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REFERENCE GROUPS AND HOUSEHOLD CONSUMPTION: EVIDENCE FROM TURKEY

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Abstract

It is well-known that relative concern influences many economic choices, including consumption decisions. Recently, several studies have linked the gradually falling savings rate in the United States since the 1980s with both relative concern and increased inequality. In this paper, we test for the presence of relative concern (i.e., peer effects) in consumption decisions for Turkey. In particular, we test whether households are affected by the purchases of other households who constitute their reference group. This is one of the few studies that investigate relative concern in a developing-country setting. Drawing on nationally representative data from the Turkish Household Budget Survey for the years 2003-2012, we examine different reference groups comprised of members having the same education level, urban-rural residence status, or age range. We find that the hypothesis is validated and that non-rich households are affected by perceiving the consumption of more prosperous individuals of the same educational background. However, we do not observe any group effects for upper-income households.

JEL Codes: C21, D03, D12

Keywords: Household expenditures, reference group, peer effects, developing country, Turkey

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1. Introduction

The aim of this study is to examine the determinants of household consumption and test for the presence of relative concern in consumption decisions in Turkey. Here, the basic intention is to identify the factors that affect household purchases and, especially, the examination of "group effects" (or peer effects) in such decisions, which is an uninvestigated topic for Turkish households.

Peer effects can be defined as the motive for changing the behavior of oneself in response to the behavior or action of others in one's reference group. The importance of this catching-up behavior has been well documented by theoretical and empirical studies. Hence, the main purpose of our study is to investigate peer effects in household consumption by exploiting a large dataset on the consumption behavior of Turkish households.

In our study, we empirically investigate peer effects, together with other determinants of household consumption, by working with the nationwide representative Turkish Household Budget Survey (HBS) for the years 2003-2012. Especially today, now that Turkey is seeking a way out of its middle-income trap, it is hoped that the findings on household consumption decisions will provide important guidance for Turkish economic policymakers seeking to boost the national savings rate and, in particular, design approaches tailored to various income groups.

Our first goal is to establish whether peer effects exist or not in this area. The question of what constitutes a reference group is somewhat controversial. Survey results have revealed that peer effects are more prominent in those with a similar education level rather than within the same age group. Considering this indeterminacy, we test the existence of group effects for separate reference groups. Specifically, we test peer effects for groups formed on the basis of same educational attainment, age range, and geography. Moreover, we test the impact of household characteristics and group effects separately for various urban-rural settings, income groups, and education levels.

In the first part of this paper, we detail the relationship between households' consumption and characteristics that are expected to influence their decisions to purchase goods, such as total household income, number of children, age, education level of the head of the household, and rural-urban residence status. In the second part, the existence of group effects on household consumption is investigated. We also question whether group effects vary according to the income quartiles. In this respect, the analysis is conducted separately for different income groups. Specifically, the existence and degree of peer effects on

middle- and low-income families are tested separately. Here, our goal is to distinguish the income group where relative concerns (i.e., peer effects) are more apparent. Additionally, we examine households as defined by their residence status. Particularly, we question whether consumption determinants and peer effects vary depending on the rural-urban residential setting. Seeking another valuable insight, we test whether relative concerns are upward-looking, such that non-rich households are affected by the consumption of rich ones.

The rest of the paper is organized as follows. After summarizing papers related to our study in the literature review in Section 2, we introduce the main data source and the empirical methodology applied in our study in Sections 3 and 4, respectively. Following the presentation and discussion of the results in Section 5, the paper concludes in Section 6.

2. Literature Review

2.1. Literature on Peer Effects

Evidence from social psychology, neuroscience, econometrics, and experimental economics indicates that humans usually compare themselves with others who occupy their reference group, and that the outcome of that engagement reflects on their sense of well-being. Individuals may feel degrees of satisfaction and experience a wide range of reactions, depending on whether they experience a negative feeling from being relatively deprived or a positive feeling from being better off, and they can change their behavior in response to that emotion.

Relative concern is especially central to feelings of happiness. An individual who earns a lower income compared to others in a certain group will feel happier if he/she earns the same amount when in a group of individuals who earn less.[1] In his seminal study, Easterlin(1974) documents that relative position could explain the observation that the self-reported happiness of individuals varies directly with income at a given point in time, but that the average level of happiness tends to be highly stable over time despite tremendous income growth, referred to as the Easterlin paradox. Easterlin also shows that the ratio of one's own income to the reference group's average income is more important for an individual's happiness than is the absolute value of one's own income. There are many studies on this so-called "relative income hypothesis"

[1] Duesenberry (1949) and Leibenstein (1950) can be considered the initial studies that document the importance of group effects on individual well-being and effect of relative concern in consumption decisions.

and its effect on happiness (for a summary of these studies, refer to Frey and Stutzer (2002) and Layard (2009)).

The concept of "conspicuous consumption," introduced to the literature by Veblen (1899), is based on the thesis that besides consumption, individuals also gain a certain utility from their status in society. Hence, to create a perception of higher status, they may increase their consumption of certain products considered symbols of high status, or imitate the consumption patterns of those in higher income classes. Basically, peer effects are what lie at the root of this conspicuous consumption behavior. When these effects are present, people start comparing their own consumption with that of others. Thus, in addition to the utility gained by consuming a specific good, the change in status (or relative ranking) in the social hierarchy gained through consuming that good also becomes important in individuals' consumption decisions. In such a situation, an individual will engage in consuming more than he/she otherwise would.

Moreover, there are studies that analyze the impact of group effects on other areas, such as work motivation, education, and real-estate acquisition. Theoretical studies investigate what possible consequences the degree of relative concern can have on economic outcomes, such as total consumption, investment, growth, and wealth accumulation. For example, an individual may exert extra effort to not fall behind his/her comparison group, referred to as the motive of "catching up with the Joneses" in the economics literature. This "falling behind" may be applicable across situations, such as wealth, income, possession of tangible assets, feeling of happiness, hours worked, marriage, home-ownership decisions, and health.

Conspicuous consumption arising from relative concern may lead an individual to consume more than he/she would in the absence of this motive. Consequently, different macro-economic effects are expected to occur, such as waste of productive resources in the economy, overconsumption, and high debt ratios. Relative concern may also force an individual to engage in unexpected activities, like working more to obtain better relative income or migrating elsewhere to secure a better position in life (Fan and Stark, 2011).

Recently, several studies have linked the excessive credit growth and high consumption in the period preceding the latest global crisis with conspicuous consumption and group effects. Frank et al. (2014) explain how an increase in consumption starting from the top income group in society has spread to the lower income groups; they argue that this peer-effect motive lies at the heart of the domino effect, which they refer to as "expenditure cascades," eventually sparking the dire sequence culminating in the worldwide crisis. The

gradually sinking savings rate in the United States since the 1980s has also been ascribed to this effect—as well as greater inequality.[2]

This thesis, which has also gained attention in the print media, has led to a revival of work on conspicuous consumption by economics researchers. Kumhof et al. (2015) and Ravenna and Vincent (2014) theoretically demonstrate how the growing income inequality and associated conspicuous consumption can ultimately cause excessive credit expansion, which later triggers such a crisis. Milanovic (2009), Stiglitz (2009), Fitoussi and Saraceno (2010), and Rajan (2010) are examples of studies that provide similar arguments and relate such groups' effects in various countries to global crises.

2.2. Literature on Peer Effects in Different Countries

With the growing interest in peer effects in consumption, new empirical studies have emerged to report on the consumption of non-rich households vis-à-vis that of rich households. The US is famous for its dramatic jump in real income over the last three decades for those at the top of the income-distribution melee.This has happened in tandem with an almost dormant median household income and higher inequality within the states of the country (Autor et al., 2008; Goldin and Katz, 2007). Based on these observations, Bertrand and Morse (2013), using the household consumption data from the Consumer Expenditure Survey, show that the rising consumption of the rich in the US has induced non-rich households to consume a greater share of their income. Drechsel-Grau and Schmid (2014) have also found support for the "keeping up with the Joneses" behavior in Germany. In contrast, Quintana-Domeque and Wohlfart (2016), using food-consumption data from Britain, find no effect of the elevated consumption of the rich on that of non-rich households. However, their finding is not surprising, as it is in line with that of Alessie and Kapteyn (1991), who report that food consumption is rather immutable, whereas other consumption categories are influenced by the consumption of the reference group.

The recently growing literature on peer effects in consumption is mostly derived from studies of developed countries. However, it is known that behavioral decisions, like those governing consumption, are influenced by culture and, hence, studies of consumption yield widely disparate results for different cultures. Redding (1990) and Wang and Ahuva (1998) show that models based on consumers in Western countries are inadequate for a full description of consumption behavior in Eastern countries. Moreover, they also demonstrate

[2] See Chrystia Freeland's article, "Keeping Up with the Slightly Richer Neighbors," in the *New York Times*, June 22, 2012.

that conspicuous consumption is more widespread in interdependent and hierarchical cultures, such as Asian ones, than in individualistic cultures like Europe and America, and that consumers in Eastern countries buy more goods that symbolize a desired position in their socio-economic hierarchy than do those in the West. Accordingly, the importance of status and, therefore, group effects in consumption (i.e., relative consumption concern) is higher in cultures that value group norms and are more socially connected than in independent cultures.

As shown by empirical studies, the existence and strength of peer effects may vary from country to country based on a number of factors, such as the political regime (see Friehe and Mechtel, 2014),[3] degree of corruption in the economy (Gokcekus and Suzuki, 2014),[4] religion (Khamis et al., 2012),[5] and ethnicity (Charles et al., 2009; Kaus, 2013).[6]

When these findings on the importance of group effects and their varying strength by culture and country are considered, it can be noted that the literature on developing countries, which are rapidly advancing and becoming more active players in the world economy, is quite limited compared to that on the developed economies. For this reason, as a country straddling Asia and Europe and representing a transition point between different cultures, Turkey is a uniquely appropriate setting for investigation of group effects in consumption.

In Turkey, the role of relative concerns in the consumption decisions of households may differ from that in other countries due to its cultural, religious, or other social features. Therefore, for several reasons, when examining the impact of group effects for Turkey, we expect spending patterns there to be unlike those in developed countries, as well as those in other emerging economies. First, Turkey is the only Muslim country among the G-20 member countries, which produce around 85% of the world's GDP. Compared to most of the other OECD nations, it is still considered a developing economy. Moreover, given the close social relationships in Turkish society, group ef-

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[3] Friehe and Mechtel (2014), in their study of the effect of the political regime on conspicuous consumption, showed that this effect was more prevalent in East Germany than in West Germany, and that this difference persisted even after the merging of the two countries.

[4] Gokcekus and Suzuki (2014) find a positive relationship between conspicuous consumption and corruption among OECD countries.

[5] Khamis et al. (2012) find differences in status-signaling motive across groups with distinctive social identities in India, some of which may be related to religion.

[6] Charles et al. (2009) find that group effects differ between African-Americans and Caucasians in the United States, while Kaus (2013) shows differences in group effects among black and white South Africans.

fects are expected to be stronger than in Western countries, where individualism is common. However, Turkey is also seen as separate from other emerging economies thanks to its own unique geography, culture, religion, and history, all of which affect social interactions and economic decisions. Furthermore, Turkey has been an independent nation and one with a liberalized economy for much longer than many others in the emerging-economy category. That being the case, its exposure to Western cultures and foreign products has a longer history than do the others.

After liberalizing its economy in the 1980s, Turkey experienced a period of rapid transformation. Not only have its consumers gained access to foreign goods and lifestyles, but the country has also experienced one of the fastest rates of urbanization of any country worldwide. Since the 1980s, its urban population has increased by 34.3 million. Moreover, the share of Turkey's middle class has grown, from 18% of the population in 1993 to 41% in 2010 (World Bank, 2014). While Turkey suffered a decline in its Gini coefficient, from 0.48 in 1994 to 0.41 in 2007, it still has one of the highest levels of income inequality of all the OECD countries.[7] However, there has been an upward trend in recent years, and both regional and inter-regional imbalances have been on a reverse track in the last four years (Filiztekin, 2015). At the same time, the rise of the urban middle class has influenced the national lifestyle, raising the level of families' exposure to other social classes and to various means of consumption. With the changing income distribution, relative concerns may have become more dominant in spending decisions in this emerging economy, and a race may have begun toward consumption in order to signal status.

2.3. Literature on Consumption Behavior in Turkey

Studies of the determinants of consumption related to Turkey can be divided into two groups. The first group looks into the determinants of aggregate consumption using time-series data at the aggregate level, referring to the total consumption expenditure component of GDP from national accounts. These studies analyze the effects on consumption of macroeconomic variables, such as interest rates, growth, and consumer confidence (e.g., Akkoyunlu, 2002; Aydede, 2008; Özcan et al., 2003).

The second group consists of studies that take a micro approach and seek the determinants of consumption at the household level. These studies generally

[7] The decline in inequality in the period from 1994 to 2003 is attributed mostly to the fall in within-group inequality, whereas in the first half of the 2000s, it was basically due to convergence between groups.

focus on a particular consumption subcategory (such as household goods) or specific product group (such as furniture). Some studies investigate consumption at a more micro level and focus on lower consumption categories (such as furniture) or single consumption items (tables). Many of these studies concentrate on food products and, especially, on items like milk or meat, while others are based on survey data conducted in Turkey in a particular region or province (e.g., Akpınar et al., 2009; Uzunöz and Karakaş, 2014).

The few studies that investigate total overall consumption for Turkey using household data either concern themselves only with a certain time period, such as a crisis or Ramadan, or are confined to a particular year.[8] There are also studies that use the HBS data to learn about the consumption of a particular group of products throughout Turkey.[9] These studies mainly focus on estimating the price and income elasticity of various consumption groups, and they differ considerably from our study in terms of scope and structure.[10] To the best of our knowledge, no previous study has researched total household consumption using the representative nationwide survey for Turkey from a similar perspective, for an extended period of time, and, especially, by incorporating the peer-effects motive for Turkish households.

The lack of panel data on household consumption for Turkey, where the same households are examined over years, may explain the lack of research in the field. However, through the surveys conducted by the Turkish Statistics Institute (TurkStat) since 2002, enough data have now been collected to work with. Although the data are cross-sectional, the HBS is still a valuable data source that can shed light on important questions. Our goal is to identify the factors affecting consumption behavior and, in particular, to detect peer effects by exploiting this large dataset on the consumption behavior of Turkish households.

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[8] Çelen (2015) investigates alcohol consumption during Ramadan; Duygan-Bump (2005) examines the effects of the 1994 financial crisis on durable goods consumption; Çağlayan and Astar (2012) address the urban and rural divide in household-consumption determinants; and Şahinli and Özçelik (2009) studies 12 product groups for the year 2003.

[9] Şahinli (2013) reports on food and non-alcoholic beverages; Şahinli and Özçelik (2015) deal with beer, milk, and cigarettes; and Şahinli and Fidan (2012) specialize in food expenditures.

[10] For that purpose, these studies apply methods such as ideal demand systems. However, the effect of household characteristics, such as demographic variables, on household consumption has not been investigated in these studies.

3. Data Description

The data in this study are acquired from the Turkish HBS, a nationally representative household survey, conducted since 2002 by the TurkStat.[11] In the survey, the final sampling unit is defined as the household, and a two-stage stratified cluster methodology has been used.

The households covered in our study are based on the definition by the TurkStat: a household is "*a community consisting of one or more than one person, living in the same house, housing, or part of the housing, who do not separate their income and expenses, who participate in household services and management, regardless of whether they have kinship or not.*" In the survey, all residential areas within Turkish borders are included and are classified into two categories: rural and urban settlements. Urban settlements are places with populations greater than or equal to 20,001, while rural settlements are defined as areas with populations of less than 20,000. Only the population in retirement homes, nursing homes, prisons, military barracks, private qualified hospitals, and hotels (defined as corporate population), as well as immigrants, are kept outside the scope of study.

The HBS data consist of survey information obtained from a varying number of sample households per month between January 1st and December 31st of that year. The HBS asks detailed questions on consumption expenditures, income, employment status, and demographic characteristics. The consumption data, collected according to international standards, is a major source of information on patterns of consumption expenditure by socio-economic groups and rural versus urban settlements, and they also play a part in the construction of the Turkish consumer price index.

Consumption expenditures encompass market purchases as well as the use of the stocks of one's own production, consumption of goods and services brought home from work, cash and non-cash gifts received from organizations or other households, and voluntary contributions to insurance (e.g., health, life, motor vehicle, and other types of insurance). They exclude transfers to organizations or other households (e.g., cash contributions and gifts), expenditures for saving purposes, and debt repayments. The reference period is the survey month for non-durable consumption and the previous year for durable consumption. As the survey is conducted throughout the year, the value of consumption is adjusted using a monthly price index to account for price changes during the year.

[11] The dynamic database for HBS data is provided online by the TurkStat (http://www.tuik.gov.tr). The microdata can be obtained in CD-ROM form from the TurkStat upon official request.

We pool cross-sectional data from the 2003-2012 waves of the survey, which are collected independently in each wave. Moreover, in each wave, more than 8,000 households were interviewed. Each year, the number of household samples varies. Due to the differences in the coding of the datasets between years, special attention was paid to ensure consistency under a common code. Any discrepancies in survey data between years are identified and the required extraction and encoding are performed accordingly.[12] In addition, considering the possibility of incorrect coding in this type of survey data, we give particular attention to data cleaning. Households with zero or negative disposable income (nine households) and those with missing consumption data (ten households) are excluded from the study.[13] These reports are assumed to be the result of incorrect coding. However, it is also possible, though rare, that an income for that year was not obtained. Irrespective of the cause, these outliers are not part of our study. Others that are sidelined are some households without valid information on educational attainment. Information on the number of households included in our study after the exclusion is given in Table 1. Year 2003 households are used only to form the reference values for the 2004 wave and are not included in the estimations.

Table 1. Sample Sizes in Different Waves of Turkish Household Budget Surveys (HBS)

Year	Number of Households From Survey	Percent
2003	25,764	-
2004	8,544	10.42
2005	8,551	10.69
2006	8,556	10.78
2007	8,543	10.56
2008	8,549	10.85
2009	10,046	11.23
2010	10,082	11.47
2011	9,918	11.77
2012	9,987	12.22
Total	108,540	100

Source: Authors' calculations using HBS data.

[12] As an example, while for the survey years 2003, 2004, and 2005, an age range is provided, for the year 2006 and afterward, the exact age of the household is specified.

[13] A total of 19 excluded households are dispersed quite evenly across survey years: two in 2003, eight in 2005, two in 2006, five in 2007, one in 2008, and one in 2011.

4. Empirical Method and Identification Issues Related to Peer Effects

Our main purpose is to test whether the consumption decisions of households are influenced by the consumption of the rich households in their reference group. We estimate the regression equations in the following form.

$$\boldsymbol{C_{it} = b_0 + b_1 Y_{it} + b_2 Y_{it}^2 + b_3 C_{it}^R + B_4 X_{it} + B_5 T_t + \epsilon_{it}} \quad (1)$$

In Equation (1), total consumption (C_{it}) for household I in year t is expressed as a function of household disposable income (Y_{it}) and its square (Y_{it}^2), consumption of the reference group C_{it}^R, and a wide set of variables to control for household characteristics (summarized in the X_{it} matrix) that are theoretically expected to influence the level of consumption.

Household disposable income is the sum of the disposable incomes of individuals in a household, less the taxes and fees paid by the household and unilateral transfers to other households within the last year; it includes imputed rent. The disposable income of an individual is the sum of the actual payments made to the factors of production (wage, interest, profit, and rent) and unilateral transfers from public and private enterprises as well as from abroad, less the indirect taxes and unilateral transfers of the household to the government (such as deductions for social security); both cash and non-cash income are included. The square of household disposable income is included to account for non-linearity.

Urban versus rural residence, which is the only available variable related to geography, is included among the household characteristics as a dummy variable. Moreover, calendar-year effects are controlled by the T_t matrix, which includes time dummies.

To identify the coefficients in Equation (1), we assume that the error term ϵ_{it} is uncorrelated with the explanatory variables. We cluster standard errors by the education group of the household head.[14]

Finally, HBS assigns each household a weight to make the survey samples representative of the country populations. In all estimations, we weight observations with those population weights.

Based on the observation that zero expenditure rarely occurs, we decide that estimation by Tobit is not needed, and, thus, we use ordinary least squares (OLS) for our estimations.

[14] The overall model specification is tested using linktest and by plotting residuals against the predicted values. We also test for multicollinearity of the variables.

To determine the factors that influence household consumption, first, we estimate Equation (1) without taking reference-group consumption C_{it}^{R} into account. Hence, we estimate the following equation, which is the benchmark estimate without peer effects.

$$\boldsymbol{C_{it} = b_0 + b_1 Y_{it} + b_2 Y_{it}^2 + B_4 X_{it} + B_5 T_t + \epsilon_{it}.} \quad (2)$$

In the second part of our estimation, which addresses the main question of identifying the importance of peer effects, we determine the reference group to which the household compares itself, as explained in detail in Section 4.1. The average consumption level C_{it}^{R} of this group constitutes a reference value to which the household compares itself, and adjusts its consumption accordingly. Therefore, we estimate Equation (1), where the coefficient on reference-group consumption tells us the strength of the peer effect.

In our estimates, (C_{it}) is taken as the average total consumption of the non-rich households, defined according to their rank in the income distribution. Here, our aim is to test whether non-rich households follow the consumption of rich households. However, it is also possible that the existence of peer effects may not be uniform across income distribution. To test for this, we experiment with alternate definitions of non-rich, depending on the percentiles of household disposable income. First, we drop the richest and poorest 10th percentiles of the households in the income distribution, as they may display different behavior than that of the majority. In other words, in our first set of estimates, we restrict attention to households in the 10-90th percentiles. Then, in order to study the behavior of the households in the upper echelons of the income distribution, we restrict the sample to those in the 70-90th percentiles, and later to those in the 50-90th percentiles. Finally, to study the behavior of the households in the lower half of the income distribution, we restrict the sample to those in the 10-50th percentiles.

4.1. Selection of Reference Groups

There is a consensus in the literature on the notion that well-being depends on one's relative position (Clark and Oswald, 1996; Kingdon and Knight, 2007; Luttmer, 2005). Typically, a modified utility function in which one's utility depends on the gap between actual income and reference-group income has been used to model relative concerns. The main question that arises is how to define the reference group. Some studies rely on the controlled environment of the laboratory to do so (Clark et al., 2010; Falk and Ichino, 2006; McBride, 2010), while other studies define the reference group empirically, relying on whatever information is available in the data.

Reference-group theory argues that individuals compare themselves not to just anyone, but to people who are similar in many respects, for example, those who come from the same social group and have similar beliefs, values, income, and/or aspirations. Basically, the reference group is used as a standard to evaluate oneself. Models of social preferences (i.e., inequality aversion; see, e.g., Bolton and Ockenfels, 2000; Charness and Rabin, 2002; Fehr and Schmidt, 1999; Mui, 1995) predict that the poor envy the rich, and reference-group theory predicts that the poor (rich) envy others from the same social group or class.

Although there is no standard in reference-group determination, two main approaches stand out in the empirical literature. The first approach, which can be called "proximity," relies on the assumption that comparisons are made with people nearby. Thus, in this approach, group interaction is based on physical proximity, where groups are formed by all individuals living in the same neighborhood (Luttmer, 2005), village (Knight et al., 2009), city or region (Persky and Tam, 1990), or country (Easterlin, 1995).

The second approach, which can be called "similarity," relies on the assumption that one compares oneself to those who have similar socio-demographic characteristics, such as being the same age, education level, race, and/or gender. In most empirical studies, data availability guides the choice of similarity characteristics that define the reference group. For example, Bygren (2004) considers those with the same education and work experience in the same occupation and in the entire labor market as the reference group.

It is also common to take a mixed approach and define reference groups based on both demographics and proximity.We follow this comprehensive approach and define the reference groups based on both geography (rural-urban setting) and similar demographic characteristics, and we test peer effects based on the similarity of the following demographic characteristics:

- Education level

- Age group

- Geography (urban-rural)

In other words, households form a reference group of people with the same demographic characteristics and belonging to the same urban-rural residence classification. Initially, we test peer effects when the reference group consists of those households with heads of household from the same education level. This approach is similar to that of Woittiez and Kapteyn (1998), who assume that people primarily meet people of about the same age and education. We

also experiment with reference groups based on age and only geography, which allows us to test the presence of peer effects for consumption decisions and which types of similarities help form the reference group.

In our analysis, regional proximity is inevitably measured only at the rural-urban level, since the HBS does not provide a finer geographical classification than the dichotomous rural-urban classification. People should relate themselves to the people they most frequently see, and regional proximity is a measure to capture the probability of relating oneself. However, with increased communication, lifestyles have converged, and the differences in living standards within cities have decreased. In that regard, a rural-urban divide will serve as a better proxy measure for similar lifestyles than would geographic proximity. Hence, although a finer geographic proximity measure could allow us to capture more dimensions, we believe that a rural-urban classification is a valid definition for the selection of reference groups. Regardless, we believe that even the rough rural-urban division reveals important differences in consumption patterns between the two groups. Information on the percentage of households in the survey by age and education level for each year is provided in Tables 2.a and 2.b, respectively.

Table 2.a. Age Group of Survey Sample by Year (%)

Age group	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
3	0.12	0.07	0.11	0.06	0.07	0.06	0.16	0.07	0.07	0.05	0.09
4	1.37	1.11	1.12	1.10	1.43	1.08	1.39	1.12	1.02	1.20	1.22
5	6.90	6.26	6.70	6.91	7.08	6.12	6.26	6.12	6.13	5.23	6.43
6	11.65	11.69	11.30	11.90	11.49	10.98	10.67	10.60	10.93	10.76	11.25
7	13.93	14.07	13.45	13.22	12.60	13.90	13.05	12.77	13.05	12.66	13.35
8	14.71	14.55	14.10	14.75	13.22	12.97	12.77	12.05	12.47	12.29	13.54
9	12.24	12.99	13.43	13.25	13.31	13.19	12.63	13.91	12.69	12.15	12.86
10	11.32	12.09	11.62	11.52	12.57	11.73	10.80	11.24	11.22	11.56	11.51
11	7.76	8.08	8.70	8.49	8.71	9.03	9.33	9.60	9.56	10.61	8.83
12	6.58	6.05	6.34	6.44	6.95	7.02	7.41	7.12	7.36	7.83	6.88
13	13.42	13.04	13.13	12.37	12.57	13.92	15.53	15.40	15.50	15.67	14.03
Total	100	100	100	100	100	100	100	100	100	100	100

Source: Authors' calculations using HBS data.

Table 2.b. Education Group of Survey Sample by Year (%)

	Illiterate	literate but no completed education	elementary school graduate (5 years)	junior high school graduate (8 years)	high school graduate	vocational college graduate	college graduate	more than college education	
Year	0	1	5	8	11	13	15	18	Total
2004	7.03	5.01	51.02	10.38	16.81	2.63	6.73	0.38	100
2005	6.82	5.51	52.04	10.59	16.19	2.18	6.22	0.45	100
2006	6.68	5.03	52.91	10.96	15.72	2.51	5.76	0.43	100
2007	6.59	5.37	51.01	10.13	17.37	2.82	6.27	0.44	100
2008	6.19	5.00	46.16	11.32	19.05	3.61	8.04	0.64	100
2009	7.66	6.17	47.56	10.50	16.86	3.33	7.02	0.90	100
2010	7.60	5.42	46.74	10.70	17.08	3.57	7.90	1.00	100
2011	7.31	5.43	45.90	10.40	17.30	4.25	8.20	1.22	100
2012	7.13	5.18	42.96	11.65	18.07	4.43	9.06	1.52	100
Total	7.01	5.35	48.34	10.75	17.18	3.29	7.29	0.79	100

Source: Authors' calculations using HBS data.

4.2. Direction of Comparison

Psychological research and behavioral studies have shown that people display asymmetry in comparisons and that the disutility of a loss is weighted larger than is the utility of a gain (i.e., loss aversion). The literature refers to Duesenberry (1949), who is known to have assumed that people are upward-looking in making social comparisons because their perceived needs and aspirations are typically above what they have (Ferrer-i-Carbonell, 2005). Moreover, in happiness studies, it is found that poorer individuals are negatively influenced by the income of their richer peers, but the opposite is not true. In other words, richer individuals do not get happier from knowing that their income is above that of their co-citizens.

The direction of comparison is also a question raised in the literature. In upward comparisons, an individual compares himself with those who are higher in the hierarchy, such as those who are richer or happier. In downward comparisons, the reference group consists of those who are in lower positions in the rank hierarchy. Upward comparison is called "self-enhancement," since it leads the individual to increase his/her effort to reach the level of those above himself/herself. Downward comparisons, on the other hand, are based on "self-motivation," since people generally intend to improve utility and well-being by comparing themselves with others who are inferior or less for-

tunate (Wills, 1981). Affleck and Tennen (1991) show that people who suffer from major medical problems use downward comparison as a coping mechanism, while Brown and Dutton (1995) and Taylor et al. (1983) present empirical evidence in which individuals enhance their mood and subjective well-being through downward comparison. Hence, the direction of comparison can be regarded as context-specific.

Summarizing the empirical evidence, Wood and Taylor (1991) conclude that "when one has an unfavorable characteristic, one may self-enhance by reminding oneself of others who are similarly flawed. Even better is a downward comparison with someone who possesses even more of the undesirable characteristic" (p. 31). Considering the possibility that comparisons can be both upward and downward, Falk and Knell (2004) build a model in which individuals endogenously choose with whom they compare themselves to increase their utility. They show that people with higher ability have "upward comparisons" (for self-enhancement purposes), while those with lower ability choose a reference group from people below them; thus, reference standards are positively correlated with ability. Further, their model provides a theoretical rationale for the frequently used assumption that people compare themselves with others who are similar.

4.3. Reference-Group Consumption

In our study, we take the asymmetry in comparison into account and question whether comparisons are made with those below or above in the income distribution. First, we define the reference group as the "richest" households among those whose heads of household have similar characteristics. We define the "rich" households in a reference group as those in the top 10^{th} percentile of the income distribution of the previous year; this percentile is chosen because it is commonly used in the extant literature (e.g., Bertrand and Morse, 2013). The average consumption of the richest 10% of households in the same reference group will be used as reference-consumption value.

Our expectation is that peer effects in consumption decisions should be directed upward, where the reference should constitute those above, with the motive being conspicuous consumption. If people want to signal higher status, they should relate their consumption to those who are perceived as rich or high class. Hence, to form reference groups based on educational attainment and rural-urban status, we divide the sample into 16 groups by education category (eight categories) and rural-urban status (two categories). Then, we rank the households within each group by their household disposable income. The average total consumption of the households in the top 10^{th}percentile

within the corresponding reference group constitutes the reference consumption value for that group. To build reference groups according to age and rural-urban status, we similarly divide the sample into 20 distinct groups by age category (10 categories) and rural-urban status (two categories). Further, we follow the same methodology, calculating the reference consumption value using the average consumption of the households in the top 10^{th}percentile of that reference group.

As mentioned above, in some contexts, lower levels in the hierarchy can be taken as a reference due to the "self-motivation" motive. With regard to robustness, we test for downward comparison, including the consumption of the "poorest" households among those that have similar characteristics as a reference. Consequently, the analysis is repeated when the reference consumption value is calculated as the average consumption of the households in the bottom 10^{th} percentile of income.

4.4. Concerns for Possible Endogeneity

For each household, the reference group is constituted from the richest (or poorest) households with the same level of education and rural-urban location as the head of household (i.e., same education category). A well-known problem in the literature occurs when one studies a single cross-section and tries to explain the behavior of a household using the average behavior in the group to which the household belongs (the "reflection problem" in Manski;1993). Thus, we define reference groups so as to avoid this problem.

To eliminate the concerns for possible endogeneity between household *i*'s total consumption (C_{it}) and its reference-group consumption C_{it}^{R}, we make use of multiple cross-sections. In each survey year, we select the reference group as the richest households in the previous survey year. For a household in the current year, the reference-group consumption in the previous survey year is predetermined and is in the information set of the household when the household is making consumption decisions. Our identification assumption is that the consumption of rich households in the previous year is uncorrelated with the unobserved characteristics of the non-rich households (which are left to the error term in Equation (1)), which might influence their consumption decision. We think that this assumption is a plausible one. Any population-level shocks to consumption are already accounted for via year fixed effects. Even after defining reference-group consumption based on the previous year's consumption, the endogeneity problem may still be present if the consumption shocks to different income groups are correlated and persistent over time. For example, a preference shock that promotes dining at fancy restaurants may

raise restaurant consumption in all income groups, and the shock may persist for several years. However, if this were the case, reference consumption would be significant in all of our estimates (for all income percentiles as well as when the consumption of the poorest households was taken as a reference value). The results prove that this effect is not driving the results, as will be further explained below.

4.5. Control Variables

The household characteristics summarized in matrix X_{it} include variables often used in the literature for the determination of consumption, which are related to the demographics of the reference person (head of household) in the household, such as gender, age, marital status, education, and labor-market status, and the family structure, such as the number of children and elderly individuals in the household.

We include age to control for the lifecycle factors that are known to influence consumption decisions. Modigliani and Brumberg's (1954) life-cycle model of behavior assumes that current consumption is proportional to average lifetime resources. Moreover, empirical studies point to a hump-shaped relationship between consumption and age, where individuals tend to consume more when young and less as they become older (Jappelli and Modigliani, 1998). Hence, to account for the effect of household demographics, we include dummy variables that indicate the age group of the head of household.

In addition, it is supposed that families take into account their wealth and expected lifetime earnings when they smooth consumption by saving and dissaving. Friedman's (1957) permanent income hypothesis suggests that current income is comprised of a permanent component and transitory component. As indicators of the permanent income of the household, we include the education and labor-market status of the head of household in our regressions. While the lifecycle theory of income postulates that current income is irrelevant for consumption decisions and that only permanent changes in income affect the path of consumption, liquidity constraints, myopia, or savings for precautionary motives support the relevance of current income in consumption decisions (see Browning and Lusardi (1996) for a survey of the relevant motives). Therefore, we also include current disposable income and its square as control variables, which is consistent with the Keynesian framework, where savings and consumption decisions depend on current income.

The X_{it} matrix also includes dummy variables to indicate the marital status and occupation of the household head, homeownership status, and several family structure characteristics. Such characteristics are included to control

for their possible influence on some types of expenditures, such as housing, food consumption at home, and food consumption in restaurants. More information on the variables used in the study and the dataset is provided in the Data Appendix.

To exclude inflationary effects, real values for household consumption expenditures and disposable income are included in the empirical model estimates. Further, price adjustment is conducted using each year's December consumer price index, obtained from the Turkish Central Bank.

5. Estimation Results

5.1. Findings on Consumption Determinants

First, without taking peer effects into account, we estimate Equation (2). This provides the benchmark model without peer effects and is the standard model used in the literature to determine the factors that influence household consumption. The estimation results of the model without peer effects are provided in Table 3.a for the whole population, including both rural and urban settlements. We report some of the coefficients of the results of the estimated model for the other household characteristics in the X_{it} matrix.[15]

The significant determinants of household consumption of the empirical model in our study are similar to those in previous studies. In all regressions, household income stands out as the most significant variable, with 1% significance. Income squared is also significant for the 50-90th and 70-90th income percentiles, but the coefficient is close to zero.

In addition, as the number of children increases, household consumption is also rising. Being an extended family in general does not seem to be a significant determinant of total consumption. However, in the estimations conducted separately for different income groups, being a large family tends to lead to a significant rise in the total consumption for the bottom 10-50% and 20-50% income groups (i.e., for below middle-income groups). The same estimations are repeated for the urban and rural residences separately and are provided in Table 3.b and Table 3.c, respectively. The findings on household characteristics do not change for estimations conducted on urban–rural settings separately.

[15] We do not provide the coefficients on the other control variables for brevity, but the results can be obtained from the author upon request.

Table 3.a. Estimation Results without Peer Effects (Whole Population)

	(1) 10-90% Full Sample	(2) 10-50% Full Sample	(3) 50-90% Full Sample	(4) 70-90% Full Sample
Dependent Variables				
Real household income	0.699***	0.775***	0.568***	0.500***
	(0.0231)	(0.0589)	(0.0338)	(0.0733)
Real household income squared	-8.80e-08	1.34e-06	2.68e-06**	3.80e-06**
	(8.41e-07)	(3.14e-06)	(9.20e-07)	(1.44e-06)
Suburban	640.6***	338.2***	898.5***	1,004***
	(61.13)	(67.69)	(74.51)	(119.3)
1. child	396.3***	321.0***	455.1**	180.9
	(86.82)	(80.40)	(190.8)	(204.4)
2. children	628.3***	442.4**	785.6***	600.5***
	(51.86)	(126.6)	(80.07)	(105.8)
3. children	773.5***	618.6***	928.7***	856.5***
	(66.00)	(101.1)	(144.7)	(105.4)
Extended family	145.6	469.2**	-51.15	176.6
	(94.35)	(176.5)	(125.6)	(99.23)
Single adult	-249.6***	-200.1	-271.4	1.217
	(59.44)	(150.8)	(193.9)	(296.0)
Renter	-150.8*	27.90	-309.8*	-597.0**
	(68.67)	(31.40)	(145.7)	(222.5)
Public housing or employer-provided housing	-1,023***	-817.7***	-1,240***	-2,219***
	(160.5)	(222.6)	(295.2)	(457.9)
Other (housing provided by parents, relatives, etc.)	162.8	125.3	284.6	631.7*
	(115.6)	(69.64)	(181.2)	(292.3)
Student	2,048***	1,991***	2,025***	1,840***
	(171.2)	(254.6)	(285.2)	(373.1)
Housewife	280.1	224.8**	304.9	-50.48
	(162.6)	(89.46)	(392.9)	(681.9)
Retired	517.7**	637.7***	296.0	-122.9
	(204.5)	(162.7)	(340.2)	(609.8)
Elderly	-16.43	63.95	-102.5	-787.1
	(183.0)	(215.2)	(337.2)	(498.3)
Disabled	-149.1	-223.4*	-39.22	-174.6
	(237.3)	(109.4)	(559.9)	(1,076)
Working (no profession specified)	2,021***	471.9	2,962*	3,647*
	(452.2)	(1,493)	(1,496)	(1,913)
Legislators , senior officials, and managers	279.6	522.4**	-6.711	-229.7
	(172.3)	(205.0)	(282.1)	(570.8)
Professional professionals	-13.48	389.1*	-514.9	-958.3
	(272.7)	(200.3)	(608.2)	(978.7)
Auxiliary professionals	650.1***	768.8***	392.4	-3.245
	(120.3)	(153.1)	(317.3)	(588.5)
Employees who work in offices and customer service	-3.477	340.1	-455.5	-951.2
	(259.9)	(248.1)	(422.8)	(801.2)
Service and sales workers	16.61	93.68	-182.9	-649.9
	(132.7)	(104.0)	(255.8)	(532.7)
Skilled agricultural, hunting, forestry , fishery workers	-302.5	16.06	-715.7**	-1,229**
	(170.2)	(196.7)	(253.6)	(499.0)
Craft and related trades workers	103.6	209.3	-106.4	-90.21
	(101.6)	(120.2)	(235.2)	(442.7)
Plant and machine operators and assemblers	11.30	83.54	-183.5	-581.9
	(91.92)	(143.5)	(250.4)	(407.6)
Workers in jobs requiring no qualifications	-221.8**	-95.10	-403.2	-554.3
	(85.26)	(137.0)	(284.9)	(517.2)
Number of observations	66,419	34,338	32,081	15,791
R-squared	0.456	0.385	0.383	0.358

Notes: Total consumption includes consumption for the "whole population." Ordinary least-squares estimates are reported. All regressions include a constant, survey-year fixed effects, the number of children, and dummy variables for large families and single-adult families. In addition, dummy variables for the age and education categories of the heads of household are included. ***, **, and * = 1%, 5%, and 10% statistical significance, respectively.

Table 3.b. Estimation Results without Peer Effects (Urban Settlements)

	(1) 10-90% urban settlements	(2) 10-50% urban settlements	(3) 50-90% urban settlements	(4) 70-90% urban settlements
Dependent Variables				
Real household income	0.735***	0.826***	0.600***	0.533***
	(0.0321)	(0.0825)	(0.0424)	(0.0735)
Real household income squared	-8.12e-07	-1.45e-06	2.16e-06	3.92e-06**
	(1.09e-06)	(4.13e-06)	(1.19e-06)	(1.41e-06)
1 child	367.7**	310.5**	405.1	76.95
	(133.3)	(127.3)	(279.2)	(301.0)
2 children	600.4***	431.8**	730.4***	600.0**
	(111.3)	(143.9)	(143.4)	(175.3)
3 children	690.9***	513.7***	854.1***	837.5***
	(101.5)	(136.1)	(239.8)	(175.0)
Extended family	-30.44	307.1*	-239.2*	-30.09
	(78.65)	(146.6)	(120.4)	(114.8)
Single adult	-195.5	-164.8	-260.0	97.48
	(103.4)	(181.5)	(219.3)	(423.2)
Renter	-187.6**	5.213	-375.7*	-813.0**
	(76.08)	(48.86)	(161.7)	(275.7)
Public housing or employer-provided housing	-1,186***	-673.1***	-1,619***	-2,865***
	(165.6)	(113.0)	(289.0)	(597.9)
Other (housing provided by parents, relatives, etc.)	149.8	162.7	213.2	565.2
	(172.1)	(120.1)	(269.2)	(512.1)
Student	1,823***	2,023***	1,397**	1,112**
	(213.7)	(294.1)	(400.5)	(392.9)
Housewife	332.5	247.7*	401.9	44.06
	(200.3)	(117.2)	(445.2)	(719.3)
Retired	485.1*	507.4**	378.5	-32.77
	(212.5)	(197.3)	(370.3)	(610.2)
Elderly	289.5	135.0	484.9	26.01
	(247.3)	(213.4)	(590.9)	(752.6)
Disabled	-233.1	-307.1	-93.55	-448.9
	(269.3)	(165.2)	(701.8)	(1,100)
Working (no profession specified)	1,656***	509.4	2,503*	3,139*
	(327.7)	(1,307)	(1,135)	(1,552)
Legislators , senior officials, and managers	225.6	435.0*	-13.91	-338.5
	(194.0)	(184.7)	(364.0)	(649.6)
Professional professionals	-47.35	507.9*	-607.0	-942.1
	(304.8)	(238.3)	(652.9)	(991.2)
Auxiliary professionals	532.2***	698.7**	286.3	-201.7
	(141.5)	(201.3)	(327.7)	(630.5)
Employees who work in office and customer service	-127.3	251.8	-555.4	-1,014
	(295.8)	(295.3)	(490.5)	(946.6)
Service and sales workers	-192.4	-116.8	-339.4	-931.0
	(185.3)	(189.1)	(332.1)	(626.6)
Skilled agricultural, hunting, forestry , fishery workers	105.4	477.4	-349.4	-594.3
	(209.0)	(284.0)	(350.6)	(648.3)
Craft and related trades workers	-47.78	54.03	-223.0	-362.0
	(147.0)	(188.1)	(307.7)	(549.8)
Plant and machine operators and assemblers	-42.42	2.121	-173.2	-582.6
	(133.8)	(195.9)	(303.2)	(420.1)
Workers in jobs requiring no qualifications	-345.4**	-245.9	-457.6	-589.8
	(135.5)	(212.6)	(423.2)	(560.9)
Number of observations	45,930	23,998	21,932	10,740
R-squared	0.441	0.350	0.353	0.329

Notes: Total consumption includes consumption for the households living in the "urban settlements." Ordinary least squares estimates are reported. All regressions include a constant, survey-year fixed effects, the number of children, and dummy variables for large families and single-adult families. In addition, dummy variables for the age and education categories of the heads of household are included. ***, **, and * = 1%, 5%, and 10% statistical significance, respectively.

Table 3.c. Estimation Results without Peer Effects (Rural Settlements)

	(1) 10-90% rural settlements	(2) 10-50% rural settlements	(3) 50-90% rural settlements	(4) 70-90% rural settlements
Dependent Variables				
Real household income	0.678***	0.459***	0.530***	0.460*
	(0.0339)	(0.0485)	(0.0663)	(0.212)
Real household income squared	-1.40e-06	2.59e-05***	2.64e-06	1.86e-06
	(1.91e-06)	(3.73e-06)	(2.81e-06)	(5.86e-06)
1 child	443.9***	309.1*	535.2***	496.8**
	(119.2)	(142.6)	(113.2)	(179.1)
2 children	666.5***	429.0**	847.1**	564.1
	(129.3)	(127.7)	(340.6)	(360.5)
3 children	987.4***	834.3***	1,120***	989.3***
	(159.4)	(111.8)	(228.4)	(261.4)
Extended family	479.1**	737.0**	318.2	627.2**
	(143.8)	(270.2)	(266.0)	(254.4)
Single adult	-333.2*	-263.3	-361.4	-231.0
	(141.2)	(207.0)	(269.7)	(420.3)
Renter	130.3	264.4**	-28.65	287.8
	(146.1)	(110.4)	(184.2)	(354.2)
Public housing or employer-provided housing	-460.9*	-726.6*	-321.3	-559.9
	(242.0)	(356.8)	(391.1)	(532.2)
Other (housing provided by parents, relatives, etc.)	208.8*	50.37	449.9	738.6
	(93.51)	(96.49)	(316.8)	(547.8)
Student	2,920***	1,719***	2,891	
	(685.4)	(344.9)	(2,069)	
Housewife	237.6	191.5	173.6	-171.9
	(152.2)	(230.2)	(218.4)	(560.2)
Retired	864.2**	1,147***	372.6	248.3
	(263.5)	(193.5)	(351.9)	(791.7)
Elderly	-237.3	141.2	-850.0*	-1,565
	(276.8)	(280.5)	(386.4)	(850.4)
Disabled	85.83	39.51	37.26	237.5
	(229.7)	(130.5)	(414.0)	(1,254)
Working (no profession specified)	6,978***	-5,369***	11,405**	10,552**
	(1,089)	(410.3)	(4,198)	(4,105)
Legislators , senior officials, and managers	387.7	753.4*	-104.8	13.91
	(247.9)	(371.8)	(217.4)	(617.2)
Professional professionals	-158.8	-218.2	-281.2	-1,327
	(287.6)	(123.1)	(525.9)	(1,885)
Auxiliary professionals	860.9*	783.9**	632.9	599.5
	(403.6)	(225.5)	(699.8)	(761.6)
Employees who work in office and customer service	284.7	388.0*	-141.3	-907.7
	(212.5)	(178.3)	(331.8)	(883.0)
Service and sales workers	719.6**	859.0	287.0	326.5
	(217.4)	(509.5)	(206.4)	(689.0)
Skilled agricultural, hunting, forestry , fishery workers	-181.8	213.6	-796.8***	-1,025
	(142.0)	(207.4)	(103.8)	(561.7)
Craft and related trades workers	573.2***	742.7***	179.6*	730.6
	(62.06)	(130.1)	(77.11)	(394.4)
Plant and machine operators and assemblers	115.1	235.9	-275.2**	-518.2
	(76.61)	(136.7)	(100.7)	(499.5)
Workers in jobs requiring no qualifications	146.5*	291.3**	-201.7	-204.2
	(62.94)	(108.4)	(161.5)	(541.7)
Number of observations	20,489	10,340	10,149	5,051
R-squared	0.327	0.279	0.241	0.211

Notes: Total consumption includes consumption for the households living in the "rural settlements." Ordinary least squares estimates are reported. All regressions include a constant, survey-year fixed effects, the number of children, and dummy variables for large families and single-adult families. In addition, dummy variables for the age and education categories of the heads of household are included. ***, **, and * = 1%, 5%, and 10% statistical significance, respectively.

5.2. Findings on Reference Group Effect

Our thesis is that households, when forming their consumption decisions, are affected by the consumption of their reference group, and change their consumption in a similar direction as that of the reference group. To test this hypothesis, we estimate our empirical model in Equation (1) for different reference-group definitions. This way, we intend to find the existence of peer effects and, if they exist, to find what constitutes a valid reference value for households. In this respect, the main question of the empirical model is whether the coefficient of reference-group consumption C_{it}^{R} is significant.

Table 4.a presents the OLS coefficient estimates of the variables Y_{it}, Y_{it}^{2}, and C_{it}^{R} for the estimations when peer effects occur by educational attainment. Therefore, the peer group is formed by the households who live in the same rural-urban setting and have the same educational attainment level. The results of four different regressions with different measures of reference values are shown in different columns. In the regression results in columns 1 and 4, the average consumption of the richest households (the top 10%) in the peer group is considered as the reference value. In columns 2 and 4, the average consumption of the poorest households (the bottom 10%) in the peer group is taken as the reference value. We experiment with the income of the richest households (the top 10%) in the same education and rural-urban group in column 3.

The results in the upper left quadrant of Table 4.a show that when the reference group is formed by the same educational attainment, the total consumption of non-rich households in the 20-90th percentile is positively correlated with the average consumption in the reference group (richest 10% in the same education and rural-urban group) at the 5% significance level. One problem that casts doubt on the observed positive correlation between the consumption of the rich and non-rich households is that the consumption of households in different income percentiles moves together. However, this is not a credible explanation. As can be seen from the results in column 2, there is no correlation between the consumption of the non-rich and that of the poorest 10%.

Another explanation for the finding of a positive correlation is a possible income shock that simultaneously affects the consumption of all income groups. To address this concern, we estimate regressions where the average income of the rich is used instead of C_{it}^{R}, and the results are presented in column 3. If a simultaneous increase in consumption is driving the results, we would expect the income of the rich to be significant; however, it turns out to be statistically insignificant in the regressions.

Table 4.a. Estimation Results with Peer Effects (Whole Population)

	20th-90th percentiles				**70th-90th percentiles**			
Dependent Variables								
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Real household income	0.676***	0.673***	0.673***	0.675***	0.513***	0.486***	0.497***	0.498***
	(0.0272)	(0.0287)	(0.0284)	(0.0277)	(0.0690)	(0.0781)	(0.0759)	(0.0743)
Real household income squared	2.76e-07	3.85e-07	3.73e-07	2.95e-07	3.42e-06**	4.11e-06**	3.76e-06**	3.72e-06**
	(8.78e-07)	(9.28e-07)	(9.15e-07)	(8.91e-07)	(1.24e-06)	(1.51e-06)	(1.47e-06)	(1.33e-06)
Consumption of the richest 10%	0.0322**			0.0334*	0.0488			0.0545
	(0.0135)			(0.0146)	(0.0406)			(0.0414)
Consumption of the poorest 10%		-0.0399		-0.0588		-0.263*		-0.290*
		(0.0620)		(0.0701)		(0.116)		(0.140)
Income of the richest 10%			0.0103				0.0418	
			(0.0124)				(0.0288)	
Number of observations	57,553	57,553	57,553	57,553	15,791	15,791	15,791	15,791
R-squared	0.432	0.434	0.434	0.434	0.358	0.358	0.358	0.358

	50th-90th percentiles				**10th-50th percentiles**			
Dependent Variables								
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Real household income	0.572***	0.566***	0.567***	0.570***	0.786***	0.774***	0.775***	0.784***
	(0.0318)	(0.0349)	(0.0343)	(0.0330)	(0.0647)	(0.0564)	(0.0570)	(0.0620)
Real household income squared	2.52e-06**	2.74e-06**	2.69e-06**	2.58e-06**	6.72e-07	1.43e-06	1.33e-06	7.96e-07
	(8.58e-07)	(9.49e-07)	(9.26e-07)	(8.87e-07)	(3.48e-06)	(2.99e-06)	(3.04e-06)	(3.32e-06)
Consumption of the richest 10%	0.0377			0.0398	0.0231			0.0238
	(0.0200)			(0.0211)	(0.0123)			(0.0131)
Consumption of the poorest 10%		-0.0784		-0.0996		-0.0206		-0.0327
		(0.0717)		(0.0830)		(0.0595)		(0.0645)
Income of the richest 10%			0.0230*				-0.000479	
			(0.0118)				(0.00927)	
Number of observations	32,081	32,081	32,081	32,081	34,338	34,338	34,338	34,338
R-squared	0.383	0.383	0.383	0.383	0.385	0.385	0.385	0.385

Notes: Total consumption includes consumption for the “whole population.” Ordinary least squares estimates are reported. All regressions include a constant, survey-year fixed effects, the number of children, and dummy variables for large families and single-adult families. In addition, dummy variables for the age and education categories, as well as the marital and labor-market status, of the heads of household are included. Dummy variables for rural versus urban residence and homeownership status are also included. ***, **, and * = 1%, 5%, and 10% statistical significance, respectively.

5.3. Reference Group Effect by Different Income Percentiles

In this part of the analysis, we test the generality of the results. We ask whether the results change when we estimate Equation (1) for different income percentiles separately. Our hypothesis is that the consumption of the reference group will affect that of poorer households, based on the conspicuous consumption motive, as they try to emulate the consumption of the rich. Hence, higher consumption by rich households should induce non-rich households to up their consumption in the following year, in order to signal status. Therefore, we expect that the correlation between the consumption of the non-rich households and that of the reference group will be stronger for lower income percentiles. However, we also know that the lowest income percentiles are usually income constrained and spend almost all of their income. As such, the results should reflect the binding of income for lower income percentiles.

We estimate the same regression equation, this time restricting the sample to different percentiles of the household income distribution. We find that the result is not robust to changes in the sample, and it disappears when the sample is restricted to either the top (70-90th or 50-90th) or the bottom (20-50th) percentiles. Considering this mixed evidence, we have weak grounds for positing a positive correlation between the total consumption of non-rich households and the average consumption of the reference group. This is unlike the pattern in the United States data, reported by Bertrand and Morse (2013) and Drechsel-Grau and Schmid (2014), who discover a positive association between the total consumption of the rich and that of the non-rich. Thus, to test the significance of the results, we investigate further and separately conduct an analysis by dividing the sample by rural-urban residential settlements.

5.4. Reference Group Effect by Different Residential Settlements

The results of the estimations carried out separately for the urban and residential settlements are reported in Tables 4.b and 4.c, respectively. We see that there is a significant difference for peer effects in household consumption behavior between the two types of settlement. The results for urban settlements indicate that the total consumption of the households in the 20-90th, 10-50th, and 50-90th percentiles are positively correlated with the consumption of the richest 10% of households. The significance is highest for the 10-50th percentile. Moreover, we do not observe any significance for the 70-90th percentile of income (upper right quadrant). Hence, with the exception of the households in the upper income distribution (70-90th percentile), in urban settlements, non-rich households raise their spending in response to an increase in

Table 4.b. Estimation Results with Peer Effects (Urban Settlements)

	20th-90th percentiles				**70th-90th percentiles**			
Dependent Variables	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Real household income	0.706***	0.707***	0.705***	0.706***	0.528***	0.523***	0.498***	0.522***
	(0.0385)	(0.0384)	(0.0405)	(0.0387)	(0.0746)	(0.0776)	(0.0836)	(0.0777)
Real household income squared	-2.46e-07	-2.68e-07	-2.05e-07	-2.42e-07	3.98e-06**	4.06e-06**	4.54e-06**	4.07e-06**
	(1.17e-06)	(1.17e-06)	(1.22e-06)	(1.17e-06)	(1.45e-06)	(1.49e-06)	(1.72e-06)	(1.50e-06)
Consumption of the richest 10%	0.0664*			0.0650*	0.110			0.105
	(0.0299)			(0.0288)	(0.0662)			(0.0630)
Consumption of the poorest 10%		-0.0935		-0.0445		-0.239		-0.160
		(0.0896)		(0.0612)		(0.174)		(0.107)
Income of the richest 10%			0.0189				0.0619	
			(0.0164)				(0.0354)	
Number of observations	39,689	39,689	39,689	39,689	10,740	10,740	10,740	10,740
R-squared	0.414	0.414	0.414	0.414	0.330	0.330	0.330	0.330

Dependent Variables	**50th-90th percentiles**				**10th-50th percentiles**			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Real household income	0.597***	0.598***	0.592***	0.596***	0.819***	0.824***	0.812***	0.818***
	(0.0429)	(0.0441)	(0.0468)	(0.0439)	(0.0790)	(0.0822)	(0.0729)	(0.0800)
Real household income squared	2.21e-06	2.19e-06	2.34e-06	2.23e-06	-1.13e-06	-1.33e-06	-7.95e-07	-1.11e-06
	(1.20e-06)	(1.22e-06)	(1.29e-06)	(1.22e-06)	(4.04e-06)	(4.12e-06)	(3.70e-06)	(4.08e-06)
Consumption of the richest 10%	0.0780*			0.0765*	0.0531**			0.0528**
	(0.0365)			(0.0339)	(0.0211)			(0.0213)
Consumption of the poorest 10%		-0.108		-0.0501		-0.0494		-0.00998
		(0.134)		(0.0758)		(0.0736)		(0.0782)
Income of the richest 10%			0.0282				0.0114	
			(0.0173)				(0.00912)	
Number of observations	21,932	21,932	21,932	21,932	23,998	23,998	23,998	23,998
R-squared	0.353	0.353	0.353	0.353	0.351	0.350	0.351	0.351

Notes: Total consumption includes consumption for the households living in “urban settlements.” Ordinary least squares estimates are reported. All regressions include a constant, survey-year fixed effects, the number of children, and dummy variables for large families and single-adult families. In addition, dummy variables for the age and education categories, as well as the marital and labor-market status, of the heads of household are included. Dummy variables for rural versus urban residence and homeownership status are also included. ***, **, and * = 1%, 5%, and 10% statistical significance, respectively.

Table 4.c. Estimation Results with Peer Effects (Rural Settlements)

Dependent Variables	**20th-90th percentiles**				**70th-90th percentiles**			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Real household income	0.664***	0.666***	0.674***	0.664***	0.465*	0.450*	0.477*	0.456*
	(0.0406)	(0.0411)	(0.0419)	(0.0416)	(0.212)	(0.207)	(0.234)	(0.207)
Real household income squared	-1.28e-06	-1.36e-06	-1.80e-06	-1.26e-06	1.71e-06	2.22e-06	1.13e-06	2.02e-06
	(2.04e-06)	(2.07e-06)	(2.08e-06)	(2.09e-06)	(5.85e-06)	(5.63e-06)	(6.88e-06)	(5.60e-06)
Consumption of the richest 10%	-0.0240			-0.0252	0.0322			0.0229
	(0.0202)			(0.0212)	(0.0420)			(0.0552)
Consumption of the poorest 10%		-0.0311		0.0216		0.208		0.161
		(0.0943)		(0.105)		(0.250)		(0.314)
Income of the richest 10%			-0.0611*				-0.0437	
			(0.0287)				(0.0704)	
Number of observations	17,864	17,864	17,864	17,864	5,051	5,051	5,051	5,051
R-squared	0.301	0.301	0.301	0.301	0.211	0.211	0.211	0.211

Dependent Variables	**50th-90th percentiles**				**10th-50th percentiles**				
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)
Real household income	0.529***	0.528***	0.532***	0.524***	0.444***	0.467***	0.513***	0.455***	
	(0.0660)	(0.0651)	(0.0701)	(0.0653)	(0.0469)	(0.0537)	(0.0471)	(0.0550)	
Real household income squared	2.69e-06	2.76e-06	2.56e-06	2.90e-06	2.72e-05***	2.54e-05***	2.12e-05***	2.64e-05***	
	(2.79e-06)	(2.80e-06)	(3.04e-06)	(2.80e-06)	(3.73e-06)	(4.09e-06)	(3.60e-06)	(4.36e-06)	
Consumption of the richest 10%	-0.0214			-0.0311	-0.0252**			-0.0180**	
	(0.0341)			(0.0384)	(0.00991)			(0.00755)	
Consumption of the poorest 10%		0.103		0.167		-0.160		-0.122	
		(0.192)		(0.226)		(0.141)		(0.145)	
Income of the richest 10%			-0.00681				-0.0754**		
			(0.0357)				(0.0245)		
Number of observations	10,149	10,149		10,149	10,340	10,340	10,340	10,340	
R-squared	0.241	0.241		0.241	0.279	0.279	0.280	0.279	

Notes: Total consumption includes consumption for the households living in "rural settlements." Ordinary least squares estimates are reported. All regressions include a constant, survey-year fixed effects, the number of children, and dummy variables for large families and single-adult families. In addition, dummy variables for the age and education categories, as well as the marital and labor-market status, of the heads of household are included. Dummy variables for rural versus urban residence and homeownership status are also included. ***, **, and * = 1%, 5%, and 10% statistical significance, respectively.

the consumption expenditures of the richest households in the previous year. We can be assured that the result is not generated by an upward shift of the entire distribution, since the consumption of the poorest 10% is not positively significant in the regressions, nor is the coefficient on the income of the richest (reported in column 3). In summary, our findings show that the majority of non-rich households, and, more so, the households below the mean income living in urban settlements care about the consumption of the richest households in the same education group, except for the ones in the upper income distribution.

Table 4.c shows no evidence for peer effects in rural settlements. The coefficient on reference consumption C_{it}^{R} is insignificant for all income percentiles. Contrary to urban areas, households in rural settlements are not affected by the consumption of the rich households in their reference group. As a result, we can conclude that non-rich households in rural areas are not influenced by the consumption of the richest households in the same education category in their consumption decisions. This can be an explanation for the weak evidence of peer effects observed when using the whole population, as reported in Table 4.a.

5.5. Reference-Group Effect by Age Group

As a final robustness check, the analysis is repeated using peer groups defined by the same age group living in the same urban-rural setting,[16] and the observed correlation between the consumption of rich and non-rich households disappears when peer groups are defined based on these categories. Moreover, the results provide initial evidence that educational similarity is a valid reference group in consumption comparisons; however, we do not find evidence for peer effects based on age group. The general result is that non-rich households in urban settlements care about the consumption of the richest households in the same education category, who are also living in the same residential settlement. Specifically, households are affected by the consumption of the richest 10^{th} percentile in the previous year. Yet, there is no evidence of peer effects for upper-income percentiles (70-90%) or for rural settlements.

[16] The results of these regressions, when the reference group is constructed based on the same age and rural-urban group, are not provided for brevity, but can be obtained from the author upon request.

6. Conclusion and Discussion

The importance of peer effects in consumption decisions has been documented for many years since Veblen (1899). Especially, recently, there has been an increasing amount of literature on the role of peer effects and interpersonal comparisons in individual decision-making, which are seen as being at the root of global financial crises. Peer effects in consumption decisions have been researched in several theoretical studies, and a number of empirical studies have found supporting evidence. Since peer effects on consumption are influenced by a quest for status, cultural factors play an important role in the presence and strength of this peer-effect motive.

However, to our knowledge, there have been no previous attempts to analyze peer effects in Turkey, a country located between the Eastern and Western worlds and at the crossroads of different civilizations. As an emerging economy, with a large population that has close social ties and can be regarded as a hierarchical culture, we expect to observe strong peer effects. Our paper fills the abovementioned gap by exploiting a large dataset on the consumption behavior of Turkish households.

Using nationwide representative data from the Turkish HBS on household expenditures for the years 2003-2012, we have documented the presence of peer effects on consumption decisions. Specifically, we find that the consumption decisions of the non-rich households in urban settlements are affected by the consumption of the rich. The effect is most significant for urban residents in the bottom half of the income percentiles. However, we do not observe any peer effects for upper-income households or for rural settlements. We experiment with different reference groups based on the same education level, age, and geography, finding that households are swayed by other households with the same educational attainment and rural-urban geographic setting. This proves both the proximity and similarity assumption as well as the upward direction of the comparisons, supporting the self-enhancement motive.

The motive to signal higher status in society can induce individuals to spend more, which can have important macroeconomic consequences, such as higher credit growth and lower savings, diverting resources away from spending on productive capital, possibly leading to less growth. Moreover, this motive is also important in the design of policies, such as welfare programs, where there is the risk that some monetary transfers may be spent on items for conspicuous consumption, rather than on necessities, such as food and education. However, to tackle these policy issues, further research is needed in this area. Yet, as an initial attempt, we have documented the pres-

ence of peer effects, and we note that it is an important motive in individual decisions and, hence, economic outcomes.

Our study can be regarded as an initial attempt to uncover the role of peer effects in consumption decisions for Turkish households. These findings suggest that peer effects matter, so policymakers also need to consider the peer-effect motive and how that might impact savings and consumption behavior of households. There are many more directions that can be followed to understand the peer-effect behavior and its consequences. One future direction of research would be to investigate how spending on different consumption categories or individual consumption items is affected by peer effects, specifically, to analyze peer effects under a finer classification of consumption categories. Another important area is to investigate the implications of the peer-effect motive in consumption decisions. One question is on the financing of consumption that results from the peer-effect motive. Specifically, what are the major responses of the households to this motive, i.e., do the households increase their income, does it result in lower saving or higher borrowing? These are key questions, with several economy-wide implications, that need to be addressed in further research.

Other venues of research could be to test the effect of interpersonal comparisons in consumption decisions across various sets of countries. Testing the presence and strength of peer effects across several countries is essential for the design of macroeconomic policy and prediction of the results of policy alternatives. By studying an unexplored question for Turkey, we believe that our study will be a valuable guide for future ones in the field and hope that it will raise questions for further research on Turkey.

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DATA APPENDIX

A1. Description of the variables used in the study

For categorical variables, dummy variables are created for each category, as described below:

Age categories: Ages 20-24; 25-29; 30-34; 35-39; 40-44; 45-49; 50-54; 55-59; 60-64; 65+.

Education categories: Illiterate; literate but no completed education; elementary school graduate (5 years); junior high school graduate (8 years); high school graduate; vocational college graduate; college graduate; more than college education.

Marital status: Never married; Married; Widow/widower; Divorced.

Labor-market status: Employed; Student; Housewife; Retired; Elderly; Disabled.

Homeownership status: Homeowner; Renter; Public housing or employer-provided housing; Other (housing provided by parents, relatives, etc.).

Rural versus urban residence: Determined according to population (Settlement areas with a population of 20,001 or more are urban, others are rural).

Household type: single nuclear family with one child, nuclear family with two children, three or more nuclear families with children, couples without children, the patriarchal or extended family, single-adult family, people living together.

From the coding of the household type, we extract information on the number of children, whether it is an extended family or not, and whether there is a single adult in the household.

Occupation: legislators, senior officials and managers, professional professionals, auxiliary professionals, employees who work in office and customer service, service and sales workers, skilled agricultural , hunting, forestry and fishery workers, craft and related trades workers, plant and machine operators and assemblers, workers in jobs requiring no qualifications.