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Time and class: How socioeconomic status shapes conceptions of the future self

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ABSTRACT

People generally care about their future. However, how vividly they imagine it, and how much they like and value it, may vary across socioeconomic status (SES). If lower-SES individuals believe their future to resemble their present, including the greater uncertainties and stressors of a lower-SES environment, then they may focus less on their future self, coming to view it less vividly, as less likable, and less valuable, amongst other qualities. We found support for these hypotheses across pilot data, two observational studies (one pre-registered), and a pre-registered experimental manipulation of SES. These results add to the growing literature on SES's psychological consequences by suggesting that SES affects people's conceptions of not only their present self, but also their future self.

Psychologists and philosophers have long been concerned with the future self – people's hopes, dreams, fears, and concerns about what will happen to them next. Indeed, pondering the future self even seems to be a cultural mandate, with children taught to think about it from an early age via questions like "What do you want to be when you grow up?". Psychologists have studied many facets of the future self, from people's hopes, dreams, and fears in life (Markus & Nurius, 1986) to more proximal goals and plans, like going to the gym (Gollwitzer, 1999). Despite this historical importance within psychology, relatively little research has focused on how individual differences in qualities of the future self develop. Understanding sources of development of the future self is key to identifying points of intervention (Dahl et al., 2018), as well as to building comprehensive theories of personality development (Roberts, 2018). In the present research, we propose that socio-economic status contributes to the development of individual differences in qualities of the future self.

Focusing on the future self

Generally speaking, the future self encompasses any thought or feeling about the self that takes place in a time yet to be experienced (e.g., Grysman et al., 2013; Ruvolo & Markus, 1992). Several prominent psychological theories have given the future self

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a central role in shaping human behavior. Perceived overlap between the current self and the future self has been posited as a key determinant of psychological well-being (Maslow, 1943; Rogers, 1951). A fulfilling state of being, these theorists contend, is reached when people make their current lives congruent with what they want their lives to be. Work on self-discrepancy theory has supported this contention: Reducing discrepancies between the current and ideal (or future) selves reduces depressive feelings (Higgins, 1987). In addition, recent theories of personality functioning and development describe goal pursuit and formation (i.e., the future self) as core components of these processes (Denissen et al., 2013; DeYoung, 2015). For example, the theory of self-regulated personality change posits that people's standings on the Big Five change as individuals acquire new reference values for the Big Five in response to goals (e.g., becoming more organized and responsible [conscientious] in order to acquire and maintain a job; Denissen et al., 2013). Cybernetic Big Five Theory contends that the Big Five are best understood as cognitive, affective, and behavioral systems for achieving goals (DeYoung, 2015). Given the future self's hallowed position in theories of human functioning, a natural question to ask is *how* the future self impacts behavior. Research on this question has found that broader qualities of the future self – like vividness or liking – help motivate behavior.

A number of studies have shown that, besides the content of future selves (Destin & Oyserman, 2010; Oyserman & Fryberg, 2006; Oyserman & Markus, 1990; Williams Shanks & Destin, 2009), broader qualities of the future self such as overlap with the current self (Blouin-Hudon & Pychyl, 2015; Ersner-Hershfield et al., 2009; Hershfield, 2011; Higgins, 1987; Lewis & Oyserman, 2015), degree of liking toward the future self (Burum et al., 2016), and clarity or vividness of the future self (Taber & Blankemeyer, 2015; Van Gelder et al., 2013, 2015) have important consequences for decision-making and investment in one's personal future. That is, besides having goals, like becoming physically fit or becoming a doctor (i.e., content of the future self), how clearly defined these goals are, or how much the goals are perceived as overlapping with aspects of the current self (i.e., qualities of the future self), seem to be be important determinants of future-oriented behavior. For instance, greater perceived overlap between the future and current selves has been found to promote having a larger savings account (Ersner-Hershfield et al., 2009) and psychological well-being (Higgins, 1987) and to reduce procrastination (Blouin-Hudon & Pychyl, 2015). Greater liking of the future self has also been found to reduce procrastination (Burum et al., 2016). Finally, holding a more vivid image of one's future self seems to decrease engagement in delinquent behaviors (Van Gelder et al., 2015) and promote engagement in career-promoting behavior like networking (Taber & Blankemeyer, 2015). The fact that qualities beyond the content of a person's selves – whether past, current, or future selves – may impact behavior fits various areas of inquiry in the broader self literature, such as research on social comparison, which has shown that subjective temporal distance of selves impacts judgments and behavior (e.g., Bashir et al., 2014; Peetz & Wilson, 2008).

To the extent that the future self matters to human functioning and that broader qualities of it are key to the future self's impact on functioning, identifying the environments that shape the development of these broader qualities could be important for understanding an array of human functioning. As of yet, little work exists that examines this domain. (Though, see the following for work on cultural schema and future time

perspective: Guo et al., 2012; Ottsen & Berntsen, 2015; Wang et al., 2015). As described above, prior research has identified vividness of the future self, liking of the future self, and perceived similarity of the future self to the current self as qualities of the future self that may determine how the future self impacts behavior. Thus, we focus on these constructs in the present research. We additionally examined several other future-self constructs: future self-esteem as a similar construct to liking of the future self; degree of caring for the future self due to its inclusion in prior studies of future selfuture-self qualities (e.g., Ersner-Hershfield et al., 2009); and finally, delay discounting and future time perspective (Zimbardo & Boyd, 1999) as general valuations of the future. In the present research, we propose that socioeconomic status is one environment impacting the development of such future-self constructs.

Relating socioeconomic status to the future self

Socioeconomic status (SES) describes people's access to normatively desired social and economic resources (e.g., wealth, income, education, prestige) and can be measured using objective qualities (e.g., income, wealth, education; Shavers, 2007) and subjective ones (e.g., perceived rank vis-à-vis others; American Psychological Association, T. F. on S. S, 2007). In the last decade, psychology has seen a large rise in research on SES's psychological effects. Researchers have found that higher-SES, versus lower-SES, people tend to have higher intelligence (Ritchie & Tucker-Drob, 2018), more satisfaction with life (Kahneman & Deaton, 2010), and even more diverse musical preferences (Goldberg, 2011). While this work has examined SES's relations to myriad constructs, relatively little of it has focused on the self. When studying the self, researchers have tended to study global, present-oriented self-concepts, such as independence–interdependence (Kraus et al., 2012; Stephens et al., 2007), narcissism (Piff, 2014), and self-esteem (Twenge & Campbell, 2002). When researchers have focused on SES and the future self, their focus has largely been on content of the future self, as opposed to broader qualities, finding that both children and parents from higher-SES families more strongly expected the children to graduate from college (e.g., Elliott et al., 2011; Williams Shanks & Destin, 2009). In a related, but not self-focused, domain, decision-making and life history researchers have found that higher-SES individuals demonstrate lower temporal discounting – choosing larger, delayed rewards more often than their lower-SES peers, who choose smaller, immediate rewards more often (Griskevicius, Delton et al., 2011; Griskevicius, Tybur et al., 2011; Lawrance, 1991). Similar results have been found by health psychologists examining health behaviors that require sacrificing immediate pleasures for later gains (e.g., smoking cessation, exercise, avoiding sugary foods; Adams & Nettle, 2009). The present research extends the literature by examining SES's impact on qualities of the future self.

Why might this be the case? Research suggests that the basic environments individuals occupy across levels of SES vary in their stability, with higher-SES individuals occupying more stable environments than their lower-SES counterparts (Stancato & Piff, in prep). In particular, higher-SES individuals tend to have higher and more consistently paying jobs, as well as more access to banking and other investment resources (American Psychological Association, T. F. on S. S, 2007; Evans, 2004). These differences in present environment stability may give rise to differences in expectations of the future.

Specifically, if one's current environment is stable, one may expect one's future environment to be stable, as well as something that one can plan for and invest in (and vice versa for an unstable environment). In addition, an unstable present environment may be experienced as stressful and negative. In turn, this stress and negativity could engulf attention that could otherwise go toward thinking about the future, as well as suggest that the future will be similar and, therefore, not worth investment (and vice versa for a stable environment). In recounting her personal experience of poverty, Linda Tirado (2013) described a similar process:

> [Poverty] doesn't leave you much room to think about what you are doing, only to attend to the next thing and the next. Planning isn't in the mix. … Nobody gives enough thought to depression. You have to understand that we know that we will never not feel tired. We will never feel hopeful. We will never get a vacation. Ever. We know that the very act of being poor guarantees that we will never not be poor. It doesn't give us much reason to improve ourselves.

Applying these two paths to the constructs we focus on, we put forward the following novel hypotheses:

> H1: *Vividness*: If higher-SES individuals' present environments are more stable and thereby afford them greater opportunity to think about their future, higher-SES individuals should have more vivid images of themselves in the future.

> H2: *Liking*: If lower-SES individuals' present environments are more stressful and negative and are believed to remain so in the future, lower-SES individuals should like their future self less.

> H3: *Similarity*: If higher-SES individuals' present environments make it easier to think about and plan for their future, and are less uncertain, then higher-SES individuals' futures may be seen as more likely to resemble the present, and thus, higher-SES individuals may see their future self as more similar to their current self.

> H4: *Self-Esteem*: Twenge and Campbell (2002) found that SES related to present self-esteem following a *social indicator* model. In this model, SES influences self-esteem because self-esteem picks up on social regard and SES is a signal of social status such that more (less) status entails more (less) regard. If individuals expect their SES to be stable over time, they should also expect to have similar levels of self-esteem over time, resulting in higher-SES individuals having higher future self-esteem.

> H5: *Caring*: If lower-SES individuals' present environments contain more stressors that require immediate attention, then lower-SES individuals may care less about their future self, as it does not require immediate attention.

> H6: *Future Time Perspective*: If lower-SES individuals' present environments contain more stressors that require immediate attention, then lower-SES individuals should be more likely to invest resources in, and behave to benefit, their present, not future.

Because similar reasoning could also be applied to delay discounting and in light of the small body of findings linking SES to delay discounting (e.g., Griskevicius, Delton et al., 2011; Griskevicius, Tybur et al., 2011; Lawrance, 1991) noted above, we also tested the link between SES and this future-related construct in three of our studies (Pilot Data, Studies 2 and 3):

> H7: *Delay Discounting*: If lower-SES individuals' present environments contain more stressors that require immediate attention, then lower-SES individuals should be more likely to invest resources in, and behave to benefit, their present, not future.

Thus, overall, we sought to investigate whether socioeconomic status impacts how people think about and value their future self across a range of future-self-related constructs.

The present research

Across four studies, two pre-registered, we tested whether socioeconomic status impacts how people think about themselves in the future. We employed both observational and experimental methods to test both our central causal claims and that the predicted relationships exist outside the laboratory. We report how we determined our sample sizes, all data exclusions, all manipulations, and all measures across all studies. Moreover, we report all studies we conducted on this project. All pre-registrations, materials, and data may be accessed on the Open Science Framework at https://osf.io/axuwy/.

Pilot data

As a preliminary examination of the broad hypothesis that SES shapes future-self constructs, we examined pilot data that focused on delay discounting as the outcome. These pilot data also enabled us to obtain an initial effect size estimate to use for power analyses in subsequent studies. For these pilot data, we used open data provided by Shenhav et al. (2017).

Participants

Shenhav et al. (2017) compiled a large, cross-sectional sample (N = 7,894) from multiple independent, smaller samples, including workers on MTurk (N = 4,106), students and residents from the Harvard University study pool (N = 1876), and volunteer subjects (N = 1,912). Given the relatively high number of MTurk participants in the sample, sample demographics resembled typical samples from MTurk (cf. Buhrmester et al., 2011). We report the full demographic information in Table S1 of the Online Supplement (available at [osf]).

Measures

Shenhav et al. (2017) administered a large number of measures, including temporal discounting and SES, as part of a validation study that did not focus on our variables of interest. We focused on three measures from their study: the log-transformed nine-item temporal discounting index ("logITCrate"), current education (highest degree attained; "educSelf"), and current income ("incomeNow"). We standardized and averaged current education and current personal income ($r=.22$) to make a composite SES index, following other methods for computing SES indices (American Psychological Association, T. F. on S. S, 2007). Personal income and education were the only available measures of current SES, which was our focus. In the temporal discounting task, participants are asked to choose between receiving a smaller but immediate reward and a larger but delayed reward. By examining how often a participant chooses the larger-later reward, researchers can infer participants' preference to allocate rewards to themselves in the future (Frederick et al., 2002; Kirby et al., 1999). We used the nine-item, instead of 27-item, temporal discounting index because it overlaps highly with the full 27-item version for non-clinical populations (Frederick et al., 2002; Shenhav et al., 2017) and we wanted to use briefer measures in subsequent studies. Please see Shenhav et al. (2017) for further study details.

Results and discussion

In line with our hypotheses, all three indices of SES were negatively correlated with temporal discounting, indicating that lower- versus higher-SES individuals chose more sooner-smaller rewards (or fewer larger-later rewards; *r*'s from −.15 to −.12, all *p*'s < .001; see row 7 of Table 1).[1]

Study 1

Following results from the pilot data that focused on a single future-self construct, we collected new data to provide an initial, exploratory test of our remaining hypotheses.

Method

Participants

Participants were obtained via Amazon's Mechanical Turk. Based on the pilot data, we selected a correlation of *r* = −.13 as the effect size to use for planning the sample size for our own data collection. With an *r* = −.13 and using an alpha of .05, power of .80, and one-tailed *t*-tests for bivariate correlations, *apriori* power analyses indicated we needed a sample size of 362 participants. As we planned to examine correlations between only self-report measures, we expected effect sizes in the new data to be slightly larger due to method overlap. Hence, we treated the *r* of −.13 as a lower bound and aimed for a final sample size of 300. All workers on MTurk were permitted to participate. Our initial MTurk sample size was 315; this reduced to 280 after removing participants who failed two or more of three attention checks (e.g., "Please select 'Strongly Agree' for this item."; *n* = 3), put the same response for every item (*n* = 3), and took the survey more than once (*n* = 29). In terms of demographics, participants resembled average samples on MTurk (cf. Buhrmester et al., 2011): largely college-educated (53%), below-median income for a single-person household relative to the U.S. (76%), about half men (56%), mostly White (73%), and in their mid-30's (*M* = 39.46, *SD* = 11.79). Table S1 in the Online Supplement (available at https://osf.io/52fs7/) shows the demographic characteristics of all studies.

Measures

We administered a large number of measures in our MTurk sample. Here, we focus on a subset of them, though all are reported in the Supplemental Materials. To measure participants' socioeconomic status, we used four overlapping but distinct indicators of SES: the MacArthur Ladder for the US (1 = *lowest*, 9 = *highest*), sub-jective SES category (lower, lower middle, middle, upper middle, or upper class), current personal income, and current education (highest degree attained). These allowed us to assess both subjective and objective aspects of SES. Subjective SES measures (MacArthur Ladder, category) are thought to provide summaries of objec-tive SES (personal income, education) with additional considerations (e.g., educa-tional prestige) that researchers might not measure (American Psychological Association, T. F. on S. S, 2007). Participants reported their personal income by selecting the range it fell in (e.g., 0 USD–$9,999). All indicators were positively

correlated, ranging from .28 to .69, with a mean of .48. We standardized and averaged these four indices to make a composite SES index; we report correlations with future-self constructs for the composite index as well as each indicator individually.

To test our hypotheses about how people think about the future self, we took a broad approach. For qualities of the future self specifically, we focused on cognitive qualities of the future self (vividness, similarity) and affective/motivational qualities of the future self (self-esteem, caring, liking). We measured future self vividness via four original items (a = .95; "I can easily imagine a vivid image of myself in the future," "I see my future as hazy" [reversed], "I have a clear picture of myself in the future," and "I can be hard to imagine a vivid image of myself in the future" [reversed]; see McElwee & Haugh, 2010 for validation of nearly identical items). We measured future self caring, liking, and similarity via single-item measures created and used by Hershfield and colleagues (Ersner-Hershfield et al., 2009), as well as future self-esteem via an original adaptation of the Single Item Self-Esteem scale (Robins et al., 2001; "When I think about myself 10 years in the future, I think of myself as a person with high self-esteem"). All future self items referred to *the self in 10 years*, following Ersner-Hershfield et al. (2009). Finally, to capture thoughts about the future in general, we used the three-item Future subscale of the short-form Zimbardo Time Perspective Inventory (a = .58; Zhang et al., 2013; e.g., "I complete projects on time by making steady progress."). All future-self constructs were positively correlated, ranging from,15 to .64, with a mean of .35.

Procedure

MTurk workers were invited to complete a survey on time and the self for compensation of 1.30 USD. After providing consent, participants completed a variety of individual differences measures unrelated to the present study interspersed with our measures of future-self constructs. After completing these indices, participants reported demographic factors, including SES, gender, race, and age.

Results and discussion. Table 1 displays the correlations between SES and our measures of future-self constructs. Supporting out hypotheses, higher- versus lower-SES individuals reported having a more vivid image of themselves in the future, liking their future self more, feeling more similar to their future self, believing their future self had higher self-esteem, and thinking more about the future (future time perspective). Contrary to expectations, higher-SES individuals did not report caring more about their future self than lower-SES individuals. All patterns held across both subjective (MacArthur Ladder, SES Category) and objective (education, personal income) SES, though they were much weaker for education.

To obtain a more general sense of the effect sizes we found, we averaged the correlations for each independent variable across all dependent variables (row 8 of Table 1). The average effect size for the composite SES measure was .203. This was a medium effect size, based on the empirical distribution of effect sizes in social–personality psychology (r= .21; Richard et al., 2003), and critically, in the predicted direction. Encouraged, we planned a confirmatory test of our hypotheses.

Table 1. Effect Sizes (Pearson r's) for Study 1 and Pilot Data

	Composite SES	MacArthur Ladder	SES Category	Education	Personal Income
Study 1					
Vividness	**.30*****	.31***	.34***	.06	.20***
Liking	**.20*****	.23***	.24***	-.02	.18**
Similarity	**.14****	.14**	.15**	.04	.11*
Self-Esteem	**.33*****	.35***	.34***	.09	.23***
Caring	**.06**	.09	.11	-.08	.06
Future Time Perspective	**.24*****	.23***	.19***	.18**	.16**
Pilot Data					
Temporal Discounting	**-.15*****	–	–	-.13***	-.12***
Mean Overall	**.203**	.225	.228	.057	.151

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. Temporal Discounting data were from Shenhav et al. (2017), with N's of 5,455 (Education) and 4,061 (Income). For all MacArthur Ladder correlations, N was 278; for SES Rank, 280; for Education, 279; and for Income, 278.

Study 2

The present study was a confirmatory, direct replication of the Pilot Data and Study 1, with identical hypotheses. All exclusions and confirmatory hypotheses and analyses for this study were pre-registered on OSF (https://osf.io/vr3nj/).

Method

Sample

Participants were recruited from MTurk to complete a study on "Time and the Self" for compensation of 0.65. USD Participants were required to be in the US, have a 95% HIT approval rate, and have completed 100 HITs. An *apriori* power analysis indicated that 270 participants would be needed to detect an expected effect of $r = .15$ with alpha of .05, power of .80, and one-tailed *t*-tests. Thus, we collected data from 300 participants prior to exclusions. Per our pre-registration, we removed anyone who failed two or more of three embedded attention checks (e.g., "Please select 'Disagree' for this item."; N= 12), leaving a final sample size of 288. Participants' demographics matched those of Study 1's participants: largely college-educated (51%), below-median income for a single-person household relative to the U.S. (76%), about half men (61%), mostly White (74%), and in their mid-30's ($M = 33.88$, $SD = 10.00$; see Table S1 for full details).

Measures

All measures of SES and future-self constructs, with one exception, were identical to the Pilot Data and Study 1's. The one exception was that we used the 13-item full form of the Future subscale from the Zimbardo Time Perspective Inventory (α = .85; Zimbardo & Boyd, 1999). As in Study 1, internal consistency was good for all composite indices ($\alpha_{Vividness}$ = .91). The nine-item measure of temporal discounting was identical to the measure we examined in the Pilot Data (Shenhav et al., 2017). All other measures were single-item measures. Again, future self vividness, similarity, self-esteem, caring, and liking items referred to *the self in 10 years*, following Ersner-Hershfield et al. (2009). As in Study 1, SES indicators correlated positively with each other ($M = .52$, *min* = .35, *max* = .78), as did the future-self constructs ($M = .32$, *min* = .01, *max* = .64).

Procedure

After providing consent, participants completed our measures of future-self constructs, future time perspective, and temporal discounting. They then reported demographic factors, including SES, gender, race, and age.

Results and discussion

Confirmatory analyses

The first column of Table 2 ("Composite SES") displays all correlations for our hypothesis tests. As predicted, future self vividness, liking, similarity, and self-esteem, as well as temporal discounting, were significantly correlated with socioeconomic status in the hypothesized direction. Respectively, these indicate that higher- versus lower-SES individuals had more vivid images of themselves in the future; liked themselves in the future more; felt closer to their future self; thought they would have higher self-esteem in the future; and allotted more money to their future selves.

Contrary to hypotheses, neither future time perspective ($r= .07$) nor caring about the future self ($r= .05$) were significantly correlated with socioeconomic status. As in Study 1, this latter correlation suggests that higher versus lower-SES people do not care about their futures more. With two observed correlations near zero for future self caring, we decided that it likely did not differ across SES and dropped it from further investigation. Regarding the former, unlike Study 1, Study 2 used the full version of the Future Time Perspective scale; however, the short form ($a = .78$) was also uncorrelated with composite SES in Study 2 ($r= .05$, $p= .356$). Thus, Study 2's future time perspective result contradicted that of Study 1's. This may have occurred for a number of reasons (e.g., well-powered studies of real effects should not always find the effect; Lakens & Etz, 2017), but upon revisiting the inventory's initial validation (Zimbardo & Boyd, 1999), we learned that the Future subscale typically decomposed into several factors, rather than a single factor, when administered to a large sample of diverse, non-undergraduate adults, such as MTurkers. As the manuscript reporting this result (Gonzalez & Zimbardo, 1985) is not available, our results using the subscale were rendered uninterpretable, for the items could not be scored correctly. Hence, we decided to drop the scale from further investigation.[2]

Table 2. *Effect Sizes (Pearson r's) for Study 2*

	Composite SES	MacArthur Ladder	SES Category	Education	Personal Income
Vividness	**.16****	.17**	.15**	.05	.14**
Liking	**.10***	.12*	.03	.08	.08
Similarity	**.18****	.18***	.13*	.14**	.12*
Self-Esteem	**.23*****	.26***	.17***	.15**	.15**
Caring	**.05**	.11*	.00	.04	.00
Future Time Perspective	**.07**	.09	-.01	.11*	.04
Temporal Discounting	**-.17****	-.08	-.04	-.27***	-.16**
Mean Overall	**.137**	.144	.073	.120	.099

Note. *** $p < .001$, ** $p < .01$, * $p < .05$. N for all correlations involving Future Self Caring was 287; N for all other correlations was 288. The absolute scores for Temporal Discounting correlations were used for calculating mean correlations. Correlations for Composite SES were used for hypothesis tests. All p-values are one-tailed tests.

Exploratory analyses

As in Study 1, we averaged all the correlations, yielding an average *r* of .137. This was smaller than the average effect size in Study 1 but still within one standard deviation of the average effect size in social–personality psychology (*SD* = .15; Richard et al., 2003). This was encouraging that we were onto real, robust effects. However, correlational data do not permit inferences about causation. Thus, a test of our causal hypotheses required an experimental study, which we conducted in Study 3.

Study 3

Having obtained reliable effects in line with several of our hypotheses (all but Hypothesis 5, for caring, and Hypothesis 7, for future time perspective), in this final study, we aimed to obtain causal evidence for our hypotheses via an experimental manipulation of SES.

Method

Based on Pearson *r*'s of .21 and .17, we conducted *a priori* power analyses for Cohen's *d*'s of .43 and .34, respectively. As before, we used an alpha of .05, power of .80, and one-tailed *t*-tests. Both power analyses were for independent means. These power analyses indicated we needed sample sizes of 136 and 216, respectively, to detect our effects. However, because we were not sure how effect sizes would vary between measured and manipulated studies and we expected to eliminate a large number of participants due to the MTurk "bot scare" (Bai, 2018), we collected data from 325 participants. All exclusions and confirmatory hypotheses and analyses were pre-registered on OSF (https://osf.io/qc52w/).

Participants were recruited from MTurk for a study on "The Self and Time" and were compensated 0.75. USD We used Lee et al.'s (2018) Study 3 procedure to manipulate SES. After providing consent, participants completed the same set of demographic questions used in Study 2 (i.e., race, gender, age, personal income, education, SES category, and the MacArthur Ladder; reported in Table S1) and then were asked to describe two things they had recently done to benefit themselves, one for immediate benefit and another for future benefit. Participants were then randomly assigned to imagine that their monthly personal income increased by 50% (+50%, higher SES condition; N = 149) or decreased by 50% (−50% lower SES condition; N = 135) and that they expected this change to be stable. This targeting of monthly income in Lee et al.'s (2018) manipulation is consistent with our own and other researchers' conceptions of SES, which prioritize possession of economic resources (e.g., American Psychological Association, T. F. on S. S, 2007; Kraus et al., 2012), and consistent with other manipulations of SES that focus on resource availability (Brown-Iannuzzi et al., 2015). Participants then wrote about how they would budget their new monthly personal income. After writing about budgeting, participants completed an instruction check asking them to identify whether they had just imagined their personal income increasing or decreasing by 50%. As a manipulation check, participants then indicated the degree to which they felt *financially constrained* (=1) or *financially comfortable* (=9) in the imagined scenario and where they would place themselves on the MacArthur Ladder (1 = *bottom*; 10 = *top*) under their new income. These checks were standardized and averaged to form a single manipulation check (*r* = .72).

Participants then imagined that six months had passed after their personal income adjustment. Specifically, they were prompted to think (but not write) about their new daily life and to consider the questions "What are you like? What do you do on a day-to-day basis? What are your goals, plans?". Participants then answered items for the following constructs from Studies 1 and 2: future self vividness (a = .90), liking, similarity, and self-esteem, as well as the nine-item temporal discounting measure (Shenhav et al., 2017). The vividness, liking, and similarity items asked participants to report about *the self now* in relation to *the self six months from now* (e.g., "How vividly do you picture this self six months from now?", "How much do you like this self six months from now?", "How similar do you currently feel to yourself six months from now?"). The self-esteem item asked whether participants thought their self six months from now would have high self-esteem. The temporal discounting items asked participants to choose as if they were in their future six months from now. Like Studies 1 and 2, the future-self constructs correlated positively with each other (M = .33, min = .09, max = .79).

As these data were collected in Fall 2018, we also had participants complete four "cultural check" items (cf. Turkprime, 2018) to verify the US citizenship participation requirement (cf. Bai, 2018). Specifically, we asked participants to name the following objects (depicted in photos): license plate, ladybug, jell-o, and diaper. After data collection, we determined whether participants used VPS/VPN services by searching their IP Location (from Qualtrics) in www.iplocation.net and then searching the provided ISP Provider/Organization in www.cloudscene.com and the list of colocation centers provided by Dennis et al. (2018).

Our initial sample size was 330 participants. Following our pre-registration, we removed from all analyses participants who failed the instruction check (N = 24) or who both used a VPS/VPN and did not pass all four cultural checks (N = 29), leaving a final sample of 284 participants (seven participants failed to meet both inclusion criteria, meaning only 46 participants were excluded; see Table S1 for demographic information, which resembled average MTurk samples). All results remained the same if we included participants who failed the instruction check, the cultural checks, or both.

Results and discussion

For all analyses, we did not assume that the conditions' variances were equal and used Welch approximations of the degrees of freedom to correct for unequal variances. This correction of the degrees of freedom produced variation in the degrees of freedom across analyses. Despite this variation, the overall sample size remained stable across the analyses (N = 284 for the manipulation check and temporal discounting; N = 283 for vividness, similarity, self-esteem, and liking [one participant in the +50% condition did not provide scores]).

Manipulation checks
Though Lee et al. (2018) described their manipulation as targeting "resource deprivation" (p. 6), we believed we had grounds to interpret it as impacting socioeconomic status. First, results from the manipulation check indicated we successfully

manipulated socioeconomic status, $t(279) = 19.80$, $p < .001$, Cohen's $d = 2.35$. Participants in the +50% condition reported feeling more financially comfortable and of a higher social class ($M = 0.67$, $SD = 0.60$) than those in the −50% condition ($M = -0.74$, $SD = 0.60$). In fact, almost 100% of the +50% participants scored above the mean of the −50% condition (Cohen's U3 = 99.06%). Thus, participants in our two conditions overwhelmingly believed they belonged to different socioeconomic statuses within the experiment.

Second, given the mean level of yearly personal income participants reported prior to the manipulation ($M = 47,041.75$ USD), losing or gaining 50% of one's monthly personal income would correspond to attaining yearly personal incomes of 23,520.88 USD or 70,562.63 USD, respectively. These changes would be sufficient to shift participants further below, or above, the median US household income in 2017 ($61,372; Rothbaum, 2018). Moreover, for even a single-person household, these changes would be sufficient to push participants in the −50% condition outside the middle class, according to guidelines set by Pew Research (lower bound of 24,000 USD for a single-person household; Research, 2015), while keeping participants in the +50% condition within the middle class (upper bound of 73,000 USD for a single-person household). In short, the manipulation shifted participants' socioeconomic status for even the smallest household possible.

Confirmatory analyses

All outcomes showed the predicted pattern of differences between conditions (see Table 3). Effect sizes were generally quite large (|Cohen's d's| from .27 to 1.53), with participants in the +50% and −50% conditions showing high degrees of separation (Cohen's U3's from 39.24% to 93.72%). Moreover, experimental condition means for several variables (i.e., liking, similarity, self-esteem) fell on the opposite side of the scale midpoint, meaning that, on average, participants reported conceptually opposite appraisals of the future self (e.g., actively *liking* vs. *disliking* their future self for the +50% and −50% conditions, respectively). Overall, these results suggested that SES caused differences in appraisals of the future self in the hypothesized directions: Lower-, vs. higher-, SES individuals viewed their future self less vividly, liked it less, felt less similar to it, thought it had less self-esteem, and allocated less money to it. Still, the size of the observed effect sizes raised concerns about the manipulation's external validity, so we decided to compare them to effect sizes from the Pilot Data and Studies 1 and 2.

Table 3. Confirmatory analyses from Study 3

	Cohen's d	Cohen's U3	p
Vividness	0.69	75.62%	< .001
Liking	1.53	93.72%	< .001
Similarity	0.76	77.65%	< .001
Self-Esteem	1.32	90.63%	< .001
Temporal Discounting	-0.27	39.24%	.011

Note. Cohen's U3 indicates the percentage of participants in the +50% condition above the mean of the -50% condition.

Exploratory analyses

Comparing effect sizes across studies. To compare effect sizes across all studies, we converted Study 3's effect sizes into Pearson *r*'s using the *tes()* function in the *compute.es* R package (Del Re, 2014). Table 4 displays effect sizes from all studies.

Study 3's effect sizes were either near (vividness, temporal discounting) or several times greater than (liking, similarity, self-esteem) those from the other studies. Thus, our experimental manipulation produced much larger effects than those in our observational studies. We think a measured interpretation of these differences is that our manipulation was heavy-handed. It seems unlikely that everyday or long-term experiences of SES would be equivalent to, or more dramatic than, losing or gaining 50% of one's personal income. This mismatch does limit the external validity of Study 3, but this study's main aim was to determine whether our causal interpretation of the findings of the other studies was plausible. To that end, it was successful. Furthermore, given the average personal income observed in this study and in the US, such a heavy-handed manipulation would seem necessary to accurately simulate re-assignment of SES. In addition, one field experiment found that personal income changes (via cash transfers) impacted psychological outcomes like satisfaction with life only when they were very large (i.e., 1525 USD USD/month vs. 404 USD USD/month; Haushofer & Shapiro, 2016), suggesting that studying the psychological effects of SES requires studying very large changes in SES (as in our manipulation).

Table 4. *Effect sizes (r's) across all Studies*

	Pilot Data/ Study 1	Study 2	Study 3
Vividness	.27	.16	.33
Liking	.18	.10	.61
Similarity	.13	.18	.36
Self-Esteem	.30	.23	.55
Temporal Discounting	-.15	-.17	-.14

Note. Effect sizes for Study 3 were converted to *r*'s using the *tes()* function in the *compute.es* R package.

Identifying a neutral condition. One issue interpreting Study 3 is determining which condition (+50% vs. −50%) drove the observed differences. We did not include a neutral control, so the manipulation's active ingredient is not obvious from the two conditions. In the case of Study 3's manipulation, "neutral" would arguably constitute not attempting to change participants' SES. That is, neutral means leaving participants' SES as it was when participants began the study. Accepting this criterion, the means from the Pilot Data and Studies 1 and 2 work as a neutral control. In these studies, variables were only measured, and no attempts were made to change participants' SES. Hence, comparing them to the means from Study 3 ought to provide initial insight into which condition drove the observed effects.

Table 5 displays means and standard deviations from all studies for future self vividness, liking, similarity, and self-esteem, as well as temporal discounting. The loss of 50% of one's personal income seemed to be the active ingredient for most of our dependent variables. For liking, similarity, self-esteem, and temporal discounting, the means from the Pilot Data and Studies 1 and 2 nearly matched the +50% mean. This suggests that the

−50% condition caused downward shifts in these constructs. In contrast, the vividness means from the Pilot Data and Studies 1 and 2 nearly matched the −50% mean, suggesting that the +50% condition caused an increase in the vividness of participants' future selves.

Table 5. Means (SD) of Dependent Variables across all Studies

	Pilot Data/ Study 1	Study 2	Study 3 -50%	+50%
Vividness	3.15 (1.20)	3.16 (1.08)	3.33 (1.10)	4.01 (0.85)
Liking	5.87 (1.22)	5.72 (1.29)	3.78 (1.70)	5.98 (1.08)
Similarity	4.98 (1.43)	4.41 (1.68)	3.65 (1.71)	5.00 (1.84)
Self-Esteem	3.83 (1.17)	3.96 (1.00)	2.61 (1.33)	4.12 (0.91)
Temporal Discounting	-4.95 (1.86)	-4.82 (1.94)	-4.17 (1.76)	-4.68 (1.76)

Note. -50% and +50% under Study 3 refer to the conditions that imagined their monthly income going down or up by 50%, respectively.

General discussion

The present findings suggest that socioeconomic status (SES) is linked to the degree to which people think about and value their future self. Relative to people with a higher SES, people with a lower SES had a less vivid image of their future self, liked their future self less, felt less similar to their future self, had lower esteem for their future self, and allocated less money to their future self. To the best of our knowledge, the findings for vividness, liking, similarity, and self-esteem are novel, whereas the money allocation fits with prior research linking SES to delay discounting (e.g., Griskevicius, Tybur et al., 2011). All of these findings held across both objective (personal income, education) and subjective (MacArthur Ladder, class category) operationalizations of SES (Pilot Data, Studies 1 & 2), as well as an experimental manipulation of personal income (Study 3).

These findings make several contributions to extant research on the psychological effects of socioeconomic status and the future self. First, whereas prior research on SES's psychological effects focused on the present self, like current values and preferences (e.g., Kraus et al., 2012), the present research demonstrates that SES may also affect the future self. Notably, the current findings describe SES differences in the future self that go beyond differences in content to qualities of this self. Qualities of selves are important to research, for a rich literature has found that qualities of selves can matter as much as their content (e.g., Campbell et al., 1996; Linville, 1985; Peetz & Wilson, 2008). For instance, Niedenthal and colleagues (Niedenthal et al., 1992) found that future self-complexity muted emotional reactions to both successes and failures related to desired future selves. In other words, the organization of the future self overrode reactions specific to the content of the promoted (challenged) future self. Thus, our findings extend knowledge of the impact of SES on the self to a range of qualities of the future self.

Although this last statement is a broad claim, the present findings constitute at least a potential starting point for several lines of inquiry that future research may take. For instance, do different cognitive mechanisms underlie SES's impact on cognitive and affective qualities of the future self? Second, the results identify a novel source of the development of qualities of the future self, in addition to the existing work on cultural schema (e.g., Guo et al., 2012; Ottsen & Berntsen, 2015; Wang et al., 2015). Among other

possibilities, future research should examine how long-lasting such changes are: Might a single loss of personal income be sufficient to prevent future gains from changing qualities of the future self? Or do these broader qualities change as personal income fluctuates over the life span? Recent research on the impact of life events on personality development has found that changes in SES, like beginning or losing paid employment, can produce stable or temporary changes in personality traits and "superficial" characteristics like Satisfaction with Life (Denissen et al., 2019). When possible, future research should use similar intensive, longitudinal research designs to examine how changes in SES impact qualities of the future self.

Beyond work on SES and the self, these findings may help explain other results in the health psychology and life span development literatures. For instance, health psychologists have found that behaviors that require sacrificing immediate pleasures for later gains (e.g., smoking cessation, exercise, avoiding sugary foods) are more frequently engaged in by higher-SES people (Adams & Nettle, 2009). Given that these behaviors are thought to reflect delay discounting generally (Adams, 2009) and that connection to the future self diminishes delay discounting (Lewis & Oyserman, 2015), qualities of the future self may mediate the connection between SES and these behaviors. These results may also help explain normative developmental trajectories in self-esteem. Self-esteem has been found to be impacted by changes in the future self (Higgins, 1987; Markus & Nurius, 1986). In addition, it appears to follow the same life span developmental trajectory as changes in the future self's content (Cross & Markus, 1991; Hooker, 1992) and personal wealth (Shorrocks, 1975): starting at a low point in early adulthood, rising across middle adulthood, and declining in older age (Lodi-Smith & Roberts, 2010; Orth et al., 2010). The present results suggest normative changes in self-esteem may occur in response to normative changes in the future self, which are themselves changes in response to normative changes in SES.

Limitations and future directions

Although we have described an array of simple effects of SES on qualities of the future self, we have not tested how these effects come about. That is, we did not directly examine psychological mechanisms underlying these effects. We specified two – perceived stability of one's future and perceived negativity of one's future – but did not test them. Future research ought to examine whether these and other plausible mechanisms explain our results. For instance, researchers might modify Study 3's experimental manipulation by crossing the two income conditions with perceived stability or negativity of the future. If the SES effect is attenuated when future stability (or negativity) is preserved across the income conditions, then stability (or negativity) is likely to be playing a mediating role in the effect of SES on future self qualities.

Another important question for future research is how SES's effects play out in real-life settings. Though our 50% change in Study 3 seemed necessary for internal validity, is so large a change needed to see similar effects outside the lab? Might smaller amounts be sufficient to make people more able to think about their futures? The results of Haushofer and Shapiro (2016) suggest that large changes in SES are required to produce changes in psychological variables. In their study, all experimental conditions received cash transfers of at least a doubling (a 100% increase) of monthly household consumption;

psychological effects (e.g., on Satisfaction with Life) were observed only when triple the minimum amount (i.e., a 500% total increase) was given. A number of cities and countries around the world have begun experimenting with various forms of basic income in the last several years or decades (e.g., Stockton, California; Otivejero and Omitara, Namibia; Finland; the Alaska Permanent Fund). To the extent that these and future policies seek to change individuals' psychological situations, proper calibration of individual funding amounts needs to be examined.

Finally, our observational and experimental studies varied on a potentially critical attribute: The observational studies examined individuals' SES as it exists in real life, whereas the experiment examined a hypothetical situation, asking individuals to imagine themselves in an alternative socioeconomic status. We have assumed that this difference does not alter inferences that can be made from each study; more specifically, we have assumed that our observational and experimental studies permit inference about the same phenomenon, the impact of SES on qualities of the future self. This assumption need not be true, of course. The studies presented here may describe qualitatively distinct phenomena. We think our assumption holds at least to some degree, however. In both the observational and experimental studies, the operationalization of SES followed from our theoretical definition of SES as access to resources. In addition, the form of the judgment made for the dependent variables was preserved across studies. For qualities of the future self, participants rated how they viewed their future self at a specified time (*10 years forward* in the observational studies vs. *6 months forward* in the experiment). For temporal discounting, participants chose between monetary rewards in a specified SES context (*their current, real SES* for the observational studies vs. *their new, hypothetical SES* for the experiment). Thus, despite the experiment's artificiality, participants experienced a similar contextual phenomenon as in the observational studies (SES as access to resources) and made similar judgments in response to this contextual phenomenon (how they viewed their future self, which reward options they preferred). Of course, actually manipulating individuals' access to resources in real life would provide better evidence for our hypotheses, but until researchers develop a feasible means of doing so, our method appears to provide at least suggestive evidence for our hypotheses.

Conclusion

Socioeconomic status has played, and continues to play, an important role in shaping individuals' experience of the world. The present research suggests that this impact includes influencing the self that people envision for the future. In particular, people occupying lower-SES environments viewed their futures selves less vividly and thought these selves overlapped less with their present selves, two aspects of the future self important for goal attainment. In addition, people occupying lower-SES environments both liked their future self less and held less esteem for it, two other aspects of the future self important for goal attainment. Thus, the present results may help explain why occupying a lower-SES environment can make goal attainment harder.

Notes

1. This result held when using the 27-item delay discounting measure ($r= -.13$, $p<.001$), instead of the 9-item as reported in Table 1.
2. Note that we also administered the Life Orientations Test–Revised (Scheier et al., 1994) as a measure of optimism ($a =.90$). We pre-registered that our observed correlations would not be accounted for by optimism to distinguish qualities of the future self from thoughts about the future in general. In hindsight, this was not a sensible hypothesis, as thoughts about the future in general are necessarily wrapped up in qualities of the future self. Still, we report the results we found. Only temporal discounting and future self-esteem and similarity remained significant after partialing out optimism ($|r|$'s from.12–.16, p's from.013–.003). All other correlations were non-significant (p's>.14).

Author contributions

S.A. and S.C. conceived the project and all study designs. S.A. collected and analyzed data, with input from S.C. S.A. drafted the manuscript, with critical feedback from S.C.

Disclosure statement

The authors declare no competing interests for this work.

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