use in creating subgroups, and (3) combine multiple theoretically relevant variables to yield promising subgroups.

Future research could explore:

- Which theoretically relevant but empirically understudied psychosocial factors shape fatherhood-related outcomes?
- What factors determine behavior change among low-income men? What are prerequisites of change? That is, what conditions must exist—at the individual, interpersonal, and contextual levels—before behavior change can be expected?
- What other factors foster or impede behavior change among low-income men?
- To what extent might these factors serve as useful variables for creating subgroups for use in impact evaluations that use an experimental design?
- Are there established measures that could be used to assess these factors at program intake?
- Are there additional, innovative methods for assessing these factors at program intake—such as the judgments and impressions of intake staff?

Regarding the creation of subgroups, future research could explore:

- Does the level of risk matter? Where on the risk-need continuum might subgroup impacts be expected?
- Do particular combinations of certain risks and readiness levels matter? What levels of need, coupled with what levels of readiness and willingness to change, might be needed for subgroup impacts to be expected?

Findings from program evaluations that examine subgroups based on factors other than demographic characteristics may aid in program development. Such findings can help fatherhood program operators think about how best to design interventions, decide those to target for program services, and assess fathers' needs at intake in the following ways:

- **Design interventions.** The most effective programs may need to target not only the outcomes ultimately sought for fathers—namely, viable employment, improved parenting, and improved partner relationships—but also aspects of their lives that may influence these outcomes, such as their relationship with their child’s mother, their experiences in the family of origin, and their stress and coping strategies. In addition, fatherhood programs may need to do more than provide information and skills; they may need to actively support the behavior change process. This would require explicitly addressing the conditions theorized to be necessary for change, such as the father’s perceived need and ability to change, his willingness to change, and his readiness to change. Programs that provide emotional supports (such as empowerment, encouragement, and opportunities to share concerns with peers) along with practical services and supports (such as goal setting, action planning, and links to necessary services) may more effectively move fathers from contemplation to preparation to action (Prochaska et al. 1992).
- **Target services.** Measures of service needs and psychosocial determinants of change such as readiness to change (Prochaska et al. 1992) might help fatherhood providers better recruit and enroll fathers most likely to benefit from program services. Fathers who (1) want to improve their employment prospects and gain viable, stable employment, (2) wish to be more involved in their children’s lives but lack the skills to be an effective parent and co-parent, (3) wish to improve their relationship with their child’s mother and/or a current romantic partner, and (4) are at a point in their lives where they are ready, willing, and able to make these changes may be the ideal candidate for a fatherhood program. By contrast, for example, unemployed fathers with a solid employment history and few other service needs may not need the intensive, comprehensive services typical of fatherhood programs, so these fathers may be better served by directing them to job search and job placement services in the community. At the other extreme, fathers who not only lack employment, parenting, and relationship skills but who face severe obstacles such as substance abuse, mental health issues, or domestic violence may need to address these issues first before they can successfully participate in and benefit from a fatherhood program.
- **Assess fathers’ needs at intake.** Baseline measures used in program evaluations could be adapted for use on intake forms to help providers identify fathers’ service needs and risks, strengths and protective factors, barriers to participation, and impediments to behavior change. This information could help providers better target, triage, and sequence the appropriate set of services.

To be sure, subgroup impact analyses present methodological challenges and concerns—sample size requirements and multiple comparisons chief among them. Evaluation sample sizes must be large enough to ensure sufficient statistical power to detect impacts in subgroups (or in the subpopulation comprising the evaluation sample), and examining numerous subgroups within a single sample runs the risk of finding spurious impacts purely by chance. Despite these and other practical challenges, it is useful to think about the various “kinds” of fathers who may enroll in and might benefit from fatherhood programs and to seek strategies for identifying which of these fathers may benefit most from intervention. Opening the black box to understand what works for whom and under what circumstances can help policymakers and program providers make more effective use of resources.

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APPENDIX A

APPROACH TO SEARCHING AND SELECTING STUDIES FOR REVIEW IN ENVIRONMENTAL SCAN OF SUBGROUPING METHODS

The project team developed a standard study review template designed to capture key data from each study. The template was piloted and refined according to feedback from all team members before its use for the reviews. For each study reviewed in the scan, in addition to any identifying information, we documented the following:

- Subgrouping method
- Subgroups
- Specific constructs and variables used to create subgroups

In addition, in preparing for our upcoming review of the literature on the determinants of behavior change (generally and specifically relating to outcomes targeted by fatherhood programs), we identified psychosocial variables that may be used in creating subgroups potentially relevant to fathers and fatherhood programs. (In a subsequent report, we will summarize the findings from a more extensive literature review of these predictors of behavior change.)

The environmental scan consisted of three types of searches: (1) audience segmentation methods used in public health, (2) service-user typology methods used to study homeless and public housing populations, and (3) subgrouping methods used in evaluations of fatherhood programs.

A. Audience Segmentation Methods in Public Health Literature

We consulted the public health research literature on the adoption of social marketing approaches to targeting public health interventions. Our initial database search identified 63 unduplicated studies, of which we screened out 42 because they:

- Did not mention audience segmentation in the abstract
- Appeared to focus only on a definition of audience segmentation or recommended audience segmentation in future research rather than describing a particular audience segmentation method
- Lacked a focus on public health
- Were published by an author whose more recent work we already have identified/included

We completed reviews of 14 studies for which full-text articles were available and documented the reviews in an online database for analysis.

B. Service- User Typology Methods in Homelessness/Public Housing and Other Literature

We simultaneously consulted the literature on service-user typologies developed to identify subgroups (for example, public housing residents, homeless individuals, low-income mothers, and welfare recipients) that may differ in the nature or extent of their needs for a variety of services. The purpose of the search was to identify subgrouping methods used specifically in service-user typology research and to identify general categories of constructs/variables used to create subgroups, as pertaining to fatherhood-related outcomes.

We began by compiling a list of the 95 references and associated abstracts referenced in Rog et al. (2007; Appendix B) and Theodos et al. (2010). To identify studies focusing on developing service-user typologies for other populations, such as welfare recipients or low-income women, we conducted a database search and added 4 service-user typology articles to our list. Overall, we screened out studies that:

- Did not discuss subgrouping methods or typologies.
- Discussed subgrouping methods but described methods or populations for which we already had several sources of information. (For example, we already had several references discussing cluster analysis for homeless individuals.)
- Discussed predictors or determinants of homelessness, but with a focus inapplicable to fatherhood outcomes.

We identified eight studies that were relevant for review as part of this search.

C. Subgrouping Methods Used in Evaluations of Fatherhood Programs

We examined impact evaluations identified in the Strengthening Families Evidence Review (SFER)—a systematic review of research on programs serving low-income fathers (Avellar et al. 2011) and programs serving low-income couples (Avellar et al. 2012). Specifically, we selected impact evaluations rated as “high quality,” then reviewed the original impact reports to see the extent to which subgroup impacts were examined and, if so, which subgroups were considered, how such subgroups were defined, and any impacts found.

We reviewed a total of 12 high quality impact evaluations—eight evaluating fatherhood programs, and four evaluating programs serving low-income couples.

APPENDIX B
THEORIES OF BEHAVIOR CHANGE REVIEWED

In this appendix, we briefly describe key theories that address psychosocial contributions to decision-making and behavior change. Section 1 describes health behavior theories, Section 2 describes behavioral economics theory, and Section 3 presents psychological and developmental theories pertaining specifically to fatherhood.

A. Health Behavior Change Theories and Concepts

Glanz and colleagues (2008) reviewed decades of research in public health and found the following theories most often examined by health behavior change researchers:

- **Theory of Reasoned Action/Theory of Planned Behavior (TRA/TPB; Ajzen and Fishbein 1980).** These individual-focused theories view the individual as a rational decision maker. According to TRA/TPB, an individual's intention to engage in a behavior is the best predictor of whether he actually will. Behavioral intention is born of the individual's assessment of the desirability of the perceived outcome, social pressures and norms regarding acceptable behavior, and the individual's perceived control over enacting the behavior (Montaño and Kasprzyk 2008).
- **Health Beliefs Model (HBM; Rosenstock 1966).** Like TRA/TPB, this individual-focused model assumes individuals act rationally, but this model focuses specifically on why individuals fail to engage in healthy behaviors. It was developed to help explain why individuals do and do not participate in health prevention programs (Hochbaum 1958) and to understand individuals' responses to symptoms (Kirscht 1974) and, therefore, focuses on such psychosocial factors as an individual's perceived susceptibility to an adverse outcome (for example, contracting a disease); the perceived severity or the expected consequences of the adverse outcome (for example, pain or death); the perceived benefits or beliefs about the extent to which adopting new behaviors will reduce the adverse outcome and its consequences; confidence in one's ability (efficacy) to adopt the new behavior; and the perceived barriers and costs of engaging in the new behavior (Champion and Skinner 2008).
- **Transtheoretical Model (TTM)/Stages of Change (Prochaska et al. 1992).** This model posits that behavior change is a process that occurs in a series of five stages: (1) the Pre-contemplation stage, in which individuals are unaware of the problem; (2) the Contemplation stage, in which individuals are aware of the problem, are thinking about changing, but have not committed to doing so; (3) the Preparation stage, in which individuals have committed to change and may have already made small alterations in their behavior in preparation for more substantial changes; (4) the Action stage, in which individuals substantially modify the undesired behavior over a period of months; and (5) the Maintenance stage, in which individuals work to prevent relapse and sustain the behavior achieved in the Action stage (Prochaska et al. 1992).
- **Social Learning/Social Cognition Theory (SCT; Bandura 1977).** A central tenet of SCT is that behavior is affected by factors both within and external to individuals. Individuals learn behaviors by watching others; behaviors that are more closely linked to desirable expected outcomes are particularly salient. Ultimately, a behavior is more likely to be performed if individuals are confident of their capacity for doing so (McAlister et al. 2008).
- **Social Networks and Social Supports (see Heaney and Israel 2008).** Social networks are the "web" of social ties, with immediate and extended family members,

peers, and “important others” surrounding an individual. Social support refers to the emotional, instrumental, informational, and appraisals provided by these social relations, which can serve to enhance or impede an individual’s efforts to change (Heaney and Israel 2008).

- **Transactional Model of Stress and Coping (Lazarus and Cohen 1977).** Stressors are internal and external demands that cause stress in an individual, and coping refers to strategies for addressing the stressor and for managing emotional reactions to it. This model posits that reactions to stressors depend on individuals’ evaluation of the potential threat posed and whether they have the psychological, social, and cultural resources to counter it. The more threatening and less controllable a stressor is perceived to be, the less likely individuals will act upon it, and so behavior change is less likely. Coping styles and mechanisms—for example, information seeking, adopting positive dispositions (such as optimism, hope, future orientation, and perseverance), and accessing social support—can counteract the effects of stressors and facilitate behavior change (Glanz and Schwartz 2008).
- **Ecological Models (Bronfenbrenner 1977).** Ecological models view the developing individual as embedded in and influenced by a variety environments, both proximal and distal: families; neighborhoods; the workplace; schools; community service agencies; and federal, state, and local policy environments, for example. These environments can support or hinder behavior change. One ecological model of parenting, for example—a “Dynamic Model of Paternal Influences on Children” (Cabrera et al. 2007)—posits that fathers’ biological, cultural, and rearing history, together with family characteristics and contextual circumstances, affects fathers’ involvement with their children. Ecological models suggest that behavior change is more likely when both individual and environmental factors are supportive of the change.
- **Social Marketing (see Storey, Saffitz, and Rimón 2008).** Social marketing aims to influence individual behavior by fostering knowledge, attitudes, and skills that support desired outcomes (Andreasen 1994, 2006). Social marketing “facilitates the acceptance, rejection, modification, abandonment, or maintenance of particular behaviors by...the target audience” (Grier and Bryant, 2005). Social marketing is relevant to the design and implementation of public media campaigns as well as knowledge- and skills-based educational health and educational interventions. A key principle of social marketing is audience segmentation—targeting health promotion messages and programs to distinct subgroups based on such characteristics as goals, lifestyles, current behavior, future intentions, and readiness to change. These characteristics are important because they influence the salience of the desired behavior and individuals’ receptivity to behavior change interventions (Grier and Bryant 2005).

Below, we summarize key concepts from these major health behavior change theories.

- **Factual knowledge and awareness**, such as health facts, the preventability or treatability of a condition, and effective strategies improving outcomes and reducing risks (Slater and Flora, 1991)
- **Perceived risk**, including the perceived susceptibility to negative outcomes and the perceived need to change
- **Positive outcomes expectancies**, including the benefits of engaging certain behaviors

- **Salience/importance placed on the expected outcome**, such as the importance placed on being healthy (Slater and Flora 1991)
- **Psychological readiness to change**, for example, whether one is even aware of the need for change and, if so, whether s/he is simply considering making changes or has already taken the necessary steps toward change (Prochaska et al. 1992)
- **Willingness to change**, such as the willingness to purchase healthier foods even if pricier than less healthy foods (Slater and Flora 1991)
- **Motivation to change**, including both intrinsic (such as enjoyment from an activity, and the desire to master a skill) and extrinsic (external rewards and punishments inducing behavior change)
- **Self-efficacious beliefs about change**, such as confidence in one's ability to eat a healthy diet and exercise regularly (Slater and Flora, 1991), and confidence in following health screening procedures (BeLue et al. 2011)
- **Intentions to change**, both in terms of stated goals ("I plan to change") as well as specific, actionable plans ("I have made plans to change") (Rose et al. 2007)
- **Perceived barriers to change**, including psychological barriers (such as fear) and perceived logistical barriers (lack of time, lack of resources perceived as necessary to support change)
- **Social norms**, including expectations of one's culture, peers, and/or other "important others," actual behaviors of these important others (for example, number of friends who smoke; Rose et al. 2007), and the perceived prevalence of risky behavior in the community
- **Social support**, including the amount, source, type (instrumental, emotional), and nature of support (for example, positive or negative)
- **Kin and social networks**, including the overall size, density, and composition
- **Interpersonal relationships**, including expectations of important others, appraisals by important others, and relationship quality

B. Behavioral Economics Theory

Behavioral economics extends traditional economic theory of human behavior to ground it in "more realistic psychological foundations" (Camerer and Lowenstein 2004). As in economic theory, decision making is still theorized to be a rational process, but behavioral economics acknowledges that individuals' decisions are not simply the result of straightforward calculations of costs and benefits by a rational actor with perfect information. Rather, behavior results from both logical and psychological processes within the individual, as well as from the complex interplay between individuals and their environment.

In describing the key tenets of behavioral economics, Bertrand et al. (2004) posit that behavior change requires:

- **Reducing psychological barriers.** Individuals may not engage in a behavior even if it is sensible to do so. Psychological factors such as feelings of inadequacy or beliefs that they

cannot change their behavior can prevent individuals from engaging in more positive behavior, even if they acknowledge that these are behaviors they should adopt.

- **Strengthening identity salience.** Behaviors that are congruent with aspects of an individual's identity that are most salient to him or her are more likely to occur.
- **Triggering positive feelings.** Behaviors that trigger positive feelings, such as a sense of confidence or self-efficacy, are more likely to occur.
- **Making the desired behavior the default behavior by changing norms.** Individuals' decisions and behaviors are influenced by their environments, so if social norms are supportive of a particular behavior, it is more likely to occur.
- **Paying attention to “channel factors.”** These are small details that can impede or facilitate adoption of desired behaviors. For example, health researchers may provide a map to a doctors' office. Fatherhood programs may choose to co-locate with services fathers need, such as employment services.

C. Psychological and Developmental Theories Relevant to Father Behavior and Behavior Change

Psychological and developmental theories speak to individual, interpersonal, and contextual factors that influence fathering behavior and, as such, are also worth considering as theoretical anchors for identifying predictors of fathering behavior. Family scholars draw from a variety of perspectives, including psychoanalytic and developmental psychology, sociology, and economics (Tanfer and Mott 1998). The following briefly describes key theoretical perspectives used to study fatherhood:

- **Personality Theories (see reviews in McRae and John 1992; Mischel and Shoda 1995).** Personality characteristics predispose individuals to behave in certain ways, and certain personality characteristics may make behavior change more and less difficult. The five dimensions of personality validated over decades of research are openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism.
- **Attachment Theory (Bowlby 1979; Ainsworth 1991).** Children form attachments to their parents and other primary caregivers, and these attachments have lasting consequences for the development of close relationships and responsive parenting into adulthood.
- **Life Course/Life Stage Theory (Bengston and Allen, 1993).** Life transitions shape how men experience fatherhood and perform as fathers, and this affects their fathering behavior (Marsiglio 1995). Normative life transitions could include the start or end of a romantic relationship, residential moves, and job changes or loss of a job; such changes can affect a father's physical and emotional availability to his children.
- **Developmental/Generativity Theory (Erickson 1982).** As adults develop, they increasingly orient themselves toward the care and well-being of the next generation, which involves biological generativity (procreation), parental generativity (parenthood), and societal generativity (broader contributions to a better world) Correspondingly, men can be biological fathers, child-rearing fathers, and/or social fathers (Tanfer and Mott 1998).

- **Identity Theory (Kuhn, 1960)/Role Occupancy Theories (Fox and Bruce 2001; Pleck and Pleck 1997).** How an individual perceives himself in various roles—for example, as a parent, provider, worker, spouse/partner—can influence his behavior. The more salient and central the role of “father” to a man’s identity, the more he will engage in a variety of fatherhood-related behaviors.
- **Motivation Theory (Dweck 1999).** Behavior depends on an individual’s performance goals, which are driven by self-theories about change. Individuals who believe that intelligence and skills are fixed are not motivated to persevere in the face of adversity, whereas individuals who believe intelligence and skills are malleable will persevere when faced with challenges. The former will therefore tend to be resistant to change, preferring instead to “prove” what they already know, whereas the latter will seek to “improve” and are more open to change.
- **Parental Investment Theory (PIT; Daily and Wilson 1980).** Parents make decisions about how much time, energy, and financial resources to invest in their children, and, to some extent, these decisions are based on the likelihood that these investments will pay off for the child and/or for the father (Fox and Bruce 2001).
- **Social Scripting Theory (Simon and Gagnon 1987).** Men receive and internalize cultural norms and messages about what it means to be a father, and this affects their fathering behavior (Doherty et al. 1998).

APPENDIX C

APPROACH TO SEARCHING AND SELECTING STUDIES FOR LITERATURE REVIEW ON PSYCHOSOCIAL PREDICTORS

Table C.1 lists the search terms we used to find relevant studies for the literature review. We conducted the search in multiple steps by combining the target group and outcome domains search terms with each row in set A. The following databases were included in our search:

- Academic Search Premier
- Campbell Collaboration
- CINAHL with Full Text
- Cochrane Central Register of Controlled Trials
- Cochrane Database of Systematic Reviews
- Cochrane Methodology Register
- Database of Abstracts of Reviews of Effects
- Dissertation Abstracts International; EconLit
- Education Research Complete
- ERIC
- PsycINFO
- SocIndex with Full Text
- SocLit

Our initial search of these databases yielded 1,817 studies. We then proceeded to screen out studies for one or more of the following reasons:

- The article was not an empirical study (that is, it was a literature review or research review)
- The analytic sample used in the study did not include fathers
- The study did not examine a psychosocial predictor of interest
- The study did not examine a fatherhood outcome of interest
- The study did not examine associations between predictors and outcomes of interest (that is, descriptive-only studies, including qualitative studies)
- Results were not presented separately for fathers

Table C.1. Search Terms for Literature Review

Target Group	(father* or patern*) AND ("low income" or "low-income" or poor or poverty or disadvantage*)
SET A: Predictors of behavior change	
PERSONAL HISTORY	"Family-of-origin" OR attachment OR childhood
IDENTITY (GENERAL)	[personality OR "self-aware*" OR openness OR conscientious* OR determin* OR extravert* OR agreeable* OR neurotic*] [disposition OR temperament] [anger* OR defianc* OR resent*] [hope OR optimis*] impuls* problem-solv*
IDENTITY (ROLE-SPECIFIC)	"identity" NEAR (role OR theory)
IDENTITY (AS A MAN)	"gender-role" OR "identity as a man" OR "gender identity"
IDENTITY (AS A FATHER OR AS A CO-PARENT)	("paternal identity") OR ("parental identity") OR "parenting role"
IDENTITY (AS A PROVIDER)	(provider OR breadwinner)-NEAR role"
IDENTITY (AS A PARTNER)	[(partner OR spouse OR husband OR cohabit) NEAR role]
GOALS	[value* OR lifestyle OR "time-use" OR activit*]
STRESS AND COPING	[stress* OR coping*]
KNOWLEDGE	[information OR knowledge] NEAR "child development" OR parenting
PERCEIVED RISK FOR NEGATIVE OUTCOMES	[(vulnerabil* OR risk* OR need*) NEAR (belief* OR attitude* OR perceived OR perception OR aware*)]
SALIENCE OF OUTCOME	[(importance OR salience] NEAR (outcome* OR behavior* OR change) OR (perceived NEAR benefit)
WILLINGNESS TO CHANGE	[willing* OR desire OR want OR open*] NEAR change
RESPONSIBILITY FOR CHANGE, ATTRIBUTIONS	[responsibility OR attributions OR "reasons for failure" OR "reasons for success" OR "locus of problem"]
DESERVINGNESS	[deserv* OR *worthy OR *worthiness OR entitle*]
SELF-EFFICACY	[efficacy* OR self-eflicac* OR confiden* OR "locus of control" OR "ability to change"]
MOTIVATION	[motiv* OR *incentive OR] NEAR change
READINESS TO CHANGE	["ready to change" or "readiness to change"]
BEHAVIORAL INTENTIONS	[intend OR intent* OR plan*) NEAR (change OR behavior*)

OUTCOME EXPECTANCIES	[expect* NEAR (outcome* OR change)
SOCIAL NORMS	(peer OR social OR cultur*) NEAR (expectation* OR norm* OR appraisal*)
KIN/PEER/SOCIAL NETWORKS AND SUPPORTS	(peer* OR social OR instrument* OR logistic*) NEAR (support OR capital OR network OR integration)
SET B: Outcome domains	
	<p>("self-sufficien*" or "self sufficien*" or earn* or wage* or employ* or job) or work or education or training</p> <p>(crime or jail or incarcerat*) or</p> <p>("child support") or</p> <p>(marriage or married or cohabitat* or "co-habitat*" or partner or relationship))</p> <p>((parent* near5 skill* or abilit* or harsh*)) or discipline</p> <p>"co-parent*" or coparent* or</p> <p>(parent* or patern* or father) near5 (involve* or engage* or absent* or warmth or responsive* or affection or contact)</p> <p>(cognit* or learning) NEAR (stimulation or environment)</p> <p>("parent-child" or "father-child") NEAR (interact* or play)</p> <p>(child* near5 (abuse or neglect or maltreatment or injury or violence or)) or</p> <p>("domestic violence" or "family violence" or "intimate partner violence")</p>

APPENDIX D

DETAILED EXAMPLES OF INTERACTIVE APPROACHES USED IN SERVICE- USER TYPOLOGY RESEARCH AND AUDIENCE SEGMENTATION RESEARCH

A. Detailed Example of Interactive Approach Used in Service-User Typology Research

McGroder et al. (2003) sought to develop a typology of barriers to employment in a sample of 916 welfare-receiving mothers subject to mandatory participation in a welfare-to-work program. Using data from the National Evaluation of Welfare-to-Work Strategies, the researchers examined a number of variables reflecting mothers' service needs and challenges:

- Mothers' human capital (literacy and whether they graduated from high school)
- Mothers' labor force experience (past employment and length of time receiving welfare)
- Mothers' physical and psychological well-being (health problems, depressive symptoms, and their sense of control over their lives)
- Logistical barriers to employment (access to child care and transportation)

Applying cluster analysis to these nine variables yielded five clusters:

- The largest cluster, "Lower Risk," which comprised 30 percent of the sample, was characterized by below-average scores on each of the nine hypothesized barriers/risks. The mothers in this cluster were the least likely to report transportation or child care problems, had the fewest depressive symptoms, and averaged only one or two years of receiving welfare. None reported health problems keeping them from school or work, most had a high school degree and higher literacy scores than the sample average, and every mother in this cluster reported having had worked full-time for the same employer for at least six months.
- The second cluster, "Lower Risk but No Work History," comprised 16 percent of the sample and scored below the sample average on all barriers to employment except one. Unlike the lower risk cluster, every mother in this group reported never having worked full time for six months or more for the same employer. It was also the factor that distinguished this group from each of the others.
- The third cluster, "Human Capital but Psychological and Logistical Barriers," comprised 19 percent of the sample, and the members of this group were at risk in some ways, but at lower risk in others. As in the first two clusters, most mothers in this group had a high school degree and literacy scores above the sample average, and none reported a health problem interfering with work. Almost all had work experience and received welfare for less than two years. However, this group scored the highest of any group on depressive symptoms and lower perceived control over their lives, and most reported not being able to go to school or work because they could not afford child care.
- The fourth cluster, "Health Barriers," comprised 18 percent of the sample and had only one barrier to employment. Though they scored at the sample average on human capital and employment history, every mother in this cluster reported not being able to go to school or work because they or a family member had a health or emotional problem.
- The final cluster, "Multiple Barriers," comprising 17 percent of the sample, had the poorest human capital, spent the most time on welfare, and over half had never worked full time for six months or more for the same employer. These mothers also had

relatively many depressive symptoms and little sense of control over their lives, and most reported problems securing child care and transportation.

Examining maternal employment and child outcomes in each cluster, the researchers found that two subgroups, Multiple Barriers and Health Barriers, had the worst employment outcomes. This suggests that the severity of a single risk factor—family health problems—was as consequential for maternal employment as numerous risk factors for mothers' employment. However, children's outcomes were compromised only in the multiple barriers subgroup; children in the health problems subgroup typically did not look different from those in the lower risk group. The authors conclude that it may not be enough to know which barriers predict longer welfare stays or less employment—rather, it is important to know how barriers naturally co-occur in a given sample in order to target families with the appropriate package of services.

B. Detailed Example of Interactive Approach Used in Audience Segmentation Research

Slater and Flora (1991) sought to segment a sample of 1,669 adult residents from four central California cities into relatively homogenous subgroups reflecting their health orientation in an effort to identify appropriate health messages and intervention strategies for each segment. The researchers analyzed a number of individual and social influences on health behavior:

- Knowledge, including the link between weight and cardiovascular disease, and awareness of the preventability of cardiovascular disease
- Beliefs, including confidence in being able to maintain a healthy diet, confidence in being able to undertake exercise, and beliefs about the cost and palatability of healthy foods
- Social influences, including family and peer norms and conversations relating to diet and exercise
- Health behaviors, including dietary habits, walking, more strenuous exercise, smoking, and drinking
- Demographic characteristics, including age, gender, education, income, marital status, and household size

Applying cluster analysis to these variables yielded four clusters:

- The largest cluster, “Healthful Adults,” comprised 39 percent of the sample and was characterized by healthful scores on several dimensions. They were aware of the health risks of being overweight and of the preventability of cardiovascular disease but were not overly worried about their health, were open to healthier habits, engaged in walking and healthful eating, refrained from smoking, were exposed to peers with healthy habits, and had household support for healthful living.
- The next largest cluster, “Unhealthful Adults,” comprised 32 percent of the sample and was characterized by mostly unhealthful scores on a few critical dimensions. Members of this group understood the health risks for cardiovascular disease but nevertheless had poor diets, smoked, drank, had unhealthful peers, did not want to change their health habits, and did not feel confident they could change their diet.

- “Worried Older Adults” comprised 24 percent of the sample and had both positive and negative factors influencing their behavior. On the one hand, they understood the health risks for cardiovascular disease, they cared about preventing this outcome, they worried about their health, and they refrained from drinking. On the other hand, they did not believe cardiovascular disease was preventable, did not feel confident they could maintain regular exercise, had unhealthy diets and exercise habits, were daunted by their beliefs that healthy foods were expensive and not tasty, and received little to no household support for a more healthful lifestyle.
- The smallest cluster, “Healthful Talkers,” comprising about six percent of the sample, was in some ways similar to the healthful adults, but this group was characterized by their engagement in intense exercise and their tendency to talk about health issues.

Based on the findings of this cluster-analysis, the researchers discussed implications for designing and targeting cardiovascular health interventions. For example, they suggest that interventions targeted to Worried Older Adults should focus on educating them on ways to reduce their cardiovascular risks and increasing their sense of efficacy with respect to exercising—perhaps by providing opportunities to exercise to slowly gain confidence. These adults might also benefit from having household members involved in the program so they could better support the health habits of the Worried Older Adults. Unhealthy Adults, by contrast, may need a more comprehensive set of strategies, targeting not only their unhealthful knowledge, beliefs, and behaviors, but also the norms and behaviors of the their family and peer networks. Finally, Slater and Flora (1991) point out that the Healthful Adults may need no intervention, and yet, their positive health orientation may make them the most likely segment to sign up for (but least likely to benefit from) a cardiovascular health intervention. Moreover, because Healthful Adults comprise the largest segment of the target audience, any program evaluation including this positively selected group is likely to show negligible impacts for the sample as whole, even if such an intervention had positive impacts on one of the other subgroups.

APPENDIX E
LITERATURE REVIEW FINDINGS

Table E.1. Personal History: Predictors and Outcomes Examined in Articles Reviewed

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Quality of Parenting Received As a Child								
Constructive parenting	Kerr et al. 2009	Yes					Yes	Yes
Harsh discipline	Jaffee et al. 2001	No					Yes	Yes
Inconsistent discipline	Jaffee et al. 2001	No					Yes	Yes
Physical abuse as a child	Coohey, 2000	No					Yes	No
History of child maltreatment	Locke et al. 2004	Yes				No	Yes	No
Experienced maltreatment in childhood	Ferrari, 1999	Yes					Yes	No
Quality and effectiveness of discipline	Capaldi et al. 2008	Yes					Yes	Yes
Abusive and explosive discipline practices	Patterson et al. 1991					Yes	Yes	Yes
Residence with Parents or Caretakers in Childhood								
Number of caretaker changes	Jaffee et al. 2001	No					Yes	Yes
Number of years living with a single mother	Jaffee et al. 2001	No					Yes	Yes
Whether lived with own father while growing up	Vogel et al. 2003	Yes					No	No
Number of years lived with biological father	Shields, 1998	Yes					Yes	Yes

Table E.1 (continued)

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Quality of Relationship with Parents During Childhood								
Parent-child relationship quality	Jaffee et al. 2001	Yes					Yes	Yes
Family conflict	Jaffee et al. 2001	No					Yes	Yes
Paternal attachment	Wright, 2004	Yes					No	No
Quality of relationship with own father	Wright, 2004	Yes					Yes	No
Perceived similarities between father's and own parenting styles	Wright, 2004	Yes					Yes	No
Perceived similarities with father	Shields, 1998	Yes					Yes	Yes
Acceptance by mother	Shannon et al. 2005	Yes					Yes	No
Acceptance by father	Shannon et al. 2005	Yes					Yes	No
Childhood relationship with mother	Dechman, 1994	Yes				Yes	Yes	No
Childhood relationship with father	Dechman, 1994	No				No	Yes	No
Relationship with own father and perception of self as father in comparison	Le Bourdais et al. 2002	No					Yes	No
Father contact with own father	Levine Coley et al. 2006	No					Yes	No
Quality of fathers' relationship with own parents during childhood	Vogel et al. 2003	Yes					No	No

Table E.1 (continued)

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Relationship with father	Boyce et al. 2007					No	Yes	No
Relationship with mother	Boyce et al. 2007					No	Yes	No
Over protection	Boyce et al. 2007					No	Yes	No
Adult Attachment								
Secure attachment	Paquette et al. 2000	Yes					Yes	No
Relationship anxiety	Roggman et al. 2002	No					Yes	Yes
Psychological Well- Being and Adjustment as a Child								
History of conduct disorder	Jaffee et al. 2001	Yes					Yes	Yes
History of depression	Jaffee et al. 2001	No					Yes	Yes
Childhood aggression	Temcheff, 2008	Yes	Yes				Yes	Yes
Childhood withdrawal	Temcheff, 2008	No	No				Yes	Yes
Own parent's alcohol and drug related problems	Locke et al. 2004	No				No	No	No

Note: None of the studies reviewed estimated the effects of fathers' personal history on employment or child support outcomes.

Table E.2. Identity: Predictors and Outcomes Examined in Articles Reviewed

Variables	Study Citation	Significant Association with ...				Analyses Conducted Were...		
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Personality								
Neuroticism	Boyce et al. 2007					Yes	Yes	No
Ego defense styles	Boyce et al. 2007					No	Yes	No
Neuroticism	Sloper et al. 1993	No				Yes	Yes	No
Negative emotionality	Jaffee, 2001	Yes					Yes	No
Positive emotionality	Jaffee, 2001	No					Yes	No
Constraint	Jaffee, 2001	No					Yes	No
Interpersonal affect	Fagan, 1996	No					Yes	No
Religiosity	Guzell, 2001	No					Yes	No
Self- Esteem								
Self-esteem	Dechman, 1994	Yes				Yes	Yes	No
Self-esteem	Frost, 1997					Yes	Yes	Yes
Self-esteem	Fagan, 1998	Yes ⁴					Yes	No
Self-esteem	Fagan, 1996	Yes					Yes	No
Antisocial Behavior								
Antisocial behavior	Capaldi et al. 2008	No					No	Yes

⁴ The direction of this association was contrary to the author's hypothesis.

Table E.2 (continued)

Variables	Study Citation	Significant Association with ...				Analyses Conducted Were...		
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Antisocial Behavior	Florsheim et al. 1999		Yes			Yes	Yes	Yes
Antisocial behavior	Patterson et al. 1991	No					Yes	Yes
Types of criminal offenses	Jaffee et al. 2001	Yes					Yes	No
Criminal convictions	Jaffee et al. 2001	Yes					Yes	No
Psychiatric Health								
History of conduct disorder	Johnson et al. 2004	Yes					Yes	Yes
History of anxiety disorder	Johnson et al. 2004	Yes					Yes	Yes
History of depressive disorder	Johnson et al. 2004	Yes					Yes	Yes
History of antisocial personality disorder	Johnson et al. 2004	Yes					Yes	Yes
History of substance use disorder	Johnson et al. 2004	Yes					Yes	Yes
Identity as a Parent								
Identification with a procreative role	Bialik, 2011			Yes			Yes	No
Role as a parent includes preparing child for school	Freeman et al. 2008	Yes					Yes	No
Perception of self as father in comparison with own father	Le Bourdais et al. 2002	No					Yes	No
Satisfaction with time spent with children	Le Bourdais et al. 2002	Yes					Yes	No

Table E.2 (continued)

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Satisfaction with custody arrangement	Le Bourdais et al. 2002	Yes					Yes	No
Parental role strain	Bowman et al. 1997	Yes	Yes				No	No
Identity as a Provider								
Primary provider strain	Bowman et al. 1997	No	Yes				No	No
Co-provider attitude	Bowman et al. 1997	No	No				No	No
Identity as a Man								
Gender role attitudes (Machismo)	Ferrari, 1999	Yes					Yes	No
Attitudes towards gender roles	Caputo, 2006		No				Yes	Yes
Sex role	Boyce et al. 2007					No	Yes	No
Identification with Mexican heritage	Coltrane et al. 2004	Yes					Yes	No

Notes: None of the studies reviewed estimated the effects of fathers' identity on child support outcomes.

Measures of gender-role attitudes tap how the father views himself as a man. Studies examining general gender-role attitudes are listed in Table II.F. Cognitions, under the Gender-Role Attitudes subheading.

Table E.3. Values and Lifestyle: Predictors and Outcomes Examined in Articles Reviewed

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Family Activities								
Family rituals	Coltrane et al. 2004	Yes					Yes	No
Activities With Child								
Engagement at birth of child	Knoester et al. 2007					Yes	Yes	Yes
Change in engagement	Knoester et al. 2007			Yes ⁵		Yes	Yes	Yes
Frequency of activities	Castillo, 2010				No		Yes	No
Frequency of activities	Castillo, 2009				No		Yes	No
Activities with child	Holmes, 2010	Yes					Yes	Yes
Father activities with children	Roggman et al. 2002	Yes					No	No
Daily involvement in care of the child	Guzell, 2001	No					No	No
Religious and Civic Activities								
Religious activity	Roggman et al. 2002	No					Yes	Yes
Religious affiliation	Caputo, 2006		No				Yes	Yes
Religious activity	Caputo, 2006		Yes				Yes	Yes
Religious involvement	Wilcox et al. 2001	Yes					Yes	No

⁵ The direction of this association was contrary to the author's hypothesis.

Table E.3 (continued)

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Religious socialization	Bowman et al. 1997	No	No				No	No
Civic participation	Wilcox et al. 2001	Yes					Yes	No
Job Characteristics								
Employment status and work schedule	Le Bourdais et al. 2002	Yes					Yes	No
Work hours	Formoso et al. 2007	No					Yes	No
Work hours	Roggman et al. 2002	No					No	Yes
Occupational self direction	Goodman et al. 2008	Yes					Yes	No
Job involves caregiving	Goodman et al. 2008	Yes					Yes	No
Occupational complexity	Whitbeck et al. 1997					No	Yes	Yes
Job autonomy	Whitbeck et al. 1997	Yes					Yes	No
Work flexibility	Shields, 1998	No					Yes	No

Table E.4. Stress and Coping: Predictors and Outcomes Examined in Articles Reviewed

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Life Stressors								
Stressors	Coohey, 2000	No					No	No
Stressors	Anderson et al. 2005					Yes	Yes	No
Life stress	Hoard et al. 2004					Yes	Yes	No
Stressful life events	Boyce et al. 2007					Yes	Yes	No
Acute stress	Conger et al. 1995					Yes	No	Yes
Stressful events	Rienks et al. 2011	No					Yes	No
Life events strain	Sloper et al. 1993					Yes	Yes	No
Stressful life events	Proctor, 2005	No				Yes	No	No
Other Specific Stressors								
Exposure to community violence	Proctor, 2005	No				Yes	No	No
Job demands (work hours, job pressure, role overload)	Bumpus et al. 1999	Yes					No	No
Role overload	Goodman et al. 2008	No					Yes	No
Financial Stress								
Monetary stress	Bowman et al. 1997	No	Yes				No	No
Perceived income inadequacy	Bowman et al. 1997	Yes	Yes				No	No

Table E.4 (continued)

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Perceptions of financial stress	Coltrane et al. 2004	Yes					Yes	No
Perceived economic hardship	Gonzales et al. 2011	Yes					Yes	No
Financial stress	Thornberry et al. 2003	Yes					Yes	No
Financial difficulties	Flouri et al. 2003	No					Yes	No
Economic Pressure	Whitbeck et al. 1997	Yes				Yes	Yes	No
Parenting Stress								
Parenting stress and aggravation	Bronte-Tinkew et al. 2010	Yes	Yes				Yes	No
Parental stress	Paquette et al. 2000	Yes					Yes	No
Parental distress	Vogel et al. 2003	Yes	Yes				No	No
Parent-child dysfunctional interaction	Vogel et al. 2003	Yes	Yes				No	No
Parental stress	Whipple et al. 1991	No					No	No
Depressive Symptoms or Psychological Distress								
Psychological distress	Coley et al. 2006	Yes	Yes				Yes	No
Psychological distress	Proctor, 2005	No					No	No
Depressive symptoms	Roggman et al. 2002	No					No	Yes
Depressive symptoms	Cabrera et al. 2009	Yes	Yes				Yes	No

Table E.4 (continued)

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Depressive symptoms	Bronte-Tinkew et al. 2010	No	Yes				Yes	No
Stress-related paternal depression	Conger et al. 1995	Yes					Yes	No
Depressive symptoms	Vogel et al. 2003	Yes	Yes				No	No
Depressive symptoms	Chambers, 2004		Yes				No	No
Depressive symptoms	Ash, 1999	No				Yes	No	No
Parental depression & anxiety	Whipple et al. 1991	No					No	No
Anxiety and depression	Rienks et al. 2011	No					Yes	No
Well- Being								
Well-being	Dechman, 1994	Yes					Yes	No
Coping								
Coping efficacy	Rienks et al. 2011	No					Yes	No
Coping strategies	Sloper et al. 1993	Yes					Yes	No
Coping strategies	Roggman et al. 2002	Yes					Yes	Yes

Note: None of the studies including stress and coping predictors examined employment or child support outcomes.

Table E.5. Knowledge: Predictors and Outcomes Examined in Articles Reviewed

Variable	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-being?	Multivariate?	Longitudinal?
Knowledge about infant development	Guzell, 2001	Yes					Yes	No

Table E.6. Cognitions: Predictors and Outcomes Examined in Articles Reviewed

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Parenting Attitudes								
Attitude towards the use of harsh discipline	Coohey, 2000	No					Yes	No
Valuing of children	Ferrari, 1999	Yes ⁶					Yes	No
Severity ratings of vignettes depicting child maltreatment	Ferrari, 1999	Yes					No	No
Happy to have had a child	Le Bourdais et al. 2002	Yes					Yes	No
Positive attitude toward fathering	Knoester et al. 2007			Yes			Yes	Yes
Change in positive attitude toward fathering	Knoester et al. 2007			Yes		Yes	Yes	Yes
Gender Role Attitudes								
Sex role egalitarianism	Shields, 1998	No					Yes	No
Gender traditionalism	Coltrane et al. 2004	Yes					Yes	No
Whether tasks related to children are men's responsibility	Le Bourdais et al. 2002	No					Yes	No
Co-involved child care attitude	Bowman et al. 1997	No	No				No	No
Attitudes Toward Marriage or Relationships								
Attitudes towards marriage	Caputo, 2006		No				Yes	Yes

⁶ The direction of this association was contrary to the author's hypothesis.

Table E.6 (continued)

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Distrust of opposite sex	Caputo, 2006		No				Yes	Yes
Work- Related Attitudes								
Job satisfaction, job involvement	Paquette et al. 2000	No					Yes	No
Self- Efficacy								
Father efficacy	Freeman et al. 2008	Yes					Yes	No
Feelings of incompetence	Frost, 1997					Yes	Yes	No
Parental self-efficacy	Guzell, 2001	No					Yes	No
Responsibility/Perceived Control								
Perceived control over caregiving outcomes	Guzell, 2001	No					Yes	No
Responsibility for child's learning	Freeman et al. 2008	Yes					Yes	No
Parent cognition: child-responsible factor	Snarr et al. 2009	Yes	Yes			Yes	No	No
Parent cognition: parent-causal factor	Snarr et al. 2009	Yes	Yes			Yes	No	No
Partner cognition: partner-responsible factor	Snarr et al. 2009	Yes	Yes				No	No
Partner cognition: self-causal factor	Snarr et al. 2009	Yes	Yes				No	No
Belief that own economic situation will dictate child's future (used to predict depression)	Ash, 1999					No	No	No

Table E.6 (continued)

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...		
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?	
Perceived Outcomes									
Expectations about pregnancy and fatherhood	Boyce et al. 2007					Yes	No	No	

Notes: None of the studies reviewed examined employment or child support outcomes. Measures of gender-role attitudes tap general gender-role attitudes. Studies examining how the father views himself as a man are listed in Table II.C. Identity, under the Identity as a Man subheading.

Table E.7. Social Norms: Predictors and Outcomes Examined in Articles Reviewed

Variables	Study Citation	Significant Association with ...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Acceptance of negative stereotypes about African American men	Shields, 1998	No					Yes	No
Internalized negative stereotypes about African Americans	Wright, 2004	No					No	No
Neighborhood familism	Gonzales et al. 2011	Yes					Yes	No

Note: None of the studies reviewed estimated the effects of social norms on couple relationship, employment, child support, or father well-being outcomes.

Table E.8. Relationship with Child’s Mother: Predictors and Outcomes Examined in Articles Reviewed

Variable	Study Citation	Significant Association with...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Negative Partner Characteristics								
Negative partner characteristics	Coohey, 2000	No					Yes	No
Conflict								
Areas of conflict	Caputo, 2006		Yes				Yes	Yes
Marital concerns	Frost, 1997					Yes	Yes	Yes
Relationship disagreement	Bronte-Tinkew et al. 2010	Yes	Yes				Yes	No
Level of hostility	Florsheim et al. 1999	Yes	No			No	Yes	Yes
Domestic tension	Flouri et al. 2003	Yes					Yes	Yes
Couple conflict	Cabrera et al. 2009	Yes	Yes				Yes	No
Partner violence	Jaffee et al. 2001	Yes					Yes	No
Communication								
Negative communication	Rienks et al. 2011	No					Yes	No
Communication danger signs	Rienks et al. 2011	No					Yes	No
Relationship Quality								
Quality of relationship	Shannon et al. 2005	No					Yes	No
Love for mother	Fagan, 1996	No					Yes	No

Table E.8 (continued)

Variable	Study Citation	Significant Association with...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Relationship quality	Dush et al. 2011		Yes				Yes	Yes
Marital happiness	Frost, 1997					No	Yes	Yes
Marital relationship quality	Whipple et al. 1991	No					No	No
Relationship with partner	Castillo, 2010				Yes		Yes	No
Relationship with partner	Castillo, 2009				Yes ⁷		Yes	No
Overall happiness	Cabrera et al. 2009	Yes	No				Yes	No
Partner closeness	Mitchell, 2008	No					Yes	No
Relationship adjustment	Rienks et al. 2011	No					Yes	No
Relationship quality	Knoester et al. 2007			Yes		Yes	Yes	Yes
Interpersonal behavior with partner	Moore, 2003	No	Yes				No	Yes
Quality of romantic relationship	Gavin et al. 2002	Yes					Yes	No
Relationship quality	Kalil et al. 2005	Yes					Yes	No
Partner's supportiveness	Coohey, 2000	No					Yes	No
Relationship quality	Caputo, 2006		No				Yes	Yes
Relationship quality	Boyce et al. 2007					No	Yes	No

⁷ The direction of this association was contrary to the author's hypothesis.

Table E.8 (continued)

Variable	Study Citation	Significant Association with...				Analyses Conducted Were...		
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Perceived caring	Boyce et al. 2007					No	Yes	No
Relationship Satisfaction								
Relationship satisfaction	Rienks et al. 2011	No					Yes	No
Relationship Satisfaction	Shields, 1998	No					Yes	No
Relationship satisfaction	Moore, 2003	Yes	Yes				No	Yes
Satisfaction with relationship	Wright, 2004	Yes					No	No
Relationship satisfaction	Chambers, 2004	No					No	Yes
Marital satisfaction	Sloper et al. 1993	No				No	No	No
Marital satisfaction	Bumpus et al. 1996	Yes					No	No
Quality of Co- Parental Relationship								
Co-parenting conflict	Mitchell, 2008	Yes					Yes	No
Co-parenting conflict	Anderson et al. 2005					No	Yes	No
Father-mother conflict surrounding parenting	Levine Coley et al. 2006	Yes					Yes	No
Parenting alliance	Formoso et al. 2007	Yes					Yes	No
Interparental conflict	Formoso et al. 2007	Yes					Yes	No
Interparental conflict	Cabrera et al. 2009	Yes					Yes	No

Table E.8 (continued)

Variable	Study Citation	Significant Association with...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Parenting alliance	Rienks et al. 2011	Yes					Yes	No
Parenting alliance	Bialik, 2011			No			Yes	No
Coparental relationship status	Holmes, 2010	Yes					Yes	Yes
Nature or Status of Relationship								
Relationship status	Holmes, 2010	Yes					Yes	Yes
Nature of relationship	Dush et al. 2011		Yes				Yes	Yes
Nature/status	Cabrera et al. 2004	Yes					Yes	No
Marital status	Goodman et al. 2008	No					Yes	No
Living arrangement	Florsheim et al. 1999					No	Yes	Yes
Family structure	Cabrera et al. 2009	Yes	No				Yes	No
Marital status	Coohey, 2000	No					Yes	No
Length of relationship	Coohey, 2000	No					Yes	No
Breakup with child's mother	Knoester et al. 2007					Yes	Yes	Yes
Marital status	Bronte-Tinkew et al. 2010	No	No				Yes	No
Relationship status	Cabrera et al. 2008	Yes					Yes	No
Type of union at birth	Le Bourdais et al. 2002	No					Yes	No

Table E.8 (continued)

Variable	Study Citation	Significant Association with...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Years together before having children	Shields, 1998	Yes					Yes	Yes

Table E.9. Social Support: Predictors and Outcomes Examined in Articles Reviewed

Variables	Study Citation	Significant Association with...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Quality of Kin Relationships								
Cohesive family relationship	Sloper et al. 1993	Yes				Yes	Yes	No
Quality of extended family relationship	Mitchell, 2008	No	No				Yes	No
Father's Relationship with child's maternal grandmother	Gavin et al. 2002	Yes					Yes	No
New Partner Status								
Formation of new relationship	Knoester et al. 2007					No	Yes	Yes
Former partner involved in a new romantic relationship	Dush et al. 2011		Yes				Yes	Yes
Father has new partner and/or child	Le Bourdais et al. 2002	No					Yes	No
Kin Support								
Kin involvement with child	Coohey, 2000	No					Yes	No
Kin emotional support	Coohey, 2000	No					Yes	No
Instrumental support from extended family	Coohey, 2000	Yes					Yes	No
Emotional support from friends	Coohey, 2000	Yes					Yes	No
Friend instrumental support	Coohey, 2000	No					No	No
Friend Involvement with Children	Coohey, 2000	No					No	No

Table E.9 (continued)

Variables	Study Citation	Significant Association with...					Analyses Conducted Were...	
		Parenting?	Partner Relationship?	Employment?	Child Support?	Father Well-Being?	Multivariate?	Longitudinal?
Involvement with family and friends	Castillo, 2010				No		Yes	No
Support For From Networks								
Non-supportive work environment	Goodman et al. 2008	Yes					Yes	No
Involvement with public welfare institutions	Castillo, 2010				No		Yes	No
Involvement with public welfare institutions	Castillo, 2009				Yes		Yes	No
General Support Across Networks								
Support from family, friends and community workers	Anderson et al. 2005					Yes ⁸	Yes	No
Support from family, friends and community workers	Hoard et al. 2004					Yes ⁹	Yes	No
Financial support	Chambers, 2004		Yes				No	No
Amount of social support	Boyce et al. 2007					No	Yes	No
Satisfaction with social support	Boyce et al. 2007					Yes	Yes	No
Social support	Sloper et al. 1993	No				No	No	No
Social support	Wade et al. 2011					Yes	Yes	No

Note: None of the studies reviewed estimated the effects of social support on employment outcomes.

⁸ The direction of this association was contrary to the author's hypothesis.

⁹ The direction of this association was contrary to the author's hypothesis.

APPENDIX F

**COMPILATION OF MEASURES OF PSYCHOSOCIAL PREDICTORS
USED IN STUDIES OF LOW- INCOME FATHERS**

In this appendix, we provide a listing and brief summary of the measures used as predictors of fatherhood-related outcomes in the 64 studies of low-income fathers reviewed for this project.

Our purpose for documenting measures in this manner is twofold:

1. **To help the reader better interpret studies' findings.** In operationalizing psychosocial constructs, study authors used a variety of measures to create a wide range of variables. We often encountered what Marsh (1994) calls the “jingle-jangle fallacy,” whereby different theories address the same constructs but operationalize them differently, or empirical studies use the same constructs (even operationalized identically) but label them differently. Providing the actual wording of items comprising a given measure clarifies what was asked.
2. **To inform future research on low-income fathers.**
 - Inform measures selection. Researchers can see which measures have most often been used, and which have been found to be predictive (given the size and composition of the given study sample). May help them decide what's suitable for their studies.
 - Inform measures development. Show which constructs are not often examined, perhaps due to lack of suitable measurement.

In documenting the measures used as predictor variables in each study, we sought to capture the following information:

- Name of the measure
- Author
- Brief description of the construct/phenomenon the measure is meant to tap
- Wording for each item included in the measure
- Response categories
- How items were coded and aggregated to create the variable used in analyses
- Psychometrics (validity and reliability) for resulting variable in given study sample (unless otherwise indicated)

In no case did the articles included in the literature review provide each of these pieces of information. There are a few reasons for this. Publishers impose page limits for submitted manuscripts, and this works against a detailed description or wholesale inclusion of study measures, even in an appendix. In addition, some measures are copyrighted and cannot be re-published without permission from the measure's developer.

We provide as much information in the above areas as was included in the reviewed articles. For example, if the wording for each item was not provided (which was often the case), we at least indicated how many items comprise the measure. And if only the anchor response categories were provided, we indicate what these anchor categories were (for example, 1=almost never or never, 4=almost always or always).

Table F.1. Personal History: Variables and Measures Used in Studies of Low- Income Fathers

Variable/Measure	Study Citation	Description of Variable/Measure Used
Quality of Parenting Received As a Child		
Quality of own father's parenting	Kerr et al. 2009	Variable created from four component constructs: monitoring, parent involvement, positive parent-child relationship, and confident and efficacious discipline. Constructs were assessed three times, when target was 9-10, 10-11, and 11-12. Monitoring was based on parent and child in-person and telephone interviews and ratings completed by interviewers. Parent involvement was composed of child and parent in person and telephone interviews, interviewer rating, child and parent questionnaire reports on the <i>Family Activities Checklist</i> (Oregon Social Learning Center [OSLC], 1982-2007) regarding activities with the child in the past week, and staff ratings following home observation. Positive parent-child relationship was based on child and parent interview scales, home observer ratings, and parent interviewer ratings, child reports on the <i>Parent and Peer Attachment Questionnaire</i> (Armsden & Greenberg, 1987) and <i>Social Control Questionnaire</i> (OSLC, 1982-2007). Confident and efficacious discipline constructs were formed from the Poor Implementation (measuring calmness, consistency, and follow through) and Low Confidence (measuring perceived effectiveness of disciplinary efforts) subscales derived from mother and father interviews.
Harsh discipline	Jaffee et al. 2001	Parents indicated if they engaged in any of 10 behaviors, such as "smack [your child] or hit him/her with something" and "try to frighten [your child] with someone like his/her father or a policeman". Response categories: yes/no. Alpha=.71
Inconsistent discipline	Jaffee et al. 2001	Each father's mother evaluated how consistently she and her husband dealt with their child when he was naughty or misbehaved. Response categories: 0 (always the same) to 3 (very changeable). Items were averaged across mothers and fathers. Alpha=.60
Physical abuse as a child	Coohey, 2000	Frequency of severe assaults by father's mother and father's father measures using the following three items from Straus 1998 (with slight modifications): "hit with an object," "hit with closed hand," and "hit a lot at one time". Respondents received a score of 1 if they indicated any assault, and 0 if no assault.
History of child maltreatment	Locke et al. 2004	Assessed with the <i>Childhood Trauma Questionnaire</i> (CTQ; Bernstein et al. 1994), a self-report inventory that yields scores on five different subscales: emotional neglect, physical neglect, emotional abuse, physical abuse, and sexual abuse. Sample items from the five subscales are as follows: "My family was a source of strength and support" (emotional neglect; reverse scored); "I had to wear dirty clothes" (physical neglect); "People in my family said hurtful or insulting things to me" (emotional abuse); "People in my family hit me so hard it left me with marks or bruises" (physical abuse); and "As a child someone tried to make me do sexual things or watch sexual things" (sexual abuse).
Experienced maltreatment in childhood	Ferrari, 1999	Assessed with the <i>Childhood Trauma Questionnaire</i> (CTQ; Bernstein, 1993). Sum of responses to 70 items assessing the severity of physical abuse, emotional abuse, sexual abuse, physical neglect, and emotional neglect. Sample item: "When I was growing up, my parents were too drunk or too high to take care of the family." Response categories: 1=never true to 5=very often true. Higher scores indicate more severe abuse or neglect. Alpha=.95

Table F.1 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Poor confidence in discipline by own parents; Poor implementation of discipline by own parents	Capaldi et al. 2008	Poor implementation of discipline (author-created). Score is average of four to six items. Alpha=0.59-0.70 Poor confidence in discipline (author-created). Score is average of three items. Alpha=0.55-0.67
Own parents' discipline practices	Patterson et al. 1991	<i>Assessing Environments Questionnaire</i> (Knutson, 1985). Measure consists of three scales (abusive discipline, explosive discipline, negative atmosphere) but is used as a single construct in analysis. Alpha not reported.
Residence with Parent(s)/Caretakers in Childhood		
Number of caretaker changes	Jaffee et al. 2001	Father's caretakers in childhood were identified at each assessment based on who was reported as "mother figure" and "father figure." The number of different caretakers from birth to age 15 was summed.
Number of years living with a single mother	Jaffee et al. 2001	The number of years the child spent in a single-parent home between birth and age 15.
Whether lived with own father while growing up	Vogel et al. 2003	Participants were asked whom they lived with when they were (1) five years of age or younger, (2) age six through age 10 years, (3) age 11 through age 15 years, and (4) age 16 through age 18 years. Men who never lived with their fathers in any of the periods were compared to men who lived with their fathers in at least one of the periods.
Number of years lived with biological father	Shields, 1998	<i>Childhood Paternal Relationship Scale-Part A</i> (author-created). Nine items explored the amount of time spent with father growing up and reasons for any absences. Sample item: "How many years of your childhood (0-18 years) did your biological father live with you?" Response categories: 1=none to 5=a great deal.
Quality of Relationship With Parents During Childhood		
Parent-child relationship quality	Jaffee et al. 2001	Assessed when fathers were at ages 13 and 15 using the <i>Inventory of Parent Attachment</i> (Armsden & Greenberg, 1987). Fathers responded to 12 items that tap the extent to which they feel they can trust their parents, communicate with their parents, and are not alienated from their parents. Response categories: 1=almost never or never to 4=almost always or always. Alpha=.82
Family conflict	Jaffee et al. 2001	Summary of affirmative responses to nine items from the <i>Family Environment Scale</i> (Moos & Moos, 1981) assessing whether there was openly expressed anger, aggression, and conflict among family members growing up. Sample items: "family members often criticized each other" and "family members rarely became openly angry." Response categories: Yes/No. Alpha=.85
Paternal attachment	Wright, 2004	<i>Inventory of Parental and Peer Attachment</i> (IPPA) was modified to ask specifically about attachment to father. 28 items were rated on a Likert scale (almost never/never=1 to almost always/always=5) with higher scores reflecting greater quality of father attachment. Alpha=.91
Quality of relationship with own father while growing up	Wright, 2004	<i>Childhood Paternal Relationship Scale-Quality of Parental Relationship Subscale</i> (CPRS Part C; Shields & Harrell, 1997). 15 items were rated on a Likert scale (not at all=0 to a lot=3), with higher scores reflecting greater quality of relationship. Alpha =.84

Table F.1 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Perceived similarities between own and fathers' parenting styles	Wright, 2004	<i>Childhood Paternal Relationship Scale-Similarities of Paternal Relationship Subscale</i> (CPRS Part D; Shields & Harrell, 1997). Three items were rated on a Likert scale (strongly true=1 to strongly false=5), with higher scores reflecting greater perceived similarity between respondent and his father. Alpha = .86
Perceived similarities with father	Shields, 1998	<i>Childhood Paternal Relationship Scale-Part D</i> (author-created). Sum of responses ("strongly true" to "strongly false") to three items, two of which were reverse coded. Sample items: "I am raising my child (children) very much like my father raised me; I make an effort to be a very different kind of father than my father was as I was growing up." A higher score reflects a greater perceived similarity.
Childhood relationship with mother; Childhood relationship with father	Shannon et al. 2005	Men were first asked questions about their family of origin: (a) who raised them (i.e., biological father or father figure; biological mother or mother figure), and (b) how frequently they saw each parent or parent figure (1=never; 5=every day or almost every day). Then the adult version of the <i>Parental Acceptance-Rejection Questionnaire</i> (PARQ; Rohner, 1991) was administered. The original scale is a 60-item, self-report instrument in which men are asked, separately, how their father and mother treated them while they were growing up, with responses on a four-point Likert scale (1=almost never true; 4=almost always true). Sample items: "My father/mother said nice things about me," and "My father/mother punished me severely when he/she was angry." A short form (24 items) of the PARQ was developed based on factor analyses conducted by Sherman and Donovan (1991). These 24 items were further reduced to 12 in this study—those with the highest loadings on the PARQ. Two separate composite scores were calculated—paternal acceptance scale (alpha=.89) and maternal acceptance scale (alpha=.88). The negatively worded items were reverse coded. A high score reflected maximum perceived acceptance and minimum perceived rejection.
Childhood relationship with mother; Childhood relationship with father	Dechman, 1994	Relationship with Mother and Father (developed for survey). Sum of responses to two items: How would you describe your relationship with your mother/father. Response categories: 1=very poor to 7=excellent. High scores indicate a more positive relationship.
Relationship with own father and perception of self as father in comparison	Le Bourdais et al. 2002	Authors created a single variable based on two survey questions from the General Social Survey (Statistics Canada). Participants were grouped into 4 categories: (1) close to own father, considers self to be better father; (2) close to own father but did not consider self as better father; (3) not close to own father, considers self to be better father; (4) not close to own father, does not consider self to be better father.
Father contact with own father	Levine Coley et al. 2006	Authors created a single variable based on two items from the Welfare, Children, and Families: A Three-City Study. Participants reported on their length of residence with their own biological father prior to age 16 and frequency of contact with own father (1=never live with/see to 4=always).
Quality of fathers' relationship with own parents during childhood	Vogel et al. 2003	<i>Parent Acceptance-Rejection Questionnaire</i> (PARQ) (Rohner 1984; and Sherman and Donovan 1991). Total score based on sum of scores on 12 items with each rated on a four-point scale.
Father care; Mother care; Overprotection	Boyce et al. 2007	The <i>Parental Bonding Instrument</i> (PBI; Parker, 1979) was used to assess how fathers perceived their parents' behavior towards them for the first 16 years of their lives.

Table F.1 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Adult Attachment		
Attachment style	Paquette et al. 2000	The father's personality traits related to his attachment history were measured using the <i>Attachment Style Questionnaire</i> (Feeney et al. 1994) which measures the respondent's general style of social relations. Measure consists of 40 items corresponding to three factors: security, seven items (alpha=.53); anxiety, 14 items (alpha=.71); and, avoidance, nine items (alpha=.52). Response categories: 1=totally disagree to 6=totally agree.
Adult attachment: Relationship anxiety	Roggman et al. 2002	Measured by averaging two subscales (relationship avoidance and relationship ambivalence) on the 13-item <i>Adult Attachment Scale</i> (Simpson, Rholes, Nelligan, 1992). Fathers were asked to respond to statements such as: "I find it relatively easy to get close to others" or "I'm not very comfortable having to depend on other people" or "I often worry that the people close to me don't love me". Response categories ranged from 1 = Strongly agree to 5 = Strongly disagree. Authors reported reliability for each subscale - avoidance: 0.81 and ambivalence: 0.58 to 0.61.
Psychological Well-Being and Adjustment as a Child		
History of conduct disorder	Jaffee et al. 2001	Assessed according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994) using information gathered during interviews with and from checklists completed by fathers' parents and teachers.
History of depression	Jaffee et al. 2001	The <i>Diagnostic Interview Schedule for Children</i> (DISC-C; Costello, Edelbrock, Kalas, Kessler, & Klaric, 1982) was administered to assess DSM-III depressive disorders. The modifications, psychometric properties, and descriptive epidemiology of the DISC-C in this sample have been described by McGee et al. (1990).
Childhood aggression; Childhood withdrawal	Temcheff, 2008	<i>Pupil Evaluation Inventory</i> (PEI-French translation; Pekarik et al. 1976), a peer nomination instrument. The PEI consists of 34 items that load onto three factors: Aggression, Withdrawal, and Likeability. Scale items assess not only the behavior of the child but also the reaction of peers toward the child. For the purposes of the study, children were screened only on the Aggression and Withdrawal factors. Within each classroom, children were asked to nominate up to four boys and four girls in their class who best matched each item on the PEI. The number of nominations received by each child was summed to obtain Aggression and Withdrawal scores.
Own parent's alcohol and drug related problems	Locke et al. 2004	A modified 16-item version of the <i>Children of Alcoholics Screening Test</i> (CAST; Newcomb & Rickards, 1995; Stacy, Newcomb, & Bentler, 1991) was used to assess parent alcohol- and drug-related problems. Three scales assessed (a) negative parental consequences associated with drinking and drug use, (b) negative child consequences associated with drinking and drug use, and (c) parental aggression associated with drinking and drug use. Sample items from this measure include "Did you ever encourage a parent to stop drinking or using drugs?" and "Did you ever protect another family member from a parent who was drinking or using drugs?"

Table F.2. Identity: Variables and Measures Used in Studies of Low- Income Fathers

Variable/Measure	Study Citation	Description of Variable/Measure Used
Personality		
Neuroticism	Boyce et al. 2007	Authors used the <i>Eysenck Personality Questionnaire</i> (EPQ; Eysenck, 1975) to measure extraversion and neuroticism (no info on items or response choices was reported).
Ego defense styles	Boyce et al. 2007	Authors used the <i>Defence Style Questionnaire</i> (DSQ; Andrews, 1989) to group fathers as having mature, neurotic, or immature defence styles.
Neuroticism	Sloper et al. 1993	Personal resources of the parent were assessed with the <i>Eysenck Personality Inventory</i> (Eysenck & Eysenck, 1964) and the <i>Brief Locus of Control Scale</i> (Lumpkin, 1983).
Negative emotionality; Positive emotionality; Constraint	Jaffee 2001	Modified version of the <i>Multidimensional Personality Questionnaire</i> (MPQ; Tellegen, 1982). Ten scales designed to assess a broad range of individual differences in affective and behavioral style were combined to measure three higher-order superfactors: Negative Emotionality, Positive Emotionality, and Constraint (Tellegen & Waller, in press). Individuals high on Negative Emotionality have a low general threshold for the experience of negative emotions such as fear, anxiety, and anger and tend to break down under stress. Individuals high on Positive Emotionality tend to seek pleasurable experiences by forming relationships with others and by engaging the environment and overcoming the challenges it presents. Individuals high on Constraint tend to endorse social norms, act in a cautious and restrained manner, and avoid thrills (Tellegen et al. 1988). The reliabilities of the three superfactors were above alpha=.79.
Interpersonal affect	Fagan 1996	Assessed using the <i>Jackson Personality Inventory - Interpersonal Affect Scale</i> (Jackson, 1976).
Religiosity	Guzell 2001	Single item created by author - "How religious do you consider yourself to be now?" Response categories: 1=not religious at all to 5=very religious.
Self- Esteem		
Self-esteem	Dechman 1994	Subset of questions extracted from the <i>Rosenberg Self-Esteem Scale</i> (Rosenberg, 1979). Score is the sum of responses (1=strongly disagree; 4=strongly agree) to four items: "I have always felt pretty sure my life would work out the way I wanted it to," "I feel that I am a person of worth, at least on an equal plane with others," "On the whole, I am satisfied with myself," "I am able to do things as well as other people." High scores indicate higher self esteem (alpha=.87).
Self-esteem	Frost 1997	<i>Rosenberg's Self-Esteem Scale</i> (Rosenberg, 1965). Score is the sum of 10 items on a four-point scale (1=strongly agree to 4=strongly disagree). Alpha .82-.84.
Self-esteem	Fagan 1996, 1998	<i>Jackson Personality Inventory, Self-Esteem Scale</i> (Jackson, 1976). Responses (true or false) to 20 items (alpha=.73). High scores indicate lower levels of self-esteem. The self-esteem scale assesses the degree to which a person perceives himself as socially adequate and deserving of the care of others. Sample items: "I have never been a very popular person" and "I am seldom at a loss for words."

Table F.2 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Antisocial Behavior		
Antisocial behavior	Capaldi et al. 2008	Sum of 16 items measuring risky behavior/delinquency from the National Youth Survey (categorical scale created based on continuous counts). Alpha=0.72
Antisocial Behavior	Florsheim et al. 1999	<i>Diagnostic Interview for Children and Adolescents-Revised</i> (Reich, 1991). Scores reflect the number of diagnostically relevant symptoms related to the occurrence of either oppositional defiant disorder or conduct disorder. Interrater reliability ranged from .58 to 1.0 with a mean of .76
Antisocial behavior	Patterson et al. 1991	Author-created measure based on state records of arrests, state records of driver's license suspensions, self-reported substance use, and hypomania and psychopathic deviance scores on the <i>Minnesota Multiphasic Personality Inventory</i> (Hathaway & McKinley, 1967).
Types of criminal offenses	Jaffee et al. 2001	<i>Self-Reported Crime Interview</i> (Elliott & Huizinga, 1989), a standardized instrument that inquires about 48 different illegal acts that study members might have committed in the past 12 months. Details about the reliability and validity of this instrument in this study are available in Moffitt, Silva, Lynam, and Henry (1994) (alpha=.88).
Criminal convictions	Jaffee et al. 2001	The number of adult criminal convictions was obtained through a search of police records.
Psychiatric Health		
History of conduct disorder, anxiety disorder, depressive disorder, antisocial personality disorder, substance use disorder	Johnson et al. 2004	Paternal alcohol abuse, drug abuse, and antisocial behavior were assessed during the 1975, 1983, and 1985–1986 maternal interviews using the Disorganizing Poverty Interview (DPI; Kogan et al. 1977). Psychiatric treatment history was assessed with items asking whether the father had received any treatment for emotional problems or substance abuse. In addition, lifetime histories of paternal attention deficit disorder (ADD), generalized anxiety disorder (GAD), oppositional defiant disorder (ODD), post-traumatic stress disorder (PTSD), major depressive disorder (MDD), conduct disorder (CD), alcohol abuse or dependence and drug abuse or dependence were assessed during the 1991–93 maternal interview using items adapted from the New York High Risk Study Family Interview (Squires-Wheeler & Erlenmeyer-Kimling, 1986). Data regarding the age of onset of paternal disorders permitted identification of psychiatric disorders that were evident during the childhood or adolescence of the offspring. Computerized DSM-IV-based diagnostic algorithms were developed using items from these instruments that assessed DSM-IV diagnostic criteria for paternal CD, GAD, MDD, PTSD, alcohol abuse or dependence and drug abuse or dependence, and paternal antisocial personality disorder.
Identity as a Parent		
Identification with a procreative role	Bialik 2011	Data obtained from Early Head Start Research and Evaluation Project. Identity as a procreative father was a measure created by the author based on the construct defined by Erikson (1963). Score is the sum of eight attributes assessed by coding interviews (alpha=.63)

Table F.2 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Role as a parent includes preparing child for school	Freeman et al. 2008	Measure of fathers' beliefs about their role in the target child's development and education and was adapted from Hoover-Dempsey & Sandler (1995), Hoover-Dempsey et al. (2005), and Green et al. (2007). Responses to four items assessing how strongly fathers agreed with statements related to components of fathers' role including: making sure the child attends and is prepared for preschool, and talking with the teacher about things that concern the child (alpha = .70). Response categories: 0 = not at all, 4 = very much
Perception of self as father in comparison with own father	Le Bourdais et al. 2002	Authors created a single variable based on 2 survey questions from the General Social Survey (Statistics Canada). Participants were grouped into four categories: (1) close to own father, considers self to be better father; (2) close to own father but did not consider self as better father; (3) not close to own father, considers self to be better father; (4) not close to own father, does not consider self to be better father.
Satisfaction with time spent with children	Le Bourdais et al. 2002	Based on a single item from the General Social Survey (Statistics Canada): "Fathers responded to a statement asking whether they were "satisfied with time in general spent with their children." Response categories: yes/no
Satisfaction with custody arrangement	Le Bourdais et al. 2002	Based on a single item from the General Social Survey (Statistics Canada): "Fathers responded to a statement asking whether they were "satisfied with where and with whom the child lives." Response categories: yes/no
Parental role strain	Bowman et al. 1997	Based on a single item from the National Survey of Black Americans: "How well have you done at being a good father to your children?" Response categories: 1=not well at all to 4=very well
Identity as a Provider		
Primary provider strain	Bowman et al. 1997	Based on a single item from National Survey of Black Americans: "Given the chances you have had, how well have you done in taking care of your family's wants and needs?" Response categories: 1=not well at all to 4=very well
Co-provider attitude	Bowman et al. 1997	Based on a single item from National Survey of Black Americans "Both men and women should have jobs to support the family" Response categories: 1=strongly disagree to 4=strongly agree

Table F.2 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Identity as a Man¹		
Gender role attitudes (Machismo)	Ferrari 1999	Assessed using the <i>Multiphasic Assessment of Cultural Constructs-Short Form, Machismo subscale</i> (Cuellar, Arnold, Gonzalez 1995). Sum of responses to 17 items measuring gender role attitudes. Sample items include: "Boys should not be allowed to play with dolls and other girls' toys" and "There are some jobs women simply should not have." In the original measure, respondents are asked to indicate whether they believe the statements are true or false. For this study, to increase the variability of responses, the author used a six-point scale. Higher scores indicate stronger endorsement of machismo attitudes (alpha=.78). Response categories: 0=strongly disagree to 5=strongly agree.
Attitudes towards gender roles	Caputo 2006	Author-created measure based on fathers' evaluation of two statements: (1) The important decisions in a family should be made by the man in the house; (2) It is much better for everyone if the man earns the main living and the woman takes care of the home and family. Response categories ranged from 1 = strongly disagree to 4 = strongly. Score is the average rating across the 2 statements.
Sex role	Boyce et al. 2007	Authors used the <i>Bem Sex Role Inventory</i> to assess psychological masculinity, femininity, and androgyny (Bem, 1974)
Identification with Mexican heritage	Coltrane et al. 2004	Assessed with the <i>Acculturation Rating Scale for Mexican Americans, Mexican Orientation subscale</i> (Cuellar, Arnold & Maldonado, 1995). Items indicate preference for and use of Spanish, and questions about self-identification and social group affiliation. Response categories: not at all to extremely often/almost always. Score is sum of responses with higher scores representing stronger Mexican orientation (alpha=.92).

Notes: 1. These measures of gender-role attitudes tap how the father views himself as a man. Studies examining general gender-role attitudes are listed in Table II.F. Cognitions, under the Gender-Role Attitudes subheading.

Table F.3. Values and Lifestyles: Variables and Measures Used in Studies of Low- Income Fathers

Variable/Measure	Study Citation	Description of Variable/Measure Used
Family Activities		
Family rituals	Coltrane et al. 2004	<i>Family Routines Questionnaire</i> (Fiese, 1994). Sum of responses to eight items assessing participation (e.g., frequency, organization) in two family rituals (i.e., mealtimes and weekend activities). Sample items: Our family regularly eats the main meal together; In our family, we have set routines and regular events that we all participate in on the weekends. Response categories: not at all true, sort of true, and very true. Higher scores represented more emphasis on family rituals. Alpha=.65
Activities with Child		
Engagement at birth of child; Change in engagement	Knoester et al. 2007	<p>Authors created two variables based on survey items from the Fragile Families and Child Wellbeing Study.</p> <p>Engagement at birth of child was measured based on the sum of responses to six items about early involved fathering (e.g., present at birth). Response categories: yes/no. Alpha=.44</p> <p>Engagement a year after birth was measured based on the mean of responses to three items about activity participation. Response categories: 0 to 7 days a week.</p> <p>Change in engagement was measured by standardizing engagement scores at each time point and calculating the difference between the two standardized scores.</p>
Frequency of activities	Castillo, 2009, 2010	Author created a single variable based on eight items from the Fragile Families and Child Wellbeing Study. Each item measured the number of times in a week the father engaged in activities with his child. Response categories: 0 to 7 days a week. Score is the sum of responses. Alpha=.83
Activities with child	Holmes, 2010	<p>Author created two variables based on survey items from the Early Head Start Research and Evaluation Project (EHSREP):</p> <p>Participation in prenatal activities was assessed by asking mothers if fathers participated in the following activities: discuss the pregnancy; and go to the doctor with mother. Response categories: yes/no. Prenatal behaviors items were summed to obtain the number of prenatal activities in which the father participated (range 0 – 2).</p> <p>Participation in activities at birth was assessed by asking mothers if fathers participated in the following activities: present at birth; and visit child in hospital after birth. Response categories: yes/no. If the baby was not born in a hospital (N = 15), the question of “Did father visit child in the hospital” was skipped. Because attending the birth was highly associated with visiting the child in the hospital (90% participated in both), for cases in which the father was present at the birth and the baby was not born in the hospital, visiting in the hospital were recoded as “yes.” Birth behaviors items were summed to obtain the number of birth behaviors in which the father participated (range 0 – 2).</p>
Father activities with children	Roggman et al. 2002	Trained research staff interviewed parents to assess the frequency with which fathers engaged in activities with their infants. Activities include: reading or telling stories, feeding, eating a meal together, going to the playground, playing at home. Response categories ranged from 1 = not at all to 5 = several times a week.
Daily involvement in care of the child	Guzell, 2001	18 items from the <i>Who Does What Scale</i> (Cowan, Cowan, Coie, & Coie, 1985) were summed and averaged.

Table F.3 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Religious and Civic Activities		
Religious activity	Roggman et al. 2002	Trained research staff interviewed parents to assess the frequency of Religious activity. Fathers were asked "How often are you actively involved in your religion?" Response categories: more than once a week, once a week, 2-3 times a month, once a month, 2-3 times a year, yearly or rarely, and never.
Religious affiliation	Caputo, 2006	Respondents indicated whether they identified themselves as: Baptist, Catholic, Mainline Protestant, Other, None
Religious activity	Caputo, 2006	Respondents were asked how frequently they attended religious services. Response categories ranged from 1 = Never to 5 = More than once a week.
Religious involvement	Wilcox et al. 2001	Authors measured religious involvement by asking respondents about their frequency of participation in church related organizations such as men's groups, Bible studies, soup kitchens. Response choices ranged from 1 = never to 5 = several times a week.
Religious socialization	Bowman et al. 1997	Authors created a single variable based on a survey item from the National Survey of Black Americans. Respondents were asked "how important is it for African American parents to send or take their children to religious services?" Response categories: 1=not important at all to 4=very important
Civic participation	Wilcox et al. 2001	Authors measured civic engagement by examining the frequency of participation in five types of activities: sports groups, fraternal organizations (veteran's groups, fraternities), professional organizations (unions, etc), service organizations (Charitable groups, political, etc), cultural activities (literary or arts related groups). Response choices ranged from 1 = never to 5 = several times a week.
Job Characteristics		
Employment status and work schedule	Le Bourdais et al. 2002	Authors created a single variable based on data from General Social Survey (Statistics Canada). Categories: (a)full-time/day; (b)not working; (c)part-time; (d)full-time/evening, night, weekend
Work hours	Formoso et al. 2007	Mothers and fathers reported the number of hours they worked per week. To test for interaction effects between work hours and partner relationship, the authors probed the interaction by creating the following groups based on maternal work hours: unemployed (0 hours), part-time employed (20 hours) and full-time employed (40 hours).
Work hours	Roggman et al. 2002	Trained research staff interviewed parents to collect data on the number of hours fathers worked per week.
Occupational self direction	Goodman et al. 2008	Author-created measure based on information from the Occupational Information Network database (Peterson et al. 2001). The measure consists of 16 items rated on a 100-point scale, including those representing occupational complexity (e.g., "making decisions, solving problems"; "develop objectives, strategies") and management (e.g., "coordinate, lead others"; "guide, direct, motivate others"). Alpha=.98

Table F.3 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Job involves caregiving	Goodman et al. 2008	Author-created measure based on information from the Occupational Information Network database (Peterson et al. 2001). The measure consists of four items rated on a 100-point scale related to caring for or assisting others, including "dealing with physically aggressive people," "assist, care for others," and "exposed to disease or infections." Alpha=.86
Occupational complexity	Whitbeck et al. 1997	Author created measure based on occupation codes from the Dictionary of Occupational Titles (U.S. Department of Labor, 1991). Score is the sum of three worker function ratings: working with data, working with people, and working with things. Higher scores indicate more occupational complexity.
Job autonomy	Whitbeck et al. 1997	Author-created measure. Score is the sum of responses to three items: "I have a flexible work schedule; I am mostly my own boss; and, I have a lot of opportunity to use my ideas and imagination in this job." Response categories: 1=strongly agree to 5=strongly disagree. A high score indicates more autonomy.
Work flexibility	Shields, 1998	Respondents indicated how much flexibility they had at work. Response categories: not very flexible, somewhat flexible, very flexible.

Table F.4. Stress and Coping: Variables and Measures Used in Studies of Low- Income Fathers

Variable/Measure	Study Citation	Description of Variable/Measure Used
Life Stressors		
Stressors	Coohey, 2000	Fathers were asked if they experienced any of the following life events or conditions: death of someone close, serious health problem, moved, stopped or started working, stopped or started going to school, had a problem with custody or visiting, was separated or divorced, was hit by partner, partner was pregnant or gave birth, had a problem with government check. Response categories: yes = 1, no = 0. Score is the sum of all items.
Stressors	Anderson et al. 2005	Resource Challenges Scale (Anderson et al, 2005) consists of seven items assessing whether the respondent: is currently unemployed, is unable to pay full amount of child support order, has limited access to reliable transportation, has no permanent place to live, has problems with alcohol or drugs, has health problems or a disability, has ever been convicted of a crime. Scores were calculated by summing items (yes = 1, no = 0). Alpha = 0.64
Life stress	Hoard et al. 2004	Life Stress Index (LSI; author-created). The LSI includes seven questions. The LSI total score had the possibility of ranging from 0 to 7, with a higher number indicating more life stresses. Alpha=. 51 Six questions had the response categories 1=yes or 0=no: "Are you currently employed?," "Do you have a permanent place to live?," "Do you have problems with alcohol or drugs?," "Do the following make it hard for you to find or keep a job—health problems or disabilities?," "Do you have access to reliable transportation?," and "Have you ever been convicted of a felony, a violent crime, spousal abuse, or child abuse?" The last question asked respondents to describe their relationship with their child's other parent. Responses of "very friendly", "somewhat friendly", or "neutral" were coded as 0 to indicate the absence of stress and responses of "somewhat hostile" or "very hostile" were coded as "1" to indicate the presence of stress.
Stressful life events	Boyce et al. 2007	Authors used a shortened version of the Life Event Scale (Tennant and Andrews, 1977) to measure the level of stressful life events in the fathers' lives in the past three months. The measure was scored by summing the total number of life events.
Acute stress	Conger et al. 1995	The construct of acute stress was assessed using two measures: First, respondents reported whether they experienced the following events in the last two years: (1) significant decreases in income, (2) other family member serious medical problem, and (3) frequency of times the respondent experienced injury or illness requiring medical attention. The second measure was based on the PERI measure of objective-life event ratings (Dohrenwend, Krasnoff, Askenasy, & Dohrenwend, 1978) which captured the occurrence of 35 negative events (job disruptions, financial problems, illness, injury, etc.) that happened to the respondent, a family member or friend in last 12 months.
Stressful events	Rienks et al. 2011	Authors used a modified 33-item version of the Family Inventory of Life Events and Changes (McCubbin & Patterson, 1991) to assess the types of stressful events i.e., "Increase in conflict or arguments among family members," "Had to borrow money, took out or refinanced a loan") participants encountered within the last year . Responses (1 = yes, 0 = no) were summed to obtain a total score. Alpha=.82

Table F.4 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Life events strain	Sloper et al. 1993	Authors used a 42-item checklist (Cheang & Cooper, 1984) that measured the individual's perception of the strain resulting from life events on a 10-point Likert scale.
Stressful life events	Proctor, 2005	Measured with the Life Experiences Survey (Sarason, Johnson, and Siegel, 1978). Respondents indicated whether they experienced 49 events (such as death, financial problems, change of residence or job, and separation from a family member) during the last year and the impact of the event on their life. Score is the sum of items parents rated as negative on a three-point scale (somewhat to extremely negative).
Other Specific Stressors		
Exposure to community violence	Proctor, 2005	Assessed using the Community Violence Questionnaire-Parent Version patterned after the Survey of Exposure to Community Violence (SECV; Richters and Saltzman, 1990). For each of 25 events, respondents reported on whether they had ever experienced each event and on the frequency of exposure in the past year. For this study, only responses pertaining to whether the individual had ever experienced each even were used. Responses to 25 items were summed to capture parents' exposure to violence or violence-related activities via witnessing and victimization. Alpha=.88
Job demands (work hours, job pressure, role overload)	Bumpus et al. 1999	Families were categorized into three groups based on the job demands of the mothers and fathers. Three measures of job demands were used: work hours, role overload, and job pressure. Work hours included time spent at work, time spent at home on work related tasks, and time spent driving to and from work. Role overload was based on responses to 13 items (Reilly, 1982); Example item: "There are too many demands on my time". Response categories were on a five-point scale, alpha = 0.88 for mothers and 0.89 for fathers. Job pressure was assessed using the Work Pressure Scale which was a modified version of the Work Environment Scale (Moos, 1986). Scores were based on nine items with responses provided on a four-point scale. Alpha = 0.79 for mothers, and 0.72 for fathers.
Role overload	Goodman et al. 2008	Authors used a modified, six-item version of the Role Overload Scale (Reilly, 1982). Responses were rated on a five-point scale ranging from strongly agree to strongly disagree. Alpha=.91
Financial Stress		
Monetary stress	Bowman et al. 1997	Authors created a single variable based on a survey item from the National Survey of Black Americans. Respondents were asked "So have you had money problems—how much did that upset you?" Response categories: 0=no problem to 4=a great deal.
Perceived income inadequacy	Bowman et al. 1997	Authors created a single variable based on a survey item from the National Survey of Black Americans. Respondents were asked "how much do you worry that your income will not meet your family's expenses and bills?" Response categories: 1=not at all to 4=a great deal.

Table F.4 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Perceptions of financial stress	Coltrane et al. 2004	Authors used a measure based on a similar instrument by Conger, Conger, Elder & Lorenz (1992). Score is the sum of responses to two items with higher values representing less financial stress. The questions asked about difficulty paying bills and whether respondents typically had money left over at the end of the month. Alpha=.70
Perceived economic hardship	Gonzales et al. 2011	Authors measured perceived economic hardship separately for mothers and for fathers using three subscales based on items from Conger et al (1994). Respondents were asked two items on inability to make ends meet, seven items on not having enough money for necessities, and two items on financial strain. Authors scored this measure by averaging the subscales with higher scores representing greater economic hardship. Alpha (English) = 0.76 for mothers, and 0.82 for fathers. Alpha (Spanish) = 0.75 for mothers and 0.76 for fathers.
Financial stress	Thornberry et al. 2003	Author created a single variable using data from the Rochester Youth Development Study (RYDS). The variable represents the number (0 to 5) of signs of financial hardship (e.g., difficulty paying bills) experienced by the respondent.
Financial difficulties	Flouri et al. 2003	Authors documented if a family was having financial difficulties using a combination of two measures (used at different time-points): At child age seven, authors relied on receipt of free school meals or if unavailable, then the Health Visitor's assessment of financial difficulties experienced by the families. At child age 11 and 16, authors based their assessment on receipt of free school meals.
Economic Pressure	Whitbeck et al. 1997	Economic pressure was measured by three scales. The first scale used two items to assess the degree to which the family's income covered the family's expenses (alpha=.82). The second scale consisted of seven items (alpha=.90) that assessed whether the family had enough money for the kind of home, clothing, furniture, car, medical care, and leisure activities they would like to have. Each item was rated on a five-point scale (1=strongly agree to 5=strongly disagree). The third scale consisted of 27 items (alpha=.85) and assessed whether the family had to make adjustments (e.g., used savings to meet expenses, sold possessions or cashed in insurance policies, postponed medical or dental care) in order to meet their financial obligations.
Parenting Stress		
Parenting stress and aggravation	Bronte-Tinkew et al. 2010	Measure was adapted from the Parenting Stress Index (PSI; Abidin, 1983). Sample item: Fathers were asked how true it was that being a parent is harder than they thought it would be. Score is the sum of responses (0=strongly disagree; 3=strongly agree) to four items (alpha= .77).
Parental stress	Paquette et al. 2000	Parenting Stress Index-short version (validated for the French-speaking population of Quebec by Bigras et al. 1996). Score is the sum of responses to 36 items composing three subscales: parental distress, dysfunctional parent-child interactions, and stress relating to a difficult child (alpha=.88).

Table F.4 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Parental distress; Parent-child dysfunctional interaction	Vogel et al. 2003	Parenting Stress Index - Parental distress and parent-child dysfunctional interaction subscales (Abidin 1995). Parents with scores at the 75th percentile (based on the norming sample) or higher were coded as having high levels of stress. The Parental Distress subscale is based on 12 items; the Parent-Child Dysfunctional Interaction subscale is based on 11 items.
Parental stress	Whipple et al. 1991	Assessed using the Parenting Stress Index (PSI; Lloyd and Abidin, 1985). Measures consists of 126 items, divided into parent and child characteristics. Authors used only the Parent Domain for their analysis, represented by seven subscales: depression, attachment, restrictions of role, sense of competences, social isolation, spouse support, health. A high score indicates stress related to parent functioning. Alpha = 0.93
Depressive Symptoms or Psychological Distress		
Psychological distress	Levine Coley et al. 2006	Assessed using the Brief Symptom Inventory-18 (Derogatis, 2000). Score is the average on 18 items. Response categories: 0=not at all to 4=extremely. Alpha=.91
Psychological distress	Proctor, 2005	Psychological Distress was measured with the Symptom Checklist 90-Revised (SCL-90-R; Derogatis, 1994). Score is the mean of responses to 90 items describing a wide range of psychological symptoms including depression, anxiety, hostility, interpersonal sensitivity, and somatization. Responses range from "not at all" to "extremely." Alpha=.95
Depressive symptoms	Roggman et al. 2002	Authors assessed depressive symptoms using the 22 item Center for Epidemiologic Studies Depression Scale (CES-D; Radloff 1977). Example items: Fathers were asked to respond to statements beginning with a phrase "During the past week" and describing a symptom such as "I was bothered by things that usually don't bother me" or "I did not feel like eating; my appetite was poor". Response categories ranged from 1 = less than once to 4 = more than five days. Alpha = 0.90
Depressive symptoms	Cabrera et al. 2009	Center for Epidemiological Studies Depression Scale-Short Form (Ross, Mirowsky, & Huber, 1983). Score is the mean of responses to 12 items. Response categories: 0=Rarely or never to 3=Most or all days. Alpha=.80
Depressive symptoms	Bronte-Tinkew et al. 2010	A dichotomous measure of major depression was constructed from the short form of the Composite International Diagnostic Interview (CIDI-SF; Kessler, Andrews, Mroczek, Utsun, & Wittchen, 1998), and based on the criteria for major depression in Diagnostic and Statistical Manual of Mental Disorders (3rd ed., rev.) (American Psychiatric Association, 1987). Respondents to the short form who affirmed screener questions were asked about seven symptoms. Following the procedures of Kessler and colleagues (1998), a numeric score ranging from 0 to 7 was converted to a probability of caseness ranging between 0 and 1. Respondents reporting three or more symptoms with a probability score greater than .5 were considered to have major depression (Walters, Kessler, Nelson, & Mroczek, 2002).

Table F.4 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Stress-related paternal depression	Conger et al. 1995	Five measures of depression were used: (1) CES-D (Radloff, 1977); (2) the Lubin Checklist (Lubin, 1963); (3) the SCL-90-R, Depression subscale (Derogatis, 1983); (4) Spouse-reported depression (author-created) based on the sum of two items pertaining to spouse's emotional state. Responses range from 1=agree to 5=disagree. (5) Observer-reported rating of fathers' and mothers' degree of sadness (single item).
Depressive symptoms	Vogel et al. 2003	Authors assessed depressive symptoms using the 22 item Center for Epidemiologic Studies Depression Scale (CES-D; Radloff 1977).
Depressive symptoms	Chambers, 2004	Author created a single variable based on the following survey item from the Fragile Families and Child Wellbeing Study: "In the past week, how often did you feel everything was an effort?" Response categories: 0 days, 1-4 days, 5-7 days
Depressive symptoms	Ash, 1999	Authors assessed depressive symptoms using 20 items from the CES-D (Radloff 1977). Alpha=.84
Parental depression & anxiety	Whipple et al. 1991	The Beck Depression Inventory (BDI; Beck, 1967; alpha = 0.93) was used by authors to measure depression. It has 21 items consisting of statements relating to cognitive symptoms of depression, and parents indicated (on a scale of 0 to 3) how each statement represented their state of mind. A score of 10 or more reflects clinical depression. The State-Trait Anxiety Inventory (STAI; Spielberger, 1983; alpha = 0.86 to 0.95) was used to measure anxiety. The measure consists of two 20-item scales: the State Anxiety scale included 20 items on how respondents felt at the time of completing the questionnaire (i.e. pleasant, happy, sad, etc) and the Trait Anxiety scale included 20 items on how the respondent felt generally (i.e. calm, secure, tense, anxious, etc).
Anxiety and depression	Rienks et al. 2011	The Brief Symptom Inventory-18 (BSI-18; Derogatis, 2000) asks participants to indicate how they have felt in the past week on a five-point Likert scale. Response categories: 0=not at all to 4=extremely. Alpha=.84 for anxiety and .90 for depressed mood).
Well-being		
Well-being	Dechman, 1994	Author-created measure based on a single survey item: "Taking all things together, how would you say things are these days?" Response categories: 1=very unhappy to 7=very happy
Coping		
Coping efficacy	Rienks et al. 2011	The authors used a modified six-item version of Sandler, Tein, Mehta, Wolchik, and Ayers' (2000) coping efficacy scale that assesses how participants feel about how well they cope with stress and how effective they feel their coping strategy will be in the future on a scale of 1 (not at all) to 4 (well). Alpha=.88

Table F.4 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Coping strategies	Sloper et al. 1993	Coping Strategies were measured using the Ways of Coping Questionnaire (Revised) (Folkman & Lazarus, 1985), adapted to measure the ways in which parents coped with problems concerning their child (Knussen, Sloper, Cunningham & Tumer, in press). Responses from mothers and fathers were pooled and subjected to principal components factor analysis. Seven factors based on 54 items were obtained. The factors were labeled 1. Practical coping; 2. Wishful thinking; 3. Seeking social support; 4. Stoicism; 5. Denial/delay; 6. Passive optimism; 7. Distancing. Proportional coping scores for each factor were calculated by obtaining mean item scores for the factor and dividing these by the sum of the means for all factors.
Coping strategies	Roggman et al. 2002	Social support was measured using an unspecified number of items from the F-COPES (McCubbin and Patterson, 1982). The measure consisted of several subscales which were then averaged together to calculate a total social support score: Informal Support (Family and friends), Community support, and Spiritual support (alphas ranged from 0.79 to 0.87 for the three subscales). Fathers reported the frequency with which they took the following types of actions when they had problems: "Talk about it with relatives", "Ask for encouragement or support from friends", "Ask for information from your family doctor", or "Participate in church or other spiritual activities". Response categories ranged from 1 = never to 5 = always

Table F.5. Knowledge: Variables and Measures Used in Studies of Low- Income Fathers

Variable/Measure	Study Citation	Description of Variable/Measure Used
Knowledge about infant development	Guzell, 2001	<i>Knowledge of Infant Development Inventory</i> (MacPhee, 1981). Respondents indicated whether they agree or disagree with factual statements about children's developmental milestones. If they disagreed with certain statements, they were asked to indicate whether the statement reflects a milestone for an older or younger child. Alpha=.59 (author notes this is lower than those reported by MacPhee)

Table F.6. Cognitions: Variables and Measures Used in Studies of Low- Income Fathers

Variable/Measure	Study Citation	Description of Variable/Measure Used
Parenting Attitudes		
Attitude towards the use of harsh discipline	Coohey, 2000	Single item from the General Social Science Survey: "It is sometimes necessary to discipline a child with a good, hard spanking." Response categories: "strongly agree, agree, disagree, or strongly disagree"
Valuing of children	Ferrari, 1999	Author-created variable based on the sum of responses to 15 items concerning the acceptance of children into the family and community, such as acceptance of children in restaurants, airplane travel, and adult conversation. Sample items include: "Young children should be able to sit through a three-hour movie like the <i>Titanic</i> without disturbing their parents" and "Kid-friendly restaurants like 'Friendly's' or 'Ground Round' are a bad idea because they encourage children to misbehave at dinnertime." Response categories: 0=strong disagreement, 5=strong agreement. Nine of the items are reverse coded. Higher scores indicate stronger valuing of children (alpha=.78).
Severity ratings of vignettes depicting child maltreatment	Ferrari, 1999	Respondents rated the severity of maltreatment as depicted in 54 vignettes (vignettes were adapted from Giovannoni and Becerra, 1979 and Isman, Glenwick, and Schiaffino's, 1996). Ratings were based on a six-point response scale (0 corresponds to "the parent is not mistreating the child"; 5 corresponds to a rating of "extremely serious"). Alpha=.81
Happy to have had a child	Le Bourdais et al. 2002	Single item from the General Social Survey (Statistics Canada). Fathers responded to a statement indicating that "the fact of having children made them happier." Response categories: yes/no
Positive attitude toward fathering; Change in positive attitude toward fathering	Knoester et al. 2007	<p>Authors created two variables based on survey items from the Fragile Families and Child Wellbeing Study.</p> <p>Positive attitude toward fathering at the time of the child's birth was based on responses to three items about the importance of fathering. Response categories: 1=strongly agree to 4=strongly disagree. Alpha=.72</p> <p>Positive attitude toward fathering a year after the child's birth was based on items pertaining to parenting aggravation. Response categories: 1=strongly agree to 4=strongly disagree. Alpha=.58</p> <p>Change in attitude was measured by standardizing scores at each time point and calculating the difference between the two standardized scores.</p>
Gender Role Attitudes¹		
Sex role egalitarianism	Shields, 1998	<i>Sex Role Egalitarian Scale-Short Form</i> (King & King, 1993). Sum of responses to 25 items, eight of which are reverse coded. Sample items: "The family home will run better if the father, rather than the mother, sets the rules for the children." "Women have just as much ability as men to make major business decisions." Response categories: 1=strongly agree to 5=strongly disagree. Higher scores indicate greater sex role egalitarianism. Alphas from a previous study ranged from .89 to .92. Alphas for study sample were not reported.

Table F.6 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Gender traditionalism	Coltrane et al. 2004	<i>Gender Based Attitudes Toward Marriage Scale</i> (Hoffman & Kloska, 1995). Sample items: A husband's job is more important than a wife's; men should make the really important decisions in the family; a man should help in the house, but housework and child care should mainly be a woman's job. Score is the sum of responses across seven items (alpha=.82). Response categories: strongly disagree to strongly agree. Higher scores represented more traditional ideals and lower scores represented more egalitarian ideals.
Whether tasks related to children are men's responsibility	Le Bourdais et al. 2002	Single item from the General Social Survey (Statistics Canada). Fathers responded to a statement indicating that "everyday tasks linked to children are not principally men's responsibility." Response categories: five-point scale from strongly disagree to strongly agree.
Co-involved child care attitude	Bowman et al. 1997	Single item from the General Social Survey (Statistics Canada). Fathers responded to a statement indicating that "both men and women should share equally in child care and housework." Response categories: four-point scale from strongly disagree to strongly agree.
Attitudes Towards Marriage or Relationships		
Attitudes towards marriage	Caputo, 2006	Author created a single variable based on participant responses to two items: (1) Is it better for a couple to get married than to just live together?; (2) Is it better for children if their parents are married? Response categories ranged from 1 = strongly disagree to 4 = strongly agree. Authors averaged scores across the two items.
Distrust of opposite sex	Caputo, 2006	Author asked each parent to respond to the following statements: (1) Men [women] cannot be trusted to be faithful; (2) In a dating relationship a man [woman] is largely out to take advantage of a woman [man]. Response categories ranged from 1 = strongly disagree to 4 = strongly agree. Authors averaged scores of the two items.
Work- Related Attitudes		
Job satisfaction, job involvement	Paquette et al. 2000	Job satisfaction was assessed using the <i>Minnesota Satisfaction Questionnaire</i> (Weiss et al. 1959). Scores were based on responses to four items with each rated on a seven-point Likert scale. Alpha=.78 The <i>Job Involvement Scale</i> (Lodahl and Kejner, 1965) measured psychological involvement in work. Scores were based on responses to 20 items with each rated on a four-point Likert scale. Alpha=.74
Self- Efficacy		
Father efficacy	Freeman et al. 2008	Subscale was adapted from the <i>Parent Perceptions of Parent Efficacy Scale</i> (Hoover-Dempsey et al. 1992). Fathers responded to 11 items assessing their perceived ability to help the child grow, develop, and learn. Items were reworded to address development and learning in the preschool period, as opposed to the school-age period. Sample questions include: 'My efforts to help my child learn are successful' and 'I know how to help my child do well in preschool/childcare.' Negatively worded items were re-coded. Response categories: 0 = not at all to 4 = very much. Alpha=.73
Feelings of incompetence	Frost, 1997	Assessed with the <i>Parenting Stress Index - Competence scale</i> (PSI; Abidin, 1986). The subscale consists of 11 items each rated on a five-point scale (1=strongly disagree, 5=strongly agree). Alpha=.77

Table F.6 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Parental self-efficacy	Guzell, 2001	Assessed with the <i>Parenting Self-Efficacy Scale</i> (Fish, Stifter, & Belsky, 1991). Measure consists of 20 items rated on a six-point Likert scale (1=strongly disagree to 6=strongly agree). Alpha=.76
Responsibility/Perceived Control		
Perceived control over caregiving outcomes	Guzell, 2001	The Parent Attribution Test (PAT; Bugental et al, 1989; Bugental, 1993) consists of 18 items rated on a seven-point scale ranging from 0=not at all important to 6=very important. Each item assesses the importance the respondent gives different factors that could make a caregiving experience positive or negative. Two subscale scores are calculated: Child control over failure and adult control over failure. Participants were grouped based on subscale scores as follows: (1) Low perceived control - parents whose score on the child control subscale is higher than the median and whose score on the adult control subscale is lower than the median; (2) High perceived control - everyone else in the sample. The dichotomous indicator of subgroup was used as a predictor in analyses.
Responsibility for child's learning	Freeman et al. 2008	Based on responses to four items that measured fathers' feelings of responsibility for the child's learning and interactions with the child's teacher or family advocate. Sample items included: 'I assume my child is doing all right if I don't hear anything from his or her teachers' and 'My child's learning is up to the teacher and my child'. Response categories: 0 = not at all, 4 = very much. Alpha = .62
Parent cognition: child-responsible factor; parent-causal factor	Snarr et al. 2009	The Parent Cognition Scale (Snarr et al. 2009) is a 30-item self-report measure designed to assess the degree to which parents endorse dysfunctional child-responsible and parent-causal attributions for child misbehavior. Respondents are asked to think about a target child's misbehavior over the past two months and to rate various possible causes for their child's misbehavior on a six-point Likert scale that ranges from 1 (always true) to 6 (never true); when scoring, each item is reverse scored so that higher scores indicate greater endorsement. Child-responsible factor: Ten items attributed child misbehavior to factors under the child's control, child willful intent to misbehave, and/or child desire to have a negative effect on the parent (e.g., "My child is headstrong," "My child tries to get my goat or push my buttons"). Parent-causal factor: An additional 10 items attributed the child's misbehavior to stable, global, trait-like characteristics of the respondent (e.g., "I'm not patient," "I can't control my child"). The remaining 10 items, not used in scoring, attributed the child's misbehavior to uncontrollable and/or unintentional child-focused factors (e.g., "My child is in a stage"), or to unstable, specific, and situational parent factors (e.g., "I was tired at the time").

Table F.6 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Partner cognition: partner-responsible factor; self-causal factor	Snarr et al. 2009	<p>The <i>Partner Cognition Scale</i> (Snarr & Slep, 2009) is a self-report measure that was derived from the Parent Cognition Scale and is designed to assess the degree to which the respondent endorses dysfunctional attributions for undesirable behavior on the part of the respondent's romantic partner. This measure comprises two factors, Partner-Responsible (eight items) and Self-Causal (nine items)</p> <p>Partner-Responsible items attribute undesirable partner behavior to factors under the partner's control, partner willful intent to be unpleasant, and/or partner desire to have a negative effect on the respondent</p> <p>Self-Causal items attribute negative partner behavior to stable, global, trait-like characteristics of the respondent (e.g., "I'm unable to be a good husband/wife"). Cronbach's alphas for fathers were .92 on Partner-Responsible and .88 on Self-Causal.</p>
Belief that own economic situation will dictate child's future (used to predict depression)	Ash, 1999	<p>Single item from the <i>Perceived Parental Influence Scale</i> (author-created):</p> <p>Fathers responded to the question "Do you feel that your financial situation will dictate your children's future?" Response categories: yes, no, don't know</p>
Perceived Outcomes		
Expectations about pregnancy and fatherhood	Boyce et al. 2007	Authors asked fathers a number of questions about whether the pregnancy was planned or unplanned, whether their expectations about the birth were clear or unclear, and whether they were aware of positive or negative experiences of other men regarding fatherhood

Notes: 1. These measures of gender-role attitudes tap general gender-role attitudes. Studies examining how the father views himself as a man are listed in Table II.C. Identity, under the Identity as a Man subheading.

Table F.7. Social Norms: Variables and Measures Used in Studies of Low- Income Fathers

Variable/Measure	Study Citation	Description of Variable/Measure Used
Acceptance of negative stereotypes about African American men	Shields, 1998	Assessed using the author-created <i>Acceptance of Negative Stereotypes Scale</i> . Score is based on the sum of responses to seven items, one of which is reverse coded. Higher scores indicate greater acceptance of negative stereotypes. Sample items: "Nowadays, African American men are not committed enough to their children and families; Generally, African American men are very involved with their children." Response categories: 1=strongly agree to 5=strongly disagree.
Internalized negative stereotypes about African Americans	Wright, 2004	The <i>Stereotype Scale Black male subscale</i> (Kelly & Floyd, 2001) is a 52-item survey that assesses participants' internalized negative stereotypes about African Americans. Response categories: 1=strongly agree to 5=strongly disagree. Lower scores reflect greater acceptance of negative stereotypes. Alpha=.76
Neighborhood familism	Gonzales et al. 2011	Self-reported measure based on the <i>Mexican American Cultural Values Scale-Familism subscale</i> (Knight et al, in press). The subscale consisted of: six items on support and emotional closeness ["Parents should teach their children that family always comes first"]; five items on obligations ["If a relative is having a hard time, one should help them out if possible"]; five items on family as a referent ["It is important to work hard and do one's best because this work reflects on the family"]. Respondents were asked to rate their level of agreement with each item, ranging from 1 = not at all to 5 = completely. Authors averaged the scores for mother and fathers which yielded a familism score for the family (alphas = 0.75 for mothers and 0.79 for fathers). Authors calculated the neighborhood familism score by averaging the family familism scores in each neighborhood.

Table F.8. Relationship with Child's Mother: Variables and Measures Used in Studies of Low-Income Fathers

Variable/Measure	Study Citation	Description of Variable/Measure Used
Negative Partner Characteristics		
Negative partner characteristics	Coohy, 2000	Fathers were asked if their partners had any of the following 'negative' characteristics: not able to control her anger, is unreliable, is critical of you, has a drug or alcohol problem. Response categories: yes = 1, no = 0
Conflict		
Areas of conflict	Caputo, 2006	This variable was based on 10 items asking respondents to choose how often certain issues (e.g., faithfulness, money, sex, spending time together, pregnancy) were sources of conflict in their relationship. Response categories: Often, sometimes or none. Authors coded "Often" as 1 and "Sometimes" or "None" as 0.
Marital concerns	Frost, 1997	<i>Partner Role Quality Scale</i> (Barnett & Marshall, 1989). Measure consists of 22 items rated on a four-point scale (1=not at all, 4=extremely). Alpha=.90
Relationship disagreement	Bronte-Tinkew et al. 2010	Variable was based on nine survey items from the Fragile Families and Child Wellbeing Study. Score is the sum of responses across items (alpha=.71). Sample item: Overall frequency of disagreements related to the mother being fair and willing to compromise when the mother and the father disagree.
Level of hostility	Florsheim et al. 1999	This measure is based on observer ratings of expectant couples as they participated in a 15-minute communication task. Couples were instructed to discuss and resolve a recent conflict. The interactions were coded using the Structural Analysis of Social Behavior observational coding scheme (Florsheim & Moore, 1997; Humphrey & Benjamin, 1989). Interrater reliability ranged from .80 to .95, with a mean of .90.
Domestic tension	Flouri et al. 2003	Authors measured co-parental relations based on the Health Visitor's assessment of domestic tension, and mental illness in the family.
Couple conflict	Cabrera et al. 2009	Mean scores were calculated across nine items assessing frequency and level of conflict with spouse/partner. Response categories: 1=never/hardly to 3=often. Alpha=.75
Partner violence	Jaffee et al. 2001	Partner violence was assessed with nine physical violence items from the <i>Conflict Tactic Scales</i> (CTS, Form R; Straus, 1990) plus four additional items that capture other physically abusive behaviors (scored 0-1). Scores were calculated for physical violence perpetration (alpha=.76) and physical violence victimization (alpha=.82). Only individuals who had a partner for at least one month in the past year were scored on this variable.
Communication		
Negative communication	Rienks et al. 2011	The <i>Communication Skills Test</i> (Saiz & Jenkins, 1995) consists of 32 questions about negative and positive communication patterns, answered on a seven-point Likert scale. This study utilized the negative communication subscale. Alpha = .92
Communication danger signs	Rienks et al. 2011	The eight-item <i>Danger Signs Scale</i> (Stanley & Markman, 1997) was used to assess relationship "danger signs" such as escalation, invalidation, and withdrawal.

Table F.8 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Relationship Quality		
Quality of relationship	Shannon et al. 2005	A composite measure of men's relationship with their partners was based on one general question and responses to six items from the <i>Love and Relationship Scale</i> (LRS; Braiker & Kelley, 1979). The general question asked, "In general, how would you rate the quality of your relationship with [child]'s mother?" Responses were rated on a five-point Likert scale (1=poor; 5=excellent). Sample items from the LRS include: "My spouse/partner listens to me when I need someone to talk to," and "I can state my feelings without her getting defensive." Negatively worded items were recoded so that higher scores indicated more positive relationships. Alpha for LRS=.81
Love for mother	Fagan, 1996	Author-created variable based on three items that assessed the amount of the father's love for the mother, the intensity of his love, and feelings of closeness to the mother. Each item was rated on a five-point Likert-type scale. Alpha=.90
Relationship quality	Dush et al. 2011	Data and measure obtained from the Fragile Families and Child Wellbeing Study. Score is the sum of multiple items. Response categories: 0 (never), 1 (sometimes), and 3 (often). Alpha: mothers (.62-.63), fathers (.70-.77)
Marital happiness	Frost, 1997	<i>Partner Role Quality Scale</i> (Barnett & Marshall, 1989). Measure consists of 22 items rated on a four-point scale (1=not at all, 4=extremely). Alpha .91
Marital relationship quality	Whipple et al. 1991	The <i>Marital Adjustment Test</i> (MAT; Locke & Wallace, 1959) was completed by only parents who were married at the time of intake. The measure consists of 32 self-reported items, measuring the level of marital satisfaction. A score of 100 or more indicated supportive marriages.
Relationship with partner	Castillo, 2009, 2010	Variable is based on a single item from the Fragile Families and Child Wellbeing Study. Fathers rated their relationship with their partner as poor, fair, good, very good, or excellent.
Overall happiness	Cabrera et al. 2009	Respondents rated their level of happiness in their marriage/relationship on the following scale: 1=not too happy, 3=very happy. A binary variable was used in analysis with 0=not happy or somewhat happy and 1=very happy.
Partner closeness	Mitchell, 2008	Measure was adapted from Cabrera et al. (2004). Score is the average of responses to three items such as: "She listens to me when I need someone to talk to," "I can state my feelings without her getting defensive," and "She can really understand my hurts and joys." Response categories: 1=strongly disagree; 4=strongly agree. Higher scores represented greater closeness. Alpha=.77
Relationship adjustment	Rienks et al. 2011	A seven-item version of the <i>Dyadic Adjustment Scale</i> (DAS; Spanier, 1976) was used.

Table F.8 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Relationship quality	Knoester et al. 2007	Data and measure obtained from the Fragile Families and Child Wellbeing Study. Relationship Quality with Coparent was assessed at child's birth and one year later. Fathers responded to four statements about the child's birth mother: (1) She was fair and willing to compromise when you had a disagreement; (2) She expressed affection or love for you, (3) She insulted or criticized you or your ideas (reverse coded), and (d) She encouraged or helped you to do things that were important to you. Response categories: 1=never to 3=often. The average rating was calculated across the four statements at each time point and the difference between scores was calculated as a measure of change.
Interpersonal behavior with partner	Moore, 2003	Couples engaged in a 10 minute videotaped task in which they were asked to discuss and resolve a recent conflict and try to come to some resolution. Videotaped interactions were coded using the <i>Structural Analysis of Social Behavior Composite Observational Coding Scheme</i> (Moore & Florsheim, 1999, 2001). Three types of interactions were coded and subgroups of couples were identified based on the predominant type of interaction observed: 1) demand-withdraw - control/blaming behavior by one partner and walling-off behavior by the other; 2) nurture-disclose - interpersonally warm expressions of control and autonomy; 3) control-assert - polar control and assertiveness
Quality of romantic relationship	Gavin et al. 2002	Authors used the <i>Dyadic Adjustment Scale</i> (DAS) to measure relationship quality. Example items included: how often respondents considered breaking up, confide in each other, quarrel, kiss, do things together, etc. The DAS consists of 15 questions that form two subscales: dyadic satisfaction and dyadic cohesion. Response categories: 0-5 Likert Scale, with low scores indicating low cohesion/satisfaction, and high scores indicating high cohesion and satisfaction. Total scores ranged from 0 to 74. Alphas = 0.89 for fathers and 0.91 for mothers.
Relationship quality	Kalil et al. 2005	Authors measured the father-mother relationship quality by asking mothers how well they got along with their child's father. Response categories: 0-4 Likert Scale with higher ratings representing higher quality relationships.
Partner's supportiveness	Coohey, 2000	To assess supportiveness of partners, authors measured both perceived support and received support. For perceived support, fathers were asked "how supportive is your partner?" Response categories: 1 (very unsupportive) to 5 (very supportive). For received support, fathers were asked whether they received six types of resources from their partner (and other first order kin: father's mother, and father's father) within the past 30 days: gave money or loans, helped with chores housework or errands, baby-sat, really listened, helped with decision-making, and was someone to do things with. Response categories: Yes = 1, No = 0.
Relationship quality	Caputo, 2006	Mothers and fathers were asked the extent to which their partners: were affectionate (often, sometimes, none), were willing to compromise or treat them fairly (often, sometimes, none), insulted or criticized them (never, sometimes, always), encouraged or helped them (often, sometimes, none). For positive attributes, authors coded "often" as 1; sometimes and none were coded as 0. For negative attributes, authors coded "never" as 1; sometimes or always was coded as 0.

Table F.8 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Relationship quality	Boyce et al. 2007	Assessed using the <i>Dyadic Adjustment Scale</i> (DAS; Spanier, 1976). The measure consists of 32 items divided into four scales reflecting dyadic consensus, cohesion, satisfaction, and affectional expression.
Perceived caring	Boyce et al. 2007	Authors used the <i>Intimate Bond Measure</i> (IBM; Wilhelm, 1988) to measure the fathers' perceptions of caring and control in their partner. The measure consisted of two scales, with a total of 24 items.
Relationship Satisfaction		
Relationship satisfaction	Rienks et al. 2011	One item assessed participants' global satisfaction with their relationship, rated on a scale of 1 (extremely unhappy) to 7 (perfectly happy).
Relationship Satisfaction	Shields, 1998	Respondents rated their relationship satisfaction before and after having children. Response categories: not at all satisfied, not very satisfied, somewhat satisfied, very satisfied, extremely satisfied.
Relationship satisfaction	Moore, 2003	Assessed using the <i>Quality of Relationship Inventory</i> (Pierce, Sarason & Sarason, 1991)
Satisfaction with relationship	Wright, 2004	Fathers were asked "how satisfied are you with your relationship with your child(ren)'s mother?" Response categories: not too satisfied, somewhat satisfied, very satisfied, extremely satisfied
Relationship satisfaction	Chambers, 2004	Data and measure obtained from the Fragile Families and Child Wellbeing Study. The Relationship Satisfaction Scale (no author info) consisted of 10 items each rated on a three-point scale (0=often, 1=sometimes, 2=never). A rating of 0 indicated unhappiness in the relationship. A rating of 2 indicated a happy relationship with no conflict. Two subgroups were identified using LCA and IRT methods based on scores on individual items. Subgroup 1 consisted of fathers in prototypical relationships - some disagreements, but nothing out of the ordinary; Subgroup 2 consisted of fathers with stress in their relationships, including problems with money, time, sex, pregnancy, drinking, and faithfulness.
Marital satisfaction	Sloper et al. 1993	Resources within the family system were assessed with the <i>Measure of Marital Satisfaction</i> (Kelso, Stewart, Bullers & Eginton, 1984).
Marital satisfaction	Bumpus et al. 1996	<i>Relationships Questionnaire - Love subscale</i> (Brakier and Kelley, 1979). Nine items were measured on a nine-point scale. Sample item: How committed do you feel toward your partner? Alphas were 0.93 for mothers and 0.91 for fathers.

Table F.8 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Quality of Co- Parental Relationship		
Co-parenting conflict	Mitchell, 2008	The Father Conflict measure was drawn from the National Survey of Families and Households (Sweet & Bumpass, 1996). Score is the sum of responses to 14 items reflecting various childrearing issues about which parents may disagree such as "disciplining child," "how mother spends money on child," "the activities your child does," and "spending enough time with child." Response categories: 0=no disagreement to 2=a great deal of disagreement. Higher scores indicated more conflict. Alpha=.84
Co-parenting conflict	Anderson et al. 2005	Respondents were asked the amount of conflict they experienced with their child's mother over how the child is raised. Original response categories: 2 = a great deal, 1 = some, 0 = no conflict. Responses were recoded to simply show presence or absence of conflict: 1 = yes, 0 = no.
Father-mother conflict surrounding parenting	Levine Coley et al. 2006	Data obtained from the Welfare, Children, and Families: A Three-City Study. Measure adapted from Vogel et al. (2003). Score is the average of responses to six items. Response categories: 1=never to 5=always or 1=none to 4=a lot. Alpha=.59 for fathers, .57 for mothers.
Parenting alliance	Formoso et al. 2007	Assessed using a modified version of the <i>Measure of the Co-Parenting Alliance</i> (Dumka, Prost, & Barrera, 2002), which assesses the extent to which parents share parenting beliefs, value and respect the judgments of the other parent, and support each other's parenting. Three items were eliminated because of nonequivalence across languages, which resulted in a 12-item scale. Alphas ranged from .90 to .94 depending on who is reporting (mother or father) and whether the respondent was an English or Spanish speaker.
Interparental conflict	Formoso et al. 2007	The Interparental Conflict measure was constructed from six-items of the <i>Dyadic Adjustment Scale</i> (DAS; Spanier, 1976) and three additional author-created items. The six DAS items focused on conflict about money, household tasks and responsibilities, friends, sex, religious matters, and relations with family. The three additional items addressed conflict about alcohol and substance use, time spent together, and work issues. Alphas ranged from .58 to .85 depending on who is reporting and whether the respondent was an English or Spanish speaker.
Interparental conflict	Cabrera et al. 2009	Fathers were asked to assess the level of conflict with their partner about issues regarding their children. Response categories: 1=never/hardly ever to 3=often. Higher scores indicated more frequent conflict.
Parenting alliance	Rienks et al. 2011	Assessed using the <i>Parenting Alliance Inventory</i> (Abidin & Brunner, 1995). Measure consists of 20 items, all of which were rated on a scale from 1 (strongly disagree) to 5 (strongly agree) and summed to create a total alliance score. Alpha = .95
Parenting alliance	Bialik, 2011	Data obtained from Early Head Start Research and Evaluation Project. Parenting alliance (author-created, based on Abidin & Konold, 1999). Sum of three attributes assessed by coding interviews (alpha=.62).

Table F.8 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Nature or Status of Relationship		
Relationship status	Holmes, 2010	Coparental relationship status was measured concurrently with father involvement at 14-, 24-, 36-, and 64-months. Repeated measurement of the time-varying covariate captured the changes in teen fathers' lives. Mothers indicated the status of the coparental relationship during each interview wave. Relationship status consisted of mutually exclusive, non-ordinal categories: Husband = 1; Live-in Partner = 2; Boyfriend = 3; Friend = 4; Divorced/Separated = 5; No Relationship = 6; or Something Else = 7. Relationship status was then dummy coded into Romantic Relationships = 1 (i.e., Husband, Live-In Partner, Boyfriend) and Non-Romantic Relationships = 0 (i.e., Friend, Divorced/Separated, No Relationship, Something Else) to allow adequate cell size in subsequent analyses.
Nature of relationship	Dush et al. 2011	Sample and measures are from the Fragile Families Study. Authors created a single variable to reflect relationship status of child's parents in period prior to relationship dissolution commitment. The variable was coded as follows: 0=the couple was dating at the wave prior to the dissolution, 1=the couple was dating and living together (cohabiting) at the wave prior to the dissolution, and 2=the couple was married at the wave prior to the dissolution. Source items were slightly different at birth vs. post-birth waves.
Nature/status	Cabrera et al. 2004	Authors documented relationship status based on mothers' reports. Mothers identified fathers as: married, cohabiter, boyfriend (non-resident but romantically involved with mother), friend (nonresident but divorced/separated), no relationship (mother reported having no relationship, romantic or otherwise, with the father)
Marital status	Goodman et al. 2008	Single variable indicating whether the couple was married or cohabitating
Living arrangement	Florsheim et al. 1999	Single variable indicated whether the couple was cohabiting or living in separate households
Family structure	Cabrera et al. 2009	Family Structure was coded as: married, cohabitation, single parents
Marital status	Coohey, 2000	Fathers were asked if they were married or unmarried
Length of relationship	Coohey, 2000	Fathers were asked how long they had been with their partner
Breakup with child's mother	Knoester et al. 2007	Authors created a variable to indicate whether fathers experienced changes in relationship status based on survey items from the Fragile Families and Child Wellbeing Study. Relationship status when the child was born was compared to relationship status a year after the child's birth. The resulting variable had the following categories: transition to marriage, transition to cohabitation, transition to a relationship with someone other than the birth mother, break up with birth mother.
Marital status	Bronte-Tinkew et al. 2010	Single variable indicated whether the couple was cohabiting or married

Table F.8 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Relationship status	Cabrera et al. 2008	Mothers characterized their relationship with their child's non-resident biological fathers as: romantic partners, friends, in no relationship, or separated/divorced/other. Authors coded romantic partners = 1, and all other relationships = 0.
Type of union at birth	Le Bourdais et al. 2002	Type of union at child's birth was coded as: marriage, marriage preceded by cohabitation, cohabitation, out of union
Years together before having children	Shields, 1998	Couples reported the number of years they were living together before having children.

Table F.9. Social Support: Variables and Measures Used in Studies of Low- Income Fathers

Variable/Measure	Study Citation	Description of Variable/Measure Used
Quality of Kin Relationships		
Cohesive family relationship	Sloper et al. 1993	The <i>Family Relationships Index</i> (Holahan & Moos, 1983) was used to assess the resources within the family system.
Quality of extended family relationship	Mitchell, 2008	Average of responses (1=poor; 5=excellent) assessing the quality of eight relationships (his mother, his other adult female relatives, his father, his other adult male relatives, mother's mother, mother's other adult female relatives, mother's father, mother's other adult male relatives). Higher scores reflect higher quality extended family relationships (alpha=.82).
Father's Relationship with child's maternal grandmother	Gavin et al. 2002	Authors measured relationship using three subscales from the <i>Network of Relationships Inventories</i> (NRI): 1) Enhancement of Worth, 2) Conflict, and 3) Annoyance (nine items). Example items included: "How much does the maternal grandmother like or approve of the things you do?; How much do you get on each other's nerves?" Response categories ranged from 0 = not often/never to 4 = always. Authors summed the scores (reverse coding where necessary), with higher scores representing more positive relationships. Alphas = 0.81 for maternal grandmothers and 0.89 for fathers.
New Partner Status		
Formation of new relationship	Knoester et al. 2007	Authors created a variable to indicate whether fathers experienced changes in relationship status based on survey items from the Fragile Families and Child Wellbeing Study. Relationship status when the child was born was compared to relationship status a year after the child's birth. The resulting variable had the following categories: transition to marriage, transition to cohabitation, transition to a relationship with someone other than the birth mother, break up with birth mother.
Former partner involved in a new romantic relationship	Dush et al. 2011	Data and measure obtained from the Fragile Families and Child Wellbeing Study. Mother indicated whether she had a new partner. Response categories: yes/no
Father has new partner and/or child	Le Bourdais et al. 2002	Uses data from General Social Survey (Statistics Canada) Single categorical variable with the following categories: (a) father has formed a new conjugal union; (b) new partner has other children; (c) father has child within new union
Kin Support		
Kin Involvement with children	Coohy, 2000	Fathers were asked whether any first order kin (father's mother, father's father, partner), second order kin (sisters/brothers), or third order kin (grandparents, aunts, uncles and cousins) provided the following types of care for his children: listens or talks to them, gives them gifts, disciplines them, watches them even when you're around, teaches them new things. To score, authors summed the number of kin reported by the father to have provided each type of care.
Kin emotional support	Coohy, 2000	Fathers were asked whether they received three types of emotional resources (really listened, helped with decision-making, was someone to do things with) within the past 30 days first order kin (father's mother, father's father, partner), second order kin (sisters/brothers), or third order kin (grandparents, aunts, uncles and cousins). To score, authors summed the number of kin reported by the father to have provided each type of emotional support.

Table F.9 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
Instrumental support from extended family	Coohy, 2000	Fathers were asked whether they received three types of instrumental resources (gave money or loans, helped with chores housework or errands, baby-sat) within the past 30 days from first order kin (father's mother, father's father, partner), second order kin (sisters/brothers), or third order kin (grandparents, aunts, uncles and cousins). To score, authors summed the number of kin members reported by the father to have provided each type of instrumental support.
Emotional support from friends	Coohy, 2000	Fathers were asked whether they received three types of emotional resources (really listened, helped with decision-making, was someone to do things with) from friends within the past 30 days. To score, authors summed the number of friends reported by the father to have provided each type of emotional support.
Friend instrumental support	Coohy, 2000	Fathers were asked whether they received three types of instrumental resources (gave money or loans, helped with chores housework or errands, baby-sat) from friends within the past 30 days. To score, authors summed the number of friends reported by the father to have provided each type of instrumental support.
Friend Involvement with Children	Coohy, 2000	Fathers were asked to identify friends who provided the following types of care for his children: listens or talks to them, gives them gifts, disciplines them, watches them even when you're around, teaches them new things. To score, authors summed the number of friends reported by the father to have provided each type of care.
Involvement with family and friends	Castillo, 2010	Non-resident fathers' involvement with informal and formal networks was assessed using numerous items included in versions of the standardized <i>Family Support Scale</i> (FSS) (Dunst et al. 1984). The FSS assesses the helpfulness of familial supports—parents; extra-familial supports—friends, and social groups; and professional supports—social service agencies. Score is the sum of responses across six items. Response categories: 0=no involvement to 2=high involvement. Alpha=.89
Support For From Networks		
Non-supportive work environment	Goodman et al. 2008	Non-supportive Work Environment was measured using two instruments: (1) a modified four-item version of the <i>Flexible Work Arrangements Scale</i> (Bond, Gallinsky, & Swanberg, 1998). Responses were rated on a four-point scale ranging from strongly agree to strongly disagree. (2) <i>Moos Work Environment Scale</i> (Moos, 1986), Co-Worker Support & Supervisor Support subscales. The nine-item subscales were rated on a four-point scale ranging from strongly agree to strongly disagree. Mean scores for each individual scale were summed to create a single, global measure (alpha=.77)
Involvement with public welfare institutions	Castillo, 2009, 2010	Non-resident fathers' involvement with informal and formal networks was assessed using numerous items included in versions of the standardized <i>Family Support Scale</i> (FSS) (Dunst et al. 1984). The FSS assesses the helpfulness of familial supports—parents; extra-familial supports—friends, and social groups; and professional supports—social service agencies. Score is the sum of responses across six items. Response categories: 0=no involvement to 2=high involvement. Alpha=.89

Table F.9 (continued)

Variable/Measure	Study Citation	Description of Variable/Measure Used
General Support Across Networks		
Support from family, friends and community workers	Anderson et al. 2005; Hoard et al. 2004	Assessed using a modified version of the <i>Family Support Scale</i> (FSS; Dunst, Jenkins, & Trivette, 1984). The authors added six additional items to the FSS to assess support from: friends of father's parents, father's current partner, partner's parents, partner's relatives, partner's friends (if not biological mom), other fathers. The modified instrument included 24 items, each rated on a 5 point Likert scale, ranging from: 0 = not at all helpful and 4 = extremely helpful. Three subscales of support were included in analysis: 1) family support (parents, partner, own children); 2) support from extra-familial individuals (friends, coworkers, social groups; 3) professional supports (teachers, doctors, therapists, etc). Average scores were calculated for each subscale. Total FSS score was calculated by summing all 24 items, ranging from 0 to 96 (Alpha = 0.91).
Financial support	Chambers , 2004	Data and measure obtained from the Fragile Families and Child Wellbeing Study. Fathers were asked "During baby's mother pregnancy did you receive any financial support?" Response categories: yes/no
Amount of social support, Satisfaction with social support	Boyce et al. 2007	Authors used the <i>Sarason Social Support Scale</i> (SSSS; Sarason 1983) to measure the level of social support fathers received, and their satisfaction with the support. The measure consists of 12 items.
Social support	Sloper et al. 1993	Social support resources were assessed with the <i>Social Support Resources Questionnaire</i> (Vaux & Harrison, 1985).
Social support	Wade et al. 2011	Assessed using the <i>Medical Outcomes Study-Social Support</i> instrument (Sherbourne & Stewart, 1991). Score is the sum across four subscales: tangible support, affection, positive social interaction, and emotional-informational support.

APPENDIX G
ROUNDTABLE SUMMARY

A. Project Purpose

The purpose of the Black Box project was to identify innovative approaches—focusing on psychosocial factors grounded in behavior change theories—for defining subgroups of men who may benefit from fatherhood programs. A key project objective was to disseminate study findings at a roundtable in which federal and non-federal experts in program evaluation, fatherhood research, and fatherhood programs and policy discuss implications for DHHS evaluation projects focused on low-income fathers. The ultimate goal is to improve future evaluations of fatherhood programs.

B. Overview of Project Tasks

The research team at Mathematica Policy Research: (1) conducted a scan of cutting-edge approaches to defining subgroups; (2) reviewed the behavioral sciences literature to identify psychosocial determinants of behavior change; (3) reviewed the extent to which these theoretically-relevant psychosocial factors have been examined in the literature on low-income fathers; (4) compiled a list of measures used to tap these psychosocial constructs; (5) summarized findings in a written report; and (6) convened the roundtable of experts to discuss study findings and implications for fatherhood programs and program evaluations.

C. Participant List

The following federal and non-federal experts participated in the roundtable:

Name	Affiliation
Non-Federal Experts	
Héctor Cordero-Gúzman	Baruch College, City University of New York
Robin Dion	Mathematica Policy Research
Derek Griffith	Vanderbilt University
Joe Jones	Center for Urban Families
Charles Michalopoulos	MDRC
Ron Mincy	School of Social Work, Columbia University
David Pate	University of Wisconsin - Milwaukee
Elaine Sorensen	Urban Institute
Matthew Stagner	Chapin Hall, The University of Chicago
Brett Theodos	Urban Institute
Federal Experts	
Vicki Turetsky	HHS/ACF/OCSE
Earl Johnson	HHS/ACF/OFA
Robin McDonald	HHS/ACF/OFA
Frank Fuentes	HHS/ACF
John Tambornino	HHS/OS/ASPE
Nancye Campbell	HHS/ACF/OPRE
Linda Mellgren	HHS/OS/ASPE
Seth Chamberlain	HHS/ACF/OPRE
Kimberly Clum	HHS/OS/ASPE

D. Meeting Proceedings

Below we present a summary of the roundtable discussion, organized according to key themes that were explicitly addressed or that emerged during the roundtable.

1. Federal and Programmatic Landscape

A practitioner opened the discussion by asking about how a change in administration might affect priorities relating to fatherhood projects, research, and the focus of the fatherhood initiative, and what the implications may be for practitioners. Three federal experts who are long-time federal employees and experts in fatherhood research and policy all agreed that fatherhood is not a particularly politically-sensitive topic. Fatherhood programs have been a priority since the Clinton Administration, and this persists today.

The practitioner indicated that the significance for the field is great, especially given that federal funding for fatherhood programs has declined during past administration changes, and that philanthropy has changed priorities in recent years as their investments have declined, which has meant that work in fatherhood had really regressed. He noted the importance of building a knowledge base starting with the most recent round of fatherhood grantees.

This practitioner also emphasized that if our fatherhood program models are to be sustainable, we need to demonstrate that a child is better off if public dollars are invested in that child's father and that father's well-being. In particular, we need to figure out a way for programs to create opportunities for father-child interactions and a way to measure father involvement, otherwise the current business model won't work.

A federal expert agreed. She said that this is the problem with the child support model. It incorporates economic self-sufficiency and cash, but father involvement is not part of the model, because it's easier to measure income and employment. Funding tends to be tied to these more easily measurable outcomes.

2. Clarifying Goals of Black Box Study

Early on, an evaluator asked for clarification on goals of the study—specifically, whether the goal was to inform future evaluations in terms of what researchers and evaluators should be measuring at baseline, or to inform practitioners on how to target their programs in more effective ways.

Black Box Project Director, Sharon McGroder, said that whereas the primary audience for the project and its findings is evaluators, our findings are important for academic researchers and for practitioners. We would hope that practitioners will find the information useful in designing and implementing more effective programs and in targeting their programs more efficiently.

3. Value of Examining Subgroup Impacts in Program Evaluation Research

Experts agreed that there is value to examining subgroup impacts in program evaluation research, despite procedural and technical challenges in doing so (see Section 6). In response to Sharon McGroder's presentation of subgroup findings from the Strengthening Families Evidence Review (SFER; Avellar et al., 2011; Avellar et al., 2012), a researcher indicated that it would be useful to know the number of interventions in SFER for which there were overall impacts; he suspected that there weren't many, which is why subgroups weren't examined in many of the studies included in SFER. He lamented the standard practice of examining subgroup impacts only if aggregate

impacts have been found. An evaluator agreed that this is standard practice, adding that studies finding no aggregate impacts may be statistically underpowered, in which case there would be insufficient power to detect subgroup impacts.

Sharon explained that even if research finds no aggregate impacts, there may be evidence of impacts for a particular subgroup, such as isolated or off-setting subgroup impacts. She agreed that while it was important to continue to build the research base on what constitutes an effective program (a point also made by a federal expert who was not able to attend the roundtable but who provided written feedback on the Synthesis Report), we need not wait for a strong evidence base of which programs are effective overall prior to examining subgroups, because a program may show signs of effectiveness for particular subgroups even though they may not demonstrate impacts for their overall population.

A researcher picked up on this point. Reflecting on findings from Parents Fair Share, this researcher felt that it was a “tragedy of dissemination” that the evidence of positive impacts for severely disadvantaged men was not emphasized, overshadowed by the well-publicized storyline of no impacts for the sample as a whole. An evaluator emphasized the importance of developing theory-based subgroups in program evaluation research, rather than just looking at everything. He cautioned against looking too hard for subgroups impacts and that the “kitchen sink” approach of looking at dozens of subgroups would yield results simply due to chance alone, so he questioned whether these findings from multiple subgroup analyses are to be believed. The researcher noted that in Parents Fair Share, there was in fact a theoretical basis for examining whether the program was effective for the most vulnerable men.

Sharon noted that moving the field toward the development of theory-based subgroups is a key goal of the Black Box project. She speculated that there are probably more impacts in subgroups if we only knew what subgroups to look at, rather than just throwing everything at the wall and hoping something sticks. Sharon also pointed out that if, in addition to considering studies whose samples we slice into subgroups, we considered impact studies involving narrow subpopulations of low-income men—such as African-American noncustodial fathers—there may be more “subgroup” impacts than we realize.

A federal expert resonated with this point. He noted that the Black Box Synthesis Report did not present the racial composition for the various studies reviewed, but he assumed that most of the low-income studies involved men of color, particularly African-American men. If men of color did comprise the majority in these samples, then the main “subgroup” is defined by race/ethnicity. And if this is true, he noted, we would need a different theoretical framework and race analysis to identify psychosocial factors germane to men of color.

A policy researcher added that it is important to distinguish pre-existing theory from a theory that emerges out of a particular study and that, because the field is still nascent, there is not a lot of pre-existing theory on who would likely most benefit from services. A federal expert concurred that fatherhood program evaluation is still in the formative stages, and that qualitative work during a study can lead researchers to develop hypotheses about who is and is not responding to intervention and why.

This point about selecting subgroups based on what emerges during the evaluation led to a discussion of the utility of relying on baseline characteristics as subgrouping variables. A practitioner indicated that he and his staff used to think they could identify at program entry who would and would not be successful, but they were often proved wrong. For example, they thought that fathers

who had a support network of friends and family would do well, but they found that it was the fathers who lacked support who tended to respond best to his program. He hypothesized that it was precisely because the program was the only source of support for these men that they valued participating and responded to services.

A researcher likewise questioned the predictive utility of baseline characteristics, given the example of men who are not entirely ready to make changes when they enter a program, but because of what they receive in the program, their readiness is “turned on” and they are then ready to benefit from program services.

A federal expert provided another example of how what happens during the program can lead to different outcomes. She suggested that in large-scale demonstration studies, one can examine differences in outcomes according to differences in treatment quality, noting that in Parents’ Fair Share, treatment quality showed up “in a subgroup way” and could be important in interpreting program impacts.

Sharon pointed out that examining subgroups defined by post-baseline variables—such as changes in readiness or social support, and varying levels of program quality—are not experimental analyses, so the causal evidence regarding subgroup program impacts is not strong. Nevertheless, the experts agreed that it was important to understand fathers’ program experiences in an effort to identify “active ingredients” and the pathways through which a program may have affected key outcomes.

4. Informing Subgroups with Impact vs. Outcomes Studies

To set the stage for the discussion of subgroup impacts, Sharon’s “Getting on the Same Page” presentation clarified the distinction between outcomes and impacts. She also referred to outcomes when presenting study methods, noting that a key premise of the Black Box study was that baseline levels on outcomes of interest may serve as good subgrouping variables. Another underlying premise was that psychosocial predictors of behavior change may also serve as good subgrouping variables, so a key study goal was to examine the extent to which theoretically-relevant “determinants” of behavior and behavior change predicted fatherhood-related outcomes among low-income men.

Pia Caronongan’s subsequent presentation of findings from this review of the literature prompted a discussion about the validity of the underlying premise that predictors of fatherhood-related outcomes were good candidates for subgrouping variables. A policy researcher pointed out that while the report distinguished outcomes from impacts, the bulk of the report (the literature review) focused on outcomes research. An evaluator also appreciated that we were careful to distinguish outcomes from impacts but was likewise curious as to why the report focused on outcomes, and he suggested dropping this chapter from the report. He argued that whereas outcomes tell you whether an individual needs services, they may be irrelevant when trying to identify who benefits from intervention or how best to target programs. Instead, he suggested focusing the search for subgroups on the subgroups that have already been examined in program evaluation research, even from non-experimental evaluations and SFER studies rated as moderate or lower in quality. A researcher echoed this point, wondering whether we should have simply reviewed impact studies rather than outcome studies. Sharon noted that a review of outcomes studies allowed us to examine the kinds of psychosocial factors already addressed in the fatherhood literature, even if the findings themselves don’t necessarily suggest whether these variables would make good subgroups.

Also addressing this point, Federal Project Officer Kimberly Clum said that, in some ways, we've gotten stuck in how we think about serving subgroups; we rely on demographic characteristics and don't consider things that are heterogeneous in the people's experiences. For example, for the key outcome of economic self-sufficiency, research tends to focus on whether or not men had a job at the outset of the study. Kim argued that the literature is very narrow in how it views subgroups of men, ignoring such factors as larger social structures, inequality, norms, and peer group support. So the overarching goal of the Black Box project, Kim noted, was to look beyond the demographic characteristics typically examined in program evaluations and consider whether additional constructs—constructs reflecting psychosocial factors—were worth pursuing. On this point, there was wide agreement that this was a useful direction for future research.

5. Informing Subgroups with Qualitative and Small-Scale Studies

Early in the Roundtable, many experts expressed discomfort over what they viewed as a premature attempt to extrapolate Black Box study findings to experimental evaluations of fatherhood programs. A policy researcher noted that it is a longer-term process because there remains much to learn about fathers in fatherhood programs and what leads to changed behavior. This policy researcher characterized the dilemma as trying to fast-forward to stage 8 when our knowledge base is only at stage 2. He suggested that stages 3 through 7 involves a series of qualitative and small-scale studies exploring the theoretically-derived psychosocial factors such as those identified in the Black Box study. He reiterated his earlier point that qualitative studies can help generate theories, which should occur prior to testing theories in large-scale impact studies.

A researcher concurred that we need smaller-scale studies not only to address the question currently before the group (i.e., what non-demographic variables may be important for defining baseline subgroups), but also to improve the science of fatherhood program research in general. He noted that for 30 years, scaling up of human service interventions occurred without attention to whether the programs were grounded in theories of human behavior. He likewise advocated for smaller-scale and qualitative studies of fatherhood programs to help develop the evidence base before ramping them up to scale.

This researcher then gave an example of what he learned from a process study of how a fatherhood program helps fathers navigate the child support system. His research team found that fathers do not make immediate use of program information on how to request a modification to child support orders but, rather, waited until they had a job. Through in-depth discussions with fathers, researchers learned that fathers thought the judge would be more responsive to a request for modification if he saw the father taking steps to improve his situation. This finding led the research team to propose altering the sequence of program activities, providing child support information at a time when men were most likely to find the information useful.

A second researcher likewise highlighted the value of process studies for addressing the big question not posed by the Black Box study: *Why* does this program work? He emphasized the importance of basic needs assessment information and our current lack of understanding of what fathers want in a program and what they say they need.

Picking up on the theme of identifying fathers' needs, a third researcher advocated for the use of community-based participatory research methods (in which study "subjects" are collaborative partners in the research endeavor). He provided an example from his research on men who present to WIA office, many of whom experienced trauma in childhood. Convinced he and his research

team were “missing something,” they are now exploring what race, gender, and masculinity means to these men and how it relates to their ability to obtain and maintain employment.

Another researcher suggested that small-scale studies allow you to explore how best to measure novel topics prior to investing in large-scale evaluations. For example, if we suspect that readiness to change is affected by the program and is a proximal outcome that may need to change before more distal outcomes can be expected to change, then a small-scale study would allow us to examine various ways to measure readiness to change and explore the various pathways hypothesized to matter.

A federal expert resonated with this call for more qualitative and smaller-scale studies. He reflected that only after William J. Wilson received funding to explore the “marriageability of men”—a concept Wilson hypothesized as critical to the declining marriage rates among African-Americans—was he able to study this construct empirically. His subsequent book, “When Work Disappears,” helped this field progress. This federal expert further shared his concern that not all federally-funded grant programs may be ready and/or appropriate for random assignment evaluation; another federal expert agreed that fatherhood programs are in the formative stage and that they may be subject to the imperative to conduct random assignment evaluation too soon in their development.

6. Feasibility of Examining Subgroup Impacts in Program Evaluation Research

Roundtable experts were quick to note the technical difficulties in examining subgroup impacts. A researcher recognized that the exercise we were asking roundtable participants to engage in—defining subgroups using psychosocial variables—needed to include a discussion of sample size and power. Relatedly, one needs to know what effect size might be expected for various subgroups so that the study design can be powered to detect impacts in those hypothesized subgroups. Sharon McGroder reflected that identifying minimum detectable effects (MDEs) requires doing the research and reflecting after the fact on whether the study may have been underpowered, and using this information to generate hypotheses and MDEs for the next study.

An evaluator concurred that sample sizes in subgroups and questions surrounding measurement (for example, identification or development of valid and reliable scales, and questions about the timing of measurement for certain constructs) are key challenges in subgroup impact research. This evaluator reflected that measurement challenges may be one reason for the focus on demographic rather than psychosocial variables. She also voiced the concern that an interactive subgrouping approach involving multiple variables would yield small cell sizes, though Sharon noted that profile analyses (such as latent class analysis or cluster analysis) can address this problem. Despite these challenges, this evaluator agreed that there is value to thinking about how best to refine subgroups to make them more meaningful so we can learn more about who tends to benefit from programs.

Another evaluator pointed out that the best way to test scales and metrics and the best way to do subgrouping research is to actually do the research and learn from the findings.

In addition to the technical challenges in conducting subgroup impact analyses, experts identified tensions between the goals of evaluators and the goals of providers that have implications for subgroup impact analyses. A policy researcher mentioned the tension between the pressures faced by programs to demonstrate results and evaluators pushing for casting a wide enough net to yield large enough samples. He noted that practitioners tend to know who is best suited for their

program, but when evaluators encourage them to cast a wider net to yield larger study samples, this can dilute impacts, and that maybe evaluators need to listen more to practitioners on this matter. An evaluator echoed this tension, noting that for the Building Strong Families (BSF) evaluation, programs felt pressure to meet sample size requirement and ended up enrolling people they suspected were unlikely to participate. So while larger sample sizes are needed to detect subgroup impacts, if many of the people being recruited aren't motivated or "ready to change," it is unclear whether the impact findings (or lack thereof) are meaningful.

A federal expert noted another tension. When federally-funded grantees propose serving narrow populations but then can't engage enough of these kinds of participants, they are not meeting funding requirements and may be required to broaden who they serve to reach service targets. In this case, it is not evaluators but funders who are driving the "wider net." This federal expert noted that this tension stems from the authorizing legislation, which defines the services to be provided, requiring providers to seek out the kinds of participants they think can benefit.

7. Cultural and Racial Frameworks

There was a lengthy discussion on the need to develop and apply a theoretical framework germane to the lives of men of color. A federal expert argued for a better and more nuanced representation of race in subgrouping research. He pointed to the importance of such factors as religiosity, stress, and trauma, which are often closely tied to race and ethnicity. A policy researcher agreed with the need for a theoretical framework that reflected the culture of men being studied, but he acknowledged that Mathematica researchers were hamstrung in doing so for the Black Box study, as they were stuck with the theoretical frameworks used by researchers whose studies they reviewed.

Sharon McGroder echoed the need for culturally-relevant theoretical frameworks in studying fathers and fatherhood programs but wondered whether the psychosocial constructs and/or broader categories presented in the Black Box report—such as social norms, and identity as a man and as a father—were worth exploring among men of color as possible factors that could shape their response to a program. She explained that ASPE's vision was to draw from other disciplines, such as public health and social marketing, to see if there were relevant concepts we should consider in defining subgroups of men in fatherhood programs, and she asked whether there was value in drawing from these fields.

A federal expert agreed there was value. But he noted that while many of the factors such as relationship with child's mother and stressors may be common, they will play out differently and will be influenced by a whole host of different factors—for example, stress related to living in a community that doesn't want you there. One issue not addressed, this federal expert noted, is culture and language. We need to think about these types of factors, he argued, to add texture in terms of the realities of the experiences of low-income men. It is these factors, this federal expert argued, that will determine how ready a father is and what his motivation is to participate in a fatherhood program. These cultural issues also influence what service providers offer, who offers it, and the curricula being used.

Another federal expert noted that this requires researchers to get out of their comfort zone, and he wondered whether researchers examined religiosity and whether that plays a role in fathers' being successful. Sharon indicated that a few studies reviewed for the Black Box study did examine religiosity.

A researcher emphasized the importance of using a critical racial lens and provided an example from his work with a WIA agency in Milwaukee. He described his research, which focuses on the effect of policing in the areas where the target population works and lives, and how the specific community experience of racial and ethnic minorities (such as lack of civil liberties, racial profiling, and legal barriers) may affect program response or participation.

Another researcher provided an example from his research on incarcerated fathers in a parenting program. He found that some aspects of the curriculum were more salient than others, while other parts of the curriculum were disregarded altogether. For example, a lot of men were not willing to participate in the part of the curriculum that discouraged fighting because in their communities, they thought it would make their children less safe. This researcher noted that because this was a community-based participatory research study, this issue was identified early on and was used to tailor program messages to the needs of the fathers and their communities.

A practitioner concurred that violence and stress is a huge issue, particularly for minority men; they are looking over their shoulder 24/7. He added that practitioners don't have the capacity to assess some of the specific mental health issues these men face.

A federal expert agreed, adding that men of particular racial or ethnic backgrounds often experience isolation and anxiety, even about small things. For example, taking his kids to school may be cause for stress and anxiety for a Mexican-American father in Arizona; even if he has documentation, he may be worried about being stopped and interrogated. These are very specific kinds of stress and anxiety related to his experience as a man of color.

Sharon McGroder reflected that it sounded like we need to better understand different aspects of a "community," such as safety concerns, legal issues, policing, social support, community networks, and community institutions or infrastructure. These could then be used to define a more nuanced theoretical framework from which specific subgroups could be derived.

A researcher pointed out that sometimes demographic characteristics, like race and ethnicity, are really proxies for other things such as environmental stressors, and he recommended a useful paper on this topic.¹⁰ He argued that if we think more about what these demographic variables mean, we might be able to do a better job of defining, measuring, and using them in research.

8. Value of Examining Psychosocial Factors

After the fruitful discussion about the need to develop and adopt conceptual frameworks reflective of the lives of men of color, and the woeful lack of such a framework in the extant literature on low-income men, the conversation shifted to whether it was nevertheless valuable to consider psychosocial factors as possible subgrouping variables. An evaluator remarked that, not sitting in the fatherhood field, he thought the Black Box study is a more important accomplishment than what he was hearing from other experts. He noted that approaches to subgroup analyses are not well-developed in the social sciences, so this report and expert roundtable is important for pushing the thinking forward. He acknowledged that progress would be "haphazard and messy" and that it may take years of "letting a thousand flowers bloom" to develop the theoretical frameworks and methodologies to define better subgroups, but at least he personally was provoked to think

¹⁰ LaVeist, T. (1996). Why We Should Continue to Study Race But Do a Better Job: An Essay on Race, Racism, and Health. *Ethnicity and Disease*, 9, 21-29.

more about psychosocial factors in defining subgroups. The other experts agreed with this assessment.

Many roundtable experts indicated that readiness to change was an important factor worth considering. A researcher gave an example of a study of placement of children in foster care. He noted that when the judge was about to take child from home, family preservation programs were much more effective because that's when it really mattered to the parents. Then all the things they were telling the parents about keeping their child safe—they finally got it. Otherwise, they didn't engage in family preservation activities. He reflected that reaching this threshold, parents were ready to change because only then was the threat of losing their children real and imminent and, thus, what they had been learning about child safety suddenly became salient.

A policy researcher noted that he was the federal project officer on this study, and he recommended taking a look at the research by Julia Littell from Bryn Mawr who has studied readiness to change issues, as well as John Schuerman.¹¹

A researcher reiterated the example from his study of how a fatherhood program he evaluated helps fathers navigate the child support system, in which many fathers requested an order modification only after they secured employment, believing that only then would the judge be responsive to the request. This suggested to this researcher and his research team that readiness to make use of information and program services is a key precursor to behavior change.

Citing self-determination theory, another researcher noted the importance of motivation in behavior change—especially the role of intrinsic motivation (*motivation coming from within the individual*) over extrinsic motivation (*external rewards and punishments designed to induce behavior*). He also noted that motivation and readiness to change is a “moving target,” that it is important not only for individuals to begin behavior change but also to sustain behavior change.

A practitioner resonated with the point that readiness to change can be a moving target, reflecting that knowing a father's readiness at baseline may not help you understand who may especially benefit from intervention. He said that he and his staff would sometimes try to predict who would complete the program but were often surprised by who ended up as a success story. Many men who enter the program at highest risk were precisely the men who most benefited from the program because of the change process that occurred in the program. The practitioner illustrated this point by noting that in his work with low-income African American men, many of the young men often miss the maturity process that results from having a father or father figure orient them to boyhood and manhood, so they lacked order and discipline. When they walk into his program, they are not necessarily looking for structure but, the practitioner notes, if you create a space that allows them to get exposed to structure, many of them find it attractive, which then helps them evolve and increase their readiness for services. That's why he doesn't necessarily only recruit men who are ready from the beginning; he reaches out to the most disaffected men even if it means losing some of them, because many of them don't know what they want or need until they get exposure to it.

The conversation then moved beyond a discussion of the value of using psychosocial factors in creating baseline subgroups to a discussion of their potential value in targeting and designing interventions.

¹¹ Schuerman, J.R., Rzepnicki, T.L., and Littell, J.H. (1994). *Putting Families First: An Experiment in Family Preservation*. New York: Walter De Gruyter.

For example, an evaluator suggested that identifying key predictors of likely take-up can be particularly helpful in cases when services are oversubscribed and strategic targeting would be helpful. This evaluator noted that program folks currently are not able to base many of their decisions about targeting on research, but they are hungry for more to guide them in their practice.

Regarding the design of interventions, a federal expert picked up on a researcher's earlier point that readiness to change can be affected by a program, and she suggested that if a program's goal is to change behavior, and readiness to change is necessary to change behavior, then maybe we need interventions designed to change readiness to change. On this point, another federal expert referenced research from the fields of criminal justice and substance abuse, describing a re-analysis of data from the Serious and Violent Offender Re-entry Initiative (SVORI) demonstration, which targeted readiness to change itself as a proximal outcome.¹² She indicated that there is now increased focus on programs that first affect readiness to change before actually delivering the intervention. This federal expert surmised that these interventions may sometimes be more successful than skills-based interventions and that once a participant is ready to change, he may be able to take advantage of services already available, such as employment services (with additional services for those who need greater support). She wondered whether this approach would be more effective than providing employment services to someone who is not ready to change, and suggested that enrolling individuals who are not ready to change may be one reason for the lack of program impacts in many studies.

The conversation then broadened even further, moving beyond the discussion of psychosocial factors. A researcher emphasized that if we are to really understand which men benefit from programs and why, it is important to consider not only individual-level psychosocial factors but also structural and systemic factors, which have been missing from the conversation and the Black Box report. He noted there are a series of complexities that are systemic in a given community or city or state that affect an individual's ability to be employed, pay child support, and be involved with his children. Approaching these issues the way legal scholars look at it, including a race analysis, would be informative, this researcher argued, especially for black men who are under a different microscope.

This researcher illustrated his point by describing his research with men participating in home visiting programs. From surveys, program staff indicated their interest in helping these men succeed, but in focus groups, these same staff displayed anger and distrust toward the men they served and did not validate their role as a father. This researcher hypothesizes that these staff may have issues with their own fathers or negative personal experience with men, which affects their attitudes toward the men they serve and, consequently, decisions about service delivery. He emphasized the power that these "street bureaucrats" have in these men's lives as brokers and gatekeepers of important services, and that these systemic realities must also be taken in account alongside consideration of psychosocial factors.

9. Relevant Psychosocial Constructs

Roundtable experts identified a number of psychosocial phenomena that are relevant to the lives of low-income men that should be included in future research—whether as subgrouping variables, proximal outcomes, or simply as descriptors of these men's lives. Below we summarize the

¹² Lattimore, P.K., Barrick, K., Cowell, A., Dawes, D., Steffey, D., Tueller, S., and Visher, C.A. (2012). Prisoner Reentry Services: What Worked for SVORI Evaluation Participants? Final Report. Research Triangle Park, NC: RTI International.

factors identified as most salient, beginning first with psychosocial factors identified in the Black Box study, then highlighting additional factors not specifically addressed in the Black Box report.

Psychosocial factors discussed as important that were addressed in the Black Box study included:

- **Readiness to change.** This psychosocial factor was the most often discussed during the roundtable. One of the researchers summarized the three ways that experts had discussed readiness to change:
 - critical juncture, or forcing event (such as a meeting with a judge, or an arrest)
 - window of opportunity (such as the moment of a child’s birth)
 - threshold (the point at which a father is prepared to make use of information or services because of the **salience of the outcome** expected)
- **Motivation.** Experts also discussed the related concepts of intrinsic motivation (such as wanting a better relationship with one’s child) and extrinsic motivation (such as the threat of having children removed from care, or having a request for a child support modification granted).
- **Men’s past experiences.** Experts agreed that it is important to understand men’s experiences with their own fathers. For example, a practitioner emphasized the importance of having a father or father figure help orient a young boy to boyhood and manhood. A researcher and two federal experts each pointed to the important role that past trauma can play in men’s lives.
- **Depression in men.** A researcher noted that symptoms of depression in men are different from symptoms in women and can include anger and outbursts. This researcher noted that current measures of depression were designed to detect symptoms more commonly found in women than in men, and that researchers need to focus on and improve measurement of depression in men.
- **Stressors, stress, and anxiety.** Many experts agreed that stressors and feelings of stress and anxiety are constant companions in these men’s lives. A federal expert indicated that many Latinos experience stress from living in communities that don’t want them there, whether or not they are undocumented immigrants. A practitioner concurred that many men of color live under suspicion and face harassment and constant surveillance; they also experience anxiety and fear for their safety from living in dangerous neighborhoods.
- **Religiosity.** As part of his call for race analysis and a more nuanced representation of race in subgrouping research, a federal expert argued that religiosity is important to many men of color and should be more systematically examined in research on low-income fathers and men of color.
- **Peer norms.** Experts agreed that peer and social norms help shape fathers’ behavior.
- **Fathers access to his children.** Experts agreed that understanding the relationship dynamics between the father and the mother(s) of his child(ren) is critical for helping the father become more involved in his child’s life, and that programs can help foster this access. For example, a practitioner described his collaboration with a not-for-profit, “Art with the Heart,” in which fathers engage with their children and their child’s mother in community art projects.

Experts identified the need to consider additional psychosocial factors not addressed in the Black Box study but that are particularly relevant to men of color, including:

- **Structure and discipline.** A practitioner indicated that this is what many of the men who come to his program need, even if they don't realize it. This is an example of a proximal outcome targeted by fatherhood programs that might also be useful to explore as a mediating pathway through which fathers outcomes are affected.
- **Isolation.** Related to feelings of stress and depression, many experts mentioned that men of color targeted by fatherhood programs often experience feelings of isolation and loneliness.

Finally, in addition to considering psychosocial characteristics of men and their interpersonal relationships, many experts emphasized the importance of considering structural and systemic factors reflecting the conditions and contextual realities these fathers face, including:

- **Culture.** Experts agreed that, in addition to peer and social norms, broader cultural norms are important, for they help define what it means to be a good father.
- **Structural opportunities for father involvement.** A practitioner argued that noncustodial fathers need structural opportunities to engage with their children, and that the sustainability of the fatherhood program "business model" rests in the ability to measure and demonstrate the importance of such involvement.
- **Attitudes and behaviors of "street bureaucrats."** A researcher highlighted the power that street bureaucrats have in directing fathers to services, and that their negative attitudes toward the men they serve can adversely affect the fathers' access to needed services.

In conclusion, a federal expert pointed out that research begins with assumptions and theories and that these assumptions and theories must be grounded in the realities of men's lives. This federal expert and others emphasized the importance of understanding whether certain motivations, conditions, contexts, experiences, and norms may be unique to, or play out differently for, various racial, ethnic, and cultural sub-populations. Only research studies that are grounded in these realities can provide dependable results that can effectively inform programming and lead to real results for men.

10. Implications for Programs

Throughout the roundtable, discussions of psychosocial factors and subgrouping often touched on issues relating to program design, delivery, and intake.

Regarding program design, experts pointed out the importance of tailoring program messages to the needs and goals of participants. For example, a researcher highlighted findings from the Fathers and Sons project, a prevention program targeting early sexual behavior, violence, and substance abuse among pre-adolescents. He noted that many men disagreed with the anti-violence message because their communities involve dangers that require their children know how to defend themselves. Similarly in his study of the Harlem Children's Zone, this researcher noted that the "no spanking" message was not well-received, because men said that they needed their children to listen to them under all circumstances—men argued that a swat on the behind was preferred to being hit by a car, for example.

Drawing from his research in public health, a researcher described a program seeking to promote men’s healthier eating through increased intake of fruits and vegetables. He developed a taxonomy of ethnic identity, then tailored the healthy eating messages to the 16 distinct profiles based on their sources of motivation for eating healthier.

Another researcher said that while he liked that the Black Box project seeks to move beyond demographic characteristics in learning who responds best to intervention, he pointed out that this requires moving beyond the individual-level framework of psychosocial characteristics to looking at what programs actually do. This includes not only the services provided but also how participants are treated and the ambiance of the setting.

A practitioner reflected that his program sought to provide what men lacked in their lives: social support, structure, and discipline. He suspected that the men that benefited most from his program were those who lacked these at program entry. In particular, he noted that providing support groups for men in a comfortable setting really allows men to open up about their stresses and concerns; they begin unpacking deeper issues, but unfortunately, programs often don’t have the resources to offer counseling to address these deeper issues.

A researcher thought that program providers need to be mindful about the timing and sequencing of service delivery. Programs might be most successful, he posited, if information and services are provided at a time when participants are best able to make use of them—whether due to a forcing event (like a custody hearing) or only after their readiness is “turned on.” A federal expert suggested that programs may actually want to target readiness to change as a proximal outcome prior to providing services that individuals may not yet be ready for.

Experts also had ideas about how knowledge about fathers’ psychosocial factors could help with targeting and triaging services. A researcher suggested that not every program effort had to be high reach and highly intensive. If we could figure out the “active ingredients” and how to best tailor services to needs of particular individuals, this researcher said, then we could deliver the right intervention to the right individuals and, thus, more cost-effectively use resources.

An evaluator also made this point, drawing from his research on homelessness and public housing. He noted that services need not be all or nothing and, in fact, when services are oversubscribed (like the tens of thousands in Chicago eligible for limited public housing assistance), the key is figuring out who might benefit from intensive and comprehensive services and who needs only light touch services. This evaluator mentioned that there is plenty of room to learn about predictive tools that might help triage services.

A federal expert noted child support researchers are using predictive analytics to sort and segment caseloads to better target and sequence services. She thought that psychosocial variables have a place in this effort but that the variables would need to be easily measured by an intake worker.

11. How Findings Can Inform Fatherhood Evaluations

At the outset of the Black Box study, the goal of the roundtable was to identify strategies for incorporating project findings into evaluations of fatherhood programs and initiatives. However, our study revealed that research on the psychosocial determinants of behavior change among low-income fathers is in its infancy, and **roundtable participants agreed that there is not enough evidence to make concrete recommendations regarding baseline measures of psychosocial factors that should be included in future fatherhood evaluations.**

Despite lack of empirical evidence, experts agreed that there was sufficient theoretical basis to supplement the use of demographic characteristics with an exploration of psychosocial factors that may shape a father's ability to benefit from a fatherhood program. Such exploratory research would help move the field forward by helping to build theory and generate hypotheses to test empirically.

In addition to considering psychosocial factors in creating baseline subgroups, experts believed that psychosocial factors implicitly or explicitly targeted by fatherhood programs—such as readiness to change, motivation to change, and social support—should be routinely measured and modeled as proximal outcomes, for these proximal outcomes reflect the pathways through which outcomes of ultimate interest—father involvement, employment, child support, partner relationships, and father well-being—may be achieved.

12. Challenges in Using Psychosocial Factors to Define Baseline Subgroups

Experts discussed three major challenges to using psychosocial factors to define subgroups for use in experimental program analyses: sample size requirements, measurement, and tensions between the needs of evaluators and practitioners.

- **Sample size.** Many experts pointed to the common challenge of adequately powering impact and subgroup impact analyses, regardless of the subgrouping variables used, given the difficulty in obtaining sample sizes considered large enough to detect expected effect sizes. At the same time, however, experts agreed that psychosocial factors may well play a role in shaping which men benefit from intervention. Experts highlighted the need to ground the definition of subgroups in theories of behavior change and to generate theory-based subgroup hypotheses in order to do a better job of identifying subgroups for whom a program may be more and less effective. Though sample size would still matter, less “noise” from more theoretically-grounded subgroups may help to mitigate the sample size (power) issue.
- **Measurement.** Experts reflected that one reason demographic variables were often used to create subgroups is that their operationalization is straightforward—even if, as a researcher noted, it is not entirely clear what demographic factors like race and ethnicity mean or what they are proxies for. Extensive research is needed to develop and validate measures of subjective constructs reflecting psychosocial factors. Experts noted that we are far from being able to recommend good measures of key psychosocial constructs because theories of behavior are rarely used to identify relevant psychosocial constructs, nor is there much empirical evidence to guide the selection of key constructs. A researcher commented that the Black Box literature review was designed to address these limitations by “shaking the trees” to see what psychosocial factors could and have been examined pertaining to low-income fathers. Mathematica's Pia Caronongan noted there is also little commonality in how the same psychosocial construct is measured.

Experts recommended investment in developing and testing psychosocial measures; an evaluator suggested “letting a thousand flowers bloom,” and a researcher suggested a more systematic process by providing researchers ready access to measures through a centralized system of validating and measuring such variables.

- **Tensions between evaluators, practitioners, and funding authorization.** Experts described tensions between the technical requirements of a well-designed impact study and the realities of programs and the populations they serve. For example, evaluators strive for well-powered studies and thus large sample sizes, but this might require

broadening recruitment beyond those expected to benefit from services, which would only serve to dilute program effectiveness. In some cases, increasing sample sizes may even require expanding program eligibility beyond what is allowed legislatively. A policy researcher suggested respecting practitioners' instincts regarding who they believe are most likely to benefit from services and helping practitioners increase recruitment of participants for whom their program is a good match.

The need for larger samples also works against evaluating smaller programs and programs that offer an array of services that not every participant is expected to need or receive. A researcher advocated "throwing a wider net closer to the ground" by evaluating smaller programs with a strong program theory, even if these are non-experimental evaluations.

A practitioner reflected that what he's learned about program evaluation he learned from experts conducting rigorous research—many of whom were in the room—and that most practitioners are not so fortunate. He emphasized the need for a bridge between research and practice, whereby researchers educate practitioners on the value of research by communicating study findings in such a way that practitioners learn how to design and better manage their programs.

13. Directions for Future Research

At the close of the roundtable, we posed the question, "What more do we need to know?" Below is a summary of ideas and suggestions that experts proposed.

- **Develop a culturally-relevant theoretical framework.** Roundtable experts agreed that we need a better understanding of the lives of low-income men of color. This would include qualitative studies and small-scale quantitative studies designed to help build a theoretical framework for identifying key factors—psychosocial factors, but also structural and systemic factors—that could influence the extent to which men of color participate in and benefit from fatherhood programs.
- **Consider participatory research.** A federal expert cautioned researchers not to rely on preconceived notions or make assumptions based on personal experience when designing studies involving disadvantaged men and men of color; otherwise, study design and research questions can be "off the mark." Researchers extolled the value of participatory research for ensuring topics of study are relevant to and resonate with study "subjects."
- **Address systemic bias against exploring new measures.** A researcher lamented the "vicious cycle" in the social sciences of measuring and reporting on the same five demographic characteristics because these are the easiest to measure—even if their theoretical underpinnings are not clear. He called for research that explicitly examines and tests various ways of measuring a host of psychosocial factors in an effort to test empirically the various fatherhood theories as they are developed. This researcher advocated for a centralized system of measuring and validating variables to more efficiently move the field forward on measures development and minimize reinventing the wheel. Another researcher concurred that even when psychosocial variables have been examined—such as depression—they are not contextualized to reflect the lives of African-American and Latino men.
- **Better understand program processes and how men respond.** Experts uniformly agreed that we need more information on the programs themselves, how they are

experienced by the men they serve, and why they do (or don't) work. A researcher advocated research identifying the "active ingredients" in fatherhood programs and process studies exploring why programs appear to work for some men and not others. He also emphasized the importance of information from basic needs assessments to better understand what fathers want in a program and what they feel they need. Another researcher concurred that it would be useful to know when key behavior change processes are "turned on" and how programs can foster this process. A federal expert agreed that it would be useful to know the circumstances under which readiness to change and other hypothesized determinants of behavior change are activated, whether interventions could be developed to explicitly target readiness to change as a critical proximal outcome, and whether individuals exposed to such interventions would then naturally seek out available services on their own.

Regarding the exploration of subgroups, a researcher pointed out the importance of testing various hypotheses—do programs work better for men with more or few sources of social support?—through small-scale quantitative studies before going to scale. A federal expert concurred. He said that large-scale impact studies are very expensive and are designed to answer a single question (does the program work?), but the fatherhood field can benefit from asking many smaller questions first.

- **Examine proximal outcomes.** Researchers argued that outcomes studies are important for exploring potential pathways through which programs may affect fathers and, ultimately, their children. One of these researchers proposed a research agenda by suggesting that we start by drawing from theories of human behavior to develop a theory of behavior change among low-income men of color, then design and test research-based programs on a small scale. We could then explore whether these programs appear to affect proximal outcomes, such as readiness to change and willingness to engage with his children, and whether any such changes appear linked to longer term outcomes, such as father involvement and, eventually, child well-being. A couple researchers echoed the call for research on measures, especially to get to the point where researchers can recommend one or two key things that fatherhood programs should measure at baseline (as predictors of outcomes or as possible subgroups) and as proximal outcomes hypothesized as necessary precursors to changes in outcomes of ultimate interest. Only then can theoretically-relevant subgroups be tested, this researcher argued, and only then should program evaluation research go to scale.
- **Explore various methodological approaches to creating subgroups.** Experts also suggested more research was needed on various methodological and statistical approaches to creating subgroups and their relative utility. A federal expert highlighted the increased use of predictive analytics in segmenting child support caseloads and wondered whether this work could help inform the targeting of services at the program level. A researcher thought it would be interesting to see results from a cluster analysis of key psychosocial factors to see whether naturally occurring subgroups existed, taking into account a number of theoretically-relevant variables. A federal expert who was not able to attend the roundtable but who sent written comments on the Black Box Synthesis Report suggested researchers consider methods such as latent class analysis and other approaches presented at the 2009 Interagency Meeting on Subgroup Analysis (http://www.acf.hhs.gov/programs/opre/other_resrch/interagency_meeting/interagency_overview.html). Similarly, a policy researcher suggested researchers examine a recent

paper by Laura Peck for an approach to examining impacts for post-baseline or “endogenous” subgroups that retains the experimental design.¹³

- **Bridge research and practice.** A practitioner emphasized the need for researchers to communicate their findings in a way that helps practitioners design, implement, manage, and improve their programs.
- **Fund research on culturally-diverse populations.** In responding to a question about why research on fathers—especially disadvantaged fathers of color—is so limited, a federal expert answered that money has not been behind researchers who study diverse populations because there hasn’t been a recognition or awareness of the changing demographics in recent years nor the implications of these shifting patterns for the next 10 to 50 years. He added that even small studies could have a tremendous impact on the field. An evaluator pointed out that HHS has the power to shape research by including language encouraging subgrouping research as part of their RFPs and that the best way to test scales and metrics and identify theory-based sub-groups is to actually do the research.

E. Summary and Conclusions

Roundtable participants agreed that there is value to considering fathers’ psychosocial characteristics that may predispose them to benefit from fatherhood programs but that this research is still very nascent. Experts called for qualitative research to explore the lives of low-income men of color and their experiences in fatherhood programs, small-scale quantitative research to explore the links between psychosocial characteristics and fatherhood outcomes, and program evaluation research that employs a variety of innovative strategies for creating subgroups using both psychosocial and structural/systemic factors.

Research on what works in fatherhood programming is also still in the formative stages. Experts strongly believed that fatherhood research has a way to go before we are in a position to recommend psychosocial variables (and quality measures of those variables) for use as baseline subgroups in program impact research. Before we can test the predictive utility of psychosocial subgroups in large-scale fatherhood evaluations, smaller-scale and qualitative studies—grounded in theoretical frameworks reflecting the lives of men of color—are needed to identify both psychosocial and structural/systemic issues that may suggest for whom and under what circumstances a fatherhood program is most effective, and the processes by which men appear to benefit from programs.

¹³ Peck, L.,R. (2012, July). *What Works for Addressing the What Works Question in Field Experiments?* Abt Associates Thought Leadership paper. Bethesda MD: Abt Associates.

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