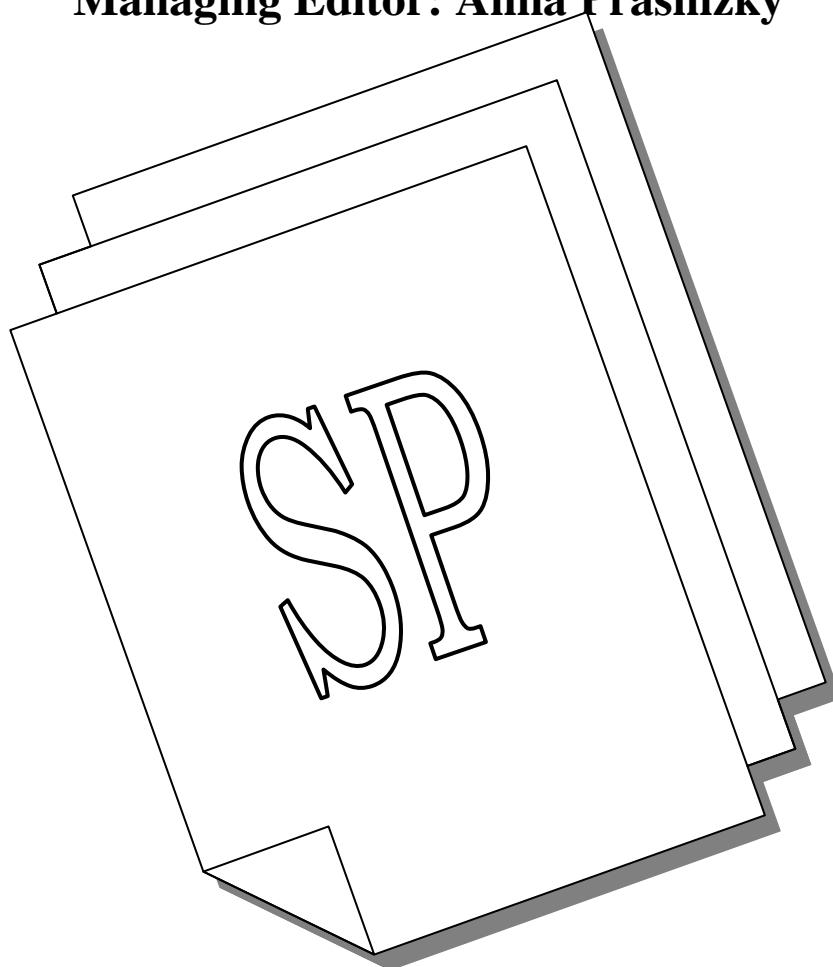


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Revisiting “The Non-Linear Impact of Schooling”: A First Step toward a Necessary Corrective

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Abstract

Harold Himmelfarb’s research in the 1970s yielded estimates of average hours per year of Judaic instruction offered by Jewish day schools and supplementary schools in North America that have since been used by quantitative researchers to model the impact of formal Jewish education on Jewish identity. Unfortunately, these estimates are not reflective of contemporary patterns of Jewish schooling. Using data from a national sample of Jewish schools collected by JData.com, an on-line repository for information on Jewish educational programs in North America, this research revisits Himmelfarb’s estimates and provides a contemporary update. Limitations of the new approach are addressed. The revised figures do not substantially affect outcomes of statistical models; nevertheless, as a matter of principle, the revisions are necessary to reduce error in a key variable used widely in quantitative research on Jewish identity.

Introduction

Quantitative research on Jewish identity generally seeks to identify the element or elements that have statistically significant effects on measures of religiosity, affiliation with the Jewish community, and subjective salience of Jewishness. Jewish education is widely held to be a critical element in the development of Jewish identity, but it is associated with a variety of factors, particularly the religiosity of one’s family and their active engagement in Jewish life in general. It is therefore important to isolate the independent effect of Jewish education on Jewish identity, controlling for other factors. One of the most important tools in the quantitative researcher’s arsenal is the regression model, which does exactly that. However, to isolate the effect of Jewish education on various measures of Jewish identity while controlling for these other factors, the statistical model requires an accurate measure of Jewish education.

For nearly 40 years, Harold Himmelfarb’s estimates of hours of Jewish instruction per year of various types of formal Jewish education (Himmelfarb, 1974, 1977) have been used by quantitative researchers to model statistically the impact of Jewish education on Jewish identity. However, the estimates are problematic in several ways and require an update to bring them in line with contemporary practices of Jewish schools. The present research outlines the problems with the estimates, reviews why such measures are important to quantitative researchers, revises the estimates using contemporary data, and addresses implications for the field of Jewish education.

Himmelfarb's Research

Himmelfarb's doctoral research in sociology at the University of Chicago in the 1970s focused on the impact of different types and amounts of childhood Jewish education on adult involvement in Jewish life (Himmelfarb, 1974). It demonstrated that controlling for other factors, the more time one spent in Judaic instruction in childhood, the greater the impact on Jewish ritual behavior, affiliation with Jewish organizations, attachment to Israel, and other factors associated with Jewish identity. In order to assess this impact, however, Himmelfarb sought to create a single measure to quantify exposure to formal Jewish education, one that would combine time spent in Jewish day schools with time spent in supplementary schools. His key reason for doing so was that "the potency of quantity of schooling as a predictor of achievement lies in the fact that there are large variations in the average total number of school hours per year received by students in different schools" (Himmelfarb, 1977). Subsequent literature on schooling and cultural capital in both the general population (e.g., Bourdieu & Darbel, 1990; Nagel & Ganzeboom, 2003) and the Jewish population (e.g., Gamoran & Boxer, 2005) confirms that increased quantity of schooling is associated with greater familiarity and comfort with the knowledge, skills, and background pertaining to a given culture (Bourdieu, 1984).

Details on the development of Himmelfarb's estimates were published in a 1977 article in the journal *Sociology of Education*, entitled "The Non-Linear Impact of Schooling: Comparing Different Types and Amounts of Jewish Education" (Himmelfarb, 1977). Himmelfarb asked survey respondents to tell him about the Jewish educational experiences in their youth, including what types of Jewish schools they attended and estimates of the number of hours per week they spent attending those schools. Based on the respondents' recollections, Himmelfarb determined that the average Jewish day school provided 17 hours per week of Judaic instruction, the average Hebrew school that met more than once a week provided eight hours per week, and the average one-day-a-week or Sunday school provided three hours per week. Himmelfarb assumed that all Jewish schools were in session for 40 weeks out of the year, and so he simply multiplied the hours per week for each school type by 40 to determine hours of formal Judaic instruction per year. Accordingly, a year of day school was equivalent to 680 hours of Judaic instruction, a year of multiday Hebrew school was equivalent to 320 hours, and a year of Sunday school was equivalent to 120 hours.

Since the publication of this article, dozens of researchers have cited it, and others cited the hours-per-year figures directly from Himmelfarb's doctoral dissertation. Some did so in passing or simply to show that there is research on the impact of religious education on religiosity (e.g., Reisman, 1985; Peshkin, 1988; Ressler, 1993; Corey, Phelps, Ball, Demonte, & Harrison, 2012), while others used Himmelfarb's formulation of hours per year of Jewish education for each of the types of formal Jewish education in order to assess via statistical modeling the impact of Jewish education on the Jewish identity of respondents to a variety of scientific surveys (e.g., Bock, 1976; Sigal, August, & Beltempo, 1981; Hartman & Hartman, 2003; Kadushin & Kotler-Berkowitz, 2006; Koren & Androphy, 2006; Phillips & Fishman, 2006; Phillips & Kelner, 2006).

The Problem

This latter category of citations is the concern of the present research. Given that quantitative researchers are still using Himmelfarb's estimates to control for the

impact of formal Jewish education in assessments of Jewish identity, it is critical that the estimates be accurate. There are several reasons to believe that they are not.

First, Himmelfarb's figures rested on the assumption that the school year for all forms of Jewish education was 40 weeks (Himmelfarb, 1974, 1977). However, although the school year is spread out over 40 weeks in many places in the United States, there is no state that mandates more than 186 days of instruction per year¹, equivalent to 37.2 weeks. Twenty-nine states require 180 days (36 weeks), and about a dozen states require fewer than 180². In Canada, most provinces mandate 190 days of instruction per year, equivalent to 38 weeks; Quebec mandates 180 days. It therefore seems likely that very few day schools today would offer a full 40 weeks or more of instructional time per year. Further, given that supplementary schools typically begin only after the school year begins, end before the school year ends, and have longer vacation times for mid-year breaks than similarly located public schools, it seems likely that such schools would offer even fewer weeks of instruction per year.

Second, the amount of time that has elapsed since Himmelfarb conducted his research was a potential source of error for continued use of his estimates. Himmelfarb conducted his research about 40 years ago, and most of the people he surveyed had received their Jewish education in the 1950s or earlier (Himmelfarb, 1977). The Jewish educational system in North America has undergone significant changes in the past 60 years and it is crucial that quantitative researchers use an up-to-date measure of hours of Jewish instruction. Anecdotal evidence suggests that children attending supplementary schools today attend for fewer hours than their forebears had when they were children. Indeed, Himmelfarb himself noted (1977), citing Bock (1976), that "changes in Jewish schools over the years have been toward fewer hours of Jewish studies"; given such a trend and absent any evidence of its reversal, it is likely that there would be fewer hours of formal Jewish instruction per year for each type of schooling today than what Himmelfarb recorded in his research 40 years ago.

Third, Himmelfarb conducted his research solely on people whose Jewish education took place in Chicago (Himmelfarb, 1977). Given the particular challenges associated with the kind of research he was doing, this was a valid approach. However, there is no reason to believe that the Chicago Jewish population was or is representative of the North American Jewish population as a whole; indeed, it is far more plausible that it is non-representative. Given that Himmelfarb's estimates are used to assess the impact of Jewish education on Jewish identity regardless of where one received one's Jewish education, a more representative sample is advisable.

Fourth, Himmelfarb's sample itself may not have been representative of the Chicago Jewish population. Himmelfarb (1974, 1977) surveyed adults using the Distinctive Jewish Names (DJN) method³ in the Chicago and North Suburban phone books, and supplemented that sample with alumni from two Jewish schools in Chicago who were still living in the area. This may have been the best available approach in the 1970s, but it is nearly impossible to attain a representative sample this way and more effective methods are available today. Additionally, Himmelfarb's survey had a

¹ Exact figures for each state are available through the states' Departments of Education or equivalent agencies.

² Some states mandate hours in session rather than days, hence the ambiguity.

³ See Masaryk (1966), Himmelfarb, Loar, and Mott (1981), and Phillips (2007) for description and critique of the DJN method.

response rate of approximately 30%. Without effective means of controlling for non-response bias, such a response rate calls into question the representativeness of the sample (e.g., Groves, 2006; Babbie, 2007).

Finally, Himmelfarb (1977) excluded several groups of people from his analysis: anyone who was unmarried, born outside the US, had intermarried parents, or was not raised as a Jew was excluded. Given that he was trying to analyze the impact of Jewish education on Jewish identity and people who are not raised as Jews typically do not receive formal Jewish education in their youth, their exclusion makes sense. Each of the other categories, however, is well represented in the Jewish educational system today. Dropping these categories of people from his analysis skewed Himmelfarb's sample; more importantly, it leaves the sample bearing no resemblance to the profile of the students who attend Jewish schools in North America today. If quantitative researchers wish to continue to use hours of Jewish education in their research, they need updated figures based on a population that actually reflects contemporary trends in Jewish schools and the profile of the students who attend them.

Data and Methods

Fortunately, today there is a data source that can provide such information. JData.com is an on-line database that collects and provides census-like information about Jewish educational programs in North America⁴. Every year, the JData.com team works with day schools and supplementary schools (as well as other Jewish educational programs) to record basic information about their students, faculty and staff, resources, governance, and other aspects of their operations. For the purposes of revisiting Himmelfarb's estimates, the key variables collected by JData.com for each school were enrollment, the number of hours per week that the schools were in session, and the number of weeks in session per year. Accounting for enrollment ensured that greater weight would be given to schools with more students; for example, a school with 100 students should count ten times as much toward the estimated average than a school with only ten students. Ultimately, the total number of hours of Jewish instruction was calculated on a grade-specific basis by multiplying the number of students enrolled in the grade by the weeks the school was in session, then multiplying again by the hours of Jewish instruction per week:

$$(\text{Number of students}) \times (\text{weeks per year}) \times (\text{hours per week}) = (\text{total instructional hours})$$

For each school type, the total Jewish instruction hours from all grades were added up across all schools and divided by the aggregate number of enrolled students to yield the average number of hours of instruction.

Day Schools

JData.com does not ask day schools to separate the hours they are in session into Jewish instructional time and other time, so a decision must be made about how to determine hours of Jewish education per week of day school. The present research

⁴ The author is an occasional advisor to the project.

focused on two options: assuming that some fixed percentage of the time the schools are in session should be considered “Jewish instructional time” or maintaining comparability with Himmelfarb’s work by assuming 17 hours per week of Jewish instruction. A day school may reasonably claim that everything they do is Jewish education and therefore every hour they are in session should count as “Jewish instructional time,” but the fact of the matter is that for most day schools, a great deal of time is dedicated to subjects and activities that are not specifically Jewish – English, social studies, math, science, lunch, etc. And it is certainly true that even within those subjects some of the instructional time may be inherently Jewish⁵ and should be considered accordingly. Key informants advised that if the determination for this research were to be made on the basis of percentage of overall instructional time, that the percentage should be set at anywhere from 33% to 50%, with the understanding that some schools would spend a greater percentage of their time on Jewish instruction and some would spend less. Ultimately, however, applying such a percentage tended to yield an average total across schools of between 15 and 20 hours per week of Jewish instruction. Accordingly, the present research adopts Himmelfarb’s estimated average of 17 hours per week of Jewish instruction in day schools.

For the 2011-2012 school year, 159 day schools provided data for the two remaining key variables, enrollment (grades 1 through 12) and days in session⁶. The number of days in session was divided by five to yield the number of weeks of instruction per year⁷. Although a school year of approximately 180 days is normative in most of North America (i.e., 36 weeks of instruction), ten schools indicated they were in session for 200 days or more (i.e., 40 or more weeks of instruction), while the lowest recorded total was 160 days (i.e., 32 weeks)⁸. The schools run the gamut of geographic location and ideological spectrum, as illustrated in Tables 1 and 2.

Table 1. Day schools by region

Region	# schools
Northeast	47
Midwest	13
South	48
West	51

⁵ A social studies class, for example, may spend extra time covering Jewish history; an English class might include a unit on Jewish literature; a science class might link environmental concerns with Jewish values; and so on.

⁶ JData.com has enrollment figures for an additional 193 schools but not the number of days they were in session. If these schools are treated as if they were each in session for 180 days, as is normative in much of the United States, and the data are aggregated with those of the 159 schools where such figures are available, the final estimated average number of hours of Jewish instruction per year differs from the estimate for the 159 schools by less than 1%. Accordingly, the schools for which number of days in session is not available are excluded from the analysis.

⁷ In North American day schools, children typically attend school five days a week, from Monday through Friday.

⁸ Three day schools reported that they were in session for fewer days out of the year: one for 90 days, one for five days, and one for one day. These entries were assumed to be typographical errors and were thus excluded from the count of schools for which all key pieces of data were available.

Table 2. Day schools by orientation

Orientation	# schools
Community	43
Conservative	27
Orthodox	62
Pluralist or trans-denominational	14
Reform	12
Sephardic	1

Following the methodology described above, the 159 day schools were found to have a total of 38,532 students enrolled for the 2011-2012 school year, and offered a total of 23,162,891 hours of Jewish instruction. Dividing the total hours of Jewish instruction by the number of students yields an average of just over 601 hours of Jewish instruction per student for the year. For simplicity's sake, this figure can be rounded to 600 hours, 80 hours fewer than Himmelfarb's estimate (Himmelfarb, 1974, 1977).

Multiday Hebrew Schools

For the 2011-12 school year, a total of 90 supplementary schools that met at least twice per week provided information about enrollment (grades 1 through 12), hours per week in session, and number of weeks in session. Table 3 shows the geographic distribution of these schools; these schools are disproportionately located in the Northeast and South, with only 11 out of 90 located in the Midwest or West.

Table 3. Multiday supplementary schools by region

Region	# schools
Northeast	43
Midwest	4
South	36
West	7

The 90 schools were found to have a total of 9,139 students enrolled for the 2011-2012 school year, and offered a total of 1,160,949 hours of Jewish instruction. Dividing the total hours of Jewish instruction by the number of students yields an average of just over 127 hours of Jewish instruction per year, or roughly four hours per week for 32 weeks. Even if this figure is rounded up to 130 hours, it remains only about 40% of the Jewish instructional time posited by Himmelfarb's data (1974, 1977).

One-day-a-week Hebrew schools

For the 2011-2012 school year, a total of 102 supplementary schools that met once a week, typically on Sundays, provided information about enrollment (grades 1 through 12), hours per week in session, and number of weeks in session. Table 4 shows that these schools are disproportionately located in the Northeast and South, as was the case for multiday Hebrew schools.

Table 4. Multiday supplementary schools by region

Region	# schools
Northeast	48
Midwest	4
South	43
West	7

The 102 schools were found to have a total of 8,682 students enrolled for the 2011-2012 school year, and offered a total of 550,513 hours of Jewish instruction. These figures yield an average of a little over 63 hours of Jewish instruction per student per year, or roughly two hours per week for 32 weeks. Even if this figure is rounded up to 65 hours, it is just more than half of the hours posited by Himmelfarb's data (1974, 1977).

Benchmarks and Policy Relevance

To clarify the differences between Himmelfarb's data and the figures suggested by JData.com, Table 5 shows how many cumulative hours of Jewish instruction a student would receive from two, five, eight, and twelve years of each type of Jewish school using either Himmelfarb's numbers or JData.com's. For example, if someone attended a multiday supplementary school for two years to prepare for bar or bat mitzvah, he or she would accumulate 640 hours of Jewish instruction under Himmelfarb's formula but only 260 hours under JData.com's.

Table 5. Cumulative hours of Jewish education by school type and duration

School type and duration	Himmelfarb	JData.com
<i>One-day-a-week supplementary school</i>		
2 years	240 hours	130 hours
5 years	600 hours	325 hours
8 years	960 hours	520 hours
12 years	1,440 hours	780 hours
<i>Multiday supplementary school</i>		

2 years	640 hours	260 hours
5 years	1,600 hours	650 hours
8 years	2,560 hours	1,040 hours
12 years	3,840 hours	1,560 hours
<i>Day school</i>		
2 years	1,360 hours	1,200 hours
5 years	3,400 hours	3,000 hours
8 years	5,440 hours	4,800 hours
12 years	8,160 hours	7,200 hours

The differences between Himmelfarb's figures and JData.com's are relatively small for day schools but much larger for supplementary schools, and these discrepancies have some important policy implications. Gladwell (2008) popularized the notion of "the 10,000 hour rule," which is derived from psychological research on individual efforts to master the skills associated with expertise in a given field through deliberate practice (Ericsson, Krampe, & Tesch-Romer, 1993). It stipulates that the key to success in any field is, functionally speaking, a matter of deliberately practicing its specific craft for a prolonged period of time. Gladwell's examples included athletics, software development, and playing and composing music, but he cited research suggesting that the key to becoming a world-class expert in any field is the significant investment of time and effort suggested by "the 10,000 hour rule." This investment, rather than the requirement of precisely 10,000 hours, is the key.

Similarly, research in a wide array of fields has shown that many interventions require that some specific threshold be reached in order for the treatment to have any lasting effect; if the tipping point is not reached, the treatment has no effect (e.g., Schelling, 1971). Previous research on Jewish education has suggested similar dynamics. Bock's (1976) analysis of the 1971 National Jewish Population Survey, using Himmelfarb's formula to convert respondents' reported years of formal Jewish education of various types into total hours of Jewish instruction and controlling for other background factors, found a threshold of 1,000 hours of Jewish instruction was necessary for formal Jewish educational experiences in childhood to have any impact on adult Jewish ritual observance. Additionally, Bock found a threshold of 500 hours necessary for effects on attitudinal measures such as attachment to Israel and salience of Jewish identity. Fishman and Goldstein (1993) and Goldstein and Fishman (1993) reported that controlling for other factors, both years of formal Jewish education and intensity of that experience (i.e., Sunday school vs. multiday supplementary school vs. day school) affected adult ritual behavior and probability of endogamy.

Referring again to Table 5, the implication of Bock's threshold figures is clear. Students who are sent to day school will clear these thresholds easily regardless of whether Himmelfarb's figures or JData.com's are used; most day school students attend for more than one year, and so they will clear the 500 hour threshold in their first year and the 1,000 hour threshold in their second. However, under Himmelfarb's

figures, a child who receives his or her Jewish education today will not reach 1,000 hours of Jewish education until he or she has been in Sunday school for nine years or multiday Hebrew school for four years, and he or she will only reach 500 hours in the fifth year of Sunday school or the second year of multiday Hebrew school. But when JData.com's figures are used, one would need 16 years of Sunday school or eight years of multiday Hebrew school to reach 1,000 cumulative hours of Jewish instruction, and eight years of Sunday school or four years of multiday Hebrew school to reach 500 hours. Many students in North America today who do not attend day school do not stay in supplemental schools long enough to reach these thresholds.

The proportion of North American Jewish students who do not reach these thresholds can be estimated by examining survey data from the pre- and post-trip evaluation of the Summer 2008 cohort of the Taglit-Birthright Israel program. This cohort is the closest approximation of a representative sample of Jewish young adults available in North America today. On virtually every measure, they resemble what our best knowledge tells us is a representative sample⁹. Among these 37,983 young adults, aged 18-26 at the time of the survey, 18,854 individuals provided information about their formal Jewish educational experiences, including how many years, if any, they attended a Jewish day school, a Hebrew school that met more than once per week, and a one-day-a-week Jewish supplementary school. Additionally, data from Taglit's registration system made it possible to ensure that non-respondents did not unduly bias results (see the methodological appendix to Saxe, Phillips, Wright, Boxer, Hecht, & Sasson, 2008, for details). Given the differences between Himmelfarb's figures and JData.com's, it stands to reason that there would be differences in the proportion who reach the aforementioned threshold numbers of hours of Jewish instruction, and indeed there are. Table 6 shows the proportion of respondents who reached the 500 and 1,000 hour thresholds among all respondents (n=18,854) using both Himmelfarb's and JData.com's figures, and Table 7 shows what proportion reached these thresholds among respondents who never attended day school (n=15,781).

Table 6. Hours of formal Jewish education, all school types (weighted estimates)

n=18,854	Himmelfarb	JData.com
At least 500 hours	65%	55%
At least 1,000 hours	52%	30%

Table 7. Hours of formal Jewish education, supplementary school only (weighted estimates)

n=15,781	Himmelfarb	JData.com
At least 500 hours	59%	46%
At least 1,000 hours	44%	17%

⁹ In essence, they closely resemble the cohort of young adults described by the researchers who conducted the 2000-2001 National Jewish Population Survey (United Jewish Communities, 2004).

As Table 6 shows, using Himmelfarb's figures, only about two-thirds of all respondents accrued sufficient cumulative hours of Jewish instruction to clear the 500 hour threshold, and about half cleared the 1,000 hour threshold; by contrast, using JData.com's figures, just over half of respondents clear the 500 hour threshold, and not even one-third received 1,000 hours. Table 6, however, includes the 3,073 respondents who attended a day school for at least one year. As Table 7 shows, when these respondents are removed from the sample and only those respondents who never attended day school are examined, the proportions clearing the thresholds are even smaller. Using Himmelfarb's figures, about three-fifths of respondents who never attended day school accrued at least 500 hours of Jewish instruction, and a little less than half accrued 1,000 hours; by contrast, using JData.com's figures, a little less than half accrued 500 hours and less than one-fifth accrued 1,000 hours. In essence, what this cohort demonstrates is that even with outdated overestimates of the amount of Jewish instruction to which individuals are exposed, many Jewish students do not reach the threshold figures previously reported as necessary for formal Jewish education during childhood to have a statistically significant long-term impact on adult Jewish identity. And with figures that are closer reflections of the Jewish educational experiences of contemporary young adults, even fewer reach the threshold figures.

To be fair, given the efforts to improve Jewish education since the time of Himmelfarb's research, as well as ever-increasing interest in Jewish summer camps (see, for example, Sales & Saxe, 2004), educational trips to Israel (e.g., Saxe & Chazan, 2008), and other opportunities that blur the line between formal and informal Jewish education, it would be worthwhile to revisit the threshold figures of 500 and 1,000 hours of formal Jewish instruction, just as this research has revisited Himmelfarb's figures. Nevertheless, to the extent that quantity of time spent in formal Jewish education affects Jewish identity in the long term, it is apparent that the Jewish community is missing an important opportunity with a large proportion of the population, if not the vast majority, and particularly among those who never attend day school.

Limitations

The corrective offered by use of JData.com's figures is not perfect. There are important limitations to using any measure of hours of Jewish instruction to run statistical models of Jewish identity, and JData.com's is no exception. First, JData.com is still a relatively new venture. Only one full year of data was available for this study and, for supplementary schools, it would be preferable to have data from additional schools in the Midwest and West. It is possible, though unlikely, that the estimates developed for hours of Jewish instruction in each school type would vary significantly from one year to the next and from one region to another. Nevertheless, when multiple years of data become available and JData.com has more complete data on supplementary schools, it will be possible to control for these possibilities, as well as to track changes in hours of Jewish instruction over time. Indeed, this is a worthy opportunity for future research.

Second, hours of Jewish instruction cannot be equated with Jewish learning. At best, the amount of time spent in formal Jewish education is equivalent in some way to opportunities to learn; the hope is that the more time one spends in an educational setting, the more he or she will learn.

Third, JData.com offers no measures of school or teacher quality, yet the general educational literature is quite clear that both have a significant impact on outcomes (e.g., Wayne & Youngs, 2003; Gould, Lavy, & Paserman, 2004). Given that not all schools or teachers are of equal quality, it is unlikely that one hour at one particular school (or with one particular teacher) would be of precisely equal value to an hour at another school (or with another teacher). Of course, Himmelfarb's figures also did not account for these factors.

Fourth, the theory of cultural capital suggests that once the threshold level is met and an individual has accrued a certain baseline level of knowledge, each subsequent hour of instruction may have greater impact. One cannot accrue 5,000 hours of formal Jewish instruction without first accruing 1,000 hours, and one cannot reach the 1,000th hour without first reaching the 100th hour, and so on. But learning is an iterative process, building new knowledge atop the old or adding nuance to what is already known. The more hours one has invested in learning – the more Jewish cultural capital one has attained – the more background knowledge and learning tools one has developed and can call upon, in turn, to add new or more nuanced knowledge. Statistical models can account for this challenge, but doing so requires that they have accurate measures of hours of Jewish instruction – the models are only as reliable as the measures in them.

Fifth, one cannot assume that one year has consistent meaning across school types. The number of hours of Jewish instruction aside, day schools can assure that students are actually attending class for the vast majority of hours when instruction is taking place because there are significant penalties for failure to attend. Typically, there are no such consequences for poor attendance at multiday Hebrew schools or one-day-a-week schools, so the difference between a year of day school and a year of supplementary school may be wider than the number of hours suggests.

Finally, although statistical models attempt to control for differences in family background, such as religious ritual behavior, intermarriage, social networks, informal educational experiences, and other factors, it is never possible to control perfectly for such things. This is the nature of statistical research; a good model attempts to minimize error to the greatest extent possible and can still produce important insight about general trends despite its imperfections.

Discussion

Counter-intuitively, the discrepancies between Himmelfarb's figures and JData.com's make no difference for statistical modeling of various ritual, affiliational, or attitudinal measures of Jewish identity. For any given outcome variable, any predictor variable that is statistically significant in a model using Himmelfarb's figures is still statistically significant in a model using JData.com's figures instead, and any predictor variable that is not statistically significant using Himmelfarb's figures is still not statistically significant if JData.com's figures are substituted.

An example of this can be seen in the long-term evaluation of the Taglit-Birthright Israel program. Saxe, Sasson, Hecht, Phillips, Shain, Wright, and Kadushin (2011) modified Himmelfarb's figures for use in statistical models examining the effect of participating in the Taglit-Birthright Israel program on several measures of Jewish identity, most notably whether participants on and applicants to the program seven to ten years earlier subsequently married a Jew, while controlling for a wide array of background factors, including formal Jewish education. Convinced that

Himmelfarb's figures did not accurately reflect trends in Jewish day schools and supplementary schools in the United States in the late 1980s and 1990s, when the respondents in their study were enrolled in such programs, the authors analyzed schools in the Greater Boston area during the 2008-2009 academic year to determine new estimates of hours of Jewish instruction offered during the year for each school type. They found that a year of day school was equal to approximately 600 hours of Jewish instruction and that a year of supplementary school was equal to approximately 100 hours; they did not differentiate between multiday and one-day-a-week supplementary schools. The day school figure is identical to the one that emerges from JData.com's national database as described earlier in this article, but the supplementary school figure is different in large part due to combining multiday and one-day-a-week programs; both figures are different from Himmelfarb's. Although Saxe et al. do not go into such detail, their statistical models would not change if they used Himmelfarb's figures or JData.com's – the same variables that predicted inmarriage using the hours of Jewish education figures used by Saxe et. al still predict inmarriage using either Himmelfarb's figures or JData.com's.

Conclusion

Although which set of figures for hours of Jewish education one uses for statistical modeling does not substantially affect results, the differences between the figures are still very important. One of the central principles of statistical research is that researchers must do what we can to reduce error, even if doing so does not substantially affect interpretation of data. This paper has demonstrated a way to reduce the error in an important measure, hours of Jewish instruction, used widely in statistical modeling in research on Jewish identity. Himmelfarb's figures – 680 hours of Judaic instruction per year of day school, 320 hours per year of multiday supplementary school, and 120 hours per year of one-day-a-week supplementary school – were critically important in their time, but they are long since out-of-date. Today, with contemporary data available from far more schools in more diverse settings, a corrective is possible and yields contemporary estimates of 600 hours of Judaic instruction per year of day school, 130 hours per year of multiday supplementary school, and 65 hours per year of one-day-a-week supplementary school. This corrective will be refined in time as JData.com expands its coverage to more schools and is able to provide data from multiple years. Statistical researchers would be well advised to take advantage of it.

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