Robustness Appendix to Conspicuous Consumption and Race

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Robustness Appendix to "Conspicuous Consumption and Race"

This robustness appendix provides a variety of additional results and background material for our paper "Conspicuous Consumption and Race". The data and code for all results shown in the paper and for the robustness appendix can be found online at http://faculty.chicagogsb.edu/erik.hurst/research/race_and_consumption_data_page.html.

The appendix is broken into six sections. In the first section, we describe and discuss results from the survey that we independently conducted to elicit individual perceptions about what consumption categories are considered "visible" (in the sense described in the main text of our paper). In Section 2, we show a series of robustness results about Black-White consumption differences using the CEX data described in the text. In particular, we explore the robustness of our results across various subpopulations and across alternative econometric specifications.

In Sections 3 and 4, we show the robustness of our results across alternate data sources. In section 3, we use data from the 1960-1961 Consumer Expenditure Survey to show that Black households spent more on visible goods and less on other consumption items in the 1960s than did Whites with similar permanent income and demographics. In Section 4, we conduct a variety of analyses using the newly available expenditure data from the 2005 Wave of the Panel Study of Income Dynamics (PSID). While its sample sizes are much smaller than the CEX, the PSID has much better measures of permanent income, and has finer measures of the household's geographic location. We exploit both of these benefits of the PSID to show that all the main results from the CEX shown in the main paper are found in this data source as well.

In Section 5, we use zip code level data on retail establishments to show that retail trade establishments selling visible goods are more likely to be located in Black communities, holding mean income, the total number of retail establishments, and total population constant. There are undoubtedly other explanations for these results than our status and signaling account, but we

present these estimates as broadly consistent with paper's main results. Finally, in section 6, we use our original CEX sample to assess – in dollar terms – how much increased visible spending reduces expenditures on necessities (food, housing, and utilities), broad entertainment goods, and health and education.

1. Conspicuous Consumption Survey

We believe the set of expenditures we treat as visible in the paper is intuitively obvious, but we nonetheless conducted a simple survey to confirm that our classification fit with people's views about which expenditures are actually visible.[1] We surveyed over 320 graduate students in the University of Chicago's Harris School of Public Policy and the University of Chicago's Graduate School of Business via an anonymous online survey.

After asking about respondents' age, sex, race and marital status, the survey asked (question (Q2)): "Consider a person who lives in a household and community roughly similar to yours. How closely would you have to interact with this person in order to observe that they consistently spend more than average on each of the following categories?" Their answers ranged from 1 (indicating that higher than average spending could be observed if the respondent did not interact socially with the person at all) to 5 (indicating that spending would never be observed). In Q3 of the survey, we asked respondents the following: "Consider a randomly chosen individual in society. Imagine that this person's lifetime income suddenly increased by 20%. For each item below, tell us how you would expect the person's spending on each of the

[1] We are not the first to assess the visibility of different consumption goods using a survey. Heffetz (2007) sampled 480 individuals and asked them how long it would take them to observe whether an individual consumes an above average amount of particular consumption goods. Our survey was very much inspired by Heffetz work, but we conducted our own survey for three main reasons. First, given our focus on interactions with relatively unfamiliar individuals, we were more interested in the familiarity an individual needs to determine someone's above-average consumption rather than the length of time it would take him to observe this. Second, we needed to ask individuals about the perceived income gradient associated with higher amounts of consumption for particular categories. In other words, is above average spending on a particular good a signal of higher income or wealth. Finally, Heffetz's survey, like ours, included a relatively small number of respondents and we were unsure if the results would extend to a broader population. It is encouraging, however, that our classification of visible goods is very similar to the classification proposed by Heffetz.

following items to change". The answers again ranged from 1 to 5, with 1 indicating spending would fall, 2 spending would stay the same, and 3-5 that spending would increase by less than, exactly, or more than 20%, respectively.

Table R1 details the survey questions and potential responses. The consumption categories presented to asked of survey respondents were designed to approximate the CEX consumption categories outlined in Appendix Table A1. Table R2 shows the demographics of the students who responded to the survey. Table R3 summarizes the survey results. The first column shows the proportion of survey respondents who thought they would be able to observe above-average spending on an item even if they were relatively unfamiliar with the consumer (responses "1" or "2" to Q2). We call these goods visible. The statistic in column 2 of Table R3 is the proportion of survey respondents who reported that the consumption item has an income elasticity of at least 1.

Respondents reported that the type of spending they would most readily observe is for clothing, jewelry and vehicles (excluding maintenance). For example, nearly two-thirds of respondents reported that they would be able to ascertain above-average spending on clothing and jewelry for individuals they hardly know. Other spending thought to be highly observable includes (in decreasing order): expenditures on tobacco products, shelter expenditures, alcohol and personal care expenditures. Spending on all other goods was reported to be harder to observe than these seven goods. The second column shows that only five items were thought to be both highly observable and also thought to have income elasticities greater than 1. For example, an item like entertainment durables, which includes such things as televisions, was thought to have a high income elasticity but not to be especially observable. In contrast, tobacco and alcohol spending are thought to be easily observable but have quite low expected income elasticities. Consistent with this survey evidence, in the cross-section CEX data, the combined

alcohol/tobacco category was the only consumption category with a *negative* cross sectional income elasticity.

In the paper we treat as "visible" goods items as those that meet two criteria: 1) they are easily observed; and 2) higher consumption of the good is generally associated with higher income. The results from our survey justify our characterization of expenditures on apparel, including accessories such as jewelry; expenditures on personal care; and outlays on vehicles, excluding maintenance as "visible" spending in our analyses. The survey results suggest that people regard personal care spending as less visible than the other categories. Not surprisingly, given the fact that personal care spending is such a small portion of total visible spending, the findings in the Appendix and in the main paper are not sensitive to the inclusion or exclusion of personal care spending into our overall results. Food away from home was the next highest reported visible good. In the following section, we specifically analyze food away from home and show that the racial patterns for food away from home differ markedly from the racial patterns for clothing, personal care, and cars.

The survey yields important evidence about housing. Respondents report that housing is both reasonably observable and that it has a high expected income elasticity. For reasons discussed at length in the paper, we adopt the conservative policy of excluding housing from the measure of total spending in most of our main results in the paper. Further, we generally analyzed housing separately, except for some robustness specifications in which we assess how the results are affected when housing expenditure is lumped in with overall visible spending.

2. Robustness Results Using Data from Main CEX Sample

A. Stability of Results to Different Specifications and Within Different Sub-Samples

In this section, we explore the sensitivity of our results to alternate specifications and sample restrictions. All the analysis in this section is conducted using the Consumer Expenditure

Survey (CEX) data described in the main paper. In the following two sections, we will use different data sets to explore the robustness of our results.

For reference, we restate the main estimating equation from the paper (equation (1)) used to document racial differences in spending patterns:

$$\ln(visible_i) = \beta_0 + \beta_1 Black_i + \beta_2 Hispanic_i + \varphi Expenditure_i + \theta X_i + \eta_i \qquad \text{(R1)}$$

where $Black_i$ is a dummy variable and $Expenditure_i$ is the log of total expenditure for household *i*. As discussed in the main paper, we include the expenditure control to proxy for the household's permanent income. We instrument $Expenditure_i$ with $Income_i$ – where $Income_i$ is a vector of current household total family income controls including: a dummy for whether income was missing; the log of income if it was non-missing; a cubic in the level of income; a set of three education dummies, with less than high school being the omitted group; and a series of one-digit industry and occupation codes. A full discussion of this specification can be found in the text.

X_i is a vector of demographic controls including a quadratic in age, household wealth controls, year effects and indicator variables for the number of adults in the household, the number of total family members in the household, marital status, whether the household head is male, and indicators for urbanicity, MSA residence, and Census region.

As the starting point for our robustness specifications, we use exactly the same sample and specification as the primary one in the paper - specification 6 of Table 2 of the main paper. Tables R4 and R5 represent robustness estimates from various modifications to the primary sample and specification.

Table R4 presents estimated Black and Hispanic effects (β_1 and β_2) for various sub-samples. The results in rows (1)-(3) indicate that the racial difference in visible consumption remains large among the sub-samples of single men, single women, and married households. For example, Black (Hispanic) single men consume 32 percent (37 percent) more visible goods than

similar White single men. The comparable differences for Black and Hispanic single women, relative to White single women, were 28 percent and 21 percent, respectively.

Rows (4)-(7_ of Table R4 show the racial gap in visible consumption *within* different educational groups. We find racial differences in visible consumption within all educational groups, although the magnitudes of the differences vary slightly for different education levels. Black households headed by someone with only a high school degree consume 30 percent more visible goods than a comparable White household. The comparable Black-White gap in visible expenditures for households headed by someone with at least a college degree is 23 percent. The gradient in the racial gap in visible consumption with respect to education is steeper between Whites and Hispanics. Among households headed by a person with only a high school degree, Hispanics consume 40 percent more visible goods than comparable Whites. Among college graduates, the gap falls to 6 percent.

In Rows (8)–(10) of Table R4, we explore how the racial gap in visible expenditures changes with age. On average, the gap in visible expenditures for Blacks relative to Whites is larger in the age range of 18-34 than it is in older ages. The Black-White difference in visible expenditures diminishes with age.

Table R5 shows that our main findings are robust to a variety of alternative specifications and restrictions. Again, all of the results shown in R5 are alterations to our primary specification in the text (row (6) of Table 2). Row (1) restricts the sample to those households with non-zero income measures. Row (2) restricts the sample to households with complete income records. The NBER CEX files have a variable that indicates whether or not any of the components of total family income was either "invalid non-response" or "don't know, refusal". In row (2), we only include households that had valid total family income responses. As seen from rows (1) and (2) of Table R5, our results are in no way sensitive to the inclusion or exclusion of households with zero, missing, or incomplete income records.

Row (3) of Table R5 excludes households with less than $23,200 a year in total expenditures – the 25th percentile of the expenditure distribution. Row (4) excludes households under the age of 24. These regressions are meant to assess whether our findings are driven by very poor or very young households, and the results indicate that this is not the case.

Row (5) restricts the sample to those with households who completed all four CEX interviews. Since 50% of CEX respondents complete less than their scheduled interviews, we wondered whether such households were driving our results. Excluding these households had no effect at all on our results. Row (6) includes the log of state housing prices measures (as described in the main text) as an additional control. Row (7) restricts the sample to only those households where the head is working full-time. Row (8) restricts the sample to include only those households in the CEX between the years of 1996 and 2003. Row (9) restricts the sample to only those households in the CEX between the years of 1996 and 2003, and includes a complete vector of city size controls. The household's city size is only provided in the CEX starting in 1996. Not only are the main results robust to these sample and specification modifications, but some of the results in the table show larger differences in spending by Blacks and Hispanics on visible goods in some specifications than comparable Whites.

We also find that the racial gap in visible consumption has been consistently present during the period between 1986 and 2002 (these results are not reported in the tables). For example, the racial gap in visible consumption between Blacks and Whites for our main analysis sample, conditional on income, expenditure, and demographics, was 26 percent for the sub-period of 1990-1993 and was 21 percent for the sub-period of 1999-2002. Additionally, we found no difference in the estimated race coefficients in a sample of renters and a sample of home owners. Lastly, expenditures on food away from home were 22 percent *lower* for Blacks compared to similar Whites. The comparable gap between Whites and Hispanics in expenditures on food away from home was close to zero.

As an additional exercise, we have explored the robustness of our instrument set used to predict permanent income in our main analysis. Note, as discussed in the text, our measure of permanent income is log total expenditures instrumented with current income measures as well as education, occupation and industry dummies (see main text for full details). Given this formation, we are making the assumption that education, occupation, and industry does not affect household expenditures on different consumption categories aside from their effect on permanent income. While we believe this is a plausible restriction, one could tell stories as to why individual spending on visible goods may be related to education or occupation above and beyond its effect on permanent income. We can test these concerns directly. Specifically, we can exclude the education and occupation controls from our instrument set and, instead, include them as components of our X vector of additional controls. In doing so, we are assuming that the current income measures are our only excluded instruments

Such a modification to our empirical analysis does not affect our estimated race coefficients in any way. For example, if we re-estimate the specification in row 6 of Table with the more limited instrument set, the coefficient on the Black and Hispanic indicator variables are 0.25 and 0.22, respectively. In other words, our key results are robust to only using our current income controls as the excluded instruments.

On the whole, the results presented in the paper about racial differences in spending on visible goods are robust to many different specifications and is found within all sub-groups we analyzed.

3. Racial Spending Differences in the 1960-1961 CEX

In this section, we check the robustness of our results using the 1960-1961 Consumer Expenditure Survey. The 1960-1961 CEX was a precursor to the modern CEX used in the paper. The downside of the 1960-1961 CEX is that it has fewer observations than the recent CEX (from

1986 – 2003). The upside of using this data is that we can examine the racial differences in spending on consumption categories in the distant past.

Our specification using the 1960-1961 CEX data was nearly identical to our standard specification with the more recent CEX data. In particular, we regressed the log of spending on a given consumption category on a Black dummy, the log of total expenditure, a marital status dummy, age controls, sex of head control, an urban dummy, region dummies, and a full vector of family size and number of children dummies. Again, we instrument the log of total expenditure with current total family income dummies, education dummies, industry and occupation dummies. We use indicators for current income categories rather than the log of current income because total family income was only reported as a categorical variable in the 1960-1961 CEX. As in the main analysis, we restrict the sample to heads between the ages of 18 and 49 (inclusive) and all regressions were weighted using the CEX family weights. Our sample is further restricted to include only Black and White households given the low number of Hispanics in the 1960-1961 CEX.

Table R6 shows the results for visible consumption. As in the more recent periods, during the early 1960s, Blacks spent 27 percent more clothes and 23 percent more on personal care than comparable Whites. Conditional on having positive expenditure on spending on either a car purchase, car accessories or car maintenance, Blacks spend roughly 5 percent more than comparable Whites – although this difference is not statistically different from zero. It should be noted that Blacks also spend less on all other spending categories that we analyzed in the 1960-1961 CEX. For example, compared to similar Whites, Blacks spend 5 percent less and 9 percent less on food and entertainment, respectively. In summary, as in recent periods, Blacks spend substantially more on clothing and personal care than otherwise similar Whites.

A reduction in labor market discrimination, skill improvements, and the growth of transfer programs means that the current racial income gap is much smaller than the gap in 1960.

If the signaling and status model presented in the paper were the only explanation for differences by race in visible spending, one would expect that racial differences in visible spending in the early 1960s would be *larger* than for later years. Presumably, the gain to blacks from distinguishing themselves from poorer peers would have been larger then than now. We find the opposite pattern: the racial difference in clothing spending in 1960 is slightly smaller than the racial difference in clothing spending in 1986-2003 (27% vs. 38%).

Although finding different patterns would have strengthened the paper's main argument, it is important to remember that along with overall income convergence, there have been changes in *many* other factors which likely affected spending on clothing and personal care over the past 40 years, holding the preferences for relative status constant. For example, the nature of work done by Blacks has changed dramatically over time. In a sample of Black CEX household heads aged 18 to and 49, the proportion working as managers, professionals, or technicians in 1960 was much smaller than the comparable proportions in the recent CEX (roughly 4% vs. 15%, respectively). If expenditures on clothing are more complementary with white-collar occupations, relative Black occupational upgrading would have produced independent changes in the racial spending gap on clothing.

It is difficult to assess the role of occupation on visible expenditures, especially since occupation helps predict permanent income and permanent income is correlated with spending on clothing. We tried to subset the early CEX data to match the employment and occupation composition reflected in the recent data. Given the small sample size of Blacks in the 1960-1961 data and the fact that occupation is only measured at the one-digit level, this procedure did not yield any useful results (point estimates jumped around and the standard errors were large).

Although the CEX data does not allow us to shed light on the role of occupational or other changes, we believe that changing Black occupational attachment over the past half-century may play an important role in explaining changes in racial gaps in visible spending, and of

relative well-being more generally. We consider this a potentially important area for future research.

4. Racial Spending Differences in the PSID

The paper uses data from the 2005 Panel Study of Income Dynamics (PSID) to confirm the paper's main results from the CEX. As discussed in the text, the 2005 wave of the PSID adds new expenditure measures to the reports of food, housing services, and (in some years) utilities it consistently measured before that. The expanded 2005 consumption categories include expenditures associated with vehicles (purchase price of cars which were recently purchased, car loan payments, lease payments, car repair expenses, gasoline expenses, parking expenses, public transportation expenses, cab fare expenses, and "other vehicle expenses"), education, household furnishings, clothing, entertainment and recreation (including trips and vacations).

As discussed in detail in the paper, one of the main benefits of using the PSID to validate the CEX results is that the rich, multi-period income data in the PSID allows for an alternate measure of permanent income that is NOT based on household expenditures, which we were forced to use in the CEX. With PSID data, we create a permanent income measure that is based on averaging household income over many years. This alternative measure of permanent income allows us to assess the robustness of the CEX results to using total expenditure (instrumented with current income, education, occupation and industry) as our control for permanent income.

The second advantage of the PSID is exploited in this Appendix. The PSID offers detailed geographic codes for each household. In addition to state (the lowest level of geographic identification in the CEX), the PSID also measures household's county, MSA, zip code, and census track. These latter four geographic measures are part of the PSID's restricted geo code files. In order to use the files, one must seek special permission from the survey. The survey reports that the lag time to gain access to the restricted geo code data is roughly 6 months. We

obtained permission to use this restricted data in 1999, but the absence of broad consumption measures in the PSID at that time limited the usefulness of using the PSID to measure differences in racial spending patterns. Since we still have access to the 1999 geo codes for the exploration of racial differences in consumption, we linked location codes from the 1999 wave of the PSID to the consumption expenditure data from the 2005 wave of the PSID as part of our robustness analysis. This allows us to test whether our results hold in the PSID at the state level (replicating our results from the CEX) and at the lower levels of aggregation of the MSA-race level.

One important drawback to using the PSID data is that the sample sizes are very small relative to the combined CEX data. In particular, there are only roughly 4,000 households in the 2005 PSID that meet our limited sample restrictions. Roughly 1500 are Black.[2] The CEX data has roughly 10 times as many total observations. Once we restrict the sample to households which were also in the PSID during 1999 *and* which had non-missing MSA identifiers, the number of households falls dramatically, to fewer than 1,800 total observations with only approximately 700 Blacks. If we further condition on households who did not change states between 1999 and 2005, the sample size falls even more. If we restrict to households who did not move at all between 1999 and 2005 (guaranteeing that they did not change MSAs), the total sample size is less than 1,000 observations. So, relative to the CEX data, power is potentially an issue. However, despite the power issues, the racial patterns of consumption on visible goods are very similar between the CEX and PSID.[3]

We present two sets of PSID results in this Appendix. In Table R7, we replicate the results of Table 8 of the main paper and show that once we control for reference group income at

[2] We use the full PSID sample including the SEO oversample for our analysis. We use the PSID core family weights when conducting all of our statistical analysis. Using the PSID weights, blacks comprise roughly 16 percent of our analysis sample. All of our results are quantitatively similar if we exclude the SEO sample from our analysis.

[3] Another drawback of the PSID is that the PSID is not designed to measure consumption expenditures. The validity of the PSID consumption measures (both in means and distribution) has yet to be assessed. Again, despite this, the pattern of racial spending on visible goods is very similar between the PSID and the CEX.

the state-race level, the racial gap in clothing spending diminishes substantially. Row 1 of Table R7 displays the conditional racial gap in clothing spending. In row (2), we add controls for state fixed effects. As with the CEX data, state fixed effects do not alter the racial gap in clothing spending in any way. In row (3), we include both state fixed effects and mean reference group income (where reference groups are defined at the state-race variable). This variable is identical to the variable used in the CEX data (i.e., we used the CPS from 1990-2002 to define mean total family income for men at the race–state level). See the main text for details. The specification in row (3) of Table R7 is analogous to the specification in column (4) of Table 8 of the paper. Controlling for mean state income for one's own race causes the race coefficient in the clothing spending regression to fall from 0.23 to -0.62. The new estimate is very noisy. Again, this is not surprising given the lack of power. However, it is interesting to note that the coefficient on mean income by race/state cell is negative and statistically significant (even with the low power). Individuals with poorer reference groups spend more on clothing, all else equal. Overall, these results are broadly consistent with the similar specifications using CEX data.

In Table R8, we define the reference groups at the MSA-race level. The MSA geocodes from the PSID allow for finer levels of spatial reference than in the CEX. Table R8 shows that the results are very similar to those using state/race income. The various rows in Table R8 reflect the alterations necessary to merge the household 1999 MSA data with the 2005 sample used above. As the results in rows (1)-(3) of Table R8 show, the additional sample restrictions do not alter the racial gap in any way. The sample restrictions include: 1) having the household in the sample in 1999 (row 2) ; and 2) having the household report a non-missing MSA code in 1999 (row 3). There are two reasons that a household may have a missing MSA code in 1999. First, they may not live in an MSA, since about 20% of all households live outside of MSAs. Second, conditional on living in an MSA, the PSID may report missing MSA codes. Aside from the

sample restrictions in rows (2) and (3), the regressions are identical to the ones shown in row (3) of Table R7, which already include state fixed effects already.

In row 4, we augment the specification to include the mean total family income of male households in the MSA for one's own race. We get this variable from the 5% extract of the 2000 Census IPUMS. Notice, that including the MSA-race specific income control reduces the race coefficient by about 25 percent. Again, simply including MSA income makes the Black-White difference in clothing spending smaller. In row (5), we exclude the mean race specific MSA income measure and, instead, include MSA fixed effects. As with state fixed effects, MSA fixed effects do little to explain the racial difference in spending. In row (6), we include both MSA fixed effects and mean income at the race-MSA level. In this specification, the race coefficient becomes negative and statistically insignificant. For the MSA level analysis, it seems that MSA fixed effects and within MSA variation in income by race together explain the racial differences in clothing expenditures.

In summary, we have performed a battery of robustness exercises using data from the PSID. Even though the sample sizes are much smaller, the same patterns of results are found in the PSID as we documented in the CEX. The PSID also allows us to use alternate measures of permanent income and to define reference groups at a more disaggregated level. The results are robust to both of these alterations.

5. Differences in Visible Retail Establishments Across Black and White Zip Codes

The robustness results shown in sections 2-4 were all variants of the main results shown in our paper. All specifications examined racial differences in spending on visible goods. In this section, we look at another implication of our results. In particular, we ask whether retail

establishments that sell visible goods are more likely to locate in Black areas, holding the size and income of the area constant.[4]

To do this, we use data from the 2004 county level business patterns. The analysis is conducted at the level of the zip code. We study the fraction of all retail establishments in a given zip code that sell "visible" goods. We define total retail establishments as all stores with NAICS establishment codes 44-45 (retail trade). We define visible goods to include clothing and jewelry establishments (NAICS establishment codes 4811 – 44831, which includes men's, women's, and children's clothing, clothing accessories, shoes, jewelry stores, etc.) as well as personal care establishments (NAICS establishment code 44612 which includes cosmetic, beauty supply, and perfume stores).[5] We merge the data from the 2004 county level business patterns with zip code level data on racial composition, mean total family income, and total population from the 2000 Census.

Table R9 shows the results of a Tobit regression of the share of visible goods establishments among total retail trade establishments on the fraction of the population in the zip code that is Black, the fraction of the population in the zip code that is neither Black nor White, a cubic in mean total family income within the zip code, and a cubic in total population within the zip code. We estimate a Tobit regression because a non-trivial fraction of all zip codes had no visible goods establishments among all retail establishments. The sample is restricted to zip codes with at least one retail trade establishment.

The analysis shows that conditional on zip code size and income, Black zip codes have a greater share of visible goods establishments out of total retail trade establishments than otherwise similar White zip codes. In particular, a zip code where the population is all Black has

[4] We thank Jesse Shapiro for the suggestion to examine whether there are more visible retail stores in minority zip codes.

[5] Beauty salons and barber shops are NOT included in either total retail trade establishments or in our measure of personal care establishments. Beauty salons and barber shops are classified in the NAICS codes in the general "other services" category.

9.3 percent more clothing and jewelry stores than otherwise similar all White zip code (0.004/0.043).

We realize that these results are, at best, merely suggestive with respect to the mechanism we highlight. Several factors beyond the scope of this paper determine the spatial distribution of retail establishments. And, these results are not weighted by total establishment sales figures. Nonetheless, we think it reassuring and broadly supportive of the argument made in the paper that, in zip codes of the same income, establishments specializing in the sale of visible items appear to be concentrated in neighborhoods with more racial minorities.

6. Decomposing the Impact of Racial Differences in Visible Spending

One natural question that arises from the analysis in the main text of the paper is how Blacks and Hispanics finance their higher levels of conspicuous consumption. As Table 4 of the paper shows, Blacks and Whites spend less on all other components of consumption, aside from housing. Yet, that analysis does not tell us whether it is higher spending on visible consumption that accounts for the lower spending on the other categories.

To address this question, we estimate the following regression, using the original CEX sample, which is described in the notes to Tables 1 and 2 of the main text:

$$\ln(s_i^k) = \beta_0 + \beta_1 Black_i + \beta_2 Hispanic_i + \varphi\left(Permanent\ Income\right)_i + \theta X_i + \gamma \ln(visible_i) + \eta_i \qquad \text{(R2)}$$

where *Black*, *Hispanic*, *visible*, and *X* are defined as in the main text and s_i^k is the expenditure by household *i* on expenditure category *k*. As with the specifications in the text, *permanent income* is measured as the log of household total expenditures. Also, as described in detail in the text, we instrument the log of household total expenditures with

the household's current income, education, occupation, and industry controls. Equation (R2) is identical to equation (R1) discussed earlier, except for the inclusion of the log of visible expenditures as an additional regressor.

By examining the race coefficients (β_1 and β_2) from equation (R2), with and without the inclusion of the log visible expenditure, we can assess the extent to which the racial differences in spending on the other consumption goods are systematically related to minorities' higher spending on visible goods. To mitigate the effect of zero expenditures on particular consumption categories, we examine only three broad consumption categories. These categories are, respectively, "necessities", which includes expenditures such as housing, food, and utilities; "broad entertainment", which includes expenditures on entertainment services, entertainment durables, and alcohol and tobacco; and "health and education", which includes expenditures on health and education. These three categories comprise the overwhelming majority of the household's non-visible total expenditures (see Appendix Table A2).[6]

Table R10 shows the results of regression (R2). Columns (1) and (2) present the change in the Black and Hispanic coefficients, respectively, associated with the addition of the log of visible spending as an additional control to the regression. Notice, adding visible expenditure increases the estimated race effects, for both Blacks and Hispanics, and for all consumption categories. Controlling for visible spending either increases the positive point estimates on the race coefficients (as in the case of necessities) or lowers the absolute value of negative point estimates (as in the case of broad entertainment and

[6] The remaining categories that we do not examine include home furnishings, other transportation, and other nondurables. We have separately looked at these categories. In total, visible spending explains very little of the racial differences in these remaining categories.

health and education). Column (3) presents the coefficient on log visible spending. In all cases, more spending on visible goods leads to less spending on the consumption category.

To translate the additional spending on visible goods by Blacks and Hispanics into the implied dollar declines in spending on non-visible goods, we multiply the change in the racial coefficients by the average spending of Whites on a given consumption category. Column (4) of Table R10 shows the average spending by Whites on necessities, broad entertainment and health and education. These totals are also presented in Appendix Table A2 of the main text. Columns (5) and (6) simply show the results of multiplying the average spending by Whites by the change in the Black and Hispanic coefficients shown in column (2) and (3), respectively. For example, the additional spending on visible goods results in Blacks spending $825 less per year on necessities, $76 less per year on broad entertainment, and $184 less per year on health and education. These totals sum to nearly $1100. If the empirical model is specified correctly, the remainder of the $1800 per year spent by Blacks on visible spending comes from spending on other consumption categories such as home furnishings and other nondurables (which we estimate to be roughly $100 per year); from household savings; or from other unmeasured household outlays, such as transfers from the household to other family members.

Appendix Table R1: Survey Questions

Q1: Background Information

Sex (male or female); Age; Race (White, Black, Hispanic, Asian, Native American, or other); Current Marital Status (single, married)

Q2: Beliefs About the Visibility of Consumption Categories

In this set of questions, we are attempting to gauge how easy it is to observe the amount someone spends on a broad set of consumption categories.

Consider a person who lives in a household and community roughly similar to yours. How closely would you have to interact with this person in order to observe that they *consistently spend more* than average on each of the following consumption categories?

Your answers should range from 1 to 5 with:

1 = I would observe their above average spending even if I did not interact with them socially at all.
2 = I would observe their above average spending if they were a casual acquaintance and I only occasionally interacted with them socially.
3 = I would observe their above average spending only if they were a friend.
4 = I would observe their above average spending only if they were a *close* friend.
5 = I would never observe their above average spending no matter how much I interacted with them socially.

Q3: Response of Spending to Income Changes

In this set of questions, we are trying to understand one's perceptions about the relationship between income and consumption for a variety of consumption categories.

Consider a randomly chosen individual in society. Imagine that this person's lifetime income suddenly increased by 20%. For each item below, tell us how you would expect the person's spending on each of the following items to change.

1 = Spending would fall
2 = Spending would stay the same
3 = Spending would increase by *less than* 20%
4 = Spending would increase by *exactly* 20%
5 = Spending would increase by *more than* 20%

Categories respondents asked about (exact wording): Grocery Expenditures (food purchased at grocery stores excluding spending on tobacco products and alcohol); Non Grocery Food Expenditures (restaurants, cafeterias, etc.); Alcohol; Tobacco Products (cigarettes, cigars, etc.); Clothing, Shoes, and Clothing Accessories; Jewelry and Watches; Personal Care and Grooming Expenditures (including hair care, make-up, perfume, and gym memberships); Shelter Expenditures (monthly rent payment, house value, etc.), Household Utilities (expenditures for telephone service, home heating, home electricity, etc.); Value of Owned and Leased Vehicles (excluding expenditures on maintenance and repair); Vehicle Maintenance and Repair (oil changes, car repairs, other car maintenance); Other Transportation Expenses (gasoline, public transportation, parking fees, rental cars, etc.); Home Furnishings (furniture, linens, dishes, etc.); Entertainment Durables (television sets, stereos, sports equipment, other entertainment equipment); Other Entertainment Expenditures (DVDs, CDs, movie tickets, golf fees, books, periodicals, cable television fees, vacation travel); Children's Education (tuition, books, other school related expenses); Health Expenses (health insurance, out of pocket medical expenses, prescription drugs); and Charitable Giving (including religious giving).

Appendix Table R2: Descriptive Statistics from the Conspicuous Consumption Survey

Variable	Sample Mean
Percent Male	60%
Percent Married	38%
Age Distribution	
Percent Age < 24	2%
Percent Age 24 – 26	18%
Percent Age 27 – 29	44%
Percent Age 30 – 32	28%
Percent Age 33 – 35	5%
Percent Age > 35	3%
Racial Composition	
Percent White (non-Hispanic)	61%
Percent Asian	24%
Percent Black	7%
Percent Hispanic	6%
Percent Other	3%

Notes: Sample demographics for the "Conspicuous Consumption" survey that we implemented among students in the MBA and Public Policy Programs at the University of Chicago. See the text in the robustness appendix for full details. We had 320 students complete the survey.

Appendix Table R3: Results of the Visible Goods Survey

Category	Fraction of the Sample Reporting Consumption Item as Easily Observable	Fraction of the Sample Reporting Consumption Item as Having Income Elasticity of 1 or More
Clothing	0.64	0.57
Jewelry	0.62	0.52
Vehicles (Non Maintenance)	0.49	0.44
Personal Care	0.31	0.35
Tobacco	0.40	0.16
Alcohol	0.35	0.07
Shelter	0.37	0.47
Food Away From Home	0.24	0.47
Entertainment Durables	0.17	0.53
Other Entertainment	0.12	0.50
Children's Education	0.15	0.30
Groceries	0.08	0.05
Utilities	0.06	0.05
Home Furnishings	0.09	0.37
Other Transportation	0.05	0.08
Charity	0.04	0.18
Health	0.02	0.07
Vehicle Maintenance	0.03	0.07

Notes: This table summarizes the results of our survey of 320 graduate students about their beliefs about what goods are "visible". Robustness Appendix Table R1 outlines the exact wording of the survey questions. Column 1 reports the fraction of households who answered 1 or 2 to survey question Q2. Answers 1 or 2 indicated that the survey respondents would be able to ascertain above average spending on the consumption category for individuals with which the respondent was relatively unfamiliar. Column 2 reports the fraction of households who answered 4 or 5 to survey question Q3. Answers of 4 and 5 indicate that the survey respondent believed there was a unitary income elasticity or greater with respect to spending on the consumption category.

Table R4: Differences in Visible Consumption between Blacks, Whites, and Hispanics, Conditioned on Income, Expenditure and Demographic Controls

Sample	Black Coefficient	Hispanic Coefficient
1. Single Men (n = 10,406)	0.32	0.37
	(0.04)	(0.05)
2. Single Women (n = 13,450)	0.28	0.21
	(0.03)	(0.06)
3. Married Households (n = 25,507)	0.23	0.20
	(0.02)	(0.04)
4. Education of Head < 12 (n = 5,250)	0.30	0.40
	(0.06)	(0.04)
5. Education of Head = 12 (n = 14,605)	0.30	0.22
	(0.03)	(0.07)
6. Education of Head >12 & < 16 (n = 14,876)	0.27	0.18
	(0.03)	(0.06)
7. Education of Head >= 16 (n = 14,632)	0.23	0.06
	(0.04)	(0.04)
8. Age of Head Between 18 and 34 (n = 23,837)	0.30	0.24
	(0.03)	(0.05)
9. Age of Head Between 35 and 49 (n =25,526)	0.23	0.26
	(0.02)	(0.05)
10. Age of Head Between 50 and 69 (n = 19,717)	0.15	0.22
	(0.05)	(0.07)

Notes: Sample restrictions are the same as described in the note to Table 1 of the main paper. Additional sample restrictions are described in each row of the table. Aside from these additional sample restrictions, the regressions in this table have the same specification and use the same controls as the specification shown in row (6) of Table 2 of the main paper. Robust standard errors (clustered at the state level) are in parenthesis.

Table R5: Alternate Estimates of the Differences in Visible Consumption Between Blacks, Hispanics, and Whites

Specification	Black Coefficient	Hispanic Coefficient
1. Restrict Current Household Income > 0 (n = 30,619)	0.26 (0.03)	0.23 (0.05)
2. Restrict to Households With Complete Income Records (n = 31,106)	0.30 (0.03)	0.23 (0.05)
3. Restrict Total Expenditure > $5,800/quarter (n = 35,181)	0.26 (0.03)	0.15 (0.06)
4. Restrict Age to be between 24 and 49 (inclusive) (n = 43,785)	0.26 (0.02)	0.25 (0.05)
5. Restrict Sample to Only Those With 4 Completed CEX Surveys (n=27,285)	0.26 (0.02)	0.23 (0.05)
6. Include Log of State Housing Prices as a Control (n = 49,363)	0.28 (0.02)	0.26 (0.04)
7. Restrict Sample to Only Households Where Head is Working Full Time (n = 23,744)	0.24 (0.03)	0.17 (0.05)
8. Restrict Years 1996 – 2003 (n = 24,430)	0.28 (0.04)	0.26 (0.05)
9. Restrict Years 1996 – 2003: With City Size Controls (n = 24,430)	0.31 (0.04)	0.29 (0.04)

Notes: This table examines the robustness of the results show in row (6) of Table 2 of the main text. Aside from the changes noted, the regressions in this table are identical to the ones presented in row (6) of Table 2 of the main text. Robust standard errors (clustered at the state level) are shown in parentheses.

Appendix Table R6: Racial Differences in Visible Expenditure from the 1960-61 Consumer Expenditure Survey

Dependent Variable	Coefficient on Black Dummy
Log of Clothing Expenditures (n = 7,678)	0.28 (0.02)
Log of Personal Care Expenditures (n = 7,681)	0.25 (0.02)
Log of Total Car Expenditure (n = 6,601) [a]	0.07 (0.04)
Log of Food Expenditures (n = 7,684)	-0.05 (0.01)
Log of Entertainment Expenditures (n = 7,567)	-0.09 (0.05)

[a] Regression estimated on a sample of households with strictly positive total car expenditures.

Notes: Data from the 1960-61 Consumer Expenditure Survey. Sample restricted to individuals between the ages of 18 and 50 (inclusive). Furthermore, we only include households who report their race as either being Black or White. The table reports the coefficient on the Black dummy from a regression of the log of spending on a given category on a Black dummy, the log of total expenditure, a married dummy, a series of age dummies, a male dummy, an urban dummy, region dummies, and a vector of family size and number of children dummies. Like for our main specifications presented in the tables in the main text, we instrument the log of total expenditure with a series of current family income dummies, education dummies, and industry and occupation dummies. See the text of the robustness appendix for additional details. We further restrict all regressions to include only households who had positive spending on the given consumption category during the previous year. The full sample included roughly 7,690 households. As seen from the sample sizes listed for each regression, nearly all households reported positive spending on clothing, personal care items, food expenditures, and entertainment during the prior year. All data are weighted using the survey weights provided. Robust standard errors are in parentheses.

Appendix Table R7: PSID Results With State Fixed Effects and Mean Income By State and Race

Specification	Coefficient on Black Dummy	Coefficient on Mean Income By Race and State
1. Base Regression (n = 3,898)	0.24 (0.07)	
2. Base Regression with State Fixed Effects (n = 3,898)	0.23 (0.07)	
3. Base Regression with State Fixed Effects and Log of Mean Income By Race and State (n = 3,898)	-0.62 (0.36)	-1.61 (0.66)

Notes: The base sample and specification used for these regressions are nearly identical to the specification used in row (1) of Table 5 of the main paper. We do, however, make one modification to the sample by restricting the sample to only include households with non-missing state of residence information. As seen by comparing the sample sizes between this table and row (1) of Table 5 from the main paper, we lose 30 observations with this restriction. For comparison, we redisplay the base specification on this slightly restricted sample in row 1 of this table. In the specification shown in row (2), we augment our base specification by including a complete vector of state fixed effects. In row (3), we include both state fixed effects and the log of mean income of the individuals same race for the state which they reside. This variable is identical to the variable we used in the Tables 8 of the main paper. All data are weighted using core PSID family weights and robust standard errors clustered at the state level are in parentheses.

Appendix Table R8: PSID Results With State and MSA Fixed Effects and Mean Income By MSA and Race

Specification	Coefficient on Black Dummy	Coefficient on Mean Income By Race and MSA
1. Base Regression (n = 3,928)	0.22 (0.07)	
2. Base Regression Restricted to Household in the Sample in 1999 (n=2,469)	0.21 (0.09)	
3. Base Regression Restricted to Households in the Sample in 1999 who Had a Non-Missing MSA Identifier (n = 1,757)	0.22 (0.11)	
4. Specification 3 with Control for Log of Mean Income By MSA and Race (n = 1,757)	0.17 (0.13)	-0.11 (0.20)
5. Specification 3 with MSA fixed Effects (n = 1,757)	0.18 (0.11)	
6. Specification 5 with Control for Log of Mean Income By MSA and Race (n = 1,757)	-0.52 (0.39)	-1.57 (0.87)

Notes: The specification in row 1 of this table is identical to the specification in row (2) of Table R8 (see the notes to Table R8 for a full description). The specifications in rows (2) and (3) of this table are identical to the specifications in row (1) except the sample is modified in two ways. In row (2), we restrict the sample to include only those households who had the same household head in 1999. In row (3), we further restrict the specification in row (2) to only include households who had non-missing MSA identifiers in 1999. See the robustness appendix text for the rational for these restrictions. In row (4), we amend the specification in row (3) to also include mean income for the household's reference group where reference group is defined as individuals of the same race within the same MSA. We define mean income as being the mean total family income from the 2000 census. In row (5), we redo the specification in row (3) with MSA fixed effects. In row (6), we redo the specification in row (3) with both MSA fixed effects and mean income of the MSA-race reference group. Robust standard errors clustered at the state level are in parentheses.

Table R9: Zip Code Establishment Level Analysis

Dependent Variable	Marginal Effect on Proportion Black in the Zip Code	Marginal Effect on Proportion "Other" in the Zip Code	Mean of Dependent Variable
Share Clothing/Jewelry Establishments Out of Total Retail Establishments	0.004 (0.002)	0.008 (0.003)	0.043
Share of Clothing/Jewelry/Personal Care Establishments Out of Total Retail Establishments	0.011 (0.002)	0.007 (0.003)	0.051

Notes: Data come for the 2004 county level business patterns. The level of the analysis is the zip code. Sample restricted to all zip codes that had at least one retail establishment (NAICS establishment codes 44-45). Clothing and Jewelry establishments represent all five digit NAICS establishment codes between 44811 and 44831 (men's clothing, women's clothing, children's clothing, clothing accessories, shoes, jewelry stores, etc.). Personal care establishments include only cosmetic, beauty supply, and perfume stores (NAICS code 44612). Beauty salons and barber shops are NOT included in either total retail establishments or in our measure of personal care establishments. Beauty salons and barber shops are classified in the NAICS codes in the general "other services" category. The marginal effects in this table come from a tobit regression of the share of visible goods establishments over total retail establishments in the zip code on the proportion black in the zip code, the proportion non black and non white in the zip code, a non linear function of zip code level total family income, and a non linear function of zip code level population. Marginal effects from these regressions are presented in the table. Both the zip code level income and population measures are positively related to the fraction of visible establishments in the zip code (in both specifications).

Robustness Table R10: Decomposing the Effects of Increased Visible Spending By Blacks and Hispanics On the Spending of Other Categories

Log of Expenditure Category	(1) Change in Black Coefficient	(2) Change in Hispanic Coefficient	(3) Coefficient on Log Visible Spending	(4) Dollar Value of Spending For Whites Per Year	(5) Dollar Value Change in Black Spending	(6) Dollar Value Change in Hispanic Spending
Necessities	0.040	0.036	-0.154	20,630	825	743
Broad Entertainment	0.016	0.013	-0.074	4,780	76	62
Health and Education	0.061	0.052	-0.273	3,010	184	157

Notes: Table shows the results of regressions of log spending on a given consumption category on race dummies, permanent income controls, and household demographic controls with and without controls for log visible spending. Aside for how the consumption categories are defined and for the controls for log visible spending, these regressions are identical to the ones shown in Table 4 of the main text. The consumption categories we analyze include "necessities" (which includes food, utilities, and housing – as defined in Table 4), "broad entertainment" (which includes entertainment services, entertainment durables, and alcohol and tobacco – as defined in Table 4), and "health and education" (which includes health and entertainment – as defined in Table 4). Columns (1) and (2) show the change in the Black and Hispanic coefficients, respectively, from estimating equation (R2) without and with log visible expenditure as an additional control. Column (3) includes the coefficient on log visible spending when estimating equation (R2) with log visible expenditures as an additional regressor. Column (4) shows the average annual spending on the consumption category by Whites in the sample. Columns (5) and (6) compute the additional dollar reduction in spending on the consumption category by Blacks and Hispanics that results from their increased spending on visible goods. This is computed by multiplying the change in the racial coefficient for each consumption category by the average spending on that category by Whites.