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Review

Women's empowerment and fertility: A review of the literature

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ABSTRACT

Women's empowerment has become a focal point for development efforts worldwide and there is a need for an updated, critical assessment of the existing evidence on women's empowerment and fertility. We conducted a literature review on studies examining the relationships between women's empowerment and several fertility-related topics. Among the 60 studies identified for this review, the majority were conducted in South Asia ($n = 35$) and used household decision-making as a measure of empowerment ($n = 37$). Overall, the vast majority of studies found some positive associations between women's empowerment and lower fertility, longer birth intervals, and lower rates of unintended pregnancy, but there was some variation in results. In many studies, results differed based on the measure of empowerment used, sociopolitical or gender environment, or sub-population studied. This article is one of the first evaluations of the literature assessing the relationships between women's empowerment and fertility. We identify several key issues that merit further investigation.

1. Introduction

Over the last two decades, women's empowerment has become a focus for development efforts worldwide. In 2000, 189 countries signed on to the eight Millennium Development Goals, which included a commitment to promoting gender equality and empowering women (MDG3) (United Nations, 2000).

Since then, several scholars have attempted to synthesize existing knowledge on women's empowerment and international development. In the only review that focused on reproductive-related outcomes, published over a decade ago, Blanc (2001) synthesized the research examining the role of gender-based power in sexual relationships and its impact on reproductive health. Malhotra et al. (2002) summarized the most promising methods to measure and analyze women's empowerment and provided a review of empirical studies from the fields of economics, sociology, anthropology, and demography. In 2008, Kishor and Subaiya (2008) provided data on the distribution and correlates of women's empowerment in 23 countries documenting the wide variation in levels of decision-making power and gender-equitable attitudes.

Recently, the World Bank devoted the World Development Report (2012) to the theme of Gender Equality and Development. The report argues that the success of global development efforts

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hinges on gender equality and recommends public policies that promote gender equity as a means of ensuring economic growth.

At the same time that these efforts aimed to improve the status of women globally, support for family planning—an integral component in transforming women's lives—waned (Cleland et al., 2006; Crossette, 2005). The recent London Summit on Family Planning brought renewed attention to the importance of family planning as a means of reducing fertility and expanding the options available to women beyond reproduction (Carr et al., 2012).

This literature review builds on previous reviews of women's empowerment, by focusing specifically on research that examines its associations with fertility. To guide our work we use a definition and conceptualization of women's empowerment based on Kabeer's (1999; 2001): "the expansion of people's ability to make strategic life choices in a context where this ability was previously denied to them." Within this definition, two central components of empowerment are the agency and the resources needed to exercise life choices. This definition allows a broader conceptualization than interpersonal sexual relationship power.

2. Methods

We conducted literature searches using PubMed, POPLINE, and Web of Science search engines in May 2013. Searches were conducted by using the following individual and combined keywords (and MeSH terms in PubMed): fertility, family size, ideal family size, birth intervals, birth/birth spacing, induced abortion, reproductive health, unplanned pregnancy, unintended pregnancy, parturition, birth, pregnancy, pregnancy spacing/intervals, and childbearing, published from January 1990 to December 2012. This initial search resulted in 6259 articles in PubMed, 3578 in POPLINE, and 4508 in Web of Science, for a total of 14,345 articles, including duplicates among the three databases (Fig. 1).

We evaluated each article against our inclusion criteria based on the title and abstract. To be included, studies must have: 1) been in English, 2) used quantitative analysis, 3) used observational or experimental study design, 4) analyzed data from low- or middle-income countries as defined by the World Bank, 5) examined one or more of the searched fertility topics, 6) examined "women's empowerment" either as an independent or dependent variable and described how it is measured. To meet the last criterion, an article had to include, either in its theoretical framework or stated research objective, the intention to examine women's empowerment, women's autonomy, women's status, or a closely related construct that fit within our definition of women's empowerment (Kabeer, 2001). Based on the research that demonstrates the distinction empirically (e.g., Hindin, 2000) and general theoretical consensus (Caldwell, 1986; Jejeebhoy, 1995; Mason, 1986), education may contribute to women's empowerment but is a distinct construct; therefore, studies that examined women's education or literacy in their own right were not included in this review. However, studies that conceptualized education as one form of empowerment, and/or used education as a proxy for empowerment were included. In order to limit the scope of this review, abstracts were further screened to exclude studies focused on the following topics: family planning and contraception (without also focusing on fertility), sexually transmitted infections, HIV/AIDS, and maternal, infant and child health. References from key articles were hand-searched to ensure that our review included all pertinent studies. This step allowed for the inclusion of book chapters, reports, and gray literature. This process resulted in 263 articles.

We then compiled a list of articles and abstracted data on the study design, study sample, measures of empowerment, independent variables, dependent variable(s), and results. This process eliminated 203 articles that did not meet the specified criteria, resulting in 60 reviewed articles. We first describe the measures of empowerment used in the studies. We then summarize the characteristics of the articles and synthesize the findings by topic. Dependent variables were considered positively associated with independent variables based on statistical tests conducted by the original authors at the significance level they determined. We conclude with a discussion of the ongoing challenges for the design, measurement and analysis of studies in this inherently complex area of investigation and make recommendations for future studies on empowerment and fertility.

3. Results

3.1. Measures of women's empowerment

We identified 19 domains of women's empowerment in the reviewed studies and for each, provided specific examples of how the studies operationalized empowerment (Table 1). While the majority of the 60 studies assessed empowerment across multiple domains, 4 studies examined only one domain. In over two-thirds ($n = 47$) of the studies, multidimensionality was determined through the use of composite or sum scores, indices, factor analysis and multi-item scales, while the remaining 17 studies used individual items to represent empowerment.

Women's participation in household decision-making was the most common measure of women's empowerment, used in 37 articles. Typically researchers created an index representing the number of household decisions in which a woman participates (e.g., decisions about personal healthcare, buying children's clothes, visiting relatives, and purchasing land). There was substantial variation in how these indices were developed. Some papers included decisions in which the woman has some say (joint or sole

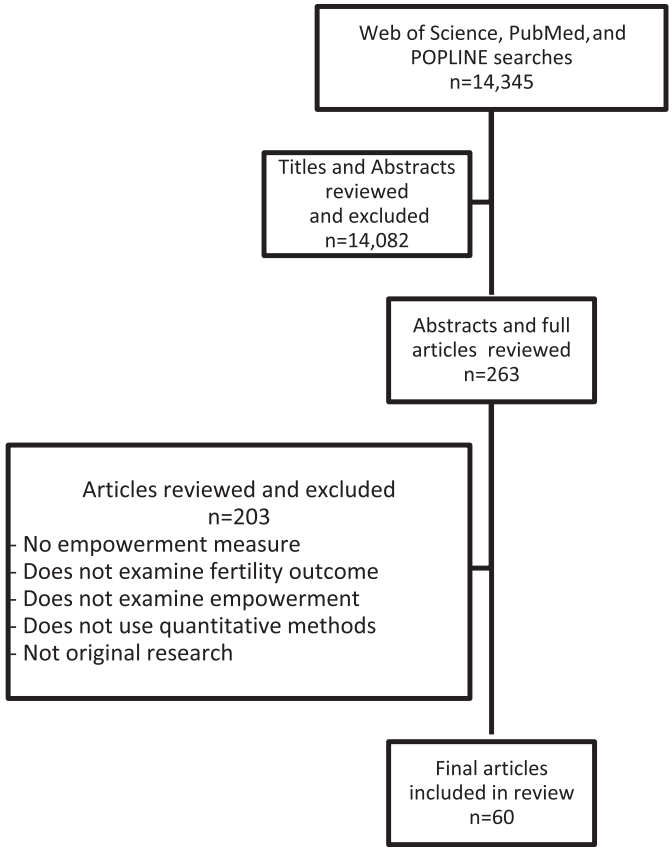

Fig. 1. Flow chart of literature search.

Table 1
Domains of women's empowerment used in the reviewed studies.

1. Age
2. Education
   - Woman's years of education
   - Husband's years of education
   - Literacy
3. Employment
   - Employment status
   - Occupation
4. Household income/wealth
   - Ownership of assets/property
   - Electricity connection in the household
   - Ownership of a radio
5. Urban/rural residence
6. Household structure
   - Nuclear vs. extended family
   - Who is head of the household
7. Childbearing experience
   - Number of children
8. Women's power in household decision-making
   - Overall weight of opinions/who usually has final say
   - Large/small household purchases
   - Sell cattle or land
   - Supporting/lending to/borrowing money
   - Management of finances/income
   - Whether woman works outside home
   - Decisions regarding children's marriage/healthcare/clothes/education/rearing
   - Decision to seek healthcare or use medicines for self or family
   - Visits to friends/relatives
   - Which friends to socialize with
   - What to cook
   - Purchases of clothes/shoes/jewelry for self
   - Problem solving
   - Leisure activities
9. Women's power in sexual and reproductive decision-making
   - Reproductive/family planning decisions
   - Number of children
   - Sex/sexual activity
10. Mobility/freedom of movement
    - Travel alone or accompanied
    - With/without permission
    - Inside/outside village
    - Market/shopping
    - Fields
    - Hospital/health center
    - Children's schools
    - Visit relatives or friends
    - Take a walk
    - See a movie
    - Political/social meetings
    - Religious venue or ceremonies
    - Community Center or club
    - NGO
11. Financial autonomy
    - Bank account/personal money
    - Employment outside the home
    - Proportion of financial contributions to household expenses
    - Authority to spend/hold money
    - Who manages family budget
    - Expected support from sons when old
    - Whether woman says she can survive without husband
12. Marriage or relationship characteristics
    - Age at marriage
    - Ability to choose partner
    - Discussion of politics
    - Whether spouse is a blood relative
    - Age/education/income/expenditures relative to spouse
    - Length of marriage
    - Familiarity of husband before marriage
    - Husband is primary social support
    - Interspousal communication
    - Ability to express opinions to partner
    - Discussion of family planning
    - Discussion of number of children to have
    - Discussion of what to spend money on
    - Discussion of what is happening in the community
    - Egalitarian roles
    - Monogamous vs polygamous
    - Distance between marital and native homes
13. Control by partner or family
    - Reproduction determined by family
    - Fear of disagreeing with partner
    - Exposure to actual/threat of physical violence, divorce, abandonment, or homelessness
    - Experience of verbal or physical violence by husband
14. Gender attitudes/beliefs of woman or partner
    - Who should make decisions about the number of children or family planning
    - Labor/gender roles
    - Whether husband is justified in beating wife
    - Whether husband should help with household chores
    - Whether being an obedient wife is important
    - Whether being an authoritarian husband is important
    - Whether boys and girls should receive the same amount of schooling or treatment
    - Whether wife is justified in refusing sex
    - Belief in or practicing Parda (veil)
    - Whether a woman should decide about purchases
    - Approval of the practice of dowry
    - Whether women should be involved in decisions of whom to marry
15. Exposure to public life
    - Access to mass media
    - Radio/TV ownership
16. Aspirations
    - Traditionally male career aspirations
    - Education level desired for sons and daughters
    - Pregnancy intentions
    - Ideal family size
    - Son preference
17. Contraceptive self-efficacy
    - Discussion of family planning with friends, neighbors, or anyone
    - Felt prepared for first sex
    - Heard about STDs before marriage
    - Current contraceptive use
    - Not fatalistic about fertility
18. General self-efficacy
    - Whether house, child, woman are "well-kept"
19. Community-level measures
    - Survival ratio
    - School enrollment ratio
    - Unemployment ratio
    - Paid/unpaid activity ratio
    - Female literacy rate
    - Female labor force participation
    - Sex ratio
    - Sex ratio of mortality
    - Proportion of unmarried females, 15–24
    - Proportion of females in nonagricultural occupations
    - Proportion of females with secondary education
    - Per capita income
    - Son preference
    - Age difference between spouses
    - Women's participation in deciding about number of children
    - Women's decisions over money they earn
    - Excess female migration
    - Area under rice cultivation

decision-making), while others counted only those decisions in which the woman has final say. Some included both major and minor decisions, while others included only major decisions, excluding day-to-day household decisions and those within women's traditional purview.

The next most commonly assessed empowerment domain was women's mobility, with 27 articles including this domain. This was determined by creating an index for the number of locations women can visit within their community, such as the market, movie theater, or health clinic, and outside of her community, such as her natal home. Some papers counted only locations where she was able to visit alone or without permission (Al Riyami and Afifi, 2003a, 2003b; Jejeebhoy, 1991).

Certain domains were more relevant and therefore, more commonly used in some regions. For example, the mobility index was more common in studies conducted in South Asia than in other regions.

The studies used a mix of both context-specific and standardized measures. Context-specific measures were used in some studies (e.g., Lee-Rife, 2010; Upadhyay and Hindin, 2005) to reflect locally-defined dimensions of women's status, whereas other studies employed measures that are applicable in all contexts, such as items that assess a woman's gender attitudes and beliefs. Among the articles, 25 conducted primary data collection and developed contextually-specific empowerment measures. For example, Upadhyay and Hindin (2005) used a locally defined measure of empowerment—whether the woman, her house and children were "well-kept" as a measure of empowerment based on findings from qualitative interviews. Singh et al. (2002) used whether the woman believes in the Parda system (wearing a veil). Context-specific measures are more likely to reflect women's lived experiences, and the characteristics or opportunities in women's lives that may make them more 'empowered' in comparison to their peers (Mumtaz and Salway, 2009). However, standardized measures allow for comparisons across study settings. Nineteen studies in our review used Demographic and Health Survey (DHS) standardized measures, most commonly, the household decision-making index.

Some authors used sociodemographic variables as controls, while others used them as proxies for women's status. For example, Woldemicael (2009) used women's educational attainment, employment, household economic status and rural/urban residence as proxies for women's status. Variables were not always clearly defined as either sociodemographic controls or measures of women's empowerment. In such cases, it was difficult to make conclusions about effects that were found.

The study population influenced the type of empowerment domain or measure used. Three-quarters of the studies focused on currently married women ($n = 44$, 73%), enabling the use of measures involving the household, finances, and in-laws. Over a quarter ($n = 16$) of the articles included ever married women, including widows and divorcees. None of the articles included never-married women. Among all of the articles, 21 included data from men and women and of these, only one included matched couples—that is, both the male and female married partners.

Twelve studies incorporated community-level or aggregated contextual measures (Aghajanian, 1992; Balk, 1994; Bhattacharya, 1998, 2006; Hirschman and Guest, 1990; Kravdal, 2001; Malhotra et al., 1995; Pallitto and O'Campo, 2005; Sanderson, 2001; Sanderson and Dubrow, 2000; Vlassoff, 1991; Wasim, 2002). Contextual factors at the community-level (Table 1, #20) included gender-specific and community-level socio-demographic factors measured through study-specific instruments and aggregate DHS data. For example, while the authors did not include individual-level empowerment data, Malhotra et al. (1995) used measures of women's status relative to men to capture the external, community-level factors influencing empowerment.

As indicated in Table 1, some studies incorporated other measures of women's empowerment (e.g., control by partner or family, gender attitudes or beliefs of woman or partner, exposure to public life, aspirations). Although less represented among the reviewed studies, several of these domains are noted by scholars such as Kabeer (2001) as important elements of women's empowerment.

3.2. Findings by fertility-related topic

Of the 60 reviewed studies, the majority ($n = 25$, 42%) collected primary data, including surveys designed to examine women's empowerment. Many used large nationally-representative databases ($n = 19$, 32%), and the same number used existing data from DHS or World Fertility Surveys ($n = 19$, 32%). Most ($n = 54$, 90%) used cross-sectional study designs while the remaining used repeated cross-sectional, panel data, or longitudinal designs.

Studies with primary data collection tended to be smaller and aimed to assess women's empowerment and its impact on reproductive outcomes. Examples include the Survey of Women's Status and Fertility in Nigeria (Kritz et al., 2000), Women's Reproductive Choices and Behaviors conducted in Madhya Pradesh, India (Lee-Rife, 2010), and the Status of Women and Fertility survey in five Asian countries (Mason and Smith, 2000). Several of these employed mixed methods—using both qualitative and quantitative methods to focus on issues within specific communities or villages (e.g., Bates et al., 2007; Vlassoff, 1991). These studies tended to be of high quality and usually made special effort to interpret and synthesize the findings.

Other studies with primary data collection relied on samples from subpopulations such as a village (Vlassoff, 1991) or slum (Pande et al., 2011). Four primary data collection studies were designed to evaluate the impact of microcredit, employment generation, or other non-governmental organization projects on the empowerment of women (Amin et al., 1995; Feldman et al., 2009; Mahmud, 1991; Steele et al., 1998).

Other national datasets used included the Oman National Health Survey 2000 (Al Riyami and Afifi, 2003a, 2003b), fertility and family planning surveys (e.g., Hogan et al., 1999; Speizer et al., 2005), and census data (e.g., Aghajanian, 1992; Bhattacharya, 2006; Hirschman and Guest, 1990; Malhotra et al., 1995; Wasim, 2002).

The majority of studies were from South Asia ($n = 35$, 58%), possibly because some of the earliest conceptualizations were developed in this region (Bhatt, 1989; Dyson and Moore, 1983; Vlassoff, 1982). Almost one-fifth were from sub-Saharan Africa ($n = 10$, 17%), and one-tenth from the Near East and Eurasia ($n = 5$, 8%). The fewest studies were in Latin America ($n = 4$, 7%) and East Asia ($n = 1$, 2%); articles from these regions may be more often published in major regional languages, rather than in English. One study compiled data from multiple countries across South and East Asia and four others compiled data from multiple developing countries worldwide (Fig. 2).

Many of the articles reviewed examined multiple fertility-related topics. The majority examined number of children ($n = 38$, 63%) or fertility preferences ($n = 18$, 30%) as topics (Fig. 3).

3.2.1. Number of children

We reviewed 38 articles that examined women's empowerment and the number of children they have had. Most studies ($n = 29$)

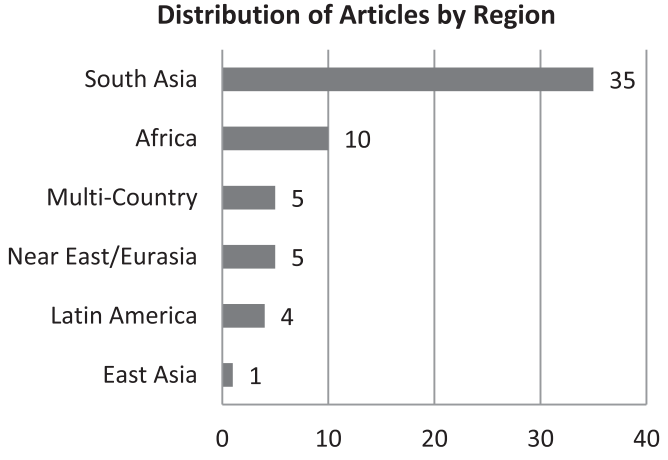

Fig. 2. Distribution of articles by region ($n = 60$).

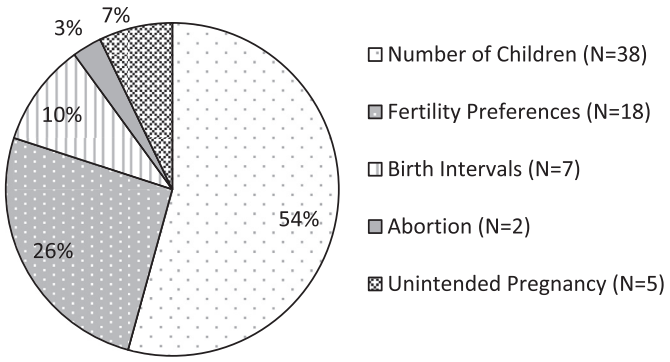

Fig. 3. Distribution of articles by fertility topic. Note: studies may include multiple topics.

analyzed the number of children either ever born or born within a specific period for individual women (Adak and Bharati, 2011; Al Riyami and Afifi, 2003a, 2003b; Ali et al., 1995; Ali and Sultan, 1999; Amin et al., 1995; Audinarayana, 1997; Balk, 1994; Bates et al., 2007; Goni and Saito, 2010; Gwako, 1997; Hari, 1991; Hindin, 2000; Hirschman and Guest, 1990; Jejeebhoy, 1991; Jin, 1995; Kabir et al., 2005a, 2005b; Khan and Raeside, 1997; Kravdal, 2001; Larsen and Hollos, 2003; Manzoor and Mahmood, 1993; Muhammad and Fernando, 2010; Sathar and Kazi, 1997a; Singh et al., 2002; Steele et al., 1998; Upadhyay and Karasek, 2012; Vlassoff, 1991; Yabiku et al., 2010). Five studies looked at district-level (Aghajanian, 1992; Bhattacharya, 1998, 2006; Malhotra et al., 1995; Wasim, 2002), and four at country-level (Abadian, 1996; Sanderson, 2001; Sanderson and Dubrow, 2000; Wickrama and Lorenz, 2002) fertility rates.

Most studies tested multiple measures of empowerment and found an inverse relationship between number of children and at least one empowerment measure. Only three studies failed to find any significant association between number of children and women's empowerment measures (Adak and Bharati, 2011; Jejeebhoy, 1991; Yabiku et al., 2010).

Ten studies found significant inverse associations between women's empowerment and number of children (Audinarayana, 1997; Bhattacharya, 1998, 2006; Hari, 1991; Hindin, 2000; Jin, 1995; Kabir et al., 2005a, 2005b; Khan and Raeside, 1997; Manzoor and Mahmood, 1993) while 22 yielded a combination of significant inverse findings and non-significant associations suggesting that the relationship across all empowerment domains is not always consistent or clear (Abadian, 1996; Aghajanian, 1992; Al Riyami and Afifi, 2003a, 2003b; Ali et al., 1995; Ali and Sultan, 1999; Amin et al., 1995; Balk, 1994; Bates et al., 2007; Booth and Duvall, 1981; Goni and Saito, 2010; Gwako, 1997; Hirschman and Guest, 1990; Kravdal, 2001; Larsen and Hollos, 2003; Malhotra et al., 1995; Muhammad and Fernando, 2010; Sanderson, 2001; Sanderson and Dubrow, 2000; Singh et al., 2002; Steele et al., 1998; Vlassoff, 1991; Wasim, 2002; Wickrama and Lorenz, 2002). For example, Abadian (1996) used the 1992 World Demographic Report on 54 countries to analyze whether three empowerment measures: female age at marriage, age difference between spouses, and female secondary education were associated with total fertility rates. Women's mean age at marriage ($\beta = -0.157$, $p < .05$) and secondary education ($\beta = -0.039$, $p < .05$) were negatively associated with total fertility rates when controlling for family planning effort scores and infant mortality rates. However, no significant associations were found between spousal age difference and total fertility rates. Abadian explains this lack of effect may be because mean spousal age difference is strongly associated with female age at marriage. In another example, Balk's study (1994) of about 5000 women in 218 rural villages in Bangladesh found, as expected, that mobility was inversely associated with total number of children ever born—both when looking at village-level ($\beta = -0.435$, $p < .01$) and individual-level variables ($\beta = -0.213$, $p < .001$). However, other measures of women's decision-making power were not significantly associated with fertility. Balk argues that proxy measures of women's status, such as education and occupation, are less likely than direct measures to adequately measure the association between women's status and fertility.

Three studies found both positive and inverse associations between empowerment measures and fertility (Amin et al., 1995; Sathar and Kazi, 1997b; Upadhyay and Karasek, 2012). Sathar and Kazi (1997b) who analyzed data from 1036 Pakistani women found that freedom to make household purchases was *negatively* correlated ($\beta = -0.101$, $p < .001$; $\beta = -0.136$, $p < .001$), while economic autonomy ($\beta = 0.068$, $p < 001$; $\beta = 0.167$, $p < .001$) was *positively* correlated, with both recent and cumulative fertility and mobility was *positively* correlated with births within the last five years ($\beta = 0.052$, $p < .001$) but negatively correlated with cumulative fertility ($\beta = -0.093$, $p < .001$). In another example of unexpected findings, Upadhyay and Karasek (2012) examined the effect of women's empowerment on ideal family size and achievement of desired fertility among over 8500 matched couples in four sub-Saharan African countries using DHS data. In Namibia greater household decision-making and in Zambia a belief in women's right to refuse sex were associated with having more children than desired (Odds Ratio (OR) = 2.3, 95 percent confidence interval [95% CI] = 1.01–5.34, $p < .05$ and OR = 1.4, 95% CI = 1.01–2.02, $p < .05$ respectively). The authors explain this paradox by concluding that in these countries it may be that more empowered women fulfilled social expectations of high fertility, although they personally desired smaller families.

3.2.2. Fertility preferences

We reviewed 18 articles that examined fertility preferences, such as ideal family size and spousal communication around desired fertility (Amin et al., 1995; El-Zeini, 2008; Goni and Saito, 2010; Hindin, 2000; Hogan et al., 1999; Isiugo-Abanihe, 1994; Jin, 1995; Kritz et al., 2000; Mason and Smith, 2000; McAllister et al., 2012; Moursund and Kravdal, 2003; Pande et al., 2011; Speizer et al., 2005; Steele et al., 1998; Upadhyay and Karasek, 2012; Vlassoff, 1991; Woldemicael, 2009; Zafar, 1996). All of these studies found that at least some women's empowerment variables were positively associated with the ability to make fertility decisions and increased spousal communication, but many found significant positive and negative findings, depending upon the context and measures of empowerment used.

All seven studies examining women's empowerment and desire for more children found a significant inverse association for at least *some* measures of women's empowerment, but most also had some non-significant findings (Hogan et al., 1999; Kritz et al., 2000; Moursund and Kravdal, 2003; Steele et al., 1998; Upadhyay and Karasek, 2012; Vlassoff, 1991; Woldemicael, 2009). For example, Steele et al. (1998) found that women's household decision-making was negatively associated with a desire for more children ($\beta = -0.24$, $p < .001$), but no association was found with their degree of mobility.

The two contextual-level studies that examined the relationship between women's empowerment and the desire for more children had inconsistent findings between individual and community-level measures. Moursund and Kravdal (2003) used data from the 1998–99 India National Family Health Survey for 60,382 married women who had at least one child to examine the relationship between women's autonomy and wanting no more children. At the individual-level, a higher score on the mobility index was

associated with wanting no more children ($\beta = 0.04$, $p < .05$). However, at the community-level, the results suggested that women who lived in areas with higher mobility ($\beta = -0.57, p < 001$) were less likely to report wanting to stop childbearing. The authors could not explain the desire for higher fertility among women in areas where they have considerable freedom of movement. Kritz et al. (2000) examined the desire for more children using data from married women from five regional/tribal groups in Nigeria. Higher decision-making and household financial contributions of *individual* women were *not* associated with desire for more children after controlling for regional gender equity and ethnic group. However, when the communities were grouped into low, medium, and high gender equity areas, some interesting differences were noted. In areas of low and medium gender equity, measures of women's autonomy, such as higher decision-making, some primary education, secondary education, women's higher financial contribution to the household (in relation to her husband), and labor force participation were positively associated with the desire for no more children. However, in areas of high gender equity, no significant associations were found between women's autonomy measures and the desire for no more children. Taken together, these contextual-level studies suggest that the context in which women live may be more influential than their own specific level of empowerment.

Seven studies examined women's empowerment effects on ideal family size preferences (El-Zeini, 2008; Isiugo-Abanihe, 1994; McAllister et al., 2012; Upadhyay and Karasek, 2012; Vlassoff, 1991; Woldemicael, 2009; Zafar, 1996). All found that at least some measures of women's empowerment were positively associated with smaller ideal family size preferences but all also had non-significant associations and significant negative associations. For example, Woldemicael (2009) demonstrated that women who reported their husbands had all the decision-making power regarding small or large household purchases were more likely to desire large families (five or more children) compared to women who had at least some say in household decisions (OR = 1.39, $p < .05$; OR = 1.27, $p < .05$). As expected, women who reported that wife-beating is not justified were less likely to want large families than those who reported that wife-beating was justified (OR = 0.74, $p < .01$). However, women who reported their husbands had the final decision-making autonomy on whether they could visit family or friends were unexpectedly *less likely* to desire large families compared to women who reported decision-making autonomy with regard to visiting family or friends (OR = 0.70, $p < .05$).

Three studies assessed women's empowerment and ability to make fertility decisions (Gwako, 1997; Jin, 1995; Mason and Smith, 2000) and all found significant positive associations. Two studies examined the impact of empowerment on husband-wife communication about fertility intentions or preferences (Hindin, 2000; Hogan et al., 1999) and found significant positive associations between women's status variables and couple communication. In Hindin's study (2000) using Zimbabwe DHS data from 3701 women, those who had no say over household purchases (OR = 0.61, $p < .001$) were less likely to have discussed their desired number of children with their partners, even after controlling for women's status variables (e.g., work status, education, literacy). Hogan et al. (1999) examined the effect of women's empowerment on the likelihood of spousal communication around preferred family size in Ethiopia. Among both urban and rural women, higher age at first marriage (rural OR = 1.65, $p < .05$; urban OR = 1.59, $p < .05$), literacy (rural OR = 2.52, $p < .05$; urban OR = 3.05, $p < .05$), and involvement in domestic decisions (rural OR = 1.31, $p < .05$; urban OR = 1.26, $p < .05$) were associated with increased odds of discussing family size preferences with their husbands.

3.2.3. Birth intervals

Seven studies examined associations between women's empowerment and birth intervals (Al Riyami and Afifi, 2003a, 2003b; Feldman et al., 2009; Fricke and Teachman, 1993; Isvan, 1991; Nath et al., 1999; Upadhyay and Hindin, 2005) but two report the same findings using the same dataset and analyses (Al Riyami and Afifi, 2003a, 2003b). Among the six unique studies, five found significant associations, despite measuring birth spacing differently. Two studies examined the length of the first birth interval (period between marriage and first birth) (Fricke and Teachman, 1993; Nath et al., 1999), another examined the length of the most recent closed birth interval (period between two most recent births) (Al Riyami and Afifi, 2003a, 2003b), another examined the length of the most recent open birth interval (period between last birth and interview date) (Isvan, 1991), and the remaining two studies examined the length of the birth interval during a specified observation period (Feldman et al., 2009; Upadhyay and Hindin, 2005).

Three studies found that greater household decision-making power was associated with longer birth intervals (Al Riyami and Afifi, 2003a, 2003b; Nath et al., 1999; Upadhyay and Hindin, 2005). However, Upadhyay and Hindin (2005) also found that, in the Philippines, women's status variables, specifically older age at first birth (Hazard ratio (HR) = 1.10, $p < .01$) and whether the woman works for pay (HR = 1.29, $p < .05$), shortened birth intervals.

Fricke and Teachman (1993) examined first birth intervals in Nepal, finding that women who had more autonomy in choosing a spouse (OR = 2.41, $p < .05$) and who were married at age 19 or older had shorter first birth intervals (OR = 4.14, $p < .001$). The authors concluded that having a choice in one's spouse and being older foster couple closeness and intimacy, thereby contributing to a shorter interval to first birth.

Feldman et al. (2009) was the one birth interval study that did not find significant associations. This intervention study in Mexico examined the effect of participation in a conditional cash-transfer program on women's autonomy and its subsequent effect on birth intervals. While the program increased women's autonomy among participants compared to controls, there was no differential effect on the length of birth intervals, the authors hypothesize, perhaps because the cash-transfer program allowed men to reduce migration for work and remain home, thus driving fertility up to the same levels as the controls.

3.2.4. Unintended pregnancy

Five articles addressed women's empowerment and unintended pregnancy, finding inconsistent effects. In an analysis of 1200 women from urban and rural areas of the Philippines, Williams, et al. (2000) explored the effects of several domains of women's agency (i.e., women's income, education, degree of comfort in discussing sex with husband, and fatalism regarding fertility) on the likelihood of an unintended pregnancy. For rural women, women's income was associated with a lower likelihood of unwanted pregnancy (ORs = 0.52–0.59 across models), whereas those indicating a higher degree of fertility fatalism were associated with higher odds of an unwanted pregnancy (OR = 2.77). The effects of other domains for rural women and for urban women were not significant or only marginally significant.

Pallitto and O'Campo (2005) examined the relationships between gender inequality, intimate partner violence (IPV), and unintended pregnancy using DHS data from Colombia. They found that women living in municipalities where men exhibit high levels of patriarchal control and high rates of IPV were more likely to experience an unintended pregnancy; however, none of the aggregated autonomy or status variables were significantly associated with unintended pregnancy.

Using life history data from Madhya Pradesh, India, Lee-Rife (2010) conducted an analysis examining the cumulative influence of reproductive events including unwanted or mistimed pregnancy, on several dimensions of empowerment: mobility, financial discretion, violence, and threats of abandonment/homelessness. Reproductive events were associated with the violence dimension only. Women with more mistimed pregnancies were less likely to experience recent violence after controlling for initial empowerment, sociodemographic characteristics, and other covariates.

Two additional analyses used DHS data to examine the relationships between women's autonomy and unintended pregnancy among married, pregnant women in the Philippines (Abada and Tenkorang, 2012) and in Bangladesh (Rahman, 2012). Abada and Tenkorang (2012) used measures from the 2003 Philippines National Demographic and Health Survey to examine household autonomy and sexual decision-making autonomy, finding that higher household and sexual decision-making autonomy were associated with lower odds of unwanted pregnancy (RR: .458 and .588, respectively). There were no significant effects found, however, for mistimed pregnancies. Moreover, there was an interaction with age, such that older, more autonomous women were more likely to report unwanted pregnancies.

In Rahman's (2012) analysis, women's autonomy was assessed according to whether women reported having any say in five household decisions (health care, large household purchases, household purchases for daily needs, visits to family or relatives, and child health care). In multivariate models controlling for sociodemographic characteristics, women with higher autonomy scores were less likely to report an unintended (mistimed or unwanted) pregnancy (OR = 0.84).

3.2.5. Abortion

Only two articles examined the relationship between women's empowerment and abortion, both focusing on India. The aforementioned analysis by Lee-Rife (2010) of women's life history data in India (where abortion is legal) indicated that, after controlling for initial empowerment conditions and other covariates, women with more abortions were nearly four times as likely to experience recent violence. The author suggested that women may seek abortion as a means of preventing a child from being born into a violent household, or may suffer a violent response from a husband who disagrees with the use of abortion to regulate fertility.

In Agrawal's (2012) analysis, women's autonomy was measured with questions on household decision-making and ability to make decisions regarding money and mobility. Although the effect sizes are somewhat attenuated by the inclusion of sociodemographic and fertility-related variables (e.g., sex composition of living children), the effect of women's autonomy on the reporting of an abortion persisted—women who reported 'high' and 'medium' levels of autonomy were significantly more likely to report ever having an abortion (AOR: 1.20 and 1.15, respectively), as compared to women with 'low' levels of autonomy. The authors discuss how sociocultural differences across Indian states inform these findings, yet there is limited attention to how women's autonomy may interact with other factors in predicting abortion, such as son preference or sex composition of children.

4. Discussion

4.1. Summary of findings

Overall, empowerment was inversely associated with number of children in the majority of studies, although many studies also found no association between some indicators of women's empowerment and number of children. Studies that used multiple and multidimensional measures of empowerment were more likely to find consistent associations, highlighting the importance of choosing appropriate measures that better approximate women's empowerment.

Empowerment was also demonstrated to be positively associated with fertility preferences, such as the ideal number of children and desire for no more children. When empowerment was measured as higher spousal communication around fertility and women's reported fertility decision-making ability, they were more likely to be associated with the desire for fewer children. While all of these studies found that at least some women's empowerment variables were positively associated with fertility preferences, the associations were less consistent than with number of children. Many found significant positive and negative findings, depending upon the measure used and the level of the measure (e.g., individual and/or community-level). These inconsistent findings call attention to the need to better understand the indicators that best approximate empowerment in each study setting (Mousund and Kravdal, 2003; Upadhyay and Karasek, 2012).

Together, the birth interval studies suggest that household decision-making power lengthens birth intervals, but certain aspects of women's empowerment contribute to shorter birth intervals. As women attempt to reconcile opportunities such as education and work with childbearing, birth intervals may become shorter. For example, two studies found that older age at first birth was associated with shorter birth intervals, suggesting that these women may be trying to "catch up" with other women and one also found that working for pay shortened birth intervals (Fricke and Teachman, 1993; Upadhyay and Hindin, 2005).

The few studies assessing the relationship between empowerment and unintended pregnancy found inverse associations and non-significant effects (e.g., Pallitto and O'Campo, 2005). Similar to the complexities inherent in measuring women's empowerment, pregnancy intention is also a nuanced, multidimensional, and culturally-defined construct (Santelli et al., 2003). The literature has yet to comprehensively address the extent to which the perceived ability to control fertility (the 'calculus of conscious choice') (Coale, 1973) and the labeling of pregnancies as 'unwanted' or 'unintended' is itself an indicator of women's agency or empowerment. The scarcity of studies on the relationships between empowerment and both unintended pregnancy and abortion is remarkable and an area for future research.

There are three limitations to acknowledge. First, it is possible that relevant studies were omitted if they used different terms to describe empowerment than those included in our search criteria. Second, we omitted articles in non-English languages that undoubtedly add to the theory and current knowledge in this area. This may explain why few studies in Latin America were identified. Third, since this review emphasizes breadth over depth; interesting study-specific issues, such as the interactive effects of particular sociodemographic characteristics or context-specific measures, were not highlighted.

4.2. Selecting appropriate measures of empowerment

Certain measures of women's empowerment, such as household decision-making, are used much more frequently than other measures. The household decision-making domain was one of the earliest ways of operationalizing women's empowerment (Dyson and Moore, 1983) and formed the basis of empowerment items incorporated into the standard questionnaire of the DHS (Kishor and Subaiya, 2008). Other domains, such as mobility, appeared frequently due to the predominance of studies from South Asia where mobility is considered a key indicator of women's empowerment. Although the repeated use of specific measures across

study settings facilitates global comparisons, continued work is needed to determine the relevance and validity of these measures, especially in lesser studied settings (Agarwala and Lynch, 2006; Mumtaz and Salway, 2009). Further research should also test innovative and infrequently used measures of women's empowerment (e.g., exposure to public life, aspirations) as listed in Table 1.

Another measurement issue concerns the use of proxy measures to represent women's empowerment. Women's education, for example, is a marker of numerous influences and processes – family socioeconomic status, family investment in a daughter's social development, sufficient mobility to attend school, and exposure to new 'worldviews' (Jejeebhoy, 1995). While some studies simply controlled for women's education, others used it as a proxy for women's empowerment or women's status (Al Riyami and Afifi, 2003a, 2003b; Hindin, 2000; Upadhyay and Hindin, 2005; Woldemicael, 2009). When proxy measures (e.g., education, employment, economic status) were included alongside other measures of women's empowerment, researchers often found independent effects suggesting that they exert their influence in different ways (Woldemicael, 2009). Future research could, either through the study design or the analysis phase, tease apart the individual contributions of education—and other sociodemographic characteristics—and women's empowerment, as well as assess their synergistic influences. Such research would help disentangle complex causal pathways and better direct subsequent research and intervention efforts (Upadhyay and Karasek, 2012).

More fundamentally, defining and appropriately operationalizing women's empowerment remains a challenge. Studies examining the effect of empowerment across settings and populations found differential effects of measures across subgroups or settings, even within the same country or region (e.g., Hogan et al., 1999). The "well-kept" measure in the Philippines (Upadhyay and Hindin, 2005) exemplifies the unique capabilities of qualitative research methods in constructing locally-relevant measures and testing the validity of existing measures. Qualitative research is also critical in identifying the multiple dimensions of women's empowerment and illustrating the ways in which women may be more empowered within certain domains of their lives, as compared to others (Gipson and Hindin, 2007). The multidimensionality of women's empowerment likely contributed to some of the null and counterintuitive effects of empowerment measures in this review, emphasizing the importance of further refinement and conceptualization of women's empowerment measures, as well as the incorporation of statistical techniques (e.g., multilevel and structural equation modeling) to better capture this complex, latent construct in quantitative analyses. Multidimensional measures of women's empowerment that represent a single domain sometimes improve explanatory power (Agarwala and Lynch, 2006). For example, empowerment measured by several items representing involvement in fertility and/or family planning decisions was consistently associated with fertility (e.g., Gwako, 1997; Jin, 1995; Pande et al., 2011). Lastly, considerable variation in the operationalization of empowerment measures likely affects what can be learned from the comparison of measures across studies. For example, the household decision-making measures can be constructed to examine 'sole' versus 'joint' decision-making, or to determine whether women had 'any' say in these household decisions, each of which may produce different estimates when examining relationships with reproductive outcomes (DeRose and Ezeh, 2010). Moreover, the chosen constructions of these measures may also reflect biases on the part of the researchers in what defines women's empowerment in a particular setting and if these constructions are even an appropriate or worthwhile goal (Mumtaz and Salway, 2009). Further investigations of the linkages between women's empowerment and health outcomes will continue to benefit from these debates and discussions, particularly those that draw on developments and insights gained from diverse multidisciplinary perspectives.

4.3. Study design considerations for future research

This review revealed key issues that affect our ability to understand the linkages between and the conclusions drawn from existing studies on women's empowerment and fertility. We suggest ways in which subsequent studies could advance this area of investigation.

First, there is a predominance of studies from South Asia. While the persistence of norms and practices that subjugate South Asian girls and women (e.g., sex-selective abortion and child marriage) warrant continued attention, other regions, like East Asia and Latin America, are minimally represented in this review. The gravitation towards certain research settings narrows our understanding of the linkages between women's empowerment and fertility when comparing studies globally, as well as when attempting to understand the unique relationships and mechanisms within each region.

Additionally, most studies in this review included only currently married women and no studies included never married women as a focus of study. Although this review focuses on fertility-related topics that, in many settings, are most likely to occur within the context of marriage, including unmarried women in subsequent studies could illuminate interactions between women's empowerment and relationship status on fertility-related outcomes. Similarly, few studies include matched couples or male perspectives on women's empowerment. Collecting information from both partners provides the opportunity to account and control for men's characteristics and fertility desires within the same models, as well as to assess couple concordance regarding reproductive intentions.

Beyond the inclusion of male partners, more studies are needed that account for the influence of communities and broader, sociopolitical forces on women's empowerment and fertility outcomes. Several reviewed studies found synergistic or countervailing influences of individual and community-level measures of women's empowerment on reproductive outcomes (e.g., Balk, 1994; Kritz et al., 2000; Pallitto and O'Campo, 2005). Although limited, these studies demonstrate the need to incorporate multiple levels of analysis to examine how social environment shapes the construction of empowerment and its relationship to fertility. Related to this, multilevel modeling could also be harnessed to shed light on the complex interactions between women's empowerment, operating at the individual level and gender equity, operating at levels higher than the individual (Malhotra, 2012).

We identified only a few studies that evaluated interventions aimed to mediate the relationship between women's empowerment and reproductive health, which were almost entirely focused on credit programs (e.g., Amin et al., 1995; Feldman et al., 2009; Steele et al., 1998). Other types of interventions aimed at fostering women's empowerment merit further investigation, especially given the ongoing empowerment programs being implemented by organizations such as the Population Council and the International Center for Research on Women.

Finally, the majority of the studies in this review relied on cross-sectional data, which limits our understanding of the linkages between women's empowerment and fertility. Cross-sectional data does not allow us to map causal pathways nor determine the direction of causality – i.e., how does women's empowerment *cause* changes in fertility outcomes? These relationships may also work in the opposite direction, such that fertility outcomes may *cause* changes in women's empowerment, or be mutually influencing. Even when the measurement of empowerment precedes an

outcome (e.g., subsequent fertility), we are still unable to establish causality in the absence of controls for external, concurrent secular changes that are also likely to influence these relationships. Longitudinal designs are needed to better reflect the *process* of women's empowerment and to determine the causal mechanisms and mediating factors that may facilitate or hinder women's empowerment (Malhotra et al., 2002). As noted by Lee-Rife (2010), the significant and independent effects found for women's initial empowerment conditions (i.e., between marriage and first birth) highlight the importance of examining the "trajectory" and the dynamic nature of women's empowerment across the life course and in response to reproductive events.

5. Conclusion

Improvements in the status and empowerment of women is central to progress in global development efforts and, perhaps more importantly, to the achievement of equitable treatment and representation of the 3.5 billion women in the world. Understanding individual women's experience of empowerment and its effects is a crucial early step in making major advances in gender equity at the society level, and in achieving the Millennium Development Goal of promoting gender equality and empowering women. This review is one of the few efforts to provide an overview of quantitative studies assessing the relationships between women's empowerment and fertility. It is our hope that this review serves as a resource to researchers, practitioners, and policymakers to help shape directions for future research and programmatic efforts.

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