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# Is Hanukkah responsive to Christmas?\*

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## Abstract

We study the extent to which religious activity responds to the presence and activity of other religions. Specifically, we employ individual-level survey data and county-level expenditure data to examine the extent to which Hanukkah celebration among U.S. Jews is driven by the presence of Christmas. We find that: (1) Jews with children at home are more likely to celebrate Hanukkah than Jews without children. (2) The effect of having children on Hanukkah celebrations is higher for reform Jews than for orthodox Jews; and, it is higher for Jews who feel a stronger sense of belonging to Judaism. In contrast, there is no such differential effect of having children on the celebration of other Jewish holidays. (3) Jewish-related expenditures in Hanukkah are higher in counties with lower share of Jews. These findings are all consistent with the hypothesis that Jews increase religious activity during Hanukkah because of the presence of Christmas, and that this response is primarily driven by the presence of children at home. One underlying mechanism that could lead to this is that Jewish parents in the U.S. celebrate Hanukkah more intensively so their children do not feel left out, and/or because they are concerned that their children will convert or intermarry.

KEYWORDS: Religions, Hanukkah, Identity.

*JEL* classification: J15, Z12.

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# 1 Introduction

Is religious activity responsive to the presence and activity of other religions? How do religious minorities persist and keep their children from converting? We investigate these questions by examining the extent to which the celebration of Hanukkah, a Jewish holiday that is celebrated in December, is driven by the presence of Christmas. Hanukkah celebration in the U.S. is especially suited to address these questions. First, U.S. Jews are a minority who account for less than two percent of the population. Second, a key concern of American Jews is conversion and intermarriage, which is estimated at over forty percent (National Jewish Population Survey, 2000).

A key observation that motivated this work is that Hanukkah is a minor holiday in Judaism in general and in Israel in particular, but it is one of the most celebrated Jewish holidays in the United States. Hanukkah is often called the “Jewish Christmas” because American Jewish parents give their children gifts, like their Christian neighbors. Surveys we conducted in both Israel and the U.S. confirm that Hanukkah is perceived to be much less important in Israel. This stark difference in the importance of Hanukkah in Israel (where Jews are a majority) and in the U.S. (where Jews are a minority) suggests that the extent of Hanukkah celebration in the U.S. may be driven by the presence of Christmas. With so many other differences between Israel and the U.S., however, one should be cautious drawing any interpretation from this anecdotal fact. Our strategy is therefore to look within the U.S., by comparing the behavior of different American Jewish households.

Our hypothesis is that Jews with children are more likely to be affected by the presence of Christmas, because Jewish parents might worry that their children would feel left out, intermarry, or convert. That is, Christmas, a fun holiday for children, induces Jewish parents to “compete.” Thus, if the presence of Christmas is important, we expect that Jewish parents will celebrate Hanukkah more intensively than Jews without children. To account for the alternative hypothesis that children induce more intensive celebration of all holidays regardless of Christmas, we use the intensity of Passover celebration as a control. To account for the alternative hypothesis that Hanukkah is simply a more fun holiday for children than Passover, we use a difference-in-difference approach whereby we identify groups (secular and reform Jews) that *a priori* seem more likely than other groups (orthodox Jews) to be responsive to the presence of Christmas because their children interact more with non-Jewish population and thus may be at a higher “risk” of intermarriage or conversion. Similarly, we identify parents who view possible intermarriage or conversion more

negatively than others (based on the self-reported strength of their sense of belonging to the Jewish people), and ask whether their response is stronger. This difference-in-difference strategy is valid under the assumption that whether an individual is reform, orthodox, or secular, and whether an individual feels strongly or less strongly about his belonging to the Jewish people is an individual “type,” which does not change over the life cycle. Under this assumption, comparing individuals of the same type, with and without young children, is similar to comparing the same individual over different stages of her life cycle.

We employ two data sets to examine these effects. The first and primary source is an individual-level survey data set that contains information on the self-reported intensity of Hanukkah celebration. The second source of data is at the county level and contains information on expenditure on Jewish items during Hanukkah and in other parts of the year. If the presence of Christmas is important and residence location is primarily driven by non-religious factors, then Jews who live in mostly Christian locations are expected to celebrate Hanukkah (compared with other holidays) more intensively. Although the evidence from these data is, by its nature, more tentative, it complements the survey by providing information on what Jews actually do rather than what they say.

We present four findings. First, Jews with children under 18 are more likely to celebrate Hanukkah than other Jewish holidays. Second, the effect of having children on Hanukkah celebration is the highest for reform Jews, followed by conservative Jews, and it is the lowest for orthodox Jews. Third, the effect of having children on Hanukkah celebration is higher for Jews who feel more belonging to the Jewish people. Fourth, expenditure on Jewish products during Hanukkah is higher in counties with lower shares of Jews. In contrast, we find that there is no such differential effect of having children on the celebration of other Jewish holidays. These patterns are consistent with the hypothesis that Jews increase religious activity during Hanukkah because of the presence of Christmas, and that this response is primarily driven by the presence of children. Jews with children at home may celebrate Hanukkah more intensively so their children do not feel left out, and/or because they are concerned their children will convert or intermarry.

Taken together, this paper demonstrates that religious activity is, at least partially, endogenous to the environment in which it takes place, and in particular to the religious activities of “competing” religions. We thus contribute to the literature that incorporates economic analysis into the study of religions (e.g. Iannaccone 1991, 1992, 1998; Iannaccone and Stark 1997; Berman 2000;

Gruber 2005) as well as to the literature that incorporates identity into economics (e.g., Akerlof and Kranton 2000). Similar and related issues have also been the focus, albeit from a different perspective, of other disciplines, including sociology (Carvan 1971a, 1971b; Finke 1990; Finke and Stark 1992; Kaufman 2002) and law (Dershowitz 1997).

## 2 Hanukkah and its importance: a brief background

Hanukkah, also known as the festival of lights, is an annual eight-day Jewish holiday beginning on the 25th day of the third Jewish month of Kislev, which falls between late November and late December, depending on the particular year.<sup>1</sup> Hanukkah is celebrated by the lighting of candles on each night of the holiday – one on the first night, two on the second, and so on. Appendix A provides a brief description of what is being celebrated in Hanukkah.

Hanukkah is not mentioned in the Tanakh (old testament), and it is considered a minor holiday in Jewish tradition. In Israel, where Jewish holidays are recognized officially, Hanukkah is observed as a vacation only in the state’s elementary and high schools. Other institutes and companies, private and public, operate as usual. In the U.S., Hanukkah is considered important as it occurs during the national winter holiday season. Many American Jews regard Hanukkah as the Jewish alternative to Christmas, thus giving it special importance.

This stark difference between Israel and the U.S. in the relative importance of Hanukkah as a Jewish holiday is witnessed by each Israeli immigrant to the U.S. (including ourselves). To provide a more quantitative statement of this difference, we also ran a short survey among undergraduate students in economics in both Israel (Tel Aviv University) and the U.S. (Stanford University), and asked them to list the three most important Jewish holidays. The results are reported in Table 1. They clearly show that Passover and Rosh Hashana (Jewish new year) are consistently ranked as the most important holidays in both Israel and the U.S., and that other holidays except Hanukkah are secondary and less important. The perceived importance of Hanukkah, however, is very different in the two countries. While in Israel it is ranked together with the other secondary holidays, in the U.S. it is viewed as just as important as Passover and Rosh Hashana, and sometimes even more so.

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<sup>1</sup>In principle, this variation in the exact timing of Hanukkah could produce very useful variation for the question at hand. Unfortunately, as described later, the relevant data sets we could find are cross-sectional, so at least this paper cannot exploit this excellent variation.

## 3 Evidence I: individual-level survey data

### 3.1 Data

We use the U.S. National Jewish Population Survey, which was collected between August 2000 and August 2001 for the United Jewish Communities and the Jewish Federation System. The data contain information on 5,148 Jewish households. The survey provides individual-level information on the intensity of Hanukkah celebration (defined as the number of candles lit during the most recent Hanukkah) and Passover celebration (defined as whether Passover dinner – the “seder” – was celebrated during the most recent Passover). Households are also asked other questions regarding aspects of their Jewish life, such as the degree of belonging to Judaism.

Households provide information about their denomination, which often means affiliation with one of three main synagogue movements (orthodox, conservative, reform, or no affiliation), which are unique to American Judaism. While all three are religious movements, they differ in the manner in which they implement their religious observance (Lazerwitz, Dashefsky and Tabory 1998). Orthodox Jews (which are the vast majority of Jews in Israel) largely follow traditional religious practices, similar to those observed by Jews in Europe in the 19th century. Reform Jews, on the other hand, are more adaptive to changes in the environment, and have adopted practices that are more open and more similar to their Christian neighbors. Reform Jews are more likely to live in mixed neighborhoods, because unlike orthodox Jews they are permitted to drive on Saturday and thus they do not have to live within walking distance of their synagogue; their children are more likely than orthodox Jewish children to attend public day schools as opposed to Jewish day schools;<sup>2</sup> and they are more likely than orthodox Jews to work in and interact with the outside community. Conservative Jews are somewhere in between.

The survey also provides demographic information.<sup>3</sup> Appendix B presents the key variables and their summary statistics.

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<sup>2</sup>However, the children of reform Jews are more likely than orthodox Jews’ children to attend Jewish Sunday schools.

<sup>3</sup>This also includes information about the MSA in which the household resides. However, with most surveyed households living in only few locations (almost half of the sample lives in the New York City area), the geographic variation is quite limited, and we do not use it. A detailed description of the survey by the Federation of North America can be found at <http://www.ujc.org/page.html?ArticleID=9451>. A methodological Appendix can be found at - <http://www.ujc.org/page.html?ArticleID=46185>.

### 3.2 Empirical Strategy

Ideally, we would run a regression of Hanukkah celebration on the extent to which households view themselves as trying to provide a Jewish alternative to Christmas, but the latter is not directly observed. We thus identify groups that are more likely to be affected by the presence of Christmas and test whether they celebrate Hanukkah more intensively than other groups. Specifically, it seems natural to view Jews with children under 18 as more likely to be affected by the presence of Christmas. Christmas is a gift-giving holiday, and Jewish parents might worry that their children would feel left out. Moreover, the intermarriage rate of American Jews is over 40% and it is a key concern of American Jewry. Jewish parents may be concerned about their children’s intermarriage down the road. Hanukkah, which falls close to Christmas, gives parents the opportunity to give their children an exciting alternative and “compete” with Christmas. Thus, we expect that Jewish parents will celebrate Hanukkah more intensively.

There are two potential problems, however, with interpreting the effect of children on Hanukkah celebration as a response to the presence of Christmas. First, Jewish parents may generally be more likely to celebrate holidays (for example, they may want to instill Jewish identity in their children). To account for this possibility, we use as a control the intensity of Passover celebration, which does not fall close to Christmas.<sup>4</sup>

Second, even if Jewish parents are more likely to celebrate Hanukkah but are not more likely to celebrate Passover, this could be because Hanukkah is a more “fun” holiday for children rather than due to the presence of Christmas. To account for this possibility, we use a difference-in-difference approach whereby we identify groups that *a priori* seem more likely than other groups to be responsive to the presence of Christmas. We then test whether having children is associated with more Hanukkah celebration in these groups.

In particular, Jewish individuals may be more responsive to Christmas if their children are at a higher “risk” of intermarriage, conversion, or feeling envy and left out during Christmas. Individuals affiliated with the various Jewish denominations naturally differ in this “risk.” Specifically, it seems reasonable to assume that, all else equal, reform and conservative Jews are at a higher “risk” of

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<sup>4</sup>One possible concern is that Passover falls close to Easter. Note, however, that to the extent that this is a problem (i.e. that Passover intensity is increased in response to Easter), this should make us less likely to find what we report below. Moreover, our results remain qualitatively the same when we use the intensity of celebrating Rosh Hashana as a control (instead of Passover).

intermarriage and conversion because they (and their children) interact more with the non-Jewish population. Indeed, orthodox Jewish children are the least likely to convert or to outmarry from Judaism (intermarriage rate of 6%), followed by conservative Jews (32%), reform Jews (46%), and secular Jews (49%) (Gordon and Horowitz, 2007; Dershowitz, 1997). Note that all Jewish denominations are religious, care about their Judaism, and might worry about conversion and intermarriage, but reform Jews are more likely to adjust their practice to their environment than conservative Jews, who are more likely to do so than orthodox Jews. Therefore, we expect the effect of having children on Hanukkah celebration to be larger for reform Jews than for conservative Jews than for orthodox Jews. Such differential effect is not likely to occur if Hanukkah is simply more fun for all children. Specifically, we run the following individual-level OLS regression:

$$HanukkahCeleb_i = \left\{ \begin{array}{l} \beta_0 + \beta_1 PassoverCeleb_i + \beta_2 Children_i + \sum_{k=1}^4 \gamma_k Denomination_{ki} + \\ \sum_{k=1}^4 \delta_k (Children * Denomination)_{ki} + X_i \beta_3 + \epsilon_i \end{array} \right\} \quad (1)$$

where  $HanukkahCeleb_i$  is the number of candles lit in Hanukkah (which means the number of days celebrated) by household  $i$ ,  $PassoverCeleb_i$  is a dummy variable that equals 1 if household  $i$  celebrated Passover seder,  $Children_i$  is a dummy variable that equals 1 if household  $i$  has children,  $Denomination_i$  are dummy variables for the different Jewish denominations (orthodox, conservative, reform, or none),  $(Children * Denomination)_i$  are interaction variables of the children dummy variable and the various Jewish denomination dummies, and  $X_i$  are control variables such as age, gender, and income. The coefficients of interest are the  $\delta$ 's.

At the same time, Jewish individuals may be more responsive to Christmas if they view possible intermarriage or conversion more negatively. Specifically, we expect Jewish parents who care more about their Jewish identity to be more likely to celebrate Hanukkah. Therefore, we expect the effect of having children on Hanukkah celebration to be larger for Jews who feel a strong sense of belonging to Judaism. We run the following individual-level OLS regression:

$$HanukkahCeleb_i = \left\{ \begin{array}{l} \beta_0 + \beta_1 PassoverCeleb_i + \gamma' JewishIdentity_i \\ + \beta_2 Children_i + \delta' (Children * JewishIdentity)_i + X_i \beta_3 + \epsilon_i \end{array} \right\} \quad (2)$$

where  $HanukkahCeleb_i$ ,  $PassoverCeleb_i$ , and  $Children_i$  are as described above,  $JewishIdentity_i$  is individual  $i$ 's self-reported feeling of belonging to Judaism,  $(Children * JewishIdentity)_i$  is an



interaction variable between having children and the degree of Jewish identity, and  $X_i$  are control variables such as age, gender and income. The coefficient of interest is  $\delta'$ .

It is important to emphasize that reform (and conservative) Jews are very concerned about their children's conversion and intermarriage, and view themselves just as Jewish as orthodox Jews do. It is the more open environment through which they observe their Judaism that makes them at a higher "risk" of conversion or intermarriage. In contrast, the sense of belonging to Judaism may well capture "how Jewish" a family is, and how much they are worried about their children's intermarriage.

### 3.3 Results

Figure 1 presents the overall average intensity of Hanukkah and Passover celebration for each group (the two left panels), as well as the incremental effect of having children (the two right panels). That is, a point in the left panels represents the average intensity of celebration (of Hanukkah or Passover) of individuals in a given group, and the right panels present the difference, within each group, between those with children and those without. Since Hanukkah is a categorical variable with four categories and Passover is a dummy variable (see Appendix B for variable definitions and summary statistics), we standardize both to have an overall mean of zero and standard deviation of one, so that units are comparable. As could be expected, the left panels of Figure 1 show that Orthodox Jews are on average more likely than reform Jews to celebrate both holidays, and celebration of both holidays is much more likely for Jews who feel more belonging to the Jewish people. Most importantly, the intensity of Hanukkah and Passover celebrations is almost identical within each group. The right panels of Figure 1 show that, for all groups, having children increases the intensity of Hanukkah celebration by 0.2 to 0.5 standard deviations. Children also make Passover celebration more likely for almost all groups, but the (standardized) effect is not as large. Most importantly, individuals who are more likely to be affected by Christmas are affected more. In both right panels of Figure 1, the groups of individuals are ordered from those who are (*a priori*) least likely to be affected by the presence of Christmas to those that are most likely to be affected. Indeed, the effect of children on Hanukkah celebration increases in all panels as we move to the right. In contrast, the increased intensity of Passover celebration due to the presence of children does not show any obvious pattern.

Tables 2 and 3 subject the relationship between Hanukkah celebration and having children to

regression analysis, as described earlier. In both tables, columns (1) and (2) present linear probability models and columns (3) and (4) present probit regressions.<sup>5</sup> Table 2 suggests that having children is associated with more Hanukkah celebration, and that orthodox Jews celebrate Hanukkah most intensively, followed by conservative Jews, reform Jews and unaffiliated Jews. The key coefficients of interest are the interactions between having children and the various denominations. The table shows that, consistent with our hypothesis and with Figure 1, the effect of having children on Hanukkah celebration is highest for reform Jews and those without affiliation, followed by conservative Jews, followed by orthodox Jews. Notice that the regressions control for Passover celebration, which, as expected, is positively correlated with Hanukkah celebration. These results are quite stable across all columns of Table 2. Table 3 repeats a similar analysis, where instead of denominations, individuals are classified to different groups according to their sense of belonging to Judaism. The pattern is similar. Individuals who feel closer to Judaism celebrate Hanukkah more, and the incremental effect of having children is higher the closer individuals are to Judaism.

It is important to notice a key conceptual difference between the exercise we report in Table 2 and the one we report in Table 3. In the latter the effect of having children is highest for the groups who celebrate Hanukkah most intensively even in the absence of children. One could be concerned that these results could be driven by a level effect. That is, if the effect of children were multiplicative, rather than additive, the results may change. For this reason, we view the results in Table 2 as particularly reassuring, because in Table 2 it is the individuals who celebrate Hanukkah less who are more affected by the presence of children.

## 4 Evidence II: county-level analysis

### 4.1 Data

In this section we supplement the survey data analysis with data on actual purchasing behavior. We use three sources to construct the data. First, we collected weekly store-level data from a large retail chain, which operates stores in various parts of the U.S. In particular, we obtained data on the weekly sales of each of the Jewish products sold. “Jewish products” is a product category

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<sup>5</sup>In the latter we code the Hanukkah variable as a dummy variable that is equal to 1 when the original Hanukkah variable takes a value of 3 or 4. Other ways to code the variable do not affect the results. This is to be expected, as Hanukkah mostly takes values of 1 and 4 (see Appendix B).

used by the retailer. The data we obtained covers 1,109 stores during the period of 10/3/2004 to 10/08/2005. We aggregated these data to the county level (to match the other data sets described below) based on store zip codes, and classified sales into the different Jewish holidays based on dates (see Appendix B for details).<sup>6</sup>

We then matched these data with county-level data on 150 religious bodies collected through the “Religious Congregations Membership Study” in 2000. These data contain the number of adherents and the number of congregations in each county. We supplemented these with county-level census data. Appendix B describes all the variables used for the analysis, and provides summary statistics.

## 4.2 Empirical strategy and results

If the presence of Christmas is important, then we expect that Jewish households who live in areas with a large fraction of Jews are likely to live in Jewish communities, so the concern of Christmas may be less important. In contrast, it is natural to expect that Jews who live in mostly Christian locations will celebrate Hanukkah (compared with other holidays) more intensively. To test this hypothesis, we investigate whether expenditure on Jewish products during Hanukkah (compared with other Jewish holidays) are lower in counties that consist of fewer Jews. We run the following county-level regression:

$$\log \left( 1 + \frac{HanukkahExpenditure}{PassoverExpenditure} \right)_j = \beta_0 + \beta_1 \log \left( \frac{JewishAdherents}{TotalAdherents} \right)_j + X_j \beta_2 + \varepsilon_j \quad (3)$$

where  $\left( \frac{HanukkahExpenditure}{PassoverExpenditure} \right)_j$  is the relative expenditures (Hanukkah vs. Passover) on Jewish products in county  $j$ ,  $\left( \frac{JewishAdherents}{TotalAdherents} \right)_j$  is the fraction of Jewish adherents out of the overall adherents in county  $j$ , and  $X_j$  are control variables. The coefficient of interest is  $\beta_1$ , which we expect to be negative.

As Appendix B shows, there is a large variation in county sizes, and even larger variation in the number and size of stores of the retailer in different counties. This is the main reason that we work with ratios of the variables rather than levels. Some of the additional variables in the regressions control for the size of the county and the overall volume of sales.

An obvious concern about this exercise is selection. It seems likely that Jews who are concerned

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<sup>6</sup>We initially planned to also categorize the products by holidays, but it turned out that those Jewish products that had the most sale volume were hard to associate with specific holidays, leaving us with too little volume for the products we could categorize.

about their children converting would choose to live in larger Jewish communities, or in counties with higher fraction of Jews. While it is hard to fully address this selection problem given our data, we note that this possible selection issue will confound the analysis and work against our hypothesis. If individuals who care more about Judaism and therefore live in larger Jewish communities celebrate Hanukkah more intensively, this will bias our estimate of  $\beta_1$  upwards.

Table 4 presents the results. The top panel presents regression of the ratio of Hanukkah to Passover sales, and in the bottom panel we normalize by Rosh Hashana sales instead of Passover. Across all specifications, the coefficient on the ratio of Jewish adherents to total adherents is negative, with elasticities ranging from  $-0.01$  to  $-0.07$ . None of the other control variables are statistically significant. Thus, we conclude that individuals who live in larger Jewish communities, who are presumably less affected by the presence of Christmas, celebrate Hanukkah less intensively compared with how much they celebrate other Jewish holidays.

## 5 Conclusion

In this paper we present evidence that is largely consistent with a story that the importance of Hanukkah among American Jews is driven by the proximity (in the time dimension) of Hanukkah to Christmas, and that many American Jews use Hanukkah as a way to provide their children with an exciting alternative. Extrapolating this story out of the data, it may also explain why Hanukkah is such a popular and important holiday among Jews living in the United States, even though it is a much less important Jewish holiday in Israel, where “competition” from Christmas is largely absent. Hanukkah is not the only holiday that serves minorities as a substitute for Christmas. Kwanzaa, an African-American holiday celebrated around Christmas (almost entirely in the U.S.), also “competes” with Christmas. The founder of Kwanzaa stated that “...it was chosen to give a Black alternative to the existing holiday and give Blacks an opportunity to celebrate themselves and history, rather than simply imitate the practice of the dominant society.” (p.21 Kwanzaa: origin, concepts, practice). It is worth noting that Christmas itself and the dates of its celebration were influenced by earlier pagan winter celebrations.

One natural idea for further research is to investigate the behavior of Jews who live in predominantly Muslim countries, and analyze whether Jews in such countries respond to “attractive” Muslim holidays. More broadly, we think that this paper highlights the fact that religious behavior

is endogenous to the environment in which it takes place. We looked at Judaism, but it is natural to speculate that other religions respond in other contexts in similar ways. This seems a promising avenue for future research.

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## Appendix A: what is being celebrated in Hanukkah

Hanukkah commemorates the rededication of the Temple of Jerusalem after its desecration by Antiochus IV, king of Syria and ruler of the land of Israel. Around 200 BCE Jews lived autonomously in the land of Israel. The Jews paid taxes to Syria and accepted the king’s legal authority. By and large, they were free to follow their own faith. By 175 BCE, Antiochus IV Epiphanes ascended to the Seleucid throne and Jews were gradually forced to violate their faith. Jews rebelled, the Temple in Jerusalem was looted, and Judaism was outlawed. In 167 BCE, when Antiochus ordered an altar to Zeus brought to the Temple, a Jewish priest (Mattathias) and his five sons led a rebellion against Antiochus. The Jewish revolt against the Seleucid monarchy was eventually successful, and the Temple was liberated. The festival of Hanukkah was instituted by Judah Maccabee and his brothers to celebrate this event. According to the Talmud, at the re-dedication of the Temple in Jerusalem following the victory of the Maccabees over the Seleucid Empire, there was only enough oil to fuel the menorah in the Temple for one day. Miraculously, the oil burned for eight days, the time needed to prepare a new supply of oil. Hanukkah commemorates this miracle and symbols the miraculous survival of the Jewish people through millennia of suffering and persecution.

## Appendix B: variable definitions and summary statistics

### Survey data variables ( $N=5,148$ )

- **Hanukkah celebration:** (0.6% of the values missing) The answer to “Number of nights you lit candles last Hanukkah.” The four possible answers were “none of the nights” (29%; coded as 1), “some nights” (16%; coded as 2), “most nights” (9%; coded as 3), and “all eight nights” (46%; coded as 4).
- **Passover celebration:** (1.0% of the values missing) The answer to “Held/Attended Seder last Passover.” The two possible answers were “yes” (67%; coded as 1) or “no” (33%; coded as 0).
- **Children:** (0.7% of the values missing) The answer to “Number of children (under 18) in household” (0: 71%, 1: 13%, 2: 11%, >2: 5%).
- **Denomination:** (14.9% of the values missing) The answer to “Identification with Jewish religious denominations” (the first mention; more than 98% of respondents did not mention a second). There were dozens of different answers, and we code only the most common four – “orthodox” (9%), “conservative” (25%), “reform” (32%), and “just Jewish” (20%) – with everyone else (14%) classified as “other.”
- **Belonging:** (13.7% of the values missing) The answer to “You feel a strong sense of belonging to the Jewish People.” The five possible answers were “strongly agree” (5%), “somewhat agree” (9%), “neither agree nor disagree” (1%), “somewhat disagree” (29%), and “strongly disagree” (56%).
- **Demographics:** See Table A1 for summary statistics of age, household income, and gender (1 if Male).

### County-level variables ( $N=105$ )

The data covers all counties in which we observe at least one retailer store. There are 105 counties, covering the following states (number of counties in parentheses): CA (36), WA (11), TX (10), MD (9), IL (6), VA (6), AK (5), HI (4), NJ (4), PA (4), MT (3), NV (3), DE (2), DC (1), ID (1). Summary statistics of all variables are presented in Table A1.

- **Sales of Jewish products:** total dollar value of sales of all products categorized (by the retailer) as “Jewish products” in all stores operating in the county.<sup>7</sup>

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<sup>7</sup>There are almost 3,000 distinct products (UPCs or “barcodes”) that are classified as Jewish, although only a small fraction of them would typically be available in a given store. The products cover a range of food items (Matzo balls, Gefilte fish, etc.), although they also include kosher drinks, and non-food items typically sold in grocery stores, such as Hanukkah candles.

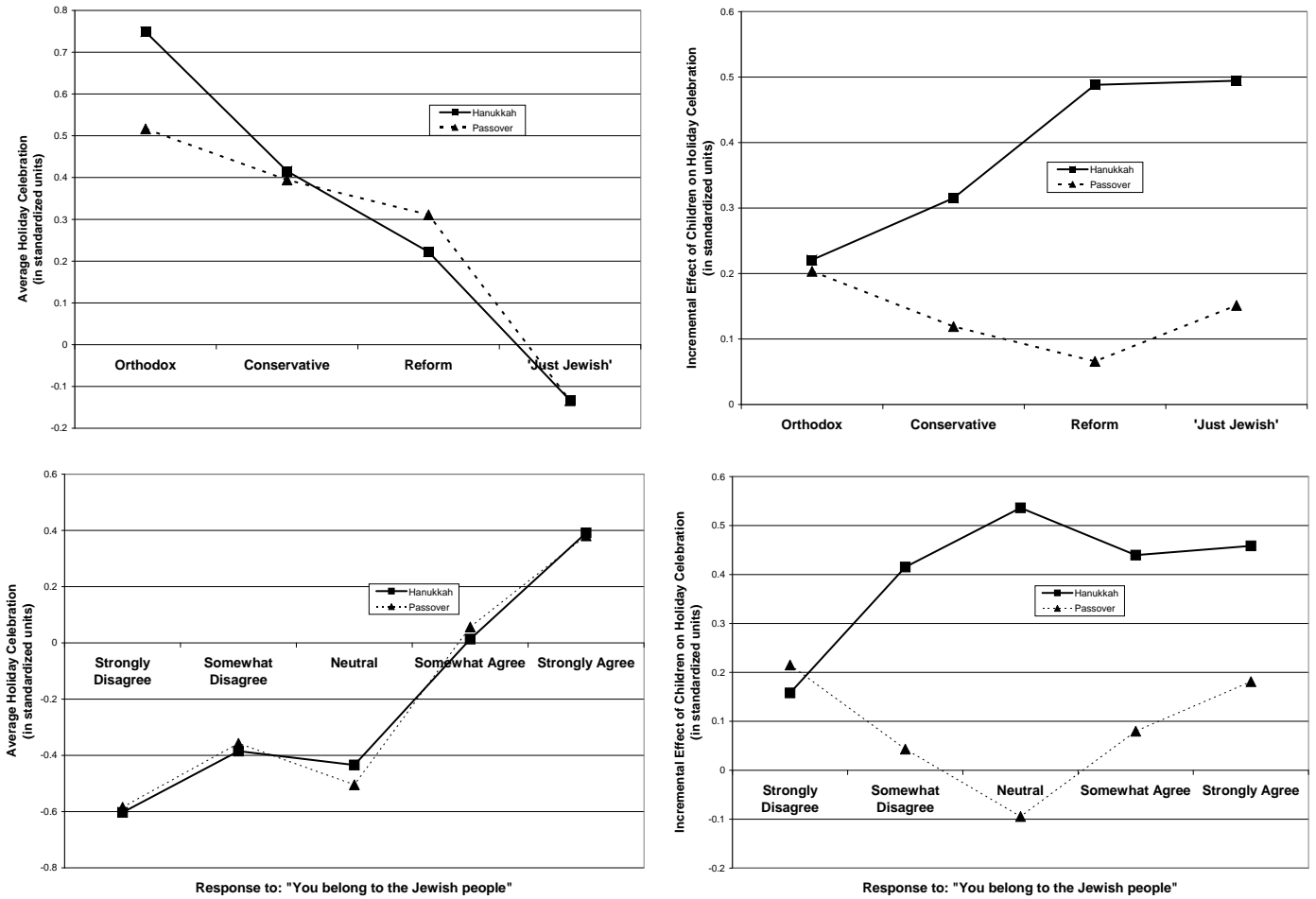
- **Total sales:** the sum of all Jewish product sales over the entire period we observe it (10/3/2004 - 8/16/2005).
  - **Rosh Hashana (Jewish new year) sales:** the sum of all Jewish product over the week of Rosh Hashana and the week that preceded it.
  - **Hanukkah sales:** the sum of all Jewish products sales over the week of Hanukkah and the week that preceded it.
  - **Passover sales:** the sum of all Jewish product sales over the week of Passover and the two weeks that preceded it.<sup>8</sup>
- **Adherents:** the number of Jewish, Protestant, and Catholic adherents in the county, based on the “Religious Congregations Membership Study” from year 2000. Adherents of other streams/religions are excluded from the analysis. The excluded adherents account for 3.2% of the total adherents in the counties we use for the analysis. Note that total adherents account for only 34.4% of the total population in the counties we use.

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<sup>8</sup>Preparation for Passover dinner is typically longer, which is the reason why we use a slightly longer time window to define Passover sales. Results are similar if we use the same window for all holidays.



Figure 1: Intensity of Hanukkah and Passover Celebrations



In both figures on the left, the plotted points represent the sample means (of the standardized Hanukkah and Passover variables) of the corresponding category defined on the horizontal axis. These do not average to zero in the top left panel because there is an omitted "other" category (which is hard to interpret, so is not in the figure). In both figures on the right, the plotted points represent the difference in means (of the standardized Hanukkah and Passover variables) between those households with children and those with no children, for the corresponding category defined on the horizontal axis.

Table 1: Survey Results Regarding the Perceived Importance of Jewish Holidays

	Israel Survey	U.S. Survey
Respondents	84	123
Do <u>you</u> consider this holiday among the 3 most important Jewish holidays?		
Rosh Hashana	90.5%	78.9%
Sukkot	34.5%	8.1%
Hanukkah	38.1%	68.3%
Purim	8.3%	8.9%
Passover	96.4%	93.5%
Shavuot	26.2%	11.4%
Don't know	1.2%	15.4%
Do you think <u>your classmates</u> consider this holiday among the 3 most important Jewish holidays?		
Rosh Hashana	88.1%	78.0%
Sukkot	42.9%	1.6%
Hanukkah	29.8%	95.1%
Purim	10.7%	4.1%
Passover	95.2%	91.1%
Shavuot	21.4%	5.7%
Don't know	4.8%	5.7%

The survey participants are undergraduate students of economics in Tel Aviv University and Stanford University. The table reports the percentages in which each holiday was checked (as one of the 3 most important) by each participant. Note that the percentages do not add up to 300% exactly; this is because a small number of respondents did not mark a full list of 3 holidays. We did not adjust the way we count their responses (e.g. by reweighting).

Table 2: Determinants of Hanukkah Celebration by Jewish Denomination

	OLS Regressions				Probit Regressions			
	Dep. Var.: Hanukkah Celebration (standardized)				Dep. Var.: Hanukkah Celebration (binary)			
	(1)		(2)		(3)		(4)	
	Coef.	Std. Err.	Coef.	Std. Err.	dF/dX	z-stat	dF/dX	z-stat
Passover Celebration (standardized)	0.339	(0.014)	0.346	(0.017)	0.157	(18.46)	0.163	(15.90)
Orthodox Jewish	0.501	(0.057)	0.571	(0.073)	0.331	(9.85)	0.350	(8.24)
Conservative Jewish	0.216	(0.029)	0.283	(0.039)	0.245	(9.00)	0.246	(7.40)
Reform Jewish	-0.003	(0.026)	0.001	(0.034)	0.143	(5.16)	0.107	(3.19)
"Just Jewish"	-0.206	(0.032)	-0.139	(0.040)	0.055	(1.82)	0.044	(1.23)
(Children>0) * Orthodox Jewish	0.159	(0.081)	0.126	(0.100)	0.162	(2.56)	0.135	(1.69)
(Children>0) * Conservative Jewish	0.274	(0.058)	0.216	(0.070)	0.187	(5.18)	0.167	(3.69)
(Children>0) * Reform Jewish	0.471	(0.065)	0.420	(0.074)	0.228	(7.03)	0.219	(5.59)
(Children>0) * "Just Jewish"	0.445	(0.049)	0.493	(0.059)	0.243	(8.98)	0.265	(7.99)
Income (standardized)			0.019	(0.016)			0.020	(1.97)
Age (standardized)			-0.024	(0.016)			-0.007	(-0.71)
Male			-0.146	(0.030)			-0.082	(-4.23)
Number of observations (households)	4,341		3,080		4,349		3,086	
R-Squared / Pseudo R-Squared	0.274		0.285		0.174		0.188	
Log Likelihood					-2,373.1		-1,679.3	

“Standardized” implies that the value of the variable was standardized to have mean zero and a standard deviation of one (in the entire sample) to ease interpretation of the coefficients.

All regressions also include the children dummy interacted with the “other” denomination category, so the coefficients on the interaction terms should be interpreted as the incremental effect of children for each category.

The dependent variable in the probit regressions is equal to 1 if Hanukkah celebration is equal to 3 or 4 (a larger number means more celebration). The results are very similar if we define the dependent variable to be 1 for only values of 4, for values of 2-4, or if we run the regression as an ordered probit.

Table 3: Determinants of Hanukkah Celebration by “Jewish Belonging”

	OLS Regressions				Probit Regressions			
	Dep. Var.: Hanukkah Celebration (standardized)				Dep. Var.: Hanukkah Celebration (binary)			
	(1)		(2)		(3)		(4)	
	Coef.	Std. Err.	Coef.	Std. Err.	dF/dX	z-stat	dF/dX	z-stat
Passover Celebration (standardized)	0.443	(0.012)	0.426	(0.014)	0.170	(19.91)	0.171	(16.64)
"Belong to Jewish People? Strongly Disagree"	-0.358	(0.067)	-0.254	(0.078)	0.160	(3.20)	0.170	(2.80)
"Belong to Jewish People? Somewhat Disagree"	-0.337	(0.049)	-0.226	(0.057)	0.174	(4.36)	0.179	(3.80)
"Belong to Jewish People? Neutral"	-0.336	(0.138)	-0.328	(0.161)	0.135	(1.44)	0.037	(0.30)
"Belong to Jewish People? Somewhat Agree"	-0.132	(0.028)	-0.043	(0.034)	0.303	(9.96)	0.306	(8.41)
"Belong to Jewish People? Strongly Agree"	0.121	(0.020)	0.222	(0.028)	0.454	(15.53)	0.462	(13.02)
(Children>0) * "Belong? Strongly Disagree"	0.058	(0.123)	-0.022	(0.135)	0.067	(0.85)	0.003	(0.03)
(Children>0) * "Belong? Somewhat Disagree"	0.407	(0.094)	0.336	(0.106)	0.225	(4.24)	0.206	(3.25)
(Children>0) * "Belong? Neutral"	0.578	(0.296)	0.662	(0.348)	0.339	(2.24)	0.404	(2.34)
(Children>0) * "Belong? Somewhat Agree"	0.414	(0.051)	0.417	(0.059)	0.250	(8.17)	0.256	(6.90)
(Children>0) * "Belong? Strongly Agree"	0.377	(0.037)	0.357	(0.046)	0.287	(10.78)	0.263	(7.93)
Income (standardized)			0.028	(0.014)			0.013	(1.28)
Age (standardized)			-0.016	(0.015)			-0.023	(-2.26)
Male			-0.239	(0.026)			-0.078	(-4.06)
Number of observations (households)	5,085		3,663		5,099		3,672	
R-Squared / Pseudo R-Squared	0.315		0.343		0.252		0.263	
Log Likelihood					-2,622.8		-1,870.9	

“Standardized” implies that the value of the variable was standardized to have mean zero and a standard deviation of one (in the entire sample) to ease interpretation of the coefficients.

All regressions were run with a full set of dummy variables (and no constant) and full set of dummy variables that are interacted with the children dummy, so the coefficients on the interaction terms should be interpreted as the incremental effect of children for each category.

The dependent variable in the probit regressions is equal to 1 if Hanukkah celebration is equal to 3 or 4. The results are very similar if we define the dependent variable to be 1 for only values of 4, for values of 2-4, or if we run the regression as an ordered probit.

Table 4: County-Level Regressions of Hanukkah-Related Expenditure

**Panel A. Dependent variable: Log (Hanukkah Sales / Passover Sales)**

	(1)	(2)	(3)	(4)
Log (Jewish adherents / Total adherents)	-0.010 * (0.006)	-0.010 * (0.006)	-0.015 ** (0.006)	-0.017 ** (0.007)
Log (Protestant adherents / Total adherents)	-0.027 (0.019)	-0.027 (0.021)	-0.024 (0.021)	-0.026 (0.022)
Log (Total adherents)		0.000 (0.007)	-0.012 (0.010)	-0.013 (0.010)
Log (Total sales of Jewish products)			0.012 * (0.007)	0.013 (0.008)
Log (Adherents Herfindahl Index)				-0.036 (0.074)
Log (Median county income)				-0.010 (0.036)
Number of observations (counties)	105	105	105	105
R-Squared	0.036	0.036	0.063	0.066

**Panel B. Dependent variable: Log (Hanukkah Sales / Rosh-Hashana Sales)**

	(1)	(2)	(3)	(4)
Log (Jewish adherents / Total adherents)	-0.057 *** (0.021)	-0.052 ** (0.021)	-0.056 ** (0.025)	-0.074 ** (0.030)
Log (Protestant adherents / Total adherents)	-0.050 (0.073)	-0.090 (0.079)	-0.086 (0.080)	-0.115 (0.085)
Log (Total adherents)		-0.036 (0.026)	-0.045 (0.038)	-0.039 (0.040)
Log (Total sales of Jewish products)			0.011 (0.033)	0.006 (0.035)
Log (Adherents Herfindahl Index)				-0.326 (0.308)
Log (Median county income)				0.010 (0.134)
Number of observations (counties)	97	97	97	97
R-Squared	0.074	0.092	0.093	0.105

\* Statistically significant at a 10% confidence level; \*\* Statistically significant at a 5% confidence level.

See Appendix B for variable definitions.

Total sales of Jewish products contains Hanukkah and Passover (and Rosh Hashana) sales. The results remain essentially the same if this is replaced by sales of Jewish products over the entire year except these holidays.

Table A1: Summary Statistics

	N	Mean	Std. Dev.	10th %	50th %	90th %
<b><u>Individual-level survey variables<sup>a</sup></u></b>						
Income (categorical, in \$000)	3,751			<15	50-75	150-200
Age	5,014	50.2	18.2	26	49	77
Male Dummy	5,148	0.443				
<b><u>County-level variables</u></b>						
Sales of Jewish products (\$)						
Total	105	26,351	59,662	594	5,673	75,160
Rosh Hashana	105	1,551	3,951	12	218	4,635
Hanukkah	105	1,041	2,383	14	213	3,752
Passover	105	8,489	21,754	108	1,481	21,943
Adherents (000)						
Jewish	105	18.8	60.8	0.1	2.3	38.3
Catholic	105	180.1	436.0	8.0	68.3	306.4
Protestant	105	108.6	167.4	12.3	57.7	196.5
Median income (\$000)	105	50.4	11.8	34.7	48.6	67.0

<sup>a</sup> The table presents summary statistics of the demographic survey variables. Summary statistics of other survey-related categorical variables are presented in the text of the appendix.