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Group Differences between Mutable Identities: The Case of Religious Affiliation

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This study investigates the persistence of group differences associated with mutable identities, using religious affiliation as a case study. Existing theory suggests such differences can persist via self-selection, where higher-performing individuals are more likely to join groups with higher average performance. Analyzing NLSY79 and GSS data, I test this mechanism by comparing movers who switch religious affiliations with stayers who do not. Findings confirm self-selection patterns: move-uppers who switch to affiliations with higher average education or wages, tend to have higher education and wages than stayers from the same origin group, while move-downers tend to have lower outcomes. However, other findings contradict the theory's mechanism: fixed-effects models show no significant direct wage gain from switching affiliations, and the frequency of moving down is comparable to moving up. These results suggest that while self-selection occurs, it may be driven more by factors like homophily rather than direct differential economic returns.

JEL Classification: J70, Z12

Keywords: Mutable Identities, Self-selection, Religious Affiliations, Group Differences, Homophily

I. Introduction

Discrimination often refers to disparities among groups defined by immutable characteristics. Racial and gender gaps in education and income are widely discussed topics. Ethnic disparities are frequently studied in multi-ethnic societies. These disparities are often considered potential evidence of discrimination because the groups are presumed similar in underlying potential, and the characteristics defining them (e.g., race, ethnicity,

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gender) are not inherently linked to the outcomes being measured, such as educational attainment or income levels. There is no *a priori* reason to believe that one racial, ethnic, or gender group possesses inherently greater educational or income potential than others. These differences raise significant justice concerns because individuals in disadvantaged groups typically cannot change their identity to escape discrimination or negative stereotypes.

However, differences also exist among groups defined by mutable identities, and these can be equally significant. Mutable identities, such as residential region or school affiliation, are also associated with group differences. These differences are rarely labelled as discrimination because they are often attributed to individual choice. Yet, choice is not always equally available; for instance, one cannot simply choose to move to an affluent region if one cannot afford the high-cost housing. Paradoxically, the possibility of choice can sometimes make these differences more persistent. If individuals who become successful can afford to move to more advantaged areas (like affluent regions), they may do so, potentially exacerbating existing disparities by concentrating advantage. If the identity were immutable (e.g., individuals were tied to their birth region), such sorting might be reduced. While group differences in cases like residential choice might seem intuitive because the ability to choose is directly linked to economic outcomes, theoretical arguments suggest that significant group differences can emerge even when choices are, in principle, equally available to everyone. Furthermore, these differences might even exceed those observed between groups with immutable identities under similar economic conditions (Fang 2001, Kim and Loury 2019).

This paper investigates group differences associated with the mutable identity of religious affiliation. Arguably, religious identity can be changed relatively freely in many Western democratic countries including the US and is not typically considered directly related to economic performance. Nevertheless, theory suggests that persistent group differences in economic performance linked to such identities are still possible. The purpose of this paper is twofold: first, to empirically test the implications of existing theories regarding mutable identities using religious affiliation as a case study, and second, to identify potential modifications needed for these models to better align with empirical patterns. This research builds primarily on Fang (2001), who demonstrated, using a statistical discrimination model (*à la* Coate and Loury 1993), that group differences can emerge even with mutable identities. Despite its interesting implications, the empirical relevance of Fang's model has not been thoroughly investigated, partly because finding real-world attributes fitting its assumption of an acquirable, productivity-irrelevant identity attribute is challenging. This paper contributes by proposing religious affiliation as a suitable candidate for such an attribute, thereby allowing the theoretical insights to be empirically tested.

The paper's results, however, are not limited solely to religious identity. Seemingly immutable identities like race or ethnicity can also exhibit fluidity or mutable aspects. Racial identity, for example, is known to be fluid in the South American context (see Telles and Paschel 2014 and literature cited therein). Sociological studies often treat race and gender as social constructs rather than purely biological or fixed attributes. Concepts like "acting white" have been discussed as examples of blurring racial distinctions (Eguia 2017, Kim and Loury 2019). Therefore, the findings regarding self-selection dynamics presented here may apply to these contexts as well. Even group differences related to residential region and school ties might involve similar mechanisms.

This paper first sketches the logical structure of the models to explain the emergence of group differences between mutable identities. The sketch intends to explain the core mechanics of Fang's (2001) canonical model but also provides alternative stories and channels to generate similar implications. Even though the cost of changing identity does not systematically differ among individuals, group differences can emerge because the return to switching to a favored (higher-performing) group is potentially greater for higher performers. Although this higher return comes from the statistical inference of the employer in the statistical discrimination model *à la* Fang, this return can be assumed to come from the social interaction within the group. Whatever the source of this return is, the key testable implication is self-selection in identity changes: individuals switching to a group associated with higher average performance ('move-uppers') are predicted to have higher skill levels than those who remain in their original group ('stayers'). Conversely, individuals switching to a group with lower average performance ('move-downers') are predicted to have lower skill levels than stayers.

Next, the paper empirically tests this prediction using data from the General Social Survey (GSS) and the National Longitudinal Survey of Youth 1979 (NLSY79). Both data sets contain information on religious affiliation. Results from the NLSY79 are reported in the main text, while GSS results are available in the appendix. Using the NLSY79, respondents are categorized as 'stayers' (current religion same as religion raised in) or 'movers' (current religion different). The average education level (and separately, average hourly wage) associated with each religious affiliation is calculated using stayers only. Based on these averages, movers are classified as 'move-uppers' if they switched to a religion with a higher average outcome than their original religion, and 'move-downers' if they switched to one with a lower average outcome.

The analysis reveals that the predicted pattern of self-selection is broadly observed in religious switching. Specifically, 'move-uppers' tend to be more educated and earn higher wages than 'stayers', while the opposite trend holds for 'move-downers'.¹ This finding

¹ In the NLSY79 data, the average education level of move-downers is not statistically different from

challenges the common assumption that religious affiliation choices are driven solely by theological or spiritual purposes.

Considering all the empirical patterns, social network model with subjective return of homophily seems most suitable for the current empirical context. Differential payoffs to skill based on group identity driving self-selection does not seem to be an objective return of higher hourly wage. Using a fixed-effects model, this study finds no significant evidence that individuals' hourly wage rates change directly as a result of switching religious identity. If economic returns drive switching, they likely take forms other than immediate wage changes. The return can be subjective utility gain which may not be empirically captured. The data also show that moving 'up' (to a higher-performing group) is not significantly more frequent than moving 'down'. This suggests that the payoff for joining a 'better' group may not be higher for everyone. In that regard, homophily, the tendency of individuals to associate with similar others, could act as an alternative or complementary driver of self-selection, potentially accommodating all these findings. In the discussion section at the end of the paper, the empirical specification is implemented to directly test the theory of homophily, and its result shows that individuals are more likely to choose religious affiliations whose characteristics are similar to their own in terms of average education and hourly wage rate.

This paper's results warrant greater attention to self-selection dynamics concerning other acquirable attributes. For instance, if homophily contributes to residential segregation based on socioeconomic status or educational level, the resulting sorting could have significant and lasting effects on intergenerational mobility and inequality.

The rest of this paper is organized as follows. Related literature is surveyed in the next subsection. In Section 2, a sketch of the existing theory and possible alternative is provided to motivate the empirical exercise. The empirical implications and the specifications to test these implications are introduced in Section 3. The data set to be used is described in Section 4, while Section 5 summarizes the results of the empirical analysis. Implications from the results are discussed and alternative theory is tested in Section 6. Finally, Section 7 provides a conclusion.

1.1 Related Literature

This paper deals with group differences between mutable identities, but the suggested logical structure for this relationship is closely related to group differences between immutable identities or discrimination. The theory of discrimination was originally addressed by Becker (1957), Phelps (1972), and Arrow (1973), with more recent

that of stayers, although it is significantly lower in the GSS data.

discussions of the issue presented by Coate and Loury (1993), Mailath et al. (2000), and Moro and Norman (2003). Many empirical studies have also investigated group differences between immutable identities (See, for example, Chiswick 1988).

The possibility of group differences between acquirable attributes have been theoretically discussed by Fang (2001) and Kim and Loury (2019). Though they use the statistical discrimination model framework, self-selection is the main driver of the group differences in the theoretical discussions as in this paper. The present paper is the attempt to verify this theoretical argument with empirical analysis and to identify the points for modifications.

The present paper deals with this issue in the context of changes in religious affiliation.² The issue of differences in economic performance between religions is motivated by Max Weber's *The Protestant Ethic and the Spirit of Capitalism*, which argues that the Protestant doctrine may be associated with economic success. Tomes (1984, 1985) and Lerner (2004) have tested this claim and demonstrated that there are broad differences in certain outcomes (e.g. income) between religious denominations, with the implicit assumption that these differences originate from the doctrines themselves. Similarly, the effect of the change in doctrines on socioeconomic performance was discussed in the history of Jews by Botticini and Eckstein (2005, 2007). Taking these differences as given, the present paper investigates how they affect the decision to change religious affiliations and whether this decision reinforces these differences and makes them more persistent. The effect of self-selected conversion on the socioeconomic performance of a religious group is discussed by Saleh (2018), who used the historical example of a specific religious group, Coptic Christianity in Egypt, and the incidence of mass conversion driven by the discriminatory tax. The present paper investigated the conversion between general religious groups without any explicit discriminatory measure.

Some sociological studies have investigated potential drivers for changes in religious affiliation. For example, some research has focused on whether individuals become more secular as society develops. This secularization theory was suggested by 19th-century thinkers such as Max Weber and Emile Durkheim. This trend was observed in Europe but not in the US at least until 1980 or 1990, and some studies have attempted to explain why it did not happen in the US (see Norris and Inglehart 2004 for a general review). There has also been a strand of sociological literature that has sought to identify the factors affecting an individual's decision to change their religious affiliation (Sherkat and Wilson 1995, Sherkat 2014). These approaches treat religious affiliation as a set of doctrines and focus on what drives individuals to shift to a more conservative or more liberal denomination. In contrast, this paper treats religious affiliation as a channel for social interaction regardless

² For a survey of studies on various aspects of religion, see Iyer (2016).

of its teachings and focuses on group differences in education and wages as an affecting factor of the change in affiliation.

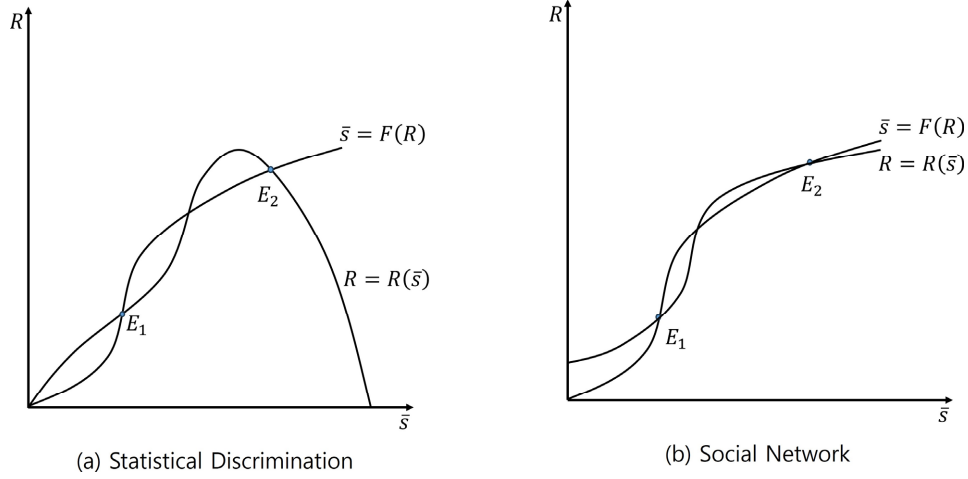
II. Logical Structure of Group Differences

To motivate the empirical exercise, this section provides a sketch of theory of group difference. This section aims to explain the logical structure of the canonical model for group differences between mutable identities (Fang 2001) rather than presenting a formal model. This will clarify the mechanics of group differences - how they emerge and persist. This section will also offer alternative channels for the same mechanics. The common testable implications will be identified, which will be pursued in the main analysis: self-selection in changing identities.

2.1 Nascent Attributes

There are two separate groups, denoted as $j = A, B$. Each group has agents who are identified by a nascent attribute such as race. Because agents will make relevant decisions in a similar manner regardless of group identity, I consider one group without denoting its identity. There are infinitely many agents of unit mass, denoted as $i \in [0, 1]$. Agents can invest in skills, and skill levels of each agent are denoted as s_i . For simplicity, assume that s_i can be either 0 or 1. The cost of skill investment c_i varies among agents, and $c_i \in [0, \bar{c}]$ follows the distribution function $F(c)$.

The return from skill investment, R is assumed to be dependent on the average skill level of the group, $\bar{s} = \int_0^1 s_i di$. The shape of $R(\bar{s})$ varies depending on the model. In a canonical model of statistical discrimination by Coate and Loury (1993), $R(\bar{s})$ has an inverted U shape. Suppose that employers do not directly observe the skill level but only the signal of it, and that skill investment will affect the distribution of the signal. Informativeness of the signal is dependent on the employer's belief about $\bar{s}$. If $\bar{s}$ is very close to 0 or 1, the signal is not very informative. If employers believe that almost all agents are qualified ($\bar{s}$ is close to 1), for example, they infer that an agent is very likely to be qualified regardless of the signal. Similar wage will be offered for different signals, and the return from changing the distribution of signal by investment in skill is small. The signal will get more informative as $\bar{s}$ gets closer to $\frac{1}{2}$. If employers believe that a worker is equally likely to be qualified or unqualified, they rely on the signal more. Better signals will lead to better wage offer and the return of the investment in skill will be bigger. Thus, $R(\bar{s})$ has an inverted U shape.

[Figure 1] Group differences by multiple equilibria

The average skill level $\bar{s}$ is increasing in R . An agent i will invest in skill if $c_i \leq R$, thus $\bar{s} = F(R)$.

An equilibrium is defined as a pair $(\bar{s}, R)$ such that 1) $\bar{s} = F(R)$ and 2) $R = R(\bar{s})$. Panel (a) in Fig 1 demonstrates the possibility of multiple equilibria, which can explain group differences. If an agent expects more skill investment from peers, this leads to higher return from the skill investment and higher average skill level is realized. On the contrary, if an agent expects less skill investment from peers, lower average skill level is realized.

Group differences can be thought of as the result of different choices of multiple equilibria. Under the same economic conditions, group A and B end up different equilibria. These different coordinations may emerge from different historical experiences and persist.

Note that it suffices to have increasing $R(\bar{s})$ to generate multiple equilibria in the model. Therefore, a social network story instead of a statistical discrimination one can work, too. If an agent has a social network of higher skill, this may give him the advantage of better job opportunity or more valuable information (Jackson 2022). This advantage is even bigger if an agent himself is skilled. Thus, the R is increasing in $\bar{s}$. As illustrated in panel (b) in Fig 1, multiple equilibria are still possible. This increasing $R(\bar{s})$ is also crucial to create group differences between acquired attributes. The suitability for the empirical application will be discussed later.

2.2 Acquired Attributes

Suppose that group identities $j = A, B$ are now determined by acquirable attributes, such as religious affiliations. Two groups initially share the same economic environment

described above. Being born in one group, an agent can change his group identity.

Agents have an intrinsic preference for each specific group identities, but this preference does not affect the rate of return R nor does it relate to cost c_i . That is, the preference for group identity is productivity-irrelevant. Specifically, if agent i changes his group identity to group j by acquiring the relevant attribute, individual i has utility $k_i^j \in [\underline{k}^j, \overline{k}^j]$ with $\underline{k}^j < 0$ and $\overline{k}^j > 0$. An individual may prefer the identity that they were born with, $k < 0$, or the other identity, $k > 0$. Preference parameter k^j is distributed with distribution function $G^j(k|c)$, but it is independent from group identity and the cost of skill investment so that $G^A(k|c) = G^B(k|c) = G(k)$.

Because there is no difference in economic environments between two groups and the preference for group identity is productivity-irrelevant, it is a natural conjecture that there is no difference in skill level between groups. If agents expect that $s_A = s_B$ and $R(\bar{s}_A) = R(\bar{s}_B)$, then agents with $k^j \geq 0$ will change their identities regardless of c . The distribution of c remains the same after agents change their identities. In the context of religious affiliations, if religion is chosen for the religious purpose only, this intrinsic preference for religion will determine each individual's religious affiliation.

However, it is also possible that group difference emerges as a self-fulfilling equilibrium. Suppose that agents expect that $\bar{s}_A > \bar{s}_B$ and $R(\bar{s}_A) > R(\bar{s}_B)$. Because they expect $\bar{s}_A > \bar{s}_B$, agents expect that their payoffs will be higher with the same skill investments if they belong to group A . Agents born in group A have more incentive to stay, while those born in group B have more incentive to move with this expectation. Because they expect $R(\bar{s}_A) > R(\bar{s}_B)$, agents born in A have more incentive to stay if qualified than if not. Since agents with low c are more likely to be qualified, they are more likely to stay in group A than those with high c . The same logic applies to agents born in group B , and those with low c are more likely to move to group A than those with high c . This results in the concentration of agents with low c to group A , and initial expectation that $\bar{s}_A > \bar{s}_B$ is likely to be justified.

Note that the intrinsic preference for each group identity is the same for all individuals. In the context of religious affiliations, as mentioned above, religion can be chosen for religious purpose only and there is no *a priori* reason to expect that one group performs better than the other in terms of skill investment. The choice of changing identity is also equally available for everyone. Unlike residential choice where pricey house will limit the choices, people can freely choose their religious identities. Then, self-selection in changing identities would not be observed, and the stayers and movers are similar in their characteristics. However, once there is the belief that one group performs better than the other, self-selection in their choices will emerge. The return from belonging to a better performing group is greater for a skilled individual and they are more likely to be move-uppers than stayers or stayers than move-downers. Thus, movers and stayers will differ in

their characteristics.

2.3 Discussion

The above logical structure applies both to the statistical discrimination model and the social network model. Though the shape of $R(\bar{s})$ are different depending on the model, the main implication of the model is the same. Self-selection between mutable identities can be obtained as long as there can be coordination nature of skill investment, which is the result of an increasing $R(\bar{s})$ (at least for some intervals).

Even though the mechanics are similar, empirical applications are different between the statistical discrimination model and the social network model. The employers' perception plays a key role for the shape of $R(\bar{s})$ in the statistical discrimination model, and the unobservable skill investment and readily observable identity traits are necessary elements. On the other hand, in the social network model, identity traits do not have to be observed by outsiders as long as they can facilitate the interaction among insiders. Skill investment can be an observable one such as education. In the following empirical test, religious identities are not readily observed by employers and education as a measure of skill investment is an observable one. Therefore, the social network model is more relevant.

Social network model can have variants. The return from the interaction with the member of the network is productivity spill-over in the above description. For example, an agent can get a better job prospect through the interaction with more skilled peers. This return will be objectively observed in a form of higher wage. However, the return from the interaction can be subjective one as in the case of homophily. If agents enjoy utility from associating with agents with similar level of s , the return is not objective outcome but subjective utility. This type of return is not readily observed. However, $R(\bar{s})$ is still increasing and the similar mechanics on group differences will be obtained. Furthermore, some aspects of empirical implication will be different. If homophily is the source of the return from social interaction, $R(\bar{s})$ is negative for low value of $\bar{s}$. With acquired attributes, the flow of move-up is bigger than that of move-down if $R(\bar{s})$ is always positive. However, the flow of move-up and move-down can be similar if $R(\bar{s})$ is negative for some intervals. This will be also checked as a minor implication.

III. Empirical Implications and Associated Models

The empirical implication to be mainly tested is the self-selection in the group transition. Individuals are more likely to move up (move down) if they are more skilled (less skilled). Alternatively, if we compare the skill levels of movers who change their identities and

stayers who keep them, move-uppers who change identities to a better performing group are more skilled than stayers and the opposite is true for move-downers who change identities to a worse performing group.

I will use religious affiliation as the group identity to test the above implication. Religious affiliation is, arguably, not directly related to skill or productivity. The empirical exercise also tests the common belief that religious affiliation is chosen for religious purpose only without any consideration of economic incentives.

There are two possible empirical specifications to test this implication. First, I can focus on the conversion choices of individuals. Then better skilled individuals are more likely to choose religious affiliations of higher skill. This can be tested using a conditional logit specification. The suggested empirical specification is

$$P_{ijk} = \frac{\exp\{\alpha_1(S_k - S_j) + \alpha_2 s_i(S_k - S_j) + X_i \beta_k\}}{\sum_{l=1}^R \exp\{\alpha_1(S_l - S_j) + \alpha_2 s_i(S_l - S_j) + X_i \beta_l\}}$$

where P_{ijk} is the probability of individual i of original religious affiliation j choosing the destination religious affiliation k , S_j and S_k are respectively the average skill level or payoff of the original and destination religious affiliations j and k , s_i is the skill level or the payoff from it of individual i , and X_i represents individual characteristics including the dummies for the original religious affiliations. The coefficient of interest is α_2 . Theoretical prediction is $\alpha_2 > 0$, which means that individuals of higher skill or payoff are more likely to move up to a better performing group.

The conditional logit specification implicitly assumes that individuals can freely choose a religious affiliation among all available ones. In reality, individuals may face a random chance to convert to a specific religion and the decision is only made whether to convert or not when this chance is given. For example, a friend may introduce a new church and an individual may decide to come to this church after one or two trials. Unlike conditional logit specification, individuals may not choose the most preferred option, but their resulting choice is better than the current one. If this is a more plausible process to religious switching, it may be better to focus on the result of choice. That is, once they change religious affiliations, it will be better than the current religious affiliations.

This leads to the second empirical specification which compares the skill levels of movers and stayers. Move-uppers are more skilled or have higher payoff than stayers and the opposite is true for move-downers. The suggested empirical specification is

$$s_i = \alpha + \sum \alpha_l D_l + \delta D^{MU} + \gamma D^{MD} + X_i \beta + \varepsilon_i, \quad (1)$$

where s_i is the skill level or the payoff from the skill of individual i , D_l is the dummy

variable for the original religious affiliation, D^{MU} and D^{MD} are dummies of moving-up and moving-down respectively, and ε_i random error. The saturated version of the model is

$$s_i = \alpha + \sum \alpha_l D_l + \delta D^{MU} + \gamma D^{MD} + \sum \delta_l D^{MU} D_l + \sum \gamma_l D^{MD} D_l + \varepsilon_i.$$

The differences between movers and stayers can vary along original affiliations, which is captured by the interaction terms. If these differences are assumed to be the same regardless of original affiliations, the above specification is obtained. The specification tries to compare the movers' skill levels or payoffs with the stayers' from the same original religious affiliation. Those movers are either move-uppers ($S_j < S_k$) or move-downers ($S_j > S_k$). Therefore, the coefficients of interest are δ and γ and the theoretical prediction is that $\delta > 0$ and $\gamma < 0$. The problem with this specification is that moving up or moving down does not happen for some original religious affiliations. Move-up does not happen from the most skilled religious affiliation as there is no affiliation to move up to. The stayers in that religious affiliation may contaminate the estimate of δ .³ To address this issue, individuals with that original religious affiliation can be excluded to estimate δ and it is checked whether the estimate is affected.

Since religious transitions are more likely to occur with some random chances, I will use the second specification for the main result considering its possible caveat. The first specification will be referred when it is available. The modification of the first specification will be tried when alternative story is tested.

Note that the specification does not try to identify the causal effect of changing religions on individual's skill or payoff. The specification compares the average skill levels of payoffs of movers and stayers. This comparison does not only capture the causal effect of changing identity but also the effect of self-selection. If a skill level is the dependent variable, the causal effect is the change in skill level due to the change of identities. But, in the model, agents with low c who will be qualified whichever group they are in, are more likely to move up than those with high c who will not be qualified in either group. So, some self-selection effect is captured. If the payoff such as wage rate is the dependent variable, the causal effect is the higher payoff with the same qualification of move-uppers than stayers. Because move-uppers are more qualified than stayers on average, the above comparison also capture the self-selection. Because the self-selection is of primary interest to this paper, I do not try to identify the causal effect separately. However, I can try to capture the causal effect on payoffs in the panel data by introducing individual fixed effect. This specification will be tried in the later part of the empirical exercise.

³ I thank the anonymous referee for pointing out this potential problem.

Another problem of the above specification is that the difference of skill levels between religious affiliations does not play any role in conversion decision as long as they are different⁴. To ameliorate this problem, I try another specification which considers the possibility that the conversion is more likely when the difference is larger for the highly skilled individuals compared with less skill individuals. Then the gap in the skill investment level or payoff between movers and stayers increases as $S_k - S_j$ increases. The empirical specification for this is

$$s_i = \alpha + \sum \alpha_l D_l + \lambda(S_k - S_j) + X_i\beta + \varepsilon_i. \quad (2)$$

A positive λ is expected.

IV. Data

Two data sets containing information on religious affiliation are used for the empirical investigation: the GSS and the NLSY79. I only report the results from the analysis of the NLSY79. The results from the GSS are reported in the Appendix and will be briefly mentioned when necessary. The NLSY79 is a nationally representative sample of 12,686 respondents born between 1957 and 1964 that contains information on religious affiliation and hourly wage rate.

Information on the respondents' religious affiliation is contained in the 1979, 1982, and 2000 surveys. Because hourly wages are more reliable and more frequently reported for older age groups, I use the information contained in the 2000 survey. The survey asks about both current religious affiliation and the religion the respondent was raised with. I classify as stayers those individuals whose current religious affiliation is the same as the one they were raised in, and the others as movers. Religious affiliation in the NLSY79 has nine categories: Catholic, Baptist, Episcopalian, Lutheran, Methodist, Presbyterian, Other Protestant, Jewish, and other.

As a measure of skill investment and payoff, I mainly consider education and hourly wage. Education level is measured as years of education and can be an empirical counterpart of the skill investment in the theory. Then hourly wages are the payoffs to the skill investment. I also consider AFQT score as another measure of skill investment. The AFQT score is a cognitive measure used by the US Department of Defense and Military Services, and is used as a measure of skill investment that is not observable to employers but is to researchers.⁵

⁴ Some differences might not be statistically significant. This imperfect measurement of moving up and down may attenuate the coefficient.

⁵ See Neal and Johnson (1996) for example.

[Table 1] Summary Statistics - NLSY79 2000 Wave

	No of obs	Mean	SD	Min	Max
Hourly wage	1380	16.60	12.71	2.15	82.70
Age	1380	39.27	2.24	36	43
Education	1380	13.64	2.57	8	20
Urban dummy	1380	.63	.48	0	1
AFQT score	1323	56.72	27.93	0	100
Father's education	1301	12.32	3.19	4	20

Notes: NLSY 79 samples with hourly wage and religious affiliation information in 2000 waves.

I use hourly wage observations from the 1990-2014 waves⁶. Hourly wages are expressed in 1990 figures using the CPI. I clean the data following Altonji and Pierre (2001). I only consider white males with more than 8 years of education. I exclude an observation if the hourly wage is less than \$2 or more than \$100. The final sample consists of 1603 individuals with 18,554 observations.

Because the hourly wage of the same individual is not observed for every wave, each wave contains a different number of observations. Table 1 presents the summary statistics for the 2000 survey. In the 2000 survey, hourly wage was recorded for 1380 individuals. Their average years of education was 13.6 years, which is around one year more than their fathers (12.3 years), with 60% of them living in an urban area.

Table 2 presents the change in religion for the NLSY79 sample, with the rows representing the religious affiliation the respondent was raised in and columns the current religious affiliation. Around 21% of the sample (329 out of 1603 individuals) are movers. The movers' proportion is similar to the one obtained from GSS data even though the classification of religious affiliations is different. Presbyterian, Other Protestant, and Others increased in congregation, while the other religious affiliations lost followers.

4.1 Overview of Inequality between Religious Affiliations

This section will briefly review the inequality between religious affiliations as established in previous research and show whether that is also evident in our data. Traditional sociological studies on inequality between religious affiliations are primarily based on the General Social Survey (GSS). While detailed comparisons vary depending on the classification of religious affiliations, the general message remains similar. Among Protestants,

⁶ The religion the respondent was raised in is likely to be a religion before one becomes an adult. However, respondents' religions before 2000 may not be the one reported in 2000. Also, it is conceivable that respondents may change their religions again after 2000. The current empirical result ignore those possibilities and may have measurement errors.

[Table 2] Religious Transition - NLSY79

Raised	Current religious affiliation									
	Cath	Bap	Luth	Meth	Presby	Epis	Oth Pro	Jew	Oth	Total
Cath	472	11	14	7	6	4	44	1	12	571
Bap	8	232	3	9	2	2	22	0	16	294
Luth	9	4	132	3	5	0	15	0	6	174
Meth	6	10	3	87	5	0	12	0	8	131
Presby	4	2	2	1	40	1	8	0	1	59
Epis	2	2	0	1	2	24	0	0	1	32
Oth Pro	7	7	2	3	1	1	193	1	8	223
Jew	1	0	0	0	0	0	1	23	1	26
Other	1	9	1	2	1	0	8	0	71	93
Total	510	277	157	113	62	32	303	25	124	1603

Notes: NLSY 79 samples with religious affiliation information at 2000 waves and any hourly wage information for 1990 -2014 waves. The number of observations for each combination of religious affiliations which respondents were raised in and they currently have.

the dominant religious group in the U.S., more traditional and liberal affiliations (such as Presbyterians and Episcopalians) tend to have higher levels of education and income than conservative (Evangelicals such as Baptists and Pentecostals) or Historically Black traditions. Jews are consistently noted as the most educated group, with Catholics typically placed in the middle. This pattern remains relatively stable across different time periods (Roof and McKinney 1987; Smith and Faris 2005).

More recently, the Pew Research Center conducted surveys on religion in 2014 and 2023, and these also confirm a similar pattern. Both in 2014 and 2023, Jews and Hindus registered the highest household income. In 2014, when more detailed classifications of religious affiliations were compared, Historically Black Protestants (such as the National Baptist Convention and the Church of God in Christ) and Jehovah's Witnesses had the lowest incomes. Among Protestants, Episcopalians and Presbyterians had the highest incomes. In 2023, when Protestants were classified broadly as Mainline, Evangelical, and Historically Black, Mainline Protestants reported higher incomes than both Evangelical and Historically Black groups.

For this study, the analysis utilizes all reported affiliations in the NLSY79 and the specific classification established by Steensland et al. (2000) for the GSS data. The ranking of average education level for each affiliation aligns with existing studies, as shown in Table A1 and A4. Specifically, in the NLSY79, Jews, Episcopalians, and Presbyterians are the three most educated groups, while Lutherans and Baptists are the two least educated groups. In the GSS, Jews, Other affiliations, and Mainline Protestants are the most educated groups, while Evangelical Protestants and Historically Black Protestants are the least educated groups.

V. Results

5.1 Education

The comparison of education levels between movers and stayers is reported in Table 3.⁷ The average years of education is calculated for each religious affiliations using stayers only. Based on those average education levels, movers are classified into move-uppers, who change to a religious affiliation with a higher education level, and move-downers, who change to one with a lower education level.⁸ Empirical specification (1) is implemented where Individuals' years of education are regressed on the dummies for move-uppers and move-downers while controlling for the original religious affiliation.

The results show that move-uppers are more educated than stayers while move-downers' education levels are not significantly different from stayers'. In column (1), move-uppers are more educated by 1.093 years. People are likely to interact with one another within the same local church and a religious affiliation is composed of many such churches.⁹ The education level of actual peers might be different from that of the religious affiliation and may better be captured by the educational level of the parent who is also likely to be the member of the same church. Thus I additionally control for the father's education in column (2), and the difference is reduced to 0.821 years but still statistically significant.

As noted in Section 3, the estimate for move-upper (move-downer) can be contaminated by the stayers in the top (bottom) religious affiliation as there is no moving up (down) from that affiliation. To address this issue, I excluded individuals from top 3 original religious affiliation (Jewish, Episcopalians, and Presbyterians) in the estimation of the coefficient of move-upper in column (3). Similarly, I excluded individuals from bottom 3 original religious affiliations (other Protestants, Lutherans, and Baptists) in column (4). The result is not qualitatively changed compared with column (2).

Column (5) presents the results of specification (2) when controlling for the father's education. The differences in the average education level between movers and stayers tend to be larger as the difference in the average education level between the destination and

⁷ Tabular comparison of education levels, which can give more detailed picture, is reported in the appendix.

⁸ The statistical significance of the difference between the group average is not considered in this classification of move-uppers and move-downers. This may cause measurement errors of these variables and attenuate the estimates and strengthen the interpretation of the result. This issue is partially addressed in the subsequent specification using the difference as explanatory variable. See the discussion in Section 3.

⁹ This empirical analysis may ignore the flows between social networks within the same religious affiliation. This measurement error may attenuate the estimates.

[Table 3] Years of Education of Move-Uppers and Move-Downers Compared with Stayers - NLSY79

	Dependent var: years of education					
	(1)	(2)	(3)	(4)	(5)	(6)
Move-upper	1.093*** (0.254)	0.807*** (0.235)	0.801*** (0.237)			
Move-downer	0.134 (0.204)	0.212 (0.194)		0.194 (0.201)		
$(S_k - S_j)$					0.478*** (0.153)	
Positive $(S_k - S_j)$						0.803*** (0.240)
Negative $(S_k - S_j)$						0.141 (0.200)
Urban	0.932*** (0.134)	0.606*** (0.128)	0.566*** (0.138)	0.746*** (0.174)	0.559*** (0.130)	0.553*** (0.129)
Father's edu		0.324*** (0.0198)	0.316*** (0.0219)	0.331*** (0.0254)	0.324*** (0.0202)	0.322*** (0.0201)
Observations	1603	1505	1,246	839	1505	1505
Adjusted R^2	0.097	0.242	0.217	0.232	0.231	0.233

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: OLS estimates are reported with robust standard errors in parentheses. All specifications include the fixed effect of the original religious affiliation by demeaning the data by each group.

original religious affiliations widens. When movers are divided into move-uppers and move-downers (column 6), this trend is driven by move-uppers.

Even though the classification of religious affiliations is different with GSS, the result with GSS in the appendix shows even clearer pattern of self-selection. With GSS, move-uppers' education levels are significantly higher and move-downers' are significantly lower than stayers' and this difference is larger between religious affiliations of bigger gap of education levels. Combined with this, it can be cautiously concluded that the self-selection by education level occurs, though not perfectly, in the change of religious affiliations. This also contradicts the perception that religion is chosen for religious purpose only.

5.2 Hourly Wage Rate

In the canonical model of group differences through statistical discrimination where an agent's skill is not observable, the skill levels of interest cannot be directly compared. However, the skill levels of movers and stayers can still be indirectly compared through

observable payoffs to the skill controlling for an observable skill. Hourly wage can be a measure of payoff to an unobservable skill.¹⁰ In the context of social network model, the payoff to the skill can be compared controlling for the skill of interest. Because the payoff to skill is greater for move-uppers than stayers, the comparison of the payoffs between movers and stayers will be predicted in the same way.

In particular, I compare the average hourly wage rate controlling for education among individuals according to their religious transition. To implement the empirical specification (1) and (2), I obtain the measure of hourly wage rate for each religious affiliation by regressing the log hourly wage on all possible dummies for the religious transitions controlling for observed skill levels. The coefficients for each religious affiliation without transition are treated as a measure of the payoff to the skill in that affiliation. If I consider Catholicism as an origin religion for example, there are 9 possible transition patterns depending on the destination religion such as Catholicism-Jewish, Catholicism-Catholicism, Catholicism-Episcopalian, and so on. For all the dummies for each possible transition, the coefficient of a dummy for Catholicism-Catholicism will be a measure of payoff to the skill of Catholicism. Briefly speaking, average hourly wage rate for each affiliation while controlling for observable characteristics is calculated using stayers only. The result of this regression is reported in Table 4. I use the results in column (1) of the table for further analysis.

Table 5 presents the results of specification (1). Column (1) shows that move-uppers have higher wage rates than stayers, while move-downers have lower wage rates than stayers. The size of the coefficients indicates that the wage gap between move-uppers and stayers (0.0837) is larger than the wage increase caused by one extra year of schooling (0.0599). To avoid the potential contamination of estimate, I excluded individuals from top 3 original religious affiliation (Jewish, Catholicism, and Presbyterians) of wage hierarchy in the estimation of the coefficient of move-upper in column (2). Similarly, I excluded individuals from bottom 3 original religious affiliations (other Protestants, Baptists, and Other) in column (4). The result is not qualitatively changed compared with column (1).

¹⁰ As was mentioned before, the application of the statistical discrimination model to this context is problematic as the religious identity may not be readily observed by employers.

[Table 4] Hourly Wage According to Religious Affiliation - NLSY79

	Dependent var: log hourly wage	
	(1)	(2)
Baptist	-0.158*** (0.0325)	-0.125*** (0.0327)
Lutheran	-0.0844** (0.0362)	-0.0750** (0.0359)
Methodist	-0.0934* (0.0520)	-0.0590 (0.0533)
Presbyterian	-0.0109 (0.0679)	-0.0164 (0.0702)
Episcopalian	-0.0798 (0.0848)	-0.0813 (0.0891)
Other Protestant	-0.113*** (0.0367)	-0.127*** (0.0362)
Jewish	0.212** (0.101)	0.190* (0.103)
Other	-0.204*** (0.0575)	-0.189*** (0.0612)
AFQT controlled	X	O
Observations	19086	18349
Adjusted R^2	0.263	0.287

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: OLS estimates are reported with robust standard errors clustered by individual in parentheses. Specifications include the following covariates: year fixed effects, dummies for all possible combinations of religious transition with Catholicism -Catholicism as an omitted category, experience up to cubic terms, urban residency fixed effects, and years of education.

The AFQT score is often used as a measure of unobservable skill investment to employers. If the difference between movers and stayers is caused by unobservable skill investment as suggested by the statistical discrimination model and the AFQT score captures this unobservable skill, the difference should be lower when controlling for the AFQT score. In column (4), where the AFQT score is controlled for, the wage rate gap between move-uppers and stayers is reduced and no longer statistically significant, but wage rate gap between move-downers and stayers becomes even larger.¹¹

¹¹ If the statistical discrimination model is not believed to be suitable for religious affiliations context, we can focus on columns (1) and (5) only.

[Table 5] Hourly Wage of Move-Uppers and Move-Downers Compared with Stayers
- NLSY79 (I)

	Dependent var: log hourly wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Move-upper	0.0837* (0.0429)	0.0798* (0.0454)		0.0668 (0.0434)	0.0954** (0.0448)	0.0748 (0.0456)
Move-downer	-0.0716** (0.0316)		-0.0796** (0.0354)	-0.0901*** (0.0311)	-0.0745** (0.0319)	-0.0908*** (0.0319)
Education	0.0599*** (0.00564)	0.0678*** (0.00776)	0.0519*** (0.00749)	0.0380*** (0.00713)	-0.0221 (0.0861)	-0.0451 (0.109)
Urban	0.0879*** (0.0172)	0.0835*** (0.0234)	0.0797*** (0.0224)	0.0801*** (0.0173)	0.0897*** (0.0173)	0.0817*** (0.0174)
AFQT				0.00342*** (0.000592)		0.00279 (0.00331)
Education × Religion	X	X	X	X	O	O
AFQT × Religion	X	X	X	X	X	O
Observations	18554	9766	11151	17856	18554	17856
Adjusted R^2	0.248	0.253	0.227	0.273	0.249	0.274

* $p > 0.10$, ** $p > 0.05$, *** $p > 0.01$

Notes: NLSY 79 samples with hourly wage rate and religious affiliation information. OLS estimates are reported with robust standard errors in parentheses clustered by individuals. All specification control for the fixed effect of original religious affiliation by demeaning the data by each group.

The higher wage rate of the move-uppers can come from both greater investment of (possibly unobservable) skills and higher payoffs from belonging to a more skilled group. Thus, in columns (5) and (6), I control for the average skill level of a respondent's current religious affiliation and its interaction term with his own skill level. In column (5), I use education level as a measure of skill investment. The theoretical framework assumes that the higher average education levels of one's group lead to higher payoffs to his own education. Therefore, the difference of wage rates between movers and stayers will reduce or disappear if the average education level of one's current religious affiliation and its interaction term with his own education level is controlled for. In column (6), I also include the AFQT score. If I seriously take the role of unobservable skill investment in the formation of the hourly wage rate as in the statistical discrimination model, I can expect that the difference between movers and stayers should reduce or disappear when the unobservable skill investment and its interaction with the average level of the skill investment of the group is controlled for. Controlling for the average education level of a religious affiliation and its interaction with an individual's education level does not greatly

[Table 6] Hourly Wage of Move-Uppers and Move-Downers Compared with Stayers
- NLSY79 (II)

	Dependent var: log hourly wage				
	(1)	(2)	(3)	(4)	(5)
$(S_k - S_j)$	0.891*** (0.258)				
Positive $(S_k - S_j)$		1.067** (0.539)	0.986* (0.531)	1.322** (0.561)	1.226** (0.559)
Negative $(S_k - S_j)$		0.814*** (0.295)	0.958*** (0.292)	0.915*** (0.306)	1.054*** (0.311)
Education	0.0595*** (0.00564)	0.0595*** (0.0055)	0.0371*** (0.00714)	-0.0182 (0.0856)	-0.0392 (0.109)
Urban	0.0870*** (0.0173)	0.0867*** (0.0173)	0.0786*** (0.0174)	0.0889*** (0.0173)	0.0807*** (0.0174)
AFQT			0.00345*** (0.000591)		0.00331 (0.00329)
Edu $\times$ Religion	X	X	X	O	O
AFQT $\times$ Religion	X	X	X	X	O
Observations	18554	18554	17856	18554	17856
Adjusted R^2	0.249	0.249	0.274	0.250	0.275

* $p > 0.10$, ** $p > 0.05$, *** $p > 0.01$

Notes: NLSY 79 samples with hourly wage rate and religious affiliation information. OLS estimates are reported with robust standard errors clustered by individual in parentheses. All specification control for the fixed effect of original religious affiliation by demeaning the data by each group.

affect the results. Rather, the difference between the move-uppers and stayers is higher in column (5) compared with column (1). Thus, higher payoff to education by belonging to a more educated group, if any, does not show in hourly wage rate. The result in column (6) is also similar to that of column (4). This may mean that the unobservable skill investment considered in the statistical discrimination model is not captured by the AFQT score.

Table 6 presents the result of specification (2). Column (1) shows that the difference in the wage rate between the movers and stayers widens when the difference of the average wage rate between the origin and destination religious affiliation gets bigger. Column (2) disaggregates this relationship into move-uppers and move-downers, and this does not affect the qualitative result. In column (3), I control for the AFQT score as a measure of unobservable skill investment. The coefficient of move-uppers decreases but that of move-downers increases, and the overall qualitative result is maintained. In columns (4) and (5), I also control for the average skill levels of the affiliations and their interaction with the individual skill level. As above, I use education and the AFQT score to measure skill levels.

Again, the qualitative results do not change. Rather, the coefficients for both move-uppers and move-downers increase compared with columns (2) and (3).

5.3 Causal Effect of Religious Identity on Hourly Wage Rate

According to the theoretical model, move-uppers have higher payoff than stayers for two reasons. First, with the same skill investment, the payoff increases by belonging to a more advantaged group. Second, those who have a lower cost of investment will choose to be move-uppers, and they have a higher level of skill investment even with the same return rate to skill. My main interest is to test self-selection in skill investment in the voluntary switching of religious affiliation. However, as a driver of the self-selection, the higher return to skill investment by belonging to a more advantaged group should be identified. To tease out this causal effect, the hourly wage rate of the same individual is tracked when they change their religious affiliations. For this, I use religious affiliation information from the 1982 and 2000 waves of the NLSY79.

I regress the difference in the hourly wage between the two years on the change in religious affiliation while controlling for the change in individual characteristics and the original religious affiliation. The change in religious affiliation is considered in two ways. First, I include two dummies for switch to a religious affiliation of a higher or a lower wage rate compared with the original affiliation (i.e., dummies for move-uppers and move-downers). Second, the difference in the average hourly wage rates reported in Table 4 is used. Because the original religious affiliation is controlled for, the coefficient for the change in religious affiliation indicates whether the hourly wage increases more for move-uppers and less for move-downers than for stayers.

[Table 7] Wage Change for Move-Uppers and Move-Downers Compared with Stayers: 1982 to 2000 NLSY79

	Dependent var: wage change		
	(1)	(2)	(3)
Move-upper	2.662* (1.489)		
Move-downer	-0.462 (1.161)		
Wage-difference		4.913 (12.85)	
Positive wage-diff.			21.665 (16.32)
Negative wage-diff.			-4.374 (18.23)
Education change	1.780*** (0.329)	1.801*** (0.329)	1.795*** (0.329)
Urban change	-0.810 (0.763)	-0.777 (0.768)	-.0759 (0.769)
Age	0.302 (0.222)	0.286 (0.221)	0.301 (0.222)
Observations	929	929	929
Adjusted R^2	0.082	0.080	0.094

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: OLS estimates are reported with robust standard errors.

Table 7 presents the results of the regression. The coefficients for move-uppers and move-downers have the predicted signs but only the coefficient for move-uppers is marginally significant, meaning that move-uppers exhibit a greater increase in their hourly wage than do stayers. The switch to a religious affiliation whose wage difference with the original religious affiliation is bigger does not lead to a notably more increase in the hourly wage as indicated by the insignificant coefficient for the wage difference in column (2). When this effect is investigated for move-uppers and move-downers separately in column (3), both are insignificant. The result shows that a change in religious affiliation is not shown to greatly affect an individual's hourly wage, especially for move-downers, when unobservable characteristics are controlled for.

In the main analysis, the difference of the hourly wage rate between movers and stayers show the expected sign of self-selection. However, the hourly wage rate does not seem to be greatly affected by a change in religious affiliation when unobservable individual characteristics are controlled for through fixed effect. Therefore, self-selection of movers by their skills must have occurred without any significant difference in the payoff to the

skill measured by hourly wage rate.

VI. Discussion and Alternative Theory

This paper investigated group differences between groups defined by mutable identities, using religious affiliation as an example. The comparison of individuals who switched religious affiliation ('movers') with those who did not ('stayers') reveals evidence of self-selection in the switching process. Specifically, 'move-uppers' (those switching to religions associated with higher average outcomes) tend to be more educated and earn higher wages for a given education level compared to 'stayers'. This finding contradicts the common perception that religious affiliation is chosen solely for religious purposes, without consideration of such socioeconomic factors. Instead, characteristics associated with different religious groups appear to influence affiliation choices, and these switching patterns likely contribute to the persistence of group differences in outcomes like education and income.

A social network framework may offer a more suitable explanation for these patterns than traditional statistical discrimination models. While both types of models can incorporate the mechanic whereby differential returns to skill (varying by group identity) drive self-selection, the assumptions of statistical discrimination seem less applicable here. Religious affiliation is often not readily observable to potential employers and is thus difficult to use as a direct signal for inferring unobservable productivity, a core assumption in statistical discrimination theories. Conversely, shared religious identity can plausibly facilitate social interactions and information flow within networks, aligning better with a social network perspective.

Among conceivable forms of returns from social interaction, a subjective return and possibly negative one for low level of $\bar{s}$ such as homophily can explain the observed empirical pattern better. First, a higher payoff to skill investment (e.g., education) in better-performing groups is not verified when hourly wage rates are used as a measure of payoff. As shown in the comparisons between movers and stayers (Table 5 and Table 6), observed wage differences are not significantly reduced when controlling for the average education levels associated with current religious affiliations. Furthermore, fixed-effects analyses attempting to isolate the causal effect of religious switching (Table 7) show that hourly wage rates do not significantly change when an individual changes their religious identity. Second, the religious transition data (Table A1 and Table A4) show that instances of 'moving down' are roughly as frequent as instances of 'moving up', which cannot be accommodated with consistently positive $R(\bar{s})$. This implies that non-skilled individuals seek similarly skilled peers or $R(\bar{s})$ is negative for low $\bar{s}$.

It is conceivable that individuals who tend to socialize with others of similar education levels or job types extend this preference for similarity into their choice of religious communities and activities.¹² Such homophilous preferences could drive self-selection patterns (as higher-skilled individuals seek higher-status groups and lower-skilled individuals seek lower-status groups) without necessarily requiring objective differences in wage returns or predicting a net flow 'upward'.

To test the theory of homophily, the modified version of conditional logit model is tried.¹³ The empirical specification is

$$P_{ik} = \frac{\exp\{\eta|S_k - s_i| + X_i\beta_k\}}{\sum_{l=1}^R \exp\{\eta|S_l - s_i| + X_i\beta_l\}},$$

where P_{ik} is the probability of individual i choosing the religious affiliation k , S_l is the average skill level measured as education or hourly wage of the religious affiliation l , s_i is the skill level of individual i , and X_i represents individual characteristics including the dummies for the original religious affiliations. Theoretical prediction is $\eta < 0$ as individuals are less likely to choose the religious affiliation whose average skill level is very different from their own.

For better convergence of the model when implementing this specification, I exclude individuals from two religious affiliations, Jewish and Episcopalian, as there are no conversions between these two and certain religious affiliations (See Table A1) and also other as it is mixture of many affiliations. Table 8 reports the coefficient and marginal effect on choosing each affiliation as difference between the affiliation's average education (hourly wage) and individual's own education (hourly wage) increases by one unit.

The coefficient is negative and statistically significant with 5% significance level when education is used as a measure of skill and with 1% significance level when hourly wage rate is used. This confirms the above conjecture that homophily plays a important role in religious conversion.¹⁴

¹² See Jackson (2022) more on homophily and its effect on inequality. Sayo (2009) models salience of identity traits based on homophily in political preference for redistribution.

¹³ I thank the anonymous referee for suggesting this specification.

¹⁴ The same result holds for GSS data. See Table A7.

[Table 8] Similarity of Skills Similarity on Probability of Choosing Religious Affiliation

	Education as a skill	Wage as a skill
$ Sl - s_i $	-.190** (.0881)	-.0961*** (.0298)
Marginal Effect		
Baptist	-.00948** (.00439)	-.00478*** (.00147)
Catholicism	-.0142** (.00669)	-.00718*** (.00228)
Lutheran	-.00701** (.00335)	-.00354*** (.00114)
Methodist	-.00662** (.00319)	-.00335*** (.00110)
Presbyterian	-.00439** (.00216)	-.00222*** (.00078)
Other protestant	-.0149** (.00697)	-.00754 (.00242)
Obs	8,388	8,388
Log likelihood	-944.64	-941.62
Pseudo R^2	0.117	0.121

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: MLE estimates are reported with robust standard errors clustered by id. Urban and all original religious affiliations dummies are controlled for. Average marginal effects are reported with standard errors calculated using delta method.

VII. Conclusion

This paper empirically tested the mechanisms underlying group differences between mutable identities. Theory suggests that group differences can be particularly persistent when associated with mutable identities, compared with immutable ones. A key mechanism potentially driving this persistence is self-selection: individuals who invest more in skills (e.g., education) are predicted to be more likely to join groups characterized by higher average skill levels. Applying this to religious affiliation, this paper finds evidence consistent with self-selection. Move-uppers are, on average, more educated and have higher hourly wages than stayers.

Empirical patterns are more consistent with homophily, a subjective return from social interaction. Using individual fixed effects to control for unobservable characteristics, this paper did not find a direct economic return in terms of wage increases associated with moving up to a different religious affiliation. The frequency of individuals moving down

was found to be comparable to the frequency of moving up. With a conditional logit specification, the prediction of homophily theory is confirmed.

An individual's identity comprises multiple attributes, some innate or immutable (race or gender at birth), others acquired or mutable (education, region of residence, or religious affiliation). Immutable attributes often receive greater policy attention regarding inequality because individuals typically cannot change them. This paper, however, highlights how differences associated with mutable attributes can be notably persistent, precisely because the possibility of switching allows for self-sorting dynamics. In the specific context of religious affiliation, this persistence may have limited direct economic consequences if, as suggested here, there are no significant objective economic advantages tied directly to affiliation with a 'higher-performing' religious group. Nevertheless, in other contexts involving mutable attributes, such as residential choice or school affiliation, the implications of self-sorting and persistent group differences could be more significant. For example, if more educated or affluent individuals congregate residentially, there may be substantial spillover effects, particularly concerning opportunities for the next generation. Therefore, understanding the dynamics and consequences of group differences based on mutable attributes warrants further attention.

Appendix

A. Tabular Comparison of Education between Movers and Stayers Using NLSY79

Table A1 displays the average years of education for individuals according to their religious affiliations with the rows representing religious affiliation a respondent was raised in and the columns representing the current affiliation. The number of observations for each combination is written in parentheses. Religious affiliation is organized in descending order of the average years of education for the stayers. The most educated affiliation is Jewish (16.78 years) and the least educated affiliation is Baptist (12.28 years).

[Table A1] Average Years of Education by Religious Transition - NLSY79

Raised	Current affiliations								
	Jew	Epis	Presby	Meth	Cath	Oth	Oth Pro	Luth	Bap
Jew	16.78 (.54,23)				12.00 (1)	14.00 (1)	12.00 (1)		
Epis		14.46 (.53,24)	19.50 (.5,2)	20.00 (1)	14.50 (1.5,2)	15.00 (1)			15.00 (3.0,2)
Presby		20.00 (1)	14.20 (.47,40)	12.00 (1)	12.75 (1.25,4)	18.00 (1)	14.75 (.94,8)	18.00 (0.0,2)	15.00 (1.0,2)
Meth			15.80 (1.02,5)	14.07 (.27,87)	15.83 (.91,6)	15.00 (1,32,8)	17.42 (.67,12)	15.00 (1.0,3)	13.90 (.82,10)
Cath	16.00 (1)	18.00 (1.68,4)	12.00 (0.0,6)	13.86 (1.16,7)	13.87 (.11,472)	14.00 (.70,12)	13.34 (.29,44)	13.21 (.43,14)	13.45 (.62,11)
Oth			13.00 (1)	17.00 (1.0,2)	12.00 (1)	13.82 (.32,71)	12.13 (.97,8)	14.00 (1)	13.11 (.77,9)
Oth Pro	10.00 (1)	20.00 (1)	17.00 (1)	14.67 (.67,3)	14.43 (.78,7)	15.25 (1.15,8)	13.75 (.18,193)	16.00 (0.0,2)	14.71 (1.11,7)
Luth			14.20 (1.43,5)	14.67 (2.67,3)	13.89 (.75,9)	14.33 (1.31,6)	13.73 (.62,15)	13.59 (.20,132)	12.25 (1.44,4)
Bap		16.00 (0.0,2)	18.00 (0.0,2)	15.00 (.85,9)	14.50 (1.04,8)	13.06 (.77,16)	13.86 (.51,22)	16.00 (2.31,3)	12.28 (.15,232)

Notes: NLSY 79 samples with hourly wage and religious affiliation information. The average years of education in every combination of religious affiliation of being raised in and now is reported with the standard error and number of observations in parentheses.

First thing to note is that the incidence of moving down is quite frequent. In the table, moving up is represented by the cells to the left of the diagonal and moving down to the

right of the diagonal. The incidence of moving down is not less frequent than that of moving up. Consider Methodist and Baptist for example. While 9 out of 294 followers in Baptist church changed their religious affiliations to Methodist, 10 out of 131 in Methodist church changed to Baptist. This trend is more apparent with larger sample with GSS. The intuitive reason why group differences between mutable identities cannot persist is that people can easily mimic a more favored attribute. The flow of moving down is possible in the theory with the assumption of the idiosyncratic preference for attributes. In the context of religious affiliations, this idiosyncratic part of preference seems to play an important part.

Even with idiosyncratic preference for religious affiliation, the theory predicts that the incidence of moving up should be more frequent than that of moving down. Higher return to the investment by moving up is what drives the self-selection in the model. Without the motivation of the theory, it is commonly believed that the religious affiliation is chosen for religious purpose only. The similar frequency of moving up and down may warrant that perception. However, the comparison of educational levels between movers and stayers shows the tendency of self-selection as proposed in the theory, which is confirmed with the regression analysis in the main text.

B. Result from GSS

B.1 Data

The GSS is a nationally representative annual or biannual cross-sectional survey of 1,200 to 2,500 respondents. I use GSS data from 1976 to 2016.

The survey contains two questions about religious affiliation: current religious affiliation and religious affiliation when the respondent was 16 years old. Following Steensland et al. (2000), I classify the reported religious affiliations as Catholic, mainline Protestant, evangelical Protestant, historically Black Protestant, other Protestant, Jewish, other (including Orthodox, Muslim, Hinduism, and others), and no affiliation. When the current religious affiliation differs from that when the respondent was 16, I treat this as a change in religious affiliation.

Because the GSS only provides categorical measures of household income, I focus on education as a measure of skill investment. To more accurately measure the final educational level, only the responses from those aged over 30 (and younger than 90) are considered. I also restrict my attention to males only for the comparable result with the main analysis but preserved black population as we have historically Black protestant as one of major religious affiliation.

[Table A2] Summary Statistics - GSS

		Sample 1 (N=16,437)				Sample 2 (N=14,024)			
		Mean	SD	Min	Max	Mean	SD	Min	Max
Change of religion (dummy)		0.30	0.45	0	1	0.21	0.41	0	1
Age		47.85	12.49	30	89	48.46	12.72	30	89
Birth year		1948.85	13.89	1921	1983	1947.36	13.86	1921	1983
Education		13.36	3.27	0	20	13.25	3.28	0	20
Father's education		10.68	4.27	0	20	10.44	4.28	0	20
Education of the group		13.28	1.13	8.5	17.9	13.23	1.12	8.5	18.1
Race		Frequency				Frequency			
	White	13,562	82.5%			11,528	82.2%		
	Black	1,965	12.0%			1,753	12.5%		
	Other	910	5.5%			743	5.3%		

Notes: GSS samples with religious denomination information. Education of the group is the average for 5 year range of birth cohorts of the observation with the same religious affiliation. Father's education reduces the sample size to 12,602 and 10,799 for Samples 1 and 2, respectively, due to missing values.

The average educational achievement for a respondent's religious affiliation is calculated as follows. I calculate the average years of education for each religious affiliation for a given birth year using a 5-year window, using only stayers who have the same religious affiliation at 16 and at the time of the survey.¹⁵ The average education level for the original and destination religious affiliations is then assigned based on the respondent's birth year and their reported religious affiliation.

The final sample contains 16,437 observations (denoted as sample 1 in Table A2). Around 30% of the respondents changed their religious affiliation according to my definition. Approximately 83% of all respondents are white, while 12% are black. The average number of years of education is around 13, with a range of 8.5 to 17.9 depending on the religious affiliation.

The change in religious affiliation is summarized in Table A3, with the rows representing the religious affiliation at the age of 16 and columns representing the current affiliation. Catholicism was the largest religious affiliation for the respondents at the age of 16 (5118 respondents). Of these, 3824 respondents remain Catholic, while 1294 respondents report a different affiliation. Because 394 respondents whose religious affiliation was not Catholic at the age of 16 reported Catholic as their current affiliation,

¹⁵ For this calculation, we exclude the respondents whose birth years are before 1885 or after 1984. If the number of observations is too low for the calculation of the average, the average education level is treated as missing. The specific threshold size is 30 except for historically black Protestant (whose threshold size is 20) and Jewish (10).

[Table A3] Religious Transition - GSS

at 16	Current religious affiliation								
	Cath	Main Pro	Evan Pro	Black Pro	Oth Pro	Jew	Oth	None	Total
Cath	3824	199	215	19	195	9	80	577	5118
Main Pro	196	2466	410	37	226	6	78	381	3800
Evan Pro	103	354	2685	20	293	5	46	335	3841
Black Pro	25	43	75	1014	77	2	34	74	1344
Oth Pro	19	41	90	8	450	3	21	164	796
Jew	4	5	4	0	5	300	8	36	362
Oth	12	10	19	3	14	2	270	51	381
None	38	51	108	8	75	7	32	476	795
Total	4221	3169	3606	1109	1335	334	569	2094	16,437

Notes: GSS samples with religious denomination information. The number of observations for each combination of the religious affiliation at the age of 16 and at the time of survey. Classification of religious affiliation follows Steensland et al. (2000).

the number of respondents who reported Catholic as their current affiliation is 4221. The most common destination for those who moved away from Catholicism was no affiliation (577 respondents). Those who switched but still remained religious mostly became Protestants of various traditions. The majority of those who became Catholic were originally Protestants of various traditions, mostly mainline Protestant (196 respondents). All religious affiliations except for other and no affiliations have lower current affiliation numbers than those at the age of 16. In particular, the number of non-affiliated respondents notably increased between the age of 16 and the time of the survey, indicating a general trend of secularization.

It can be argued that non-affiliated individuals do not form a social network. In the main text, non-affiliated individuals are not included in the analysis. Thus, I also conduct the analysis by excluding currently non-affiliated respondents and those who were non-affiliated at the age of 16. This reduces the sample to 14,024 (Sample 2 in Table A2). Compared with Sample 1, fewer respondents reported a change in their religious affiliation (around 21%). The other characteristics are very similar between Samples 1 and 2.

[Table A4] Average Years of Education by Religious Affiliation – GSS

at 16	Current religious affiliation							
	Jew	Oth	Main Pro	None	Oth Pro	Cath	Evan Pro	Black Pro
Jew	16.27 (.16,300)	15.25 (.67,8)	14.40 (.93,5)	16.53 (.36,36)	15.60 (1.03,5)	18.50 (1.5,4)	12.50 (2.40,4)	- (0)
Oth	15.50 (3.5,2)	15.12 (.20,270)	15.50 (.98,10)	15.29 (.53,51)	14.07 (.40,14)	12.83 (1.32,12)	12.63 (.75,19)	14.33 (.88,3)
Main Pro	16.17 (1.01,6)	14.47 (.28,78)	13.93 (.06,2466)	14.52 (.15,381)	14.44 (.20,226)	14.04 (.21,196)	13.14 (.16,410)	13.35 (.63,37)
None	14.86 (1.42,7)	15.66 (.53,32)	14.27 (.47,51)	13.65 (.15,476)	14.08 (.32,75)	12.89 (.69,38)	12.25 (.33,108)	12.25 (1.18,8)
Oth Pro	14.67 (.67,3)	14.86 (.81,21)	14.17 (.41,41)	13.57 (.24,164)	13.62 (.15,450)	13.79 (.56,19)	12.92 (.25,90)	13.25 (.59,8)
Cath	14.44 (.73,9)	14.56 (.37,80)	14.03 (.22,199)	14.44 (.12,577)	13.77 (.22,195)	13.14 (.05,3824)	12.54 (.25,215)	12.95 (.87,19)
Evan Pro	14.20 (.66,5)	13.50 (.50,46)	13.95 (.16,354)	13.35 (.16,335)	13.53 (.17,293)	13.50 (.26,103)	12.39 (.06,2865)	11.00 (.66,20)
Black Pro	12.00 (3,2)	12.53 (.45,34)	13.00 (.62,43)	12.39 (.30,74)	13.45 (.28,77)	12.00 (.53,25)	11.29 (.48,75)	11.82 (.10,1014)

Notes: GSS samples with religious affiliation information. The average of years of education for all observation in every combination of religious affiliations at 16 and now is reported with standard errors and the number of observations in parentheses.

B.2 Result

Table A4 displays the average years of education for individuals according to their religious affiliation, with the rows representing religious affiliation at 16 and the columns representing the current affiliation. The number of observations for each combination is written in parentheses. Religious affiliation is organized in descending order of the average years of education for the stayers. The most educated affiliation is Jewish (16.33 years) and the least educated affiliation is historically Black Protestant (11.82 years).

The incidence of moving down is quite frequent as in NLSY79. The incidence of moving down is not less frequent than that of moving up. Consider mainline Protestant and Evangelical Protestant for example. While 354 out of 3841 followers in Evangelical Protestant changed their religious affiliations to mainline Protestant, 410 out of 3800 in mainline Protestant changed to evangelical Protestant.

The comparison of educational levels between movers and stayers shows the tendency of self-selection as proposed in the theory. Move-uppers tend to be more educated and move-downers less educated than stayers. This pattern is more apparent than NLSY79. For

[Table A5] Years of Education for Move-Uppers and Move-Downers Compared with Stayers - GSS (I)

	Dependent var: years of education			
	(1)	(2)	(3)	(4)
Move-upper	0.788*** (0.0669)	0.489*** (0.0697)	0.907*** (0.0837)	0.565*** (0.0867)
Move-downer	-0.261*** (0.0769)	-0.123 (0.0782)	-0.355*** (0.0913)	-0.190** (0.0958)
Father's education		0.322*** (0.00715)		0.316*** (0.00771)
Observations	16,437	12,602	14,024	10,799
Adjusted R^2	0.114	0.256	0.120	0.257

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: OLS estimates are reported with robust standard errors in parentheses. Non-affiliated individuals at the age of 16 or now are included in columns (1) and (2), while they are excluded in (3) and (4). All specifications include the following covariates: fixed effects for the original religious affiliation, up to square terms in age, race fixed effect, and birth year fixed effect.

example, in comparison with the Catholic affiliation, the more highly educated affiliations are Jewish, other affiliations, mainline Protestant, no affiliation, and other Protestants, while the less educated affiliations are Evangelical Protestant and historically Black Protestant. Mover-uppers are more educated than stayers; for example, those who came to have Jewish affiliation have 14.44 years of education which is

1.30 years higher than stayers (13.14 years). In contrast, move-downers are less educated than stayers; for example, those who became Evangelical Protestant have 12.54 years of education.

Table A5 presents the result of empirical specification (1). For the regression analysis, I use the average years of education for 5-year cohorts in each religious affiliations using stayers only. Based on those average education levels, individuals are stayers, move-uppers, and move-downers in the same way in the main text. In columns (1) and (2) we treat no affiliation as a religious affiliation. In column (1), move-uppers are more educated by 0.79 years while move-downers are less educated by 0.26 years than stayers. I additionally control for the father's education in column (2), and the differences are almost halved and the difference for move-downers is no longer significant. However, the difference for move-uppers is 0.49 years which is still statistically significant and economically meaningful.

[Table A6] Years of Education for Move-Uppers and Move-Downers Compared with Stayers - GSS (II)

	Dependent var: years of education					
	(1)	(2)	(3)	(4)	(5)	(6)
$(Sk - S_j)$	0.475*** (0.0403)	0.261*** (0.0416)	0.523*** (0.0450)	0.293*** (0.0472)		
Positive $(Sk - S_j)$					0.350*** (0.0590)	0.362*** (0.0633)
Negative $(Sk - S_j)$					0.153** (0.0601)	0.192*** (0.0729)
Father's education		0.323*** (0.00716)		0.315*** (0.00773)	0.322*** (0.00717)	0.315*** (0.00773)
Observations	16437	12602	14024	10799	12602	10799
Adjusted R^2	0.114	0.255	0.121	0.256	0.255	0.256

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: OLS estimates are reported with robust standard errors in parentheses. Non-affiliated individuals at the age of 16 or now are included in columns (1), (2), and (5), while they are excluded in (3), (4), and (6). All specifications include the following covariates: fixed effects for the original religious affiliation, up to square terms in age, race fixed effect, and birth year fixed effect.

It is possible that this trend arises because more educated individuals became secular. It is true that relatively more educated individuals tend to secularize. In Table A4, those who move to no affiliation tend to be more educated than the stayers who maintain the same religious affiliation (diagonal cells) in every row except for other Protestants. However, the non-affiliated group as a whole is not the most educated group and there are also movers to other affiliations. In fact, the difference in the education levels between movers and stayers is more pronounced if non-affiliated individuals are removed from the analysis, as seen in column (3). Even when the father's education is controlled for in column (4), the differences are statistically significant.

Table A6 presents the results when the education gap between groups is included as a covariate instead of dummy for move-uppers and move-downers. In columns (1) and (2), the non-affiliated individuals are treated as one group. In columns (3) and (4), all of the non-affiliated respondents are excluded. In columns (5) and (6), we implement the same specification but obtain separate coefficients for move-uppers and move-downers. Though the theory does not definitely predict the sign of the coefficient of $(Sk - S_j)$, the empirical results show the positive sign, meaning that the move-uppers are even more educated and the move-downers are even less educated than the stayers if the education gap between religious affiliations is larger. According to column (1), the move-uppers are 0.48 years more educated than the stayers when the gap in the average years of education between

[Table A7] The Effect of Skills on Probability of Choosing Religious Affiliation

Education as a skill		
$s_i(Sk - S_j)$	.0742*** (.00721)	
$ S_i - s_i $		-.260*** (.0104)
Marginal Effect		
Jew	.000323*** (.000051)	-.0011*** (.000133)
Oth	.002391*** (.000248)	-.008429*** (.000466)
Main Pro	.012583*** (.001236)	-.043846*** (.001855)
None	.010338*** (.001008)	-.036523*** (.001548)
Oth Pro	.008996*** (.000889)	-.031482*** (.001389)
Cath	.010853*** (.001075)	-.037868*** (.001677)
Evan Pro	.013929*** (.001365)	-.049064*** (.002027)
Black Pro	.000674*** (.000081)	-.002334*** (.000195)
Obs	303,288	303,288
Log Likelihood	-40,111.67	-40,181.59
Pseudo R^2	0.100	0.107

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: MLE estimates are reported with robust standard errors clustered by id. Urban, year and all original religious affiliations dummies are controlled for. Marginal effects at mean are reported.

the affiliations increases by 1 year. Again if the father's education is controlled for, the size of the coefficient is almost halved (column 2), but it remains statistically significant. The pattern is more pronounced when non-affiliated are excluded (columns 3 and 4). In columns (5) and (6), this difference between movers and stayers is larger for move-uppers than for move-downers. Both for move-uppers and move-downers, the size of the coefficients increases when the non-affiliated respondents are excluded (column 6).

Conditional logit specification is also implemented, one in its original specification and the other in the specification for homophily. The result is reported in Table A7.

Both coefficient and marginal effects are reported. In the original specification, the coefficient for $s_i(Sk - S_j)$ is positive and statistically significant which corresponds to the prediction. In the specification for homophily, the coefficient for $|S_i - s_i|$ is negative and statistically significant which supports the theory.

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가변적 정체성에 따른 집단 간 격차 연구: 종교 정체성을 중심으로

이 삼 호[†]

초 록 본 연구는 종교적 소속을 사례로 삼아, 가변적 정체성(mutable identities)과 결부된 집단 간 차이가 지속되는 기제를 탐구한다. 기존 이론은 성과가 높은 개인이 평균 성과가 더 높은 집단으로 소속될 가능성이 크다는 자기선택(self-selection) 과정을 통해 이러한 차이가 유지될 수 있음을 시사한다. 본 연구는 미국 노동시장 종단면조사(NLSY79)와 종합사회조사(GSS) 데이터를 활용하여, 종교적 소속을 변경한 '이동자(movers)'와 변경하지 않은 '잔류자(stayers)'를 비교함으로써 이 기제를 검증하였다.

분석 결과, 자기선택 패턴이 확인되었다. 평균 교육 수준이나 임금이 더 높은 집단으로 이동한 사람(move-uppers)은 출신 집단의 잔류자들에 비해 더 높은 교육 수준과 임금을 보이는 경향이 있었으며, 반대로 하향 이동한 사람(move-downers)은 더 낮은 성과를 보이는 경향이 나타났다.

그러나 이론적 기제와 상충하는 결과도 도출되었다. 고정효과 모형(fixed-effects models) 분석 결과, 소속 변경에 따른 직접적인 임금 상승 효과는 유의미하지 않았으며, 하향 이동의 빈도 또한 상향 이동과 유사하게 나타났다. 이러한 결과는 자기선택 현상이 실재하더라도, 이는 직접적인 경제적 수익보다는 동류 선호(homophily)와 같은 요인에 의해 더 크게 좌우될 수 있음을 시사한다.

핵심 주제어: 가변적 정체성, 자기선택, 종교적 소속, 집단 간 차이, 동류 선호

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