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Degrees of disadvantage

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Abstract: This study is positioned in two strands of literature—intersectionality and social mobility. It is the first to measure (dis)advantage at the individual level as an outcome of the intersectionality of identities and parental circumstances. By linking circumstances at the parental level with (dis)advantage at the individual level, this study uses fuzzy-set Qualitative Comparative Analysis (fsQCA) in an unprecedented application, i.e. to study social mobility or generational persistence. By accounting for intersectional ascribed identities, this study is also the first to analyse social mobility for the intersectionality of caste, religion, and gender identities. Using data from the India Human Development Survey 2011–12, the study finds that, in a given generation, Hindu women can observe high outcomes only if they are born into advantageous parental circumstances. This is further tempered by their position in the social hierarchy. For men, advantageous circumstances are not a necessary precondition for upward mobility. By building epistemological arguments, this paper also makes a contribution by being the first to contend that fsQCA is the ideal method to study overdeterministic social science phenomena.

Key words: intersectionality, social mobility, caste, gender, India, overdeterminism

JEL classification: A12, B51, J15, J62

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Note: As the research is part of the author's PhD thesis, she will hold copyright to facilitate publication of the thesis.

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1 Introduction

Indian society has been characterized by a system of social hierarchy called the caste system. An individual's identity in society is determined right from the time of birth. One is born into a caste and religion. While an individual's identity must be composed of what they personally identify with, as far as their opportunities and access to resources are concerned, their assigned identities are what matter. It is these assigned/ascribed identities that determine who reaps socioeconomic benefits and at whose expense. Assigned identities are used by people to differentiate one group from another, but group identification is not independent but intersectional (Crenshaw 1989). An individual's assigned identities include their religion, caste, and gender, each of which adds up to their inherent advantage or disadvantage. A woman from a so-called 'lower caste' is far more disadvantaged than a man from the same caste. In addition, if the woman belonged to a minority religion, she would face more stigma as opposed to a similar woman with a majority religious affiliation. These nuances are seldom captured, let alone acknowledged when discussing inequality and deprivation.

In theoretical literature, however, considerable effort has been made to accommodate intersectionality in affirmative action policy (Carvalho et al. 2022; Carvalho and Pradelski 2022). Empirical literature recognizing intersectionality has resorted to regression-based methods as a means to study its impact on economic outcomes. The extant literature on the intersectionality of identities and their impact on economic outcomes is still nascent. However, several studies have accounted for the effects of overlapping identities using existing methods in economics research. Elu and Loubert (2013) analyse the intersectionality of gender and ethnicity in inequality of earnings and returns to schooling in the context of Tanzania using quantile regressions. Paul et al. (2022) examine wage gaps in the United States for the intersection of gender and race using Blinder-Oaxaca decomposition. Gezici and Ozay (2020) inspect the impact of COVID-19 on the probability of being unemployed for women of colour. Kabeer and Santos (2017) analyse whether the impact of reduced income inequalities permeates income inequality among intersectional identity groups in Brazil.

The difficulty of accounting for multiple intersections of identities has limited the study of intersectionality in economics literature to just two major identities—gender and race/ethnicity. In a country like India, one's social identity is marked by an overlap of caste, religion, and gender. These overlapping identities create degrees of advantage or disadvantage for each individual. Advantage or disadvantage is not a single attribute but constitutes gradients of high, low, not high, and not low (dis)advantage. These varying degrees are not accounted for by conventional or even newer methods aimed at studying intersectionality.

This study contributes to the extant literature by using fuzzy-set Qualitative Comparative Analysis (fsQCA) to analyse how gradations of inherent advantages or disadvantages result in favourable or unfavourable outcomes for the next generation. Since the study uses two generations—the parents' generation representing circumstances and the following generation's outcome representing the impact of these circumstances on the next generation—it offers a novel means to analyse social mobility. Furthermore, this study uses unique calibrations of circumstances and outcomes as *high*, *low*, *not high*, and *not low* and observes their relationship for various intersectional identities characterized by caste, religion, and gender. In this manner, this study places itself in two strands of economics literature, namely intersectionality or multidimensional identities and social mobility. The use of Qualitative Comparative Analysis (QCA) to link intersectionality to social mobility paves the way for an unprecedented application of the set-theory-based method.

The study finds that there is a high coincidence of advantageous circumstances for Hindu males and females, while for Muslims, the coincidence of advantages is non-existent. Within Hindus, the coincidence of advantages is surprisingly high among those belonging to the *Scheduled Tribes (ST)* groups,

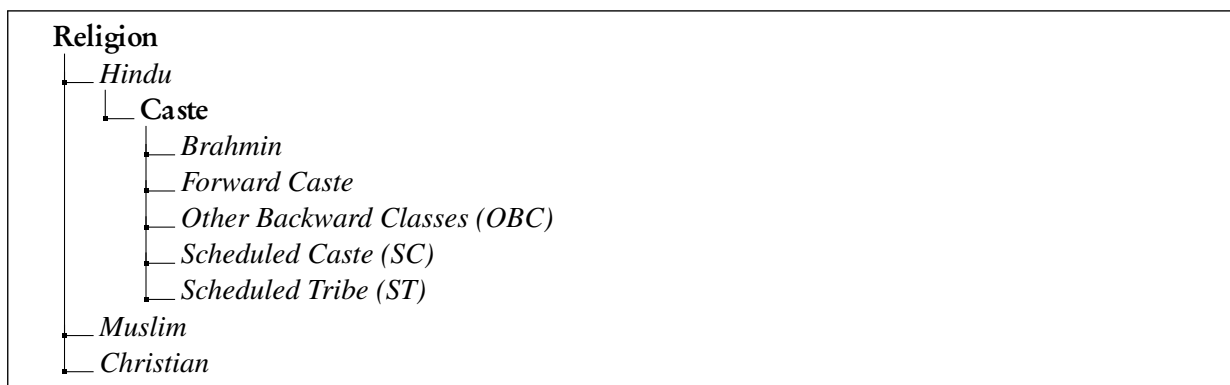
followed by those belonging to the top of the caste hierarchy. The coincidence of disadvantages is one of the highest for the *Scheduled Tribes (ST)*. Through further investigation of what these coincidences of advantages mean for each intersectional identity group and whether or not they materialize into better outcomes for the next generation, the study finds evidence for a strong relationship between the child’s high outcomes and the antecedent condition *not low* circumstances for females, as opposed to males. In other words, among those women in the current generation with high outcomes, advantageous circumstances are a necessary precondition, especially for all groups other than the ‘upper caste’ *Brahmins*. For men, depending on their position in the social hierarchy, their high outcomes are easier to achieve for those higher up the social ladder. However, men have higher social mobility than women in general.

This paper is organized as follows: Section 2 sets the context of the study, Section 3 discusses the epistemological underpinnings of QCA, which is discussed in detail in Section 4 along with the data set that is used, the results are discussed in Section 5, and Section 6 concludes the study.

2 Identities in India

Indian society is marked by several identity affiliations that are acquired by birth. A child, by virtue of being born into a family, assumes a particular religion, caste, and gender. The three identities are rooted in society and are rigid. This ensures that movement across these identities is not possible. Even a religious conversion or personal non-allegiance to a particular religion does not change a person’s identity in the eyes of society since the individual earns privilege or disadvantage based on their family identity. In this study, *categorical social identity*—identity that is embedded in the social fabric and is therefore immutable—is studied since it gives a reasonable starting point for analysing inherent social (dis)advantage. This inherent advantage or the lack of it creates distortions in the opportunities available to individuals. Unequal social standing is expected to reinforce (dis)advantages and makes social mobility more difficult for those on the bottom rung of the social ladder than those at the top.

Figure 1: Social organization in India



Source: author’s illustration.

The identities that this study focuses on are: (1) *religion*, which encompasses Hindu, Muslim, and Christian, (2) *caste* as a hierarchical sub-categorization among Hindus that includes *Brahmins* at the top of the social hierarchy, followed by *Forward Castes*, which constitute castes below the *Brahmins* but above the ‘lower castes’, the *Other Backward Classes (OBC)*, which constitutes socially and educationally backward groups that do not strictly fit into the caste system,¹ *Scheduled Castes (SC)* and *Scheduled*

¹ In this study, only OBCs among Hindus are considered for consistency.

Tribes or the former untouchable castes or tribes that are highly discriminated against, and (3) *Gender*, which cross-cuts all social identity affiliations. These identities intersect or overlap one another to create various degrees of advantages or disadvantages that proxy an individual's unequal starting point. This is exacerbated by their circumstances, which are themselves reflective of the unequal opportunities faced by their parent's generation. Parental outcomes such as education and occupation form circumstances that directly affect the next generation. Inherent inequalities in society also manifest in unequal access to resources or endowments *within* a family unit or household. In a patriarchal society, allocations are skewed in favour of the male members. This study's inclusion of gender in the intersectionality of identities becomes salient not only at the societal level but also at the household level due to its recognition that, despite similar parental circumstances, gender identity can be crucial to explaining differences in the outcome of the next generation.

3 Making the case for QCA—the epistemological underpinnings

Social phenomena are rarely deterministic. They involve a plethora of factors that ultimately lead to an outcome. A deterministic approach follows a predetermined structure of causality.

Economics as a discipline has been using deterministic approaches to study socioeconomic phenomena such as inequality. Inequality is not simply an economic phenomenon; it is influenced by social inequalities that keep it in place. The study of inequality cannot be isolated from the social causes that reinforce it. Inequality is therefore the outcome of overlapping causes—both observable and otherwise. Studying inequality within a standard deterministic framework means making causal claims from studying causal conditions independent of one another. This study uses a method that can be argued to have overdetermination as its epistemological grounding.

Overdetermination is when an effect or outcome is determined by several causes and not just one. The deterministic approach treats causal factors as independent and tries to establish the most important causal factor based on the magnitude of the coefficients observed. By treating causal factors in a contest for importance, determinism abandons the possibility of all factors being equally important for the outcome to happen, regardless of the magnitude and direction of the slope coefficients. Social phenomena are too complex to be reduced to outcomes influenced by a single and 'most important' determinant.

Another fundamental flaw in deterministic approaches is their preoccupation with a dual structure of logic. This could be poverty and no poverty or advantage and disadvantage. Unfortunately, social phenomena do not reflect a logical structure marked by dualism. In fact, it is characterized by the umpteen possibilities between poverty and no poverty or advantage and disadvantage. Recognizing the gradations or degrees that exist between this dual conceptualization is what will aid the pursuit of understanding social phenomena. Such pursuit should be one that embraces causal complexity, as opposed to simplifying reality that is far from simple.

Through its analysis of cause and effect, determinism tries to establish the relationship between cause and effect as direct or indirect. By nature of this design, it claims that the relationship between the cause and effect is determined as the effect in the presence or absence of the cause. For example, if education causes people to stay out of poverty, then lack of education causes people to experience poverty. In other words, the factor that causes people to experience poverty and escape it is the absence or presence of education.

Arguing in this manner can instill a false understanding of poverty and does not allow for the possibility that the factors that lead to and help escape from poverty are different. Ideally, poverty and its absence must be studied as separate cases. The circumstances leading to poverty and those that help escape

poverty are indeed unique to the outcome. Similarly, the experience of poverty cannot be generalized to all individuals. Within the same household, the experience of poverty can be very different, which is to say that, for a social phenomenon such as poverty, the experience of a man and that of a woman are different.

One's social identity plays a crucial role in understanding how they are affected by inequality or poverty. The identity itself poses a *de facto* (dis)advantage that permeates their social or economic outcomes. Not all aspects of this (dis)advantage can be attributed to an individual.

Through its inherent hierarchy, society forms the starting point of inequality, which reflects in individuals' unequal access to resources² and, therefore, opportunities and circumstances. Inequality arises from the advantages/privileges that a group of people of a particular caste or religious identity enjoys at the expense of other groups, which is facilitated by society. This inequality of opportunities is persistent across generations. The circumstances that one generation of people are born into are directly linked to the circumstances their parents were born into. As discussed earlier, given the circumstances within the household, the experience of disadvantage or the lack of it can be quite different based on the gender of each person in the next generation. To put it succinctly, there is no such thing as objective reality so far as society is involved. Categorical social identity, a direct manifestation of social norms and order, forms the entry point or perspective from which inequality must be viewed.

When society makes a distinction between an 'upper caste' and 'lower caste' or 'man' and 'woman', it is only fair that policies aimed at narrowing the inequality between groups also treat each of these groups differently. Since the policies influence individuals whose identities overlap rather than exist in isolation from one another, policymakers and researchers should be mindful of intersectionality. Existing approaches to the study of inequality do not allow for the treatment of identities as intersectional. Interaction variables allow for a maximum of two identity groupings beyond which the slope coefficients become difficult to interpret. In addition, circumstances that lead the next generation to experience disadvantage are an outcome of overlapping disadvantages attributed to their intersectional identities and their circumstances as attributed to the previous generation. Clearly, inequality as springing from an inherent (dis)advantage needs to be studied as an outcome of overlapping and reinforcing causes rather than independent effects of causes as a means to identify the 'most important' cause of the outcome. QCA (Ragin 2000) is a method that accounts for the inherent flaws that exist in extant methods used to study inequality.

4 Methodology and data

Ragin (2000) is credited with the development of QCA, a case-based approach that has set theory as its foundation. QCA determines the relation between conditions and the outcome. The steps involved in QCA are as follows:

1. **Conditions and outcomes are first converted to set membership scores using calibration**
Calibration involves ascertaining the relevant thresholds for conversion to membership scores. There are three main thresholds that are used (Ragin 2009): (1) exclusion criterion, (2) cross-over point, and (3) inclusion criterion. All values below the exclusion criterion are coded as 0. The values between the exclusion criterion and the cross-over point are assigned membership scores between 0 and 0.5. Those values between the cross-over point and the inclusion criterion are assigned membership scores between 0.5 and 1, and those values that fall above the inclusion

² This could even be at the household level with a bias in favour of male members rationalized in a patriarchal society.

criterion have membership scores equal to 1. To determine thresholds, two approaches are adopted (Pappas and Woodside 2021): (1) from the theory itself and (2) based on Euclidean distance.

2. Representation in truth tables

This step involves the representation of the presence or absence of conditions and the resultant outcomes in truth tables (Lazarsfeld 1937).

3. Logical minimization

The logical minimization procedure derives the simplest expression associated with a given outcome value. This process involves considering each case and, therefore, all combinations of conditions that lead to a given outcome and is called the Quine-McCluskey (QMC) algorithm (Quine 1952, 1955; McCluskey 1956).

The calibration of conditions and outcomes as membership scores proves especially useful for a more nuanced understanding of the degrees of disadvantage. Unlike other methods, QCA by virtue of being a set-theory-based method helps calibrate conditions and outcomes as ‘high’, ‘low’, ‘not high’, and ‘not low’. Furthermore, QCA treats the analysis of the outcome and that of the absence of the outcome as distinct. The problem with assuming a symmetric relation between the causal conditions and the outcome is that the relation can be summarized as direct or indirect, which does little justice to understanding social science phenomena. To claim a direct or indirect relationship is to also presume the relationship as universal and therefore generalizable to a larger population. What is often overlooked is the importance of the context—social, economic, political, and cultural—that is being studied. Since economic decisions are indeed socially embedded, as established by Granovetter (1985), this study aims at analysing the underlying mechanisms that run from one’s identity affiliations (inherent (dis)advantage) and circumstances to one’s (dis)advantage by grounding each individual to their social context instead of prioritizing external validity.

The social context in question is India, whose society is marked by diverse divisions of individuals on the basis of caste, religion, and gender. Since the three identity affiliations are not chosen but imposed by social structures that define norms and order, they represent inherent advantages or disadvantages that individuals acquire by birth. These inherent (dis)advantages determine access to resources and opportunities and further reinforce their inherent (dis)advantage. Circumstances are measured using the education and occupation of each parent, and the neighbourhood effects are measured by the average education of those in the parent’s generation in the village or urban unit to which they belong.

The study uses data from the India Human Development Survey 2011–12 (IHDS II) (Desai and Vanne-man 2015). Since the study posits that identities overlap one another, each intersection of caste, religion, and gender is separately studied to determine the relationship between the conditions and outcomes. Since the unit of study is an individual, the study seeks to measure (dis)advantage at the individual level. The only outcome that can be used as a proxy for individual (dis)advantage is the child’s education, which is calibrated as ‘high education’, ‘not high education’, ‘low education’, and ‘not low education’. The conditions representing circumstances include the mother’s education, the mother’s occupation, the father’s education, the father’s occupation, and neighbourhood effects. Much like the child’s education, the conditions are also calibrated into membership scores such as ‘high’, ‘not high’, ‘low’, and ‘not low’.

In addition to creating truth tables, QCA can be used to understand overlapping advantages and disadvantages among various intersectional groups. Overlapping disadvantages may be measured as the set coincidence of low mother’s education, low mother’s occupation, low father’s education, low father’s occupation, and low average education in the village/urban area to which the household belongs (neighbourhood effects).

As shown in Ragin and Fiss (2016), *set coincidence* and *set intersection* can be measured as follows:

$$\text{set coincidence} = \Sigma \min(A_i, B_i, C_i, D_i) / \Sigma \max(A_i, B_i, C_i, D_i)$$

where

$$\text{set intersection} = \Sigma \min(A_i, B_i, C_i, D_i)$$

$$\text{set union} = \Sigma \max(A_i, B_i, C_i, D_i)$$

A key indicator of the relationship between the condition(s) and the resultant outcome are *subset consistency* and *outcome coverage* (Ragin and Fiss 2016).

$$\text{subset consistency} = \min(A_i, Y_i) / \Sigma A_i$$

$$\text{outcome coverage} = \min(A_i, Y_i) / \Sigma Y_i$$

Suppose we are assessing the relationship between ‘high mother’s education’ (A_i) and ‘high child’s education’ (Y_i). The subset consistency is a measure of the degree to which high mother’s education and high child’s education occur together whenever high mother’s education is observed. The relevance of this relation is the magnitude of the connection between high mother’s education and high child’s education of all the times high child’s education is observed. The relevance of the relation is measured by *outcome coverage*, i.e. how much of the outcome is covered by high mother’s education.

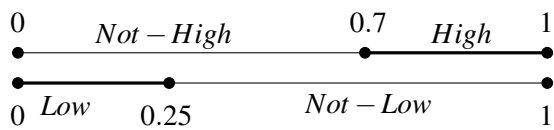
We use these measures to analyse how circumstances pertaining to one generation affect the outcome of the next generation and comment on intergenerational mobility.

4.1 The calibration process

The calibration of the variables into set membership scores is the most crucial step in QCA. Set membership scores allow for calibration of a variable, such as education as *high education*, *not high education*, *low education*, and *not low education*. These intricate gradations allow for a more nuanced assessment of relationships between the conditions and outcomes.

Figure 2 shows the distinction between *high* and *low*, and *not high* and *not low*, set membership. Calibration is carried out by determining thresholds. In this study, three thresholds are used to fit a logistic calibration. The thresholds involve inclusion criterion, crossover point, and exclusion criterion. Suppose we are to calibrate education. The inclusion criterion would be that level of education, say 7.5 years, above which all levels of education have membership in the set of highly educated people. The inclusion criterion of above 7.5 years of education is coded as 1. The exclusion criterion, say 3.5 years, helps exclude those below a certain level of education by coding them as 0. A crossover point of say 5.5 years of education would mean that those levels of education between the exclusion criterion (3.5) and crossover point (5.5) take membership scores between 0 and 0.5, and those levels of education between the crossover point (5.5) and the inclusion criterion (7.5) take membership scores between 0.5 and 1.

Figure 2: Calibration of set membership



Source: author's illustration.

This helps account for the gradations of educational attainment coded as membership scores between 0 and 1. This is called a *fuzzy set* calibration and varies significantly from a *crisp set* that assigns a value of either 0 or 1. *Crisp sets* are used in those cases where a variable is either completely in or completely out. For instance, urban and rural are crisp sets, while income can be coded as a fuzzy set. Since the conditions and outcome variables used in this study are discrete and to some extent ordered, *fuzzy set* calibrations are used.

The outcome studied here is the educational attainment of the next generation, which is a proxy for advantage/disadvantage in the current generation and is studied as an outcome of one's circumstances. Circumstances are measured by five variables—mother's education (ME), father's education (FE), mother's occupation (MO), father's occupation (FO), and neighbourhood effects (NE). The circumstances pertain to the previous generation of those whose outcomes are measured. 'Neighbourhood effects' is measured as the average education of the people in the parents' generation living in the same village or urban unit. These five conditions capture the circumstances in this study. The relationship between the conditions and outcomes known as causal mechanisms is studied separately for each intersectionality of identities, namely *caste*, *religion*, and *gender*.

The causal mechanisms are obtained by representing the conditions as the presence/absence and/or simultaneous occurrence of two or more conditions and their associated outcome, say *high education* of the individual in the next generation in a truth table. Using the logical minimization procedure, it is possible to arrive at the simplest possible expression depicting the relationship between the conditions and the outcome. As a measure that embraces causal complexity, QCA proves to be the ideal method to study how multiple conditions together create a causal mechanism that ultimately leads to the outcome. Since it uses *fuzzy set* calibrations, this method also allows for the calibration of conditions, as is shown in Figure 2, with each set calibration of membership meaning different things.

To calibrate education in a manner similar to Figure 2, the starting point is the thresholds obtained for the 'education' set. Suppose we need to calibrate mother's education (ME) as 'high mother's education' and 'not low mother's education'. The first step is to obtain the thresholds for ME. To calibrate 'high ME', we consider only those samples above the inclusion criterion of ME, say, above 7.5 years of education. Once this subsample is obtained, we repeat the threshold determination process for the new sample. With the three thresholds obtained, say 8.5, 10, and 12, we code the new set 'high ME'. 'Not high ME' constitutes the exact opposite of 'high ME' and, therefore, is calibrated with those below the inclusion threshold as a subsample. Similarly for 'low ME', those below the exclusion criterion become the main sample, while for 'not low ME', those above the exclusion criterion are used for calibrations. Calibration of occupation is carried out by fitting an order for the occupations ascertained by defining occupation by the number of years of education that is required to be eligible for the occupation.³ In this manner, each of the five conditions and the outcome can be calibrated in four unique ways.

This study is motivated by the need to analyse how circumstances and one's identity affiliations create various degrees of (dis)advantages for the next generation. Furthermore, when the outcome of the next

³ This is defined in the National Classification of Occupations, 1968, based on which IHDS-II classifies occupations. Refer to Kundu and Sen (2022), which use occupation as a variable with ordered categories.

generation is better than that of the previous generation (circumstances), there is a case for upward intergenerational mobility. In other words, if ‘not low’ circumstances lead to ‘high’ outcomes, then there is upward mobility. Additionally, this method can enable the study of whether a coincidence or overlap of advantages materializes into mobility for the next generation.

This study defines a coincidence of disadvantages as the overlap of low mother’s education (MEL), low father’s education (FEL), low mother’s occupation (MOL), low father’s occupation (FOL), and low neighbourhood effects (NEL), while the coincidence of advantages is defined as not low mother’s education (MENL), not low father’s education (FENL), not low mother’s occupation (MONL), not low father’s occupation (FONL), and not low neighbourhood effects (NENL). The definition of advantages is deliberately chosen as ‘not low’ calibrations instead of ‘high’ calibrations of the conditions since there are very few individuals represented in the group. A small sample size would, therefore, make it impossible to study the differences in circumstances for an overlap of identities.

5 Analysis

5.1 The coincidence of advantages and disadvantages

Before we determine the relationship between the circumstances of a generation on the outcome of the next generation, it is pertinent to examine the kind of circumstances that individuals are born into. We analyse the set coincidence of advantages and disadvantages by religion and gender and further by caste and gender.

Table 1 shows intersecting disadvantages measured by set coincidence, where disadvantages are calibrated through membership scores that define low father’s education, low mother’s education, low mother’s occupation, low father’s occupation, and low neighbourhood effects. This table accounts for the intersectionality of religion and gender. The table shows that Muslim males and females experience the highest coincidence of disadvantages. The set coincidence is as high as 0.91 for the coincidence of low father’s education and low mother’s education for Muslim females. With the addition of low mother’s occupation, the set coincidence for Muslim females continues to be the highest among all identity intersections. Once low father’s occupation is included, the highest coincidence of disadvantages is observed for Muslim males. This pattern continues with the inclusion of low neighbourhood effects. This table, therefore, shows that Muslims have the highest overlapping disadvantages, which points to poor circumstances and therefore a lower starting point for both Muslim males and females compared to other identity groups.

Table 2 represents the set coincidence of advantages that are calibrated as not low father’s education, not low mother’s education, not low mother’s occupation, not low father’s occupation, and not low neighbourhood effects. Although the set coincidence of the first two or three advantages shows coinciding advantages being high for Muslim women, the coincidence of all four advantages is the highest among Hindu males and females. Moreover, Table 3 shows how these advantages and disadvantages coincide within Hindus based on the intersection of caste and gender. As a general pattern, it may be observed that the so-called higher castes or *Brahmins* and *Forward Castes* have a large set coincidence of advantages and a low set coincidence of disadvantages. Since advantages are defined according to ‘not low’ calibrations rather than ‘high’ calibrations, we observe a high magnitude of coincidence of advantages among those castes at the bottom of the social hierarchy. As far as ‘high’ configurations are concerned, the sample size is too small to make any meaningful comparisons between intersectional identity groups. So we resort to ‘not low’ configurations. However, it is worth noting that the *Scheduled Castes (SC)* and *Scheduled Tribes (ST)* belonging to the bottom of the social hierarchy seem to have a considerably high coincidence of advantages in addition to disadvantages. The highest set coincidence of advantages is

therefore observed among females belonging to *Forward Castes* and *STs*. Does this coincidence of advantages materialize into upward social mobility for *SCs* and *STs*? To answer this question, we observe the relationship between the coincidence of advantages and ‘high’ child outcomes.

5.2 Do advantageous circumstances make child outcomes better?

To truly understand who the beneficiaries of coinciding not low circumstances and ensuing high child outcomes are, we study Table 4. The table clearly shows that for females to have better outcomes, they must be preceded by coinciding advantages. Among females, those belonging to the *Forward Caste*, *SC*, and *ST* categories are seen to have high subset consistency and outcome coverage. Among males, however, this pattern is not so strong. A high outcome coverage, in the case of *Forward Caste*, *SC*, and *ST* females, point to the fact that whenever a child with a high outcome is observed among their identity group, it is highly likely that the antecedent (precedent) condition is one of not low circumstances. In other words, where a high outcome child is observed, they are likely to have come from a not low circumstance. This is indicative of low mobility among *SC*, *ST*, and *Forward Caste* females. A high subset consistency implies that coinciding advantages (not low circumstances) are a consistent subset of the (high) outcome. In other words, whenever not low circumstances are observed among these intersectional identity groups, the consequent outcome for the next generation is almost always a high outcome. The outcome coverage implies the antecedent relationship, i.e. it helps us identify how often the high outcome is preceded by the antecedent condition of overlapping advantages. For females, the observation of high outcomes is almost always preceded by advantageous circumstances. For males, on the other hand, a low outcome coverage indicates that there are factors other than overlapping advantages that lead to high outcomes. Thus, for *SC*, *ST*, and *Forward Caste* females, high subset consistency (about 0.90 and above) and high outcome coverage (ranging from about 0.80 to 0.90) means that advantageous circumstances are almost always necessary and sufficient for high outcomes. If these females are born into disadvantageous circumstances, they are unlikely to have high outcomes. For males to observe high outcomes, advantageous circumstances are not a necessary precondition. What naturally follows from this finding is that society is *de facto* predisposed to treat males and females differently. Social conditioning for both these sexes causes gender differences to spring up. In a patriarchal society, it is not surprising that men have more favourable outcomes than women. This is certainly not because they are naturally better but because society makes it easier for men to move up. Given poor circumstances, men have better outcomes than women because society creates an environment of opportunities for men and one of obstacles for women. So, for a woman to move up the ladder, she must have advantageous circumstances such as educated parents and a higher income ensured by working parents who are better placed in terms of their jobs.

5.3 What causal mechanism best explains movement from advantageous circumstances to high outcomes?

Table 5 shows the subset consistency and outcome coverage associated with the simplest possible relationship between not low circumstances and high outcomes. The results shown in the table are arrived at using the QMC algorithm. The algorithm helps ascertain an expression of the presence, absence, and conjunction of all the conditions that best encompass all cases (observations) and the outcome (high child education) in the data set. This is called *causal mechanism*.

A high subset consistency score across all caste groups points to a high degree of connection between not low circumstances and high outcomes out of all the times not low circumstances are observed. This means that not low circumstances are a consistent subset of the corresponding high outcomes. If a child is born into advantageous circumstances, they will almost always end up having a high outcome in the future.

However, outcome coverage shows that the differences in magnitude are in line with the inherent caste hierarchy. Those at the bottom of the social hierarchy have a higher outcome coverage than those at the top. Whenever a child with a high outcome is observed, to what degree is this outcome preceded by the *causal mechanism*? In other words, of all the times high outcomes are observed, the degree of connection between the antecedent condition, not low circumstances, and high outcomes are high for only STs among males, while for females, the subset relation is relevant regardless of caste considerations.

This finding is in line with what was observed in the Table 4. An overlap of at least some advantages is a precondition for Hindu women to have high outcomes. There is clearly higher upward mobility for males than females. For the latter group, only advantageous circumstances can improve their future outcomes.

Table 1: Intersecting disadvantages by religion and gender

<i>Fuzzy sets</i>	<i>Set coincidence</i>	<i>Coincidence proportion</i>
Hindu male		
Low father's education, low mother's education	0.83	0.82
Low father's education, low mother's education, low mother's occupation	0.72	0.72
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.53	0.53
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.17	0.17
Hindu female		
Low father's education, low mother's education	0.85	0.84
Low father's education, low mother's education, low mother's occupation	0.71	0.71
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.46	0.46
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.15	0.15
Muslim male		
Low father's education, low mother's education	0.87	0.87
Low father's education, low mother's education, low mother's occupation	0.82	0.82
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.61	0.61
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.26	0.25
Muslim female		
Low father's education, low mother's education	0.91	0.91
Low father's education, low mother's education, low mother's occupation	0.87	0.87
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.58	0.58
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.23	0.23
Christian male		
Low father's education, low mother's education	0.81	0.81
Low father's education, low mother's education, low mother's occupation	0.74	0.74
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.46	0.46
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.09	0.09
Christian female		
Low father's education, low mother's education	0.87	0.83
Low father's education, low mother's education, low mother's occupation	0.83	0.83
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.24	0.24
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.05	0.05

Note: the table shows the set coincidence of disadvantages by religion and gender. The table does not include 'other' religious groups due to the heterogeneity within the group. It shows the proportion of disadvantages among the universal set encompassing the intersection of religion and gender. Each row within a religion-gender intersection has an additional component of disadvantage added to the set coincidence calculation.

Source: author's calculations.

Table 2: Intersecting advantages by religion and gender

<i>Fuzzy sets</i>	<i>Set coincidence</i>	<i>Coincidence proportion</i>
Hindu male		
Not low father's education, not low mother's education	0.48	0.53
Not low father's education, not low mother's education, not low mother's occupation	0.43	0.48
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.41	0.47
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.33	0.27
Hindu female		
Not low father's education, not low mother's education	0.56	0.73
Not low father's education, not low mother's education, not low mother's occupation	0.54	0.64
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.51	0.63
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.37	0.35
Muslim male		
Not low father's education, not low mother's education	0.44	0.44
Not low father's education, not low mother's education, not low mother's occupation	0.36	0.41
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.41	0.41
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.00	0.00
Muslim female		
Not low father's education, not low mother's education	0.51	0.97
Not low father's education, not low mother's education, not low mother's occupation	0.75	0.97
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.98	0.97
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.05	0.05
Christian male		
Not low father's education, not low mother's education	0.50	0.62
Not low father's education, not low mother's education, not low mother's occupation	0.44	0.62
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.63	0.48
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.30	0.22
Christian female		
Not low father's education, not low mother's education	0.59	0.50
Not low father's education, not low mother's education, not low mother's occupation	0.60	0.49
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.67	0.46
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.02	0.01

Note: the table shows the set coincidence of advantages by religion and gender. The table does not include 'other' religious groups due to the heterogeneity within the group. It also shows the proportion of advantages among the universal set encompassing the intersection of religion and gender. Each row within a religion-gender intersection has an additional component of advantage added to the set coincidence calculation.

Source: author's calculations.

Table 3: Intersecting advantages and disadvantages by caste and gender

<i>Identities</i>	<i>Set coincidence of advantages</i>		<i>Set coincidence of disadvantages</i>	
	<i>With NE</i>	<i>Without NE</i>	<i>With NE</i>	<i>Without NE</i>
Male				
Brahmin	0.41	0.82	0.18	0.62
Forward Caste	0.56	0.81	0.14	0.66
Other Backward Classes (OBC)	0.14	0.32	0.19	0.57
Scheduled Castes (SC)	0.30	0.56	0.12	0.40
Scheduled Tribes (ST)	0.47	0.56	0.24	0.48
Female				
Brahmin	0.34	0.69	0.12	0.76
Forward Caste	0.66	0.97	0.10	0.51
Other Backward Wlasses (OBC)	0.13	0.62	0.16	0.52
Scheduled Castes (SC)	0.26	0.31	0.10	0.32
Scheduled Tribes (ST)	0.62	0.69	0.22	0.47

Note: the table reports the set coincidence of disadvantages and advantages with and without the neighbourhood effects (NE) by caste and gender within Hindus. The table does not include 'other' caste groups due to the heterogeneity within the group. Source: author's calculations.

Table 4: Relationship between coinciding advantages and high outcomes by caste and gender

<i>Identities</i>	<i>Subset consistency</i>	<i>Outcome coverage</i>
Male		
Brahmin	0.44	0.42
Forward Caste	0.77	0.59
Other Backward Classes (OBC)	0.60	0.36
Scheduled Castes (SC)	0.89	0.49
Scheduled Tribes (ST)	–	–
Female		
Brahmin	0.13	0.07
Forward Caste	0.92	0.90
Other Backward Classes (OBC)	1.00	0.28
Scheduled Castes (SC)	1.00	0.77
Scheduled Tribes (ST)	0.89	0.90

Note: the table reports the subset consistency and outcome coverage of the relationship between the coincidence of advantages and high outcomes of the next generation. This relationship is studied separately as the intersection between caste and gender. The table does not include 'other' caste groups due to the heterogeneity within the group. Source: author's calculations.

Table 5: Causal mechanisms for not low circumstances to high outcomes by caste and gender

<i>Identities</i>	<i>Subset consistency</i>	<i>Outcome coverage</i>
Male		
Brahmin	0.97	0.23
Forward Caste	0.98	0.12
Other Backward Classes (OBC)	0.91	0.29
Scheduled Castes (SC)	0.89	0.49
Scheduled Tribes (ST)	1.00	0.92
Female		
Brahmin	0.99	0.83
Forward Caste	0.92	0.90
Other Backward Classes (OBC)	–	–
Scheduled Castes (SC)	0.99	0.77
Scheduled Tribes (ST)	0.89	0.90

Note: the table reports the subset consistency and outcome coverage of the simplest possible expression/causal mechanism linking not low circumstances to high outcomes of the next generation. This relationship is studied separately as the intersection between caste and gender. The table does not include ‘other’ caste groups due to the heterogeneity within the group.

Source: author’s calculations.

6 Discussion and conclusion

This study uses intersectional identity groups as a representation of the inherent social advantages or disadvantages an individual acquires by birth. These identities include religion, caste among Hindus, and gender that cross-cuts all other identity affiliations. In addition to intersectional identities, individuals are exposed to circumstances that shape their own outcomes as quantified by their education. These circumstances are due to the previous generation, i.e. their parents, which include parental education, occupation, and neighbourhood effects. The relationship between these circumstances and the resultant outcomes is ascertained by studying nuanced calibrations of these variables as *high*, *not high*, *low*, and *not low*. The use of fsQCA enables these calibrations and is helpful in assessing the degree to which advantages and disadvantages coincide among these intersectional groups.

Furthermore, it helps to ask more subtle questions, such as: What do the coincidence advantages mean for the outcomes of the next generation? In other words, does a coincidence of advantageous circumstances materialize into better outcomes for the next generation? To address this question, the study analyses the relationship between coinciding advantages (calibrated as ‘not low’ circumstances) and the high educational outcomes of the next generation and also determines the relevance of this relation for the intersectional identities in question. Additionally, the causal mechanisms leading up to the outcomes are explored to study social mobility.

Broadly, this study makes significant contributions to the study of social mobility on the basis of the nuanced questions it asks. The answers come from unique calibrations of circumstances of one generation on the outcomes of the next generation, further refined by the intersectional identities it accounts for at the individual level. By accounting for the intersectionality of identities beyond two identity groups, the study makes another contribution to intersectionality literature in economics. Moreover, the link between intersectionality and social mobility is examined using fsQCA, an existing method with an unprecedented application.

The study finds that for *Scheduled Tribe (ST)*, *Forward Caste*, and *Scheduled Caste (SC)* females, a high educational outcome almost always is preceded by the antecedent outcome of not low circumstances.

For women to enjoy better outcomes in the future, they must be born into advantageous circumstances. Through this study, it is established that the coincidence of advantages is a necessary precondition for high outcomes for women. For men, on the other hand, this is not so. There are more ways that advantageous circumstances will enable them to achieve high outcomes. As a result, upper social mobility is easier for men than women.

From an epistemological standpoint, QCA enables the study of social science phenomena from an overdeterministic framework in the sense that it does not categorically establish one variable as a cause and another as the effect due to that cause. By its very design, QCA embraces causal complexity, which is a characteristic feature of all social phenomena.

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Appendix

A Definition of key variables

1. *Caste*: There are five caste categories used in this paper: *Brahmin*, *Forward Caste*, *Other Backward Classes (OBC)*, *Scheduled Caste (SC)*, and *Scheduled Tribe (ST)*. *Brahmins* are part of the top of the social hierarchy, followed by the *Forward Castes*. *Scheduled Castes (SC)* are those who belong to the former *Untouchable* castes, of which *Scheduled Tribes (ST)* were also a part. Since the caste system is generally recognized as a part of Hinduism, this study studies caste as a subcategorization among Hindus alone.
2. *Religion*: The broad classifications under this variable are *Hindu*, *Christian*, *Muslim*, and *Other*. The *Other* category is a combination of *Sikh*, *Buddhist*, *Jain*, *Tribal*, and *Other*. All households that reported no religious affiliation were not considered in the study sample.
3. *Occupation*: This variable pertains to the occupation of both parents. The variable is transformed to represent seven divisions as per the National Classification of Occupations, 1968. *Division 1* encompasses Professional, Technical, and Related Workers; *Division 2* includes Administrative, Executive, and Managerial Workers; *Division 3* has Clerical and Related Workers; *Division 4* is for Sales Workers; *Division 5* pertains to Service Workers; *Division 6* includes Farmers, Fishermen, Hunters, Loggers, and Related Workers; *Division 7-8-9* for Production and Related Workers, Transport Equipment Operators, and Labourers; and *Undefined* for Workers not Classified by Occupation. This study calibrates occupation based on the level of educational qualifications required to be eligible for the jobs listed in this classification, which follows the same order as the classification (from high to low, with the lowest encompassing unemployed).
4. *Neighbourhood effects*: This refers to the average education of all individuals in the parents' generation in a given village or urban unit.

B Additional tables

Table B1: Average of each of the conditional variables by the intersection of caste-gender and religion-gender

Identity	Child education			Mother education			Father education			Mother occupation			Father occupation			Neighbourhood effects		
	Overall	Male	Female	Overall	Male	Female	Overall	Male	Female	Overall	Male	Female	Overall	Male	Female	Overall	Male	Female
<i>Caste</i>																		
Brahmin	11.98	11.84	12.59	5.34	5.06	6.52	9.52	9.35	10.27	8.62	8.62	8.59	7.39	7.52	6.80	6.66	6.49	7.35
Forward Caste	11.10	10.89	12.03	4.67	4.29	6.49	7.60	7.28	9.16	8.61	8.66	8.37	7.78	7.92	7.12	6.37	6.22	7.09
OBC	9.54	9.49	9.75	2.81	2.62	3.66	5.68	5.55	6.33	8.39	8.41	8.28	7.72	7.79	7.35	5.06	4.96	5.54
SC	8.73	8.61	9.23	1.74	1.57	2.41	4.30	4.11	5.11	8.02	8.03	8.01	7.14	7.21	6.87	4.74	4.59	5.34
ST	7.50	7.72	6.62	1.12	1.06	1.36	3.10	2.91	3.87	7.77	7.83	7.53	7.29	7.36	6.97	3.67	3.56	4.11
Others	9.19	9.03	9.78	3.10	3.01	3.47	3.06	4.45	5.46	8.14	8.16	8.03	7.76	7.79	7.58	4.90	4.83	5.20
<i>Religion</i>																		
Hindu	9.74	9.66	10.09	3.06	2.84	4.01	5.90	5.71	6.81	8.33	8.36	8.20	7.56	7.65	7.12	5.30	5.18	5.85
Muslim	8.06	8.03	8.18	2.09	1.99	2.42	4.68	4.52	5.28	8.72	8.74	8.65	7.85	7.93	7.56	4.48	4.41	4.73
Christian	10.76	10.40	11.47	5.80	5.78	5.85	7.31	7.21	7.52	8.12	8.14	8.10	7.24	7.27	7.15	7.05	6.93	7.29
Other	9.68	9.44	10.66	3.67	3.48	4.44	5.98	5.65	7.42	8.57	8.60	8.44	7.68	7.85	6.96	5.40	5.23	6.08

Source: author's calculations using IHDS II data.

Table B2: Intersecting disadvantages by caste and gender

<i>Fuzzy sets</i>	<i>Set coincidence</i>
Brahmin male	
Low father's education, low mother's education	0.76
Low father's education, low mother's education, low mother's occupation	0.69
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.62
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.18
Brahmin female	
Low father's education, low mother's education	0.79
Low father's education, low mother's education, low mother's occupation	0.79
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.76
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.12
Forward Caste male	
Low father's education, low mother's education	0.81
Low father's education, low mother's education, low mother's occupation	0.75
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.66
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.14
Forward Caste female	
Low father's education, low mother's education	0.84
Low father's education, low mother's education, low mother's occupation	0.73
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.51
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.10
OBC male	
Low father's education, low mother's education	0.83
Low father's education, low mother's education, low mother's occupation	0.74
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.57
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.19
OBC female	
Low father's education, low mother's education	0.82
Low father's education, low mother's education, low mother's occupation	0.73
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.52
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.16
SC male	
Low father's education, low mother's education	0.85
Low father's education, low mother's education, low mother's occupation	0.69
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.40
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.12
SC female	
Low father's education, low mother's education	0.86
Low father's education, low mother's education, low mother's occupation	0.69

Low father's education, low mother's education, low mother's occupation, low father's occupation	0.32
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.10
ST male	
Low father's education, low mother's education	0.89
Low father's education, low mother's education, low mother's occupation	0.67
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.48
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.24
ST female	
Low father's education, low mother's education	0.93
Low father's education, low mother's education, low mother's occupation	0.66
Low father's education, low mother's education, low mother's occupation, low father's occupation	0.47
Low father's education, low mother's education, low mother's occupation, low father's occupation, low neighbourhood effects	0.22

Note: the table shows the set coincidence of disadvantages by caste and gender within Hindus. The table does not include 'other' caste groups due to the heterogeneity within the group. It also shows the proportion of disadvantages among the universal set encompassing the intersection of religion and gender. Each row within a caste-gender intersection has an additional component of disadvantage added to the set coincidence calculation.

Source: author's calculations.

Table B3: Intersecting advantages by caste and gender

<i>Fuzzy sets</i>	<i>Set coincidence</i>
Brahmin male	
Not low father's education, not low mother's education	0.84
Not low father's education, not low mother's education, not low mother's occupation	0.82
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.82
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.41
Brahmin female	
Not low father's education, not low mother's education	0.72
Not low father's education, not low mother's education, not low mother's occupation	0.69
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.69
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.34
Forward Caste male	
Not low father's education, not low mother's education	0.91
Not low father's education, not low mother's education, not low mother's occupation	0.81
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.81
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.56
Forward Caste female	
Not low father's education, not low mother's education	0.97
Not low father's education, not low mother's education, not low mother's occupation	0.97
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.97
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.66
OBC male	
Not low father's education, not low mother's education	0.51
Not low father's education, not low mother's education, not low mother's occupation	0.41
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.32
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.14
OBC female	
Not low father's education, not low mother's education	0.76
Not low father's education, not low mother's education, not low mother's occupation	0.64
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.62
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.13
SC male	
Not low father's education, not low mother's education	0.71
Not low father's education, not low mother's education, not low mother's occupation	0.65
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.56
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.30
SC female	
Not low father's education, not low mother's education	0.78
Not low father's education, not low mother's education, not low mother's occupation	0.34

Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.31
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.26
ST male	
Not low father's education, not low mother's education	0.90
Not low father's education, not low mother's education, not low mother's occupation	0.56
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.56
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.47
ST female	
Not low father's education, not low mother's education	0.93
Not low father's education, not low mother's education, not low mother's occupation	0.69
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation	0.69
Not low father's education, not low mother's education, not low mother's occupation, not low father's occupation, not low neighbourhood effects	0.62

Note: the table shows the set coincidence of advantages by caste and gender within Hindus. The table does not include 'other' caste groups due to the heterogeneity within the group. It also shows the proportion of advantages among the universal set encompassing the intersection of religion and gender. Each row within a caste-gender intersection has an additional component of advantage added to the set coincidence calculation.

Source: author's calculations.