Quantifying Stability and Change in Personal Culture Using Panel Data

Abstract

Recent work has produced conflicting interpretations on the question of whether adults undergo durable changes in their personal culture over time. This paper asserts that this divergence is less due to researchers' findings than the approach taken – a tournament of models focusing on the presence or absence of change. To move beyond this, we reanalyze the data used previously in this debate with an approach that quantifies the processes of cultural difference. In doing so, we compare how much cultural difference is explained by intrapersonal change and interpersonal differences. Our results harmonize recent findings by showing that, while most measures of personal culture show change over time, the variance explained by intrapersonal change is typically small compared to interpersonal differences at baseline. Quantifying these processes offers new ways to address theoretical questions of when and how their relative importance shifts. We examplify this with the case of college experience.

Introduction

A recurring focus in the sociology of culture is the question of whether people, as they move through their lives and transition between social roles, change their personal culture — the declarative and non-declarative attitudes, beliefs, values, practices, and dispositions that exist at the individual level (Kiley and Vaisey 2020; Lersch 2023; Lizardo 2017).

This seemingly simple question underlies a number of central debates across sociological subfields. For example, pragmatist theories of action claim that changes in social environments cause people to adapt their views and make new meanings (Gross 2009; Swidler 2001), while Bourdieusian practice theories argue that the "past conditions of production" leave a mark on people's personal culture that lasts throughout their lives (Bourdieu 1990). Similarly, models of social influence assume that people adapt their culture in the face of new information (Vaisey and Lizardo 2010), while the emphasis on cohort effects in models of aggregate social and cultural change requires them to be open to change while young but become fairly resistant to it as they age (Ryder 1965). Finally, life course theories posit slower but still important changes over time as people advance through important transitions in their lives (Bardi and Goodwin 2011; Elder and George 2016).

Because all of the above theoretical perspectives have some empirical support, the current debate revolves around not whether they exist, but when and how they each apply and the relative contribution of each to explaining cultural differences. That being said, scholars have struggled to reach a consensus on the relative importance of change during adulthood. Over the span of a few years, most apparent changes in people's responses to personal culture items appear to be transitory, with little evidence of persistent change among adults (Kiley and Vaisey 2020; Vaisey and Kiley 2021). This suggests that change during adulthood is not a strong force in explaining personal cultural differences. When looked at over longer time horizons, however, there is at least some evidence that adults make persistent cultural changes, especially as they move through distinct social roles (Lersch 2023).

These seemingly inconsistent findings are partly due to the fact that researchers have taken a "tournament of models" approach in adjudicating different theoretical perspectives (Lersch 2023: p. 228). Accordingly, researchers have formalized models of responses to cultural items over time as demonstrating either "change" or "no change" to then compare their empirical fit, which essentially asks whether we ever observe within-person change in personal culture [WE COULD ALREADY HERE SWTICH TO "INTRAPERSONAL CHANGE" OR

INTRODUCE THE TERM AS AN ALTERNATIVE TO WITHIN-PERSON CHANGE].

We argue that asking only *whether* people change obscures what are actually highly compatible empirical patterns. Being able to detect "change" in a given dataset depends not only on sample populations, item measurement, statistical methods and power, but crucially also on definitions of what counts as "change." These methodological differences therefore limit the possibility of convergence on the theoretical debates. Moreover, asking whether there is evidence of change limits the kind of questions that can be asked to, "Do we see change in this measure?" But such inquiries are ill-suited to address what's at the core of the theoretical debate. There is enough evidence to assume that neither socialization at an early age nor the influence of the contemporary environment alone can explain cultural differences. The question that remains is under what conditions, across which groups, and in what domains do we observe differences in the relative importance of intrapersonal change and interpersonal differences. This focus is necessarily comparative and requires an approach that quantifies forms of cultural change rather than calling victory for the one or the other perspective.

In this paper, we try to intervene in this debate by moving beyond the "tournament of models" approach toward a quantification of the processes that lead to differences in personal culture. Drawing on the seven panel datasets analyzed in the debate, we use established methods to quantify the amount of variance in responses that is due to between-people differences at a single point during the survey versus the amount of variance in responses that is due to linear within-person change over time. This measure gives us a sense of the importance of intrapersonal change over the course of the panel relative to the differences that exist between people assuming they never changed.

We observe similar patterns across the datasets that yielded previously conflicting interpretations. In all datasets we find similar rates of personal change over time across a broad range of measures of personal culture. But quantifying these processes also reveals that intraper-

sonal change plays a substantially smaller role in explaining the variance in peoples' personal culture than between-person differences at their baselines. Whether the found contribution of intrapersonal change is large enough to be "meaningful" ultimately remains a theoretical question reflected in prior expectations about particular cultural item, population, and duration. Nevertheless, with important exceptions, the results suggest that intrapersonal change (in some cases over more than 10 years) does not seem to play a substantial role in explaining a broad range of personal cultural differences we observe between adults.

These results help clarify and, hopefully, transcend previous debates. What is more, the measure we propose offers a tool with wider utility than merely discerning durable change that can help advance theoretical perspectives. To exemplify this, we turn to the role of education for cultural differences. Specifically, we use our measure to better understand what mechanisms might underlie differences observed between people with and those without college degrees. Focusing on eight questions that tab general political dispositions, our measure enables us to compare the relative importance of intrapersonal change for both groups. We find less evidence of durable change among those with college degree. This may imply that the college experience predominantly serves as a formative period that solidifies political dispositions, rather than fosters an openness and adaptability to new information and influences later in life. This offers a novel, empirical basis to theorize about the role of college in shaping personal culture. In the same way, we believe that our approach has the potential to advance the theoretical debate on personal culture beyond what a tournament of models approach can do. [TRIED TO GET A CATCHY END SENTENCE IN.]

Background

Change and Stability in Personal Culture

Recent debates about whether adults undergo intrapersonal cultural change emerged in part because theories of cultural change at the aggregate level tend to implicitly invoke one of two models of individual behavior. The first, what Kiley and Vaisey (2020) call a "Settled Dispositions Model" (SDM), assumes that peoples' personal culture is relatively fixed by the time they are adults. While they might make temporary changes in their declarative culture in reaction to their environments, this model assumes that people return to a settled baseline over a (relatively) short period of time. This model is frequently invoked in theories of cultural change that suggest people are strongly imprinted by early socialization experiences such as the "past conditions of production" a Bourdieusian practice theory (Bourdieu 1990), cohort replacement theories of aggregate change (Mannheim 1952; Ryder 1965), and control theories in social psychology (Robinson 2007; Smith-Lovin and Heise 1988).

The second model summarized by Kiley and Vaisey (2020), an "Active Updating Model" (AUM), posits that people continually update their personal culture as they move through life. This model suggests people change their personal culture as they adapt and make new meanings when encountering new social environments, discourses, and information (Gross 2009; Swidler 2001). This model underlies, among others, theories of cultural diffusion (Christakis and Fowler 2010), attitude alignment (DellaPosta 2020), and polarization (Bail et al. 2018). It is also implicit in most studies that ask whether specific experiences, changes in social roles, or political events, affect personal culture (Gelman and Margalit 2021; Slothuus and Bisgaard 2021; Visser and Mirabile 2004).

There is no reason to believe that only one of these two models is "correct" at all times and in all places. A population observed over some period of time contains a mix of people who are noticeably changing and people who are not. Instead, different perspectives argue

that each of these ideal-typical models is more operative at different times, for different people, and for different elements of personal culture. For example, adolescence and early adulthood is typically viewed as a "formative period" for personal cultural development and thus characterized by higher rates of active updating, while middle age and later life are potentially characterized more by settled dispositions (Alwin and Krosnick 1991; Eaton et al. 2009; Krosnick and Alwin 1989). Similarly, highly salient issues, such as views around gay rights in the 2010s; issues that see substantial elite realignments, such as views around the Vietnam conflict in the 1970s (Zaller 1992); and novel issues of public opinion, such as views around vaccines during the Covid-19 pandemic, might be characterized by active updating, while established issues of low salience are characterized by stability.

Empirically comparing which of these models better fit a broad range of questions from the General Social Survey's rotating panels, Kiley and Vaisey (2020) found limited evidence of durable change. While the AUM was preferred for the majority of items, the total amount of durable change detected on these items was small. A substantial minority of questions (39 percent) favored the SDM, meaning they showed no evidence of durable change. Questions with more evidence of durable change included highly salient issues like gay marriage and "public" issues like partisan identification and religious service attendance. There was also more evidence of durable change among early adults (people ages 18-30) than the rest of the population. Overall, the researchers concluded that "results ultimately suggest that real, persistent attitude change is an uncommon phenomenon among adults'' (Kiley and Vaisey 2020: p. 500; see also Vaisey and Kiley 2021). This lack of durable change is consistent with other findings that cohort replacement plays a larger role than period effects in explaining differences in personal culture (Vaisey and Lizardo 2016).

On the other hand, the claim that change is a relatively infrequent phenomenon has been difficult to square with research identifying durable change as a result of social experiences across a number of cultural dimensions, such as morality (Brońć and Miles 2021), trust (Mewes et al. 2021), and concerns about immigration (Kratz 2021). Similarly, there are

longitudinal studies showing that cues from political elites can change an individual's position on specific policy issues (Slothuus and Bisgaard 2021; Zaller 1992) and that changes in their close contacts and acquaintances can change individuals' attitudes on group-related politics (DellaPosta 2018; Gelman and Margalit 2021). Given how often we observe people change their personal culture, it is hard to accept that adults do not change.

Drawing on these findings, Lersch challenged the SDM and AUM as a "needless dichotomy" (2023). Instead he proposed the "Life Course Adaption Model" (LCAM). This model draws on the life course perspective to model personal culture as a linear trajectory over the course of a panel that varies for each respondent. Lersch rectifies two shortcomings of the AUM and SDM. First, the AUM, as described by Kiley and Vaisey, posits that changes follow a Markovian process where personal culture responses at time t rely solely on responses at time $t-1$. Howevre, earlier life experiences can (directly and indirectly) mold personal culture when transitioning to new social roles or into new environments, even if their initial impact is delayed. For example, childhood events might influence views on family structures later when individuals form their own families. The LCAM considers therefore considers influences from earlier than just $t-1$ on responses at time t.

Second, Kiley and Vaisey's analysis of the AUM and SDM is based on three-wave panel data over four years, which might not be extensive enough to properly adjudicate [COMPARE? WE ARE USING ADJUDICATING A LOT] the two models. Lersch, however, evaluates the LCAM against the AUM and SDM using panel data spanning a wider duration (from 3 to 36 years) and more waves (3 to 18), offering a better change to observe durable change.

In Lersch's tournament of models, the LCAM gains broad [EXTENSIVE?] support from data across five countries. Out of 428 questions, the LCAM was favored in 297 cases while the SDM was preferred in only 112. The rest did not yield inconclusive results, and notably, no questions favoured the AUM. He concludes that "new experiences over the life course [...] can persistently move individuals' personal culture in novel directions" (Lersch 2023:

p. 243-244).

Despite differing interpretations of these scholars, their empirical results align closely. Kiley and Vaisey (2020) discovered that most questions they investigated favored the AUM, indicating evidence of durable change among adults – a finding largely in line with Lersch's. However, while Lersch (2023) found a preference for the LCAM in many cases, durable change only accounted for a minor proportion of variance explained. On average, individuals changed [CAN WE SAY SHIFTED TO INDICATE THE LINEAR DRIFT] about .07 standard deviations over 10 years, echoing Kiley's and Vaisey's view that such changes are typically modest. Furthermore, a quarter of the items in Lersch's study favoured the SDM, suggesting that despite broader assumptions about change and more extensive data, many questions reveal no evidence of durable change. Likewise, in studies claiming evidence of durable change in personal culture, the magnitude is often minimal. For instance, Brocic and Miles (2021) note that obtaining graduate degrees in humanities, arts, and social sciences only shift [NUDGES?] peoples' moral relativism by about .2 standard deviations compared to non-degree holders [DELETED THE LAST SENTENCE PART HERE; FELT UNNECESSARY]. Moreover, studies of aggregate change demonstrate that even on questions where cohort effects prevail, there is always evidence that some individuals change over time (Vaisey and Lizardo 2016). In other words, despite different interpretations, the results of previous work are in many ways highly consonant.

Quantification, Not Adjudication

Current debates often narrow down to ask whether people *ever* change, which is rarely theoretically interesting since the answer is almost always "yes." Over sufficient time and in a large enough sample, researchers will likely observe some evidence for durable changes in individuals. A lack thereof may simply due to a lack of clarity in the question asked or a low level of resolution in the possible answers, or that the question simply was not asked

long enough or to enough people. Conversely, finding evidence of change tells us little about how much change is present in a population and how meaningful that change is for social differences.

A more theoretically productive approach begins with a model assuming that during an observed time period some individuals might remain stable, might change a little, or might undergo significant shifts in their personal culture. Lersch's LCAM formally does this by modeling each individual as following their own trajectory over time. But rather than debating whether this model is superior to a model that assumes that people never change, researchers should quantify individual changes over time and compare those to the differences that exist between people at the panel's start. In other words, the focus should shift from asking, "do people change?" to asking, "how do change and initial differences collectively explain variation in personal culture?" [I CHANGED THAT QUESTION WORDING, PLEASE CHECK!]

In this approach, two metrics reflect distinct theoretical processes. First, "early imprinting," as Lersch calls it, denotes interpersonal differences at the start of the panel, capturing the accumulated experiences of people before participating in the panel that influence their answers. While commonly associated with experiences during an early formative period that result in settled disposition, this could also reflect transformative experiences (2014) that happen at any stage in life, as long as they predate the panel and consistently impact subsequent responses. For instance, for those people entering the panel post-retirement, this "imprinting" might reflect this pivotal life transition. Consequently, this metric also reflects variation in individuals' social roles or statuses at the start of the panel that were important in shaping their dispositions.

The second process, termed "persistent change" or "adaption" by Lersch and "active updating" by Kiley and Vaisey, denotes durable changes in personal culture over time, captured by the amount of intrapersonal linear change during the panel. Lersch attributes these changes

to social triggers such as moving into a new environment or adopting new social roles. Additionally, they might reflect the diffusion of new cultural forms across social networks, cues from political elites or otherwise culturally influential leaders, the emergence of issues in politics or culture, or large-scale social shifts.

A third metric, often termed "residual variance" or "fluctuation," represents the remainder of variance in peoples' responses over time. This non-durable change may arise for various reasons. Some might lack clear cultural dispositions, leading them to construct an opinion or attitude during the survey, with varying thoughts and considerations dominating their thinking in each interview (Feldman and Zaller 1992; Tourangeau, Rips, and Rasinski 2000; Zaller 1992). Even though the full set of considerations they could draw on remains stable over time, this could yield to such variance in responses. Additionally, this variance can also include measurement errors, such as misinterpreted questions, erroneous response selections, or responses getting coded incorrectly. While this third process thus might reflect potentially important aspects of personal culture [I FELT WE NEED TO PLAY IT DOWN A BIT], it is less central to the debate outlined here. Hence, we focus on the first two metrics.

At a theoretical level, the coexistence of two main processes – interpersonal differences and intrapersonal change – is undeniable, and they are linked in many ways [THOUGHT IF intrinsically linked]. Any intrapersonal change during one's life will inevitably manifest as interpersonal differences by the time people enter a panel survey. Furthermore, unless people are entirely socialized early on and never deviate from these dispositions – an understanding challenged by evidence – we expect observing intrapersonal change in a segment of the population when surveyed over time.

Furthermore, these metrics are not necessarily useful in isolation or without context. Central to the theoretical debate is how the two processes they capture collectively explain cultural differences in a population. In other words, when examining adults across a period of time, does intrapersonal change, compared to interpersonal differences, sufficiently account for the

observed cultural differences? Only through quantifying the two processes we can get closer to a true answer to this question.

Yet, the true merit of the proposed quantification goes beyond settling past debates; it opens up new avenues for investigations that remained closed under previous approaches. For example, merely classifying questions based on whether they show durable change [DO WE NEED "or not"? NEVER KNOW THAT AS A NON-NATIVE] overlooks possibly important differences among those that do. By quantifying the contributions of interpersonal differences and intrapersonal change, researchers can gauge their relative importance in understanding [INSTEAD explaining] differences among survey items, between groups within a given population, across time, and even across societies.

Expectations

By reframing the question and adjusting the approach, we expect consistent patterns across datasets previously analysed in the debate. First, we anticipate evidence for some intrapersonal change in most measures of personal culture across datasets. Yet, earlier studies found many questions (between 25 and 35 percent) lacking evidence of durable change. Aligning wiht this, we expect considerable variation in the variance explained by intrapersonal change, with some questions indicating minimal variance attributable to such change. [I KEPT THE "VARIANCE EXPLAINED" PHRASING THOUGH THE "VARIANCE ATTRIBUTABLE" MIGHT BE LESS OF A HARD CLAIM WITHOUT LOSING MUCH?]

Second, we expect the variance explained by intrapersonal to be modest compared to interpersonal differences at the start of the survey. This assertion [EXPECTATION? PREMISE?] is fairly uncontroversial, regardless of the theoretical process assumed to be most relevant for a particular question. Panel surveys do not encompase individuals' entire lifetimes. Thus, even if intrapersonal change explains a large part of cultural differences, the change detected in a panel covering 20 years probably will not fully account for the entire variance of

interpersonal differences.

Our expectations so far largely echo what was observed in previous studies. However, theoretical perspectives differ in how much variance they attribute to intrapersonal change, enabling quantification to provide a new perspective on existing questions. "Formative period" and cohort theories, which emphasize early-life socialization as a strong force in shaping adult personal culture, suggest that the variance from intrapersonal change would still fall short of explaining interpersonal differences, even when extrapolated to a longer time frame [WE COULD DROP HERE A REFERENCE TO THE SPAN..., possibly beyond the panel window]. Conversely, other theoretical perspectives emphasizing the importance of people's current social roles expect intrapersonal change could account for a large portion of the variance when extrapolated [CAN WE FIND AN ALTERNATIVE TO "EXTRAPOLATE"?]. While projecting observed panel change beyond the covered time period may have its critics, we see it as a reasonable starting point. [DO WE NEED THIS LAST SENTENCE? IT FEELS WE ARE MAKING OUR SELVES VULNERABLE TO A CRITIQUE TO NO BENEFIT IN THE ARGUMENT.]

Third, we expect the variance explained by each process –interpersonal differences and intrapersonal change– to depend on specific attributes of the question and panel. Noteably, the longer we observe respondents, the higher the response resolution for a given question, and the larger the sample, the greater the variance explained by intrapersonal change should be. Given that the LCAM (supported by the various underlying theoretical perspectives) posits that social experiences drive changes in personal culture and that these experiences correlate with time, observing people for longer durations [or TIME SPANS?] increases the chance that they undergo experiences that change their personal culture. [WE WOULDN'T EVEN NEED THE "they undergo experiences that" IN THAT SENTENCE.]

Analytical Strategy

Data

We use data from 7 nationally representative panel surveys from Australia, Germany, Great Britain, Switzerland, and the United States (summarized in Table 1), combining all the data files used in previous work (Kiley and Vaisey 2020; Lersch 2023).[1] These studies cover a long period of time (the range of surveys spans from 1968 to 2021), with 609 personal culture items that capture attitudes, beliefs, values, self-assessments, self-descriptions, and behaviors (Alwin 2007). We restricted the sample such that individuals between the ages of 18 and 79 are included without further elimination, and in all surveys, we used all possible cases for which respondents provided responses. In the end, the analyses that follow rely on a cross-cultural sample with a cross-domain set of items to capture the breadth of individual personal culture. Appendix A documents the list of all variables used in the upcoming analyses.

<about here> Table 1: The Description of the Data Sources

Life Course Adaption Model

We start with Lersch's (2023) Life Course Adaption Model, which formalizes survey responses at time t as a function of individual-level random intercepts and slopes for survey age, what is often called a mixed-effects growth curve model. This model formally assumes a set of propositions about change that reflect the theoretical debate to this point. First, consistent with the settled disposition model, it assumes that people start the survey with cultural differences, modeled as random intercepts for each respondent. Second, it assumes that

[1]For more information on these data sources, see (Goebel et al. 2019; Income Dynamics 2013; Smith et al. 2022; Summerfield et al. 2011; Taylor 1996; University of Essex and Research 2019; Voorpostel et al. 2016).

people change over time, taking the form of random slopes for each respondent as a linear function of time. Third, it assumes that people deviate around this baseline randomly over time, reflecting "fluctuation" or short-term non-persistent change. Finally, it assumes that people draw on earlier time points in reacting to new events. Formally, this can be written as

$$y_{i,t} = \beta_0 + u_{0,i} + \beta_1 x_t + u_{1,i} x_{i,t} + \epsilon_{i,t}$$

where β_0 is the average intercept, $u_{0,i}$ is the random intercept for individuals, $\beta_1 x_t$ is the average slope, $u_{1,i} x_{i,t}$ is the random slope for individuals, and $\epsilon_{i,t}$ is the random error term that captures transitory disturbances.

As a first step in our analysis, we fit LCAMs to each of the 609 measures of personal culture outlined above. We then use these models to derive two measures of systematic variance that correspond to the two collections of theoretical processes outlined above: interpersonal differences at baseline and intrapersonal change over time. First, to measure the importance of interpersonal differences, we calculate the sum of the squared residuals derived from measuring each respondent at the midpoint of their age trajectory.[2] We then divide this value by the total sum of squares and subtract it from from 1, producing a value we denote as τ, or the proportion of variance explained by interpersonal differences. This number is equivalent to an R^2 value generated by using random intercepts for all respondents. Second, we calculate the sum of squared residuals generated by additionally accounting for the age trajectory. We divide this number by the total sum of squares and subtract it from 1. We then subtract τ from this value. This gives us a value we denote as δ, the additional proportion of variance explained by intrapersonal change.

These two numbers reflect the total systematic or "explained" variance of the model that

[2]We use the scale midpoint, rather than the actual difference at baseline, to better capture the differences between people independent of their age trajectories.

can be attributed to either differences across people or linear change over the course of the panel.[3] Our principal outcome of interest is the proportion of systematic variance accounted for by intrapersonal change, which we calculate as

$$\frac{\delta}{\tau + \delta}$$

We can think of this number as akin to an Intraclass Correlation Coefficient focused only on the systematic components of the model while ignoring residual variance that might be attributable to measurement error or non-persisting change (see also the variance decomposition of period and cohort by Vaisey and Lizardo 2016). The higher the number is, the more variance in responses is attributable to intrapersonal change during the panel. The lower the number, the less intrapersonal change seems to play a large role in explaining cultural differences during the panel.

Because this quotient summarizes variance and therefore has no natural referent, it is hard to say at which values we observe "a lot" of intrapersonal change. But summarizing questions in this way allows us to compare the relative importance of our two broad processes across a range of questions that might have very different levels of non-systematic variance, giving us a baseline sense of the relative prevalence of these two processes for each question (something not achievable under the tournament of models approach), and allowing us to compare which kinds of questions show more or less intrapersonal change relative to interpersonal differences. While the tournament of models approach allowed researchers to say whether questions in general showed evidence of updating, this approach allows us to make more specific claims about the prevalence of these theoretical processes for particular questions relative to each other.

[3]This does not mean that other factors might not explain additional variance if they were included in the model. For example, peoples' responses about religious beliefs and participation might systematically vary by the day of the week or month in which they are surveyed. This variation is moved into the "random" or non-systematic component of the model for us.

As a second step in our analysis, we use ordinary least squares regression to model the proportion of variance explained by intrapersonal change as a function of features of the question and panel. This allows us to explore how these features affect the prevalence of intrapersonal change. These covariates include the number of response options (measured as 2, 3-5, and more than 5), the panel, the log of the number of participants, the number of waves observed, the time since the question was first asked, and the total span of time the question was asked.

Results

Our results proceed in three parts. We first explore the overall pattern of systematic variance explained by interpersonal differences at baseline and intrapersonal change over time across the seven panels. Next, we analyze the association between the relative proportion of systematic variance explained by intrapersonal change as a function of question, panel, and sample features. Finally, we highlight a few specific comparisons to illustrate the value of quantification relative to adjudication for further exploring theoretical questions.

Variance Decomposition

Figure 1 plots the proportion of systematic variance attributable to interpersonal differences ("between") and intrapersonal change ("within") for each of the 609 questions analyzed, plotted separately by panel. To broadly summarize the results, all panels show a similar range of the proportion of systematic variance attributable to intrapersonal change. Across panels, the median proportion of systematic variance attributable to intrapersonal change is 0.094 (mean of 0.098), with an interquartile range of 0.053 to 0.139. All panels include questions that show essentially no systematic variance attributable to intrapersonal change and all panels include questions where more than 20 percent of systematic variance is attributable

to intrapersonal change.

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Figure 1: Proportions of explained variance in items of personal culture; based on predictions at participants' wave mid-point.

Across all questions, interpersonal differences explain a much larger share of the systematic variance in responses than intrapersonal change. Again, this is to be expected. Interpersonal differences capture not just pre-adult socialization, but all accumulated experiences up to the start of the panel that might have a bearing on personal culture.

To the extent that there are differences across the panels, the PSID has the highest mean (.120) and median (.135) proportion of systematic variance attributable to intrapersonal change. While we cannot disentangle features of the sample from features of the questions asked to each sample, the specific samples for many PSID questions have lower average ages than those from other panels. To the extent that younger respondents might be more likely to make durable changes of opinion, this higher explanatory power of intrapersonal change might reflect the distinct age profile of respondents in this sample. At the other end, the GSS has the lowest mean (.073) and median (.069) proportion of variance attributable to intrapersonal change. This potentially reflects the fact that the GSS observes people for a shorter duration, on average, than the other panels. If, consistent with life course adaption theories, people are more likely to make significant cultural changes the longer we observe them, then duration likely affects the amount of variance attributable to intrapersonal change (a point we explore more below). However, the GSS results are still highly consistent with results from the other panels.

While there are some differences between panels, these differences are small compared to the differences within panels. For about 6 percent of items explored here, more than 20 percent of systematic variance is attributable to intrapersonal change. These questions tend to ask

about external referents (e.g., confidence in specific government leaders or political parties), life satisfaction, or current financial position. At the other end, questions about religious identification, views on gender roles, and support for civil liberties tend to have very low proportion of variance attributable to intrapersonal change.

In contrast to the tournament of models approach, quantifying change this way allows us to explore variation in the relative importance of intrapersonal change across questions that all both show evidence of change. For example, Kiley and Vaisey (2020) found that confidence in the press and confidence in religious leaders were both characterized by active updating, our results show that intrapersonal change is much more important for explaining variance in confidence in the press (0.164) than confidence in religion (0.049).

Appendix A presents the estimated proportion of variance attributable to interpersonal differences and intrapersonal change, as well as the proportion of residual variance, for each question analyzed. In general, interpersonal differences are almost always the largest component of the total variance and tend to explain between 55 and 70 percent of total variance, while intrapersonal change is always the smallest, typically explaining between 3 and 8 percent of total variance. Residual variance tends to account for between 22 and 37 percent of variance (though on several questions residual variance is greater than 50 percent).

As noted above, the substantive importance of intrapersonal change for understanding cultural differences depends on a range of factors, including how long the panel runs, whether assumptions about linear change hold, and whether the panel is capturing a distinctly turbulent period or a distinctly stable period for the item under question. However, if we assume that the period under observation is "typical" for a question —not a time of extremely heightened (or lowered) sensitivity or change-– then it does not seem realistic for this process of intrapersonal change to explain a large share of interpersonal differences for many of the questions we observe.

Meta-Analysis

Figure 2 plots the results from an ordinary least squares regression of proportion of systematic variance attributable to intrapersonal change as a function of question, panel, and sample features. These models also include fixed effects for panels (not shown), so coefficients reflect the association between a particular sample or question characteristic within a panel.[KK NOTE: CAN WE SUMMARIZE THESE PANEL FIXED EFFECTS AT ALL? AE: WE COULD SHOW THAT THEY DON'T CAPTURE TOPIC EFFECTS BEYOND OUR CLASSIFICATION IF WE INCLUDE THOSE / THAT THEY POSSIBLY CAPTURE UNMEASURED COUNTRY/CONTEXT DIFFERENCES OR DIFFERENCES IN SURVEY METHODOLOGY?]

<about here>

Figure 2: Proportion of explained variance attributable to intrapersonal change; based on predictions at participants' wave mid-point; supressed intercept model; survey indicators not shown.

Figure 2 shows that the more response options respondents are given and the larger the sample, the larger the proportion of systematic variance is attributable to intrapersonal change. We interpret these coefficients as suggesting greater resolution on a question makes it easier to detect and model change. The earlier a question was asked, even net of how long it was been asked, the lower the proportion of systematic variance is attributable to intrapersonal change.

The most notable result in the meta analysis is the negative coefficient attached to the span of years covered by the question. The longer a question is observed, the less systematic variance is attributable to intrapersonal change. Theories of personal cultural change that link changes in personal culture to social experiences, including the LCAM, suggest that

the longer we observe respondents, the more likely people are to undergo potentially transformative experiences and therefore the more variance would be explained by intrapersonal change. The fact that we find a negative coefficient attached to this variable is a challenge to that assumption.

As a further test of this coefficient, we compared the proportion of systematic variance attributable to intrapersonal change when using the full duration of a panel compared to when when we dropped the final wave and therefore reduced the total duration of observation for the question. If the coefficient reflects a true negative effect of duration on systematic variance attributable to intrapersonal change, we should see that same effect within questions. Results from this analysis are presented in Appendix B and contradict the coefficient from the regression model. The longer we observe the same question, the higher proportion of systematic variance is attributable to intrapersonal change. We interpret this combination of findings as suggesting that the kinds of questions asked for a longer time period tend to demonstrate less intrapersonal change than questions asked over shorter periods, rather than a true function of time.

This reinforces the explanation for why the GSS displays the lowest average proportion of systematic variance attributable to intrapersonal change: its shorter duration. [KK NOTE: Does this inform any other panel differences? Does the PSID, BHPS or UKHLS have longer durations on average?]

A Case Study — The Role of College for Change in Political Dispositions Among Adults

While these broad results help speak to previous debates, they mostly re-frame previous findings without extending the theoretical debate. To better illustrate the value of our approach for addressing different theoretical questions, we turn to a specific empirical example: the relative importance of intrapersonal change and interpersonal difference for explaining

cultural differences by education levels.

Previous work has established a positive relationship between education and attitude stability, especially on issues related to American politics. This stability is often attributed to education facilitating "chronic knowledge" – a general understanding of the domain of American politics, including the positions held by major parties and political figures and how issues relate to one another at a logical or socio-logical level (Alvarez and Brehm 2002; Boutyline and Vaisey 2017; Zaller 1992). Because they have more knowledge of American politics, people with a college education are better able to consistently connect the considerations in their cognition with the answer choices they are presented with in a survey.

This work has tended to focus on the fact that college-educated Americans give responses that are less likely to be affected by measurement error or short-term influences (Alwin 2007; Zaller 1992). However, this focus on the difference in the non-systematic (residual) component of variance across groups obscures the fact that the relative importance of different components of systematic variance might differ across these two groups as well.

It could be the case that education, chronic knowledge, and attention to the political sphere makes intrapersonal change more important in explaining differences among people with higher levels of education. For example, these people might be more likely to make systematic changes in response to the emergence of new information, new issues, or political realignments, while those without chronic knowledge display more variance around their baselines without their baselines changing much (Zaller 1992). In contrast, it could be the case that the stability demonstrated by educated respondents reflects the fact that they have already formed durable opinions and are relatively closed off to new information. College could serve as a formative experience that solidifies personal culture for people who attend. But among people who do not attend college, later life experiences might prove more important in forming or changing personal culture, as these experiences potentially provide information that college-educated peers received earlier.

To test these competing propositions, we use the models presented above to calculate the total systematic variance for people with at least a bachelor's degree and people with less than a bachelor's degree at wave 1[4] of the General Social Survey's panels.[5] We focus on the GSS because it contains the largest number of questions tapping general political dispositions, which is the domain where education has proven particularly relevant for understanding attitude stability. The GSS also covers a particularly turbulent window of American politics from 2006 to 2014. This window covers the start of the Great Recession, debates about federal intervention in and regulation of Wall Street, the election of Barack Obama as the first black president in U.S. history, debates about the role of the federal government in the health care sector, the emergence of the Tea Party, and political realignment and clarification on the issue of gay marriage, among other topics.

Figure 3 plots the distribution of differences between people with less than a bachelor's degree and people with at least a bachelor's degree at wave 1 of the panel. Values greater than 0 would indicate that intrapersonal change is more important in explaining the responses of college graduates than those of people without a college degree, while values less than 0 would indicate that intrapersonal change is less important for explaining variation among people with a college degree than those without a college degree.

<about here>

Figure 3: Difference between share of intrapersonal change and share of inter-personal differences in expalined variance; based on predictions at participants' wave mid-point

There is a clear pattern in Figure 4: for more than 80 percent of GSS items explored here, intrapersonal change is a larger component of systematic variance for people without a

[4]A small number of respondents report different highest degrees at wave 1, wave 2, and wave 3. Some of this is due to measurement error, and some of it is due to a small number of people obtaining a higher degree during the four years of the panel. Estimating the panel with highest at wave 1 or highest degree reported across the panel produces functionally identical results.

[5]We estimate the models presented in Figures 1 and 2 using the full sample, but only use respondents who have information on their highest degree to generate the results presented in Figures 3 and 4. In total, ### respondents (%%% percent) reported no degree information.

college degree than for people with a college degree (they have negative values in the figure). While most of these differences are small in absolute terms (less than 2 percentage points), several are greater than 5 percentage points. Given the distribution observed in Figure [the earlier one] showing that the systematic variance attributable to intrapersonal change averages [average across all questions], a 5 percentage point difference between groups is quite substantial.

To more clearly illustrate some of these differences, we highlight eight questions designed to tap general political dispositions: partisan identification (Democrat vs. Republican) and ideological identification (liberal vs. conservative) on seven-point scales; four questions about the government's role in improving the condition of the poor, paying people's medical bills, giving special treatment to blacks, and doing things that private businesses could do, measured on five-point scales; a question about whether the government should do more to reduce income differences, measured on a seven-point scale; and one question about whether blacks should be given preferences in hiring, measured on a five-point scale. Estimates for the proportion of systematic variance attributable to intrapersonal change on these eight questions, for both education groups, are presented in Figure 4.

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Figure 4: Proportions of intrapersonal change of explained variance by college degree; based on predictions at participants' wave mid-point.

On all eight questions presented in Figure 4, intrapersonal change explains less systematic variance for people with a college degree than for people without a college degree. There are also large differences across questions on the amount of systematic variance attributable to intrapersonal change for both groups. For example, on the question of whether the government should try to solve more problems or leave those problems to be solved by private businesses ("government do more or less"), less than one percent of the systematic variance is attributable to intrapersonal change for both groups. In other words, while

people might vacillate on this question at random (37 percent of variance is residual for this question), there is functionally no evidence that people make systematic changes of opinion on this issue during the GSS panel.

In contrast, partisan identification and political ideology both show a larger proportion of systematic variance attributable to intrapersonal change, with quite large differences between people with a college degree and those without. Compared to the other questions explored here, change as adults (and, potentially, their experiences as adults) plays a much larger role in explaining why people report the partisan identification and political ideology they do. And this is particularly true for respondents who do not have a college degree. The amount of systematic variance in ideological identification that is attributable to intrapersonal change among non-college educated respondents is almost four times that of college-educated respondents.

We note here that this meaningful difference in the proportion of systematic variance attributable to intrapersonal change across education groups and across questions would not be detectable using previous methods. For partisan identification and political ideology, both college-educated respondents and people with less than college degree would likely favor the AUM or LCAM over the SDM because they show evidence of some members of the population making intrapersonal change. In other words, using the tournament of models approach obscures the fact that the relative importance of intrapersonal change in explaining differences on these two items is very different across these two groups, that intrapersonal change explains more systematic variance for ideological identification than partisan identification for people without a college degree, or that there appears to be more durable change on questions of affirmative action than on questions of government aid to black Americans.

It is important to note here that these differences should not be interpreted as causal effects of attending college on the importance of social experiences for cultural change. These results are potentially confounded by age, social class, race, gender, and other factors that explain

selection into higher education. We simply use these estimates as a starting point for a broader discussion.

Discussion

This paper set out intervene in the debate on whether people change their personal culture – their attitudes, beliefs, values, practices, and dispositions – as they move through life. Instead of falling back on a "tournament of models" approach (Lersch 2023: p. 228) to call victory for one or the other possible answer to this question, it seeks to refocus the debate to the theoretically more productive issue of *how* initial differences between and durable changes within people collectively explain the variation in personal culture that is observed. To do so, it proposes a new measure that quantifies the amount of systematic variance that is attributable to either interpersonal differences at baseline or intrapersonal change.

Applying this measure to all datasets previously discussed in this debate revealed a consistent pattern. Nearly all questions on personal culture show evidence of durable, intrapersonal change over time, with some items showing noteably high intrapersonal change compared to interpersonal differences. For questions about factors that affect one's life satisfaction or views on government benefits, it seems plausible that differences in adult experiences predominantly account for the observed differences between people.

Intrapersonal change is often substantially less pronounced than interpersonal differences, accounting for less than 10 percent on average across all surveys. On numerous questions, like those on civil liberties, abortion, generalized trust, and civic duty, the systematic variance explained by intrapersonal change is essentially zero. For these questions, it seems there is not enough cultural change during adulthood to warrant attributing differences in personal culture mainly to experiences and social transitions; instead, the primary source of the observed differences appears to stem from early-life experiences.

More important than adjudicating past debates, however, the approach presented in this paper unlocks new opportunities to ask when change or stability in personal culture predominates and about their role in explaining cultural variation within a population. To exemplify this, we detailed how the proportion in cultural differences that intrapersonal change can explain not only varies substantially by survey item but also by individual characteristics such as their education. Intrapersonal change plays almost no part in explaining sentiments regarding the government's economic role but is more defining for ideological and partisan identities. Intriguingly, it is more important in explaining cultural variation among non-college graduates compared to college graduates in the U.S.. While age and other factors related to college completion might confound this pattern, this suggests that experiencing college may solidify personal culture to an extent that renders the effect of other adult experiences on political dispositions for graduates less influential relative to individuals without a college experience.

Implications for Cultural Sociology

So far, sociologists interested in understanding cultural differences have largely asked about the presence and significance of cultural change in adults (e.g., Kiley and Vaisey 2020; Lersch 2023; Vaisey and Kiley 2021). Yet doing so, might have unnecessarily limited and even set the wrong theoretical focus. In any adult population, some degree of cultural change in people is inevitable. Likewise, no viable theoretical perspective would expect just one process – stable differences or internal change between people – to underlie the differences in personal culture observed between them. Our results reinforce this point, showing the relevance of both interpersonal differences and intrapersonal change in understanding differences in personal culture across all items analyzed. [TRIED TO BETTER TUCK IT IN, BUT COULD LET GO OF THE LAST SENTENCE]

Recent findings suggest that it is theoretically more insightful to ask about the relative

importance of these two processes in understanding cultural variation. Drawing a unified conclusion from data on various cultural forms, measured on different scales and across different time frames is challenging. However, the general pattern suggests that, for most survey items, intrapersonal change in adulthood is not the primary reason for cultural differences among people.

To clarify, our findings do not imply that adults remain static or that changes are inconsequential. Even minor shifts in personal culture, such as a 2% change in support for gay marriage, can have significant ramifications. While the majority may remain consistent in their views, understanding the underlying mechanisms of even such minor shifts remains a crucial task for the sociology of culture [COULD SHORTEN TO "EVEN SUCH MINOR CULTURAL SHIFTS REMAIN CRUCIAL" BUT WANTED TO APPEAL TO THE SCHOLARS IN THE FIELD...].

Our findings primarily suggest that understanding variations in personal culture requires scholars to examine the conditions and experiences of early life. While transitions between social roles, the experience of organizational environments [CAN WE SAY SOCIAL INSTITUTIONS?], and changes in social networks are often emphasized in sociological research, these factors seem to account for a smaller proportion of differences among adults than the formative experiences early in life.

This IMPLICATION/CONCLUSION aligns with a range of recent causal inference work suggesting that selection effects, rather than treatment effects, predominantly account for personal cultural differences among individuals in varied social roles and positions (Campbell and Horowitz 2016; Wodtke 2018). While some individuals clearly change as they transition into new roles or environments, this magnitude of this change seems to be insufficient to explain the pronounced differences among people in diverse roles. When observing differences in personal culture across social roles, such as parenthood, education, or professional authority (Longest, Hitlin, and Vaisey 2013), or across occupations (Weeden and Grusky

2005), our initial presumption should lean towards selection as their primary cause, rather than treatment.

Our analysis does not provide an answer as to why intrapersonal change seems to have limited impact on understanding cultural differences. The situations that promote durable change in personal culture might simply be rare. Alternatively, it is possible that adults do encounter opportunities, necessities, and incentives for change, but their ability or willingness to change decreases. All the more it is important to research when and how social situations can have encourage durable change in adults.

In this regard, our results regarding education and political views suggest that the significance of theoretical processes that can lead to such change can vary by group. Aligning with life course theories, it seems the importance [IMPACT ... ON ? IF IT'S NOT TOO CAUSAL] of experiences for cultural change may be contingent on other, prior experiences. For example, factors that shape personal cultural differences may likely differ for college and non-college graduates; the latter might be more profoundly influenced by mid-life experiences than the former in this regard. In trying to understand differences in personal culture, sociologists should therefore pay more attention to the heterogeneous effects that different factors including social events, encounters, and situations can have. [NOT HAPPY WITH THIS LAST SENTENCE, BUT NEED SOME "MESSAGE". IF WE ARE TOO LONG, WE SHOULD LET GO OR EVEN COMPRESS THE LAST TWO PARAGRAPHS INTO ONE MUCH SHORTER ONE.]

Our findings also have implications for understanding cultural change at the aggregate level. Given that intrapersonal change does not appear as the primary driver for cultural differences among adults, our results suggest that cultural change at the aggregate level is more likely driven by processes of cohort replacement than by contemporaneous social conditions influencing a given cohort's cultural dispositions (Underwoood et al. 2022; Vaisey and Lizardo 2016). This likely holds true for cultural change at the macro societal level as well as the

micro level such as within organizations, political parties, and professions. At the same time our findings point to the fact that the importance of formative experiences versus contemporaneous social influence for cultural change hinges on individuals' level of education. The relative importance of these two factors might thus shift as education becomes more or less prominent at different points in the life course. Should scholars find similar differences across other social categorizations such as class or race, it would suggest to more strongly incorporate demographic processes into the analysis of change at the aggregate level.

Implications for Survey Measurement

A major takeaway from the meta-analysis is that greater response resolution —the number of response options survey respondents are given-– is associated with a greater share of variance being explained by within-individual change. Again, it is possible that this reflects different kinds of issues being measured with different kinds of scales. But it could also suggest that within-person change, when it happens, is relatively small —moving from "agree" to "strongly agree," rather than "strongly agree" to "strongly disagree," for example-– and therefore easier to detect with greater resolution.

Our results continue to highlight the value of long-running panel surveys for adjudicating different theories of culture that cannot be evaluated with cross-sectional data alone. Across our results, residual fluctuations in responses account for more than four times as much variance, on average, as linear persistent change, meaning that most change in responses is not systematic. Under these circumstances, extending panels beyond two waves provides significantly more leverage to understand how and why personal culture changes.

Additionally, we echo previous calls for more studies —including panel studies-– of the socialization processes of young people. Our results suggest that most of the variance between adults emerges before people turn 18 or relatively soon after. In limiting our empirical perspective to experiences that happen after that point, social scientists potentially focus on

questions that, while important, lack the capacity to explain major cultural differences.

Limitations

The approach outlined here generates estimates of how much variance in a population is due to each of two broad processes: intrapersonal change and interpersonal differences at baseline. It does not quantify the proportion of people who "change." When we observe intrapersonal change in a question, we cannot be sure whether this is driven by many people making small changes or a few people making large changes. Adjudicating this question will require different models that distinguish different kinds of change.

Our results and interpretations also hinge on how we have defined change and the assumptions built into the Life Course Adaption Model. This model treats cultural trajectories as varying linear slopes for each respondent, assuming that change is a linear function of time. This assumption likely does not hold true in practice. Change over time likely takes non-linear and discontinuous forms. People might jump from one "stable" disposition to another, for example, or experience a discontinuous "turning point" that upsets a stable trajectory. This assumption is in part a limitation of the data, as most questions are only observed for three to six waves with a large number of missing cases. Panels with more waves might allow for more flexible models of change that do not require this assumption of linearity.

Similarly, in assuming a linear trajectory for change, our approach assumes that durable change is unidirectional. To the extent that people make durable change as a result of a social transition and then return to a previous position later in life as a result of a second transition (marriage and divorce, for example), this is captured as residual within-person variance, rather than one of our two broad theoretical processes. This is a potentially reasonable assumption on short panels –change that does not last two years is hard to classify as durable– but it might not be true in longer panels. Other researchers with more flexible definitions of "durable change" might potentially identify more durable change even

in the same population.

Finally, while we examine an incredible broad array of measures of personal culture, from assessments about the relative importance of different features when buying a new car and policy preferences to religious beliefs and core values, we are limited by the kinds of questions that are asked in panel surveys and the contexts in which these surveys were administered (Australia, Germany, Switzerland, the United Kingdom and the United States). This means our findings tend to reflect questions about general (national) politics, gender roles, immigration and race relations, and general well being. Our data does not cover some dimensions of culture that might be relevant for other aspects of sociological exploration (artistic tastes, leisure activities, and time use, for example).

Implications for Future Research

We believe the approach outlined here can push past the "needless dichotomy" implicit in the question of whether people change or not and address more theoretically informed questions about the conditions under which the relative importance of intrapersonal change and interpersonal differences matter for explaining cultural differences. Characterizing questions as displaying change or not can only take researchers so far, but the question of why some questions demonstrate more change while others do not, or why some groups are characterized by more stability than others, has the potential to weigh in on a broader range of theoretical debates. We hope researchers move toward those questions.

While we focused on education as a determinant of the explanatory power of intrapersonal change, our approach can readily be extended to other socio-demographic categories that might affect intrapersonal change –race/ethnicity, religiosity, social class, gender, and political affiliation, for example– or their intersections. Researchers with different data might be able to evaluate the relative importance of intrapersonal change and interpersonal differences across contexts as well, either national contexts if the same questions are administered across

countries, or organizational contexts if data traces students within schools, workers within workplaces, or congregation members within congregations.

The wide variation across questions in the proportion of systematic variation attributable to intrapersonal change also calls for a more systematic exploration for why some forms of culture are characterized by stability while others are characterized by change, and what the consequences of these differences for the organization of beliefs in the public might be.

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Appendix

Tables

Table 1: The Description of the Data Sources

Country	Survey	Period	Outcomes
Australia	Household, Income and Labor Dynamics in Australia (HILDA)	2001-2021	30
Germany	Socio-Economic Panel Study (SOEP)	1984-2020	122
Great Britian	British Household Panel Survey (BHPS)	1991-2008	83
Great Britian	Understanding Society/UK Household Longitudinal Study (UKHLS)	2009-2020	66
Switzerland	Swiss Household Panel (SHP)	1999-2019	77
United States	General Social Survey (GSS)	2006-2012	183
United States	Panel Study of Income Dynamics (PSID)	1968-2019	48

Figures

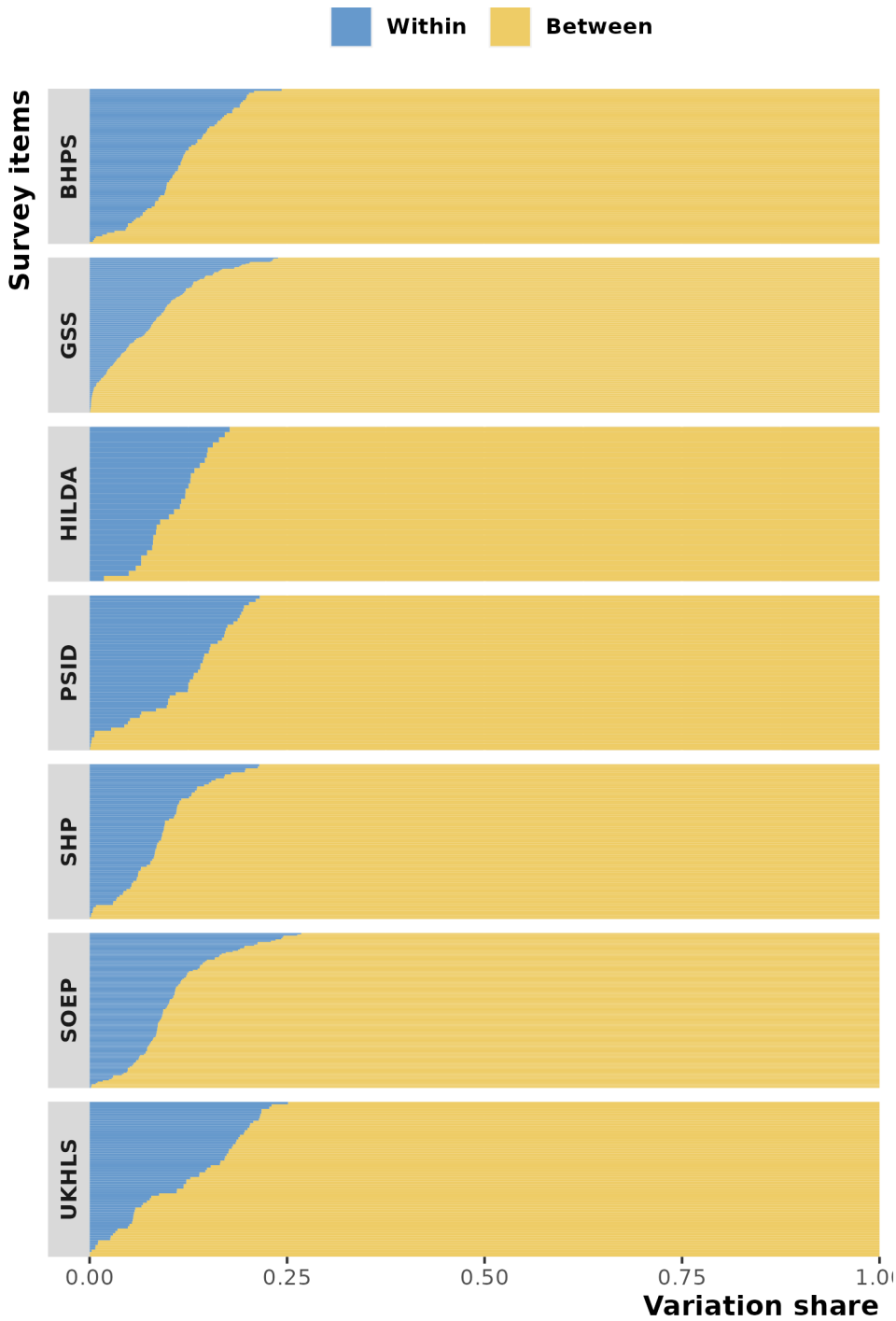

Figure 1: Proportions of explained variance in items of personal culture; based on predictions at participants' wave mid-point.

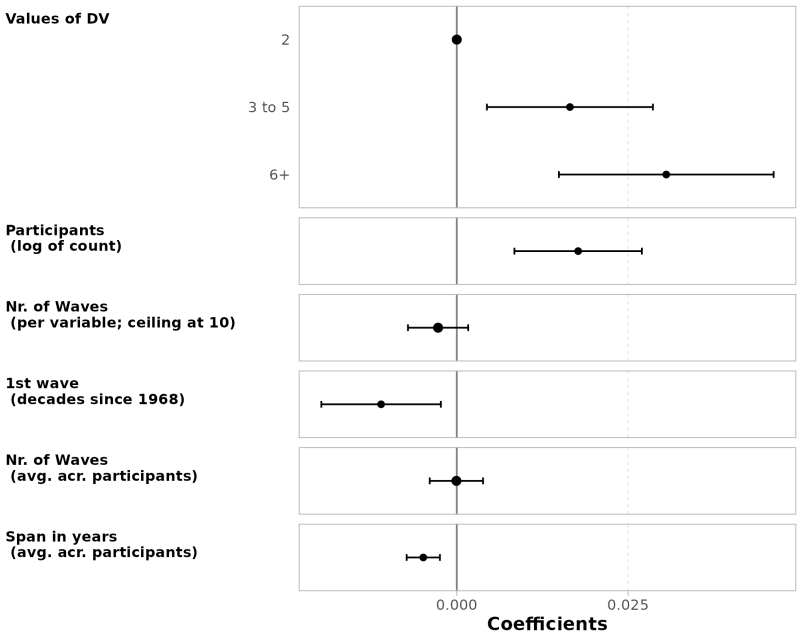

Figure 2: Proportion of explained variance attributable to intrapersonal change; based on predictions at participants' wave mid-point; supressed intercept model; survey indicators not shown.

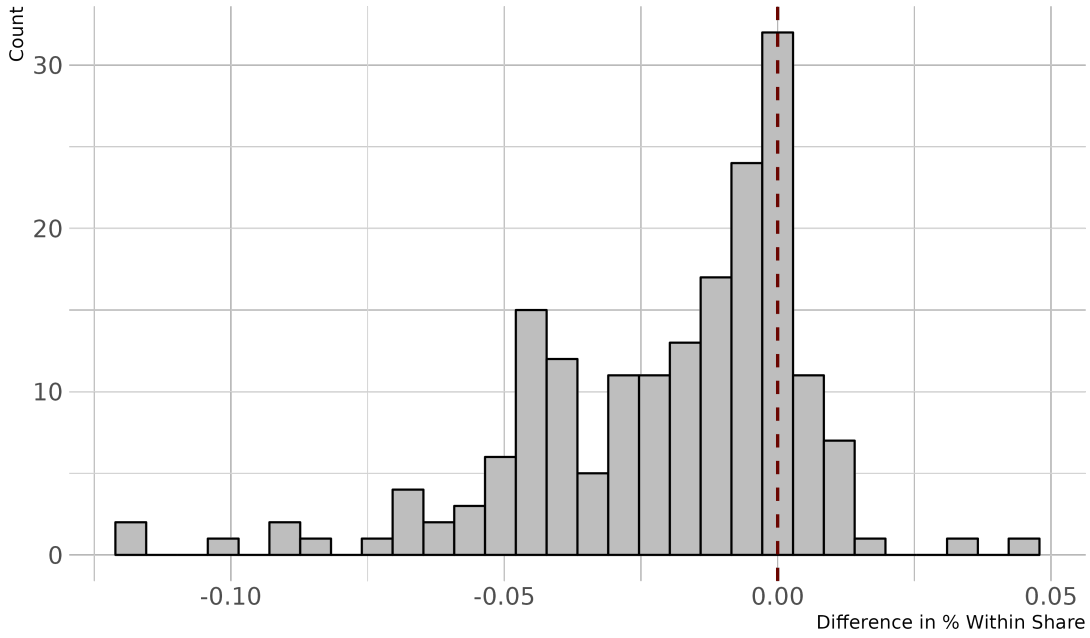

Figure 3: Difference between share of intrapersonal change and share of inter-personal differences in expalined variance; based on predictions at participants' wave mid-point.

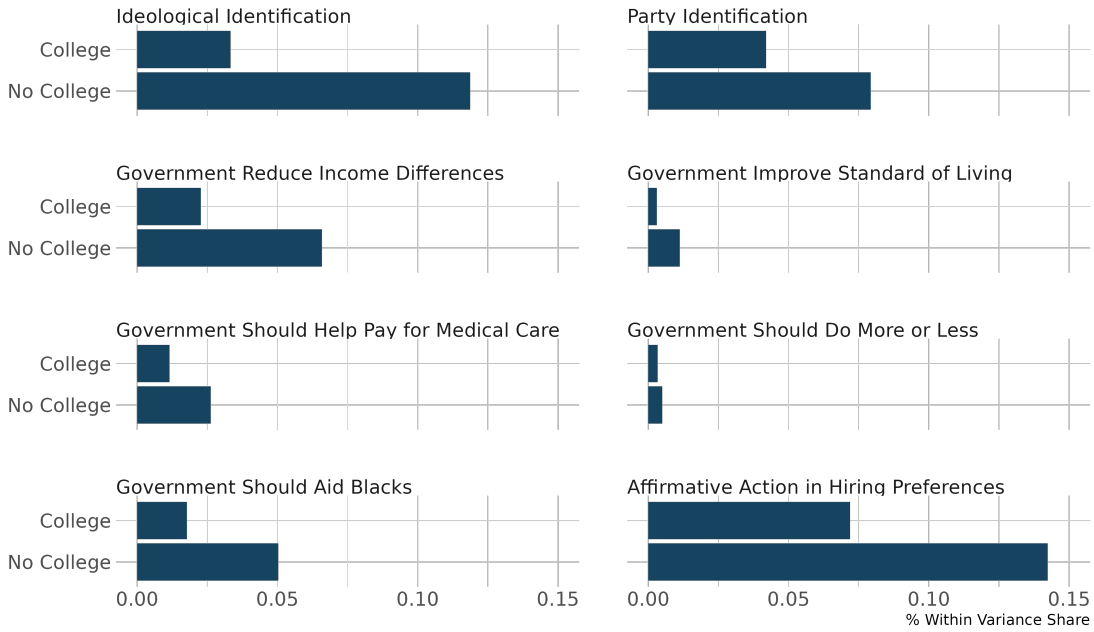

Figure 4: Proportions of intrapersonal change of explained variance by college degree; based on predictions at participants' wave mid-point.