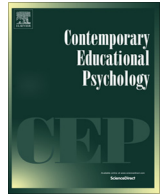




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Empirical study

No pain no gain? Social demographic correlates and identity consequences of interpreting experienced difficulty as importance

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ABSTRACT

Community college students are less likely to graduate than university students, perhaps because their difficult life circumstances increase their vulnerability to misinterpreting the identity implications of experienced difficulty with schoolwork. Without guidance, they may fail to take a “no pain, no gain” perspective in which experienced difficulty with schoolwork implies the importance of succeeding in school. Two studies support this prediction: Study 1 (N = 1035) finds that education is associated with higher likelihood of interpreting experienced difficulty as signaling task importance among adults. This effect is pronounced for racial minorities. Study 2 (n = 293) finds that students who disagreed that experienced difficulty implies impossibility were more certain about attaining their academic possible identities and more willing to sacrifice to attain these identities. Moreover, community college students benefited more than university students from being guided to consider what experienced difficulty might imply or from considering that experienced difficulty implies importance, rather than impossibility.

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1. Introduction

Currently, almost two thirds (65.9%) of American high school graduates start attending college immediately after graduating from high school (National Center for Educational Statistics, 2016). Of those, the majority start at a community college (Cabrera & La Nasa, 2001; Rowan-Kenyon, 2007). Unfortunately, of the total estimated 10.1 million students currently enrolled in community colleges, about 8 million will not graduate – graduation rates for community colleges average 21% – 79% do not graduate (Ginder, Kelly-Reid, & Mann, 2014). This community college graduation rate is less than half the graduation rate of students entering four-year colleges, about 54% of whom graduate with a bachelor's degree within six year's time (ACT Research and Policy Issues, 2012). That most high school graduates start college implies that lack of college aspirations is not the problem – entering students likely do imagine “college graduate” as an academic possible future identity – an academic identity that they might have in the future. However, that most students fail to graduate implies that

the problem is translating this academic possible identity into persistent action.

Students are right to focus on their academic possible identities—having credentials beyond high school is increasingly necessary in modern societies. Low education is associated with worse outcomes on almost every dimension of human development including unemployment, poverty, mental and physical health problems, and healthy family relationships (e.g., Card, 1999; Daly & Bengali, 2014; Leonhardt, 2014; Morgan & David, 1963; Valletta, 2015; for a full review, Oyserman, 2015). Each of the negative effects of low education are particularly likely for racial-ethnic minorities with less than a college education (Ahmed, Hill, Smith, & Frankenberger, 2007; Sassi, Devaux, Cecchini, Church, & Borgonovi, 2011; Shi & Stevens, 2005; U.S. Bureau of Labor Statistics, 2014). Having a college degree is buffering, and this is especially true for stigmatized racial-ethnic minorities. Though there are likely a number of underlying processes explaining the link between education and life outcomes, one of the important ways that college education likely reduces economic and health risk is by influencing the likelihood of chronically experiencing lack of choice and control (for reviews, Lewis & Oyserman, in press; Oyserman & Fisher, in press). Lack of choice and control, in turn, are posited to increase the likelihood that experienced difficulty is interpreted as implying impossibility rather than importance

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(Elmore, Oyserman, Smith, & Novin, 2016; Oyserman, 2015; Oyserman, Smith, & Elmore, 2014). We take the literature documenting the economic and social costs of low community college graduation rates, the economic and social benefits of graduation, and the gap between high desire and low success as pointing toward the need to develop scalable solutions to support college completion. In the current paper we focus on one scalable solution, which is guiding productive interpretation of experienced difficulty, especially among students likely to experience much difficulty. We detail our reasoning and studies next.

2. Identity-based motivation and interpretation of experienced difficulty with college

Identity-based motivation theory (IBM) describes the process by which interpretation of experienced difficulty operates to influence the self, motivation, and engagement (IBM, Oyserman, 2007, 2013, 2015). A core prediction of IBM is that it is not experienced difficulty per se but rather how that experienced difficulty is interpreted that matters for whether academic possible identities and strategies to attain them come to mind and influence engagement. Following common definitions of academic engagement (Fredricks, Blumenfeld, & Paris, 2004; Glanville & Wildhagen, 2007; Landau, Oyserman, Keefer, & Smith, 2014; Libbey, 2004; Veiga et al., 2012), we operationalized academic engagement in terms of intentions – the degree to which individuals intend to prioritize and put their best effort into a given task, and behavior – the extent that they actually do spend time, study, ask questions, and persist. There is some evidence that interpretation of experienced difficulty influences engagement. Thus, if engagement is operationalized as time spent on a subsequent academic task, students led to recall times in which they interpreted their experienced difficulty with schoolwork as implying schoolwork's importance were more engaged than students led to recall a time in which they interpreted their experienced difficulty with schoolwork as implying schoolwork's impossibility (Smith & Oyserman, 2015).

IBM predicts that social stratification (including social class and racial-ethnic minority status) matters in part by changing the odds that people will experience success-likely vs. failure-likely contexts and hence need to interpret experienced difficulty (Lewis & Oyserman, in preparation; Oyserman & Fisher, in press; Oyserman et al., 2014). Experienced difficulty can be interpreted as implying importance, “no pain, no gain” and highlight the need to sacrifice to work toward a possible academic identity and to come up with strategies to do so (Oyserman, Bybee, & Terry, 2006). But experienced difficulty can also be interpreted as implying impossibility, “not worth my time” and result in shift in effort and attention to other goals. Middle school students guided to interpret experienced difficulty with schoolwork as implying importance performed better on a subsequent test of fluid intelligence than those guided to interpret experienced difficulty with schoolwork as implying impossibility of success (Oyserman & Fisher, in press).

These insights have been used to develop an identity-based motivation intervention that, when tested in a randomized control trial intervention, improved the attendance and grade point average of low income and minority students (Oyserman, Terry, & Bybee, 2002; Oyserman et al., 2006). For example, in one randomized control trial of the identity-based motivation intervention, eighth grade students in the control condition went to school as usual and experienced the usual difficulties with schoolwork without structured interpretation (Oyserman et al., 2006). They were followed through eighth grade and the next year as they transitioned to high school. The identity-based motivation intervention occurred twice a week in the beginning weeks of the school year

for a total of 12 sessions, ending before the first quarter marking period ended. Students randomly assigned to the intervention condition participated in in-class small group activities. Activities focused on the three pillars of IBM (connection, strategies, interpretation of experienced difficulty), with the goal of fostering three norms. These norms were first, that everyone has academic possible identities and can have strategies to attain them. Second, that next year and adult possible identities – the selves one believes one might become in the near and the more distal future, are linked. Third, that along the way everyone experiences difficulties and that experiencing difficulties is a sign that one is working on a task that is important, worth one's while.

At baseline, intervention and control group did not differ on any of the obtained measures (school grades, attendance, homework time, in-class behavior including teacher report of engagement and possible identities) and no difference was expected given randomization to group. However, at the end of eighth grade and at the end of ninth grade the following school year, students in the intervention group had better grades, spent more time on their homework, were more engaged by teacher report, had better attendance and standardized test scores compared to control group students. Effects were mediated by change in school-focused possible identities and strategies to attain them. Results implied that vulnerable students are more likely to succeed if guided to interpret experienced difficulties with schoolwork as the importance of these tasks.

Although the initial test involved middle school students, later experiments demonstrated that interpretation of experienced difficulty effects are not limited to vulnerable middle school students. For example, college students were led to recall a time they interpreted experienced difficulty with schoolwork either as a sign of task impossibility or as a sign of task importance (Smith & Oyserman, 2015). Students in the interpretation of experienced difficulty as importance group rated academics as more central to their identity. They also performed better on a test of fluid intelligence. In addition, college students guided to focus on interpretation of experienced difficulty as importance generated more academic possible selves and strategies to attain them than college students guided to focus on interpretation of experienced difficulty as impossibility (Oyserman, Novin, Smith, Elmore, & Nurra, in preparation). The effect of guided focus was not moderated by how much participants endorsed the interpretation of experienced difficulty they were guided to focus on, suggesting that effects are due to cuing associated knowledge in memory rather than due to endorsement itself (for further discussion of how priming works, see Forster, Liberman, & Friedman, 2009).

Prior studies on guided interpretation of experienced difficulty highlight the effect of having people focus on one or another interpretation, but people also differ in their chronic (trait) interpretation of experienced difficulty (Fisher & Oyserman, 2016; Oyserman et al., in preparation). Across studies, when interpretation of experienced difficulty as importance and as impossibility are measured, people agree more with the idea of interpreting experienced difficulty as importance and less with the idea of interpreting experienced difficulty as impossibility. However, across studies each interpretation of experienced difficulty contributes separately to variance in relevant constructs – including efficacy and locus of control (Fisher & Oyserman, 2016; Oyserman et al., in preparation). The correlation between the two scales (interpretation of experienced difficulty as importance, interpretation of experienced difficulty as impossibility) is low with the confidence interval of the average correlation ranging from -0.13 to -0.06 in one set of four studies (Fisher & Oyserman, 2016) and the correlations ranging from -0.18 to 0.08 in another set of four studies (Oyserman et al., in preparation).

3. Social structural factors and experienced difficulty with college

In this section we consider the community college context as potentiating a particular interpretation of experienced difficulty (e.g., Oyserman & Destin, 2010). There are a number of reasons this is likely: First, low-income, working class, and racial-ethnic minorities are more likely to attend community college (Laanan, 2000). These groups of students are less likely to experience educational settings as supportive of their success (e.g. Cabrera, Nora, Terenzini, Pascarella, & Hagedorn, 1999; Hu & St. John, 2001; Hurtado, Inkelas, Briggs, & Rhee, 1997; Kao & Thompson, 2003; Smedley, Myers, & Harrell, 1993). Second, these students are more likely to experience discrimination (e.g. Bertrand & Mullainathan, 2003) and stereotype threat – the fear of confirming a negative stereotype about one's group (Lewis & Sekaquaptewa, 2016; Nguyen & Ryan, 2008; Schmader, Major, & Gramzow, 2001; Steele & Aronson, 1995). Compared to university students, community college students may have less time to invest and may experience more goal conflict because they are more likely to be working full time and to be single parents (Hoachlander, Sikora, & Horn, 2003). They may be less confident in their academic skills since they are less likely to have successfully completed rigorous coursework before college (Goldrick-Rab, 2010) and are more likely to be required to take remedial classes during college than university students (Attewell, Lavin, Domina, & Levey, 2006).¹ In part due to the above factors, community college students often misperceive the academic requirements for graduating, underestimating the difficulties they are likely to experience and the sacrifices schooling entails (Person, Rosenbaum, & Deil-Amen, 2006).

4. Predictions and current studies

Taken together, our literature review yields three predictions about social structural factors and interpretation of experienced difficulty, which we test in the current studies. The first two predictions are about the association of chronic interpretation of experienced difficulty with education and income. We predict that interpretation of experienced difficulty will be associated with college education, especially for racial-ethnic minorities, and that interpretation of experienced difficulty should mediate the relationship between income and education. We test these predictions in Study 1 using a large on-line sample of adults varying in level of education and in minority status.

The third prediction is that community college and university students will differ in their chronic interpretation of experienced difficulty, so that guiding community students to shift their interpretation of experienced difficulty should particularly benefit them. We test this prediction in Study 2. We randomly assign students during summer semester to either a guided focus on interpretation of difficulty as importance, or impossibility, or a control group in which chronic interpretation of experienced difficulty is assessed. We included enrolled summer semester community college students and compared them to university students who are typically on summer break. All students rate their likelihood of attaining their academic possible identities and their willingness to sacrifice to attain their goals but half were first guided to consider how they interpret experienced difficulty with schoolwork. This also allowed us to test the prediction that momentary (state) interpretation of experienced difficulty will matter over and above chronic (trait) interpretation of experienced difficulty.

¹ Over half are required to take one or more remedial courses, classes that do not count toward degree credits and lengthen the time to degree completion.

Our rationale for each prediction follows. First, prediction one: education and interpretation of experienced difficulty should be linked because college education is a means to escape contexts in which choice and control are limited and failure is likely (Oyserman, 2015; Oyserman et al., 2014). Second, prediction two: interpretation of experienced difficulty is predicted to be a proximal mediator of the relationship between attaining more educational credentials earning higher income (for recent review, Valletta, 2015). Chronic exposure to failure-likely contexts in which individual choice and control are limited is predicted to decrease the likelihood that experienced difficulty is interpreted as implying importance. The limitations on the chance of noncollege-educated minorities may be particularly severe, for example, Lochner and Moretti (2004) found that while higher education is generally positively associated with less participation in criminal activities, this association is stronger for African Americans than for whites. Thus, we predict that college education will be associated with higher likelihood of interpreting experienced difficulty as task importance – “no pain no gain” and lower likelihood of interpreting experienced difficulty as impossibility—especially for minority compared to majority individuals. Having at hand an interpretation of difficulty as importance should increase persistent engagement, improving chances along the way and hence be associated with higher income.

Third, prediction three: we predicted that community college students will be more likely to benefit from considering what experienced difficulty means and from productive reframing of their interpretation of experienced difficulty than university students. This prediction is in line with predictions one and two and fits the literature we cited above that highlights differences between community college and university students. For example, students attending community college are more likely to be low-income, working class and racial-ethnic minorities (e.g., Laanan, 2000), they are more likely to chronically experience college as difficult than four year college students. Being low-income, working class, minority, and first generation in college increase the likelihood of experiencing obstacles such as working full time (e.g., Hoachlander et al., 2003), discrimination and stereotype-threat (e.g., Bertrand & Mullainathan, 2003; Nguyen & Ryan, 2008). Community college students are also generally less confident in their academic skills compared to university students (Goldrick-Rab, 2010). Taken together, their chronic interpretation of experienced difficulty might differ from that of more confident, middle income and social class students attending university. Hence, guided interpretation of difficulty as importance might reduce the gap and increase centrality of academics in identity and willingness to sacrifice to attain school goals.

5. Study 1

Study 1 tests predictions one and two: that education is associated with interpretation of experienced difficulty, especially for minorities, and that this association is consequential, mediating the education to income relationship.

5.1. Sample and procedure

Adults ($N = 1,071$; 57.2% male; $M_{age} = 34.52$, $SD = 10.98$, 82.8% White) rated how strongly they agreed or disagreed (1 = *Strongly disagree*, 7 = *Strongly agree*) with 12 statements about interpretation of experienced difficulty and reported demographic information. These statements formed the interpretation of experienced difficulty as importance and as impossibility subscales and the demographic information used for the current analyses. Each is located in Appendix A. Our research team recruited this sample

on Amazon's Turk to complete seven unrelated studies; the data used in this study were located at the end of each of these studies and have not been used or published elsewhere. That is, in each of seven studies, participants responded to the study questions and then completed the interpretation of difficulty questionnaire prior to reporting their demographics. Answers to the interpretation of experienced difficulty questions and demographic questions were then pooled into a large dataset for the current analyses. We chose this method prospectively because it allowed us to collect interpretation of experienced difficulty and demographic information from a large racially and educationally diverse sample and so have statistical power to test our predictions without much cost, we paid ten cents per minute.

5.1.1. A brief discussion of conducting research on Mechanical Turk

Amazon's Mechanical Turk is a crowdsourcing platform used by businesses that behavioral scientists can use to conduct surveys and experiments (for reviews, see Chandler & Shapiro, 2016; Paolacci & Chandler, 2014; Paolacci, Chandler, & Ipeirotis, 2010). Mechanical Turk workers collectively recommended 10 cents a minute as a fair and reasonable wage (for review, see Chandler & Shapiro, 2016). Two key advantages are very low cost and ease in obtaining samples that differ from the traditional participant recruiting sources – college campuses. Although the low cost leads some to worry that participants are less thoughtful than traditional subject pool participants, analyses of differences in attentiveness between subject pool and Mechanical Turk suggests that this concern is unwarranted (Hauser & Schwarz, 2016). Mechanical Turk samples are more demographically diverse with respect to race, age, educational attainment, income, and other factors and inexpensive compared to other non-subject pool options such as survey panels (Paolacci et al., 2010).

However, because the platform is set up to complete tasks, Mechanical Turk participants often complete multiple tasks and hence can be “non-naïve” participants, who have already completed similar studies and received debriefing feedback. This can alter results, usually by suppressing effect sizes (Chandler, Mueller, & Paolacci, 2014; Chandler, Paolacci, Peer, Mueller, & Ratliff, in press). Capture-recapture analysis suggests that the effective size of the active Mechanical Turk population that a typical laboratory can access is about 7300 and it takes about 7 months for half of workers to leave the Mechanical Turk pool and be replaced by new ones (Stewart et al., 2015). This means that if researchers are not careful, they could end up sampling the same participants over and over, diminishing their data quality. To avoid this problem, we use Mechanical Turk's built in “Qualification” system to restrict participants from completing related studies. For the current case, that means that each participant could only have completed one of the seven studies that make up the pooled dataset, since all seven contained the same interpretation of experienced difficulty scale. For more details on how to employ this screening method, see Paolacci, Chandler, and Ipeirotis (2010).

5.2. Results and discussion

5.2.1. Preliminary analysis

Preliminary analyses proceeded in four steps. First, we checked data quality metrics, particularly straight line responding (Herzog & Bachman, 1981). We found that 3.4% of our sample (36 participants) provided the same response 12 times (to each interpretation of experienced difficulty item). We excluded these participants from our analysis, yielding a final $n = 1035$. The demographic makeup of this final sample is presented in Table 1.

Second, we checked and found that our dependent measures met the required assumptions (normality and homogeneity of variance) for regression analyses, our planned analytic strategy. Third,

Table 1
Study 1: Participant demographics.

	N	%
Gender		
–1. Female	439	42.5
+1. Male	592	57.3
(Prefer not to answer)	2	0.2
Race-ethnicity		
+1. White	861	81.2
–1. Minority	199	18.8
African American	73	6.9
Asian/Asian American	69	6.5
Latino	57	5.4
Highest level of education		
Less than high school diploma	18	1.7
High school diploma (GED)	149	14.5
Some college or associate's degree	361	35.1
Bachelor's degree	418	40.6
Advanced degree	83	8.1
Age		
Range	18–73	
Mean	34.59	
SD	11.06	
Annual income		
1. <\$10,000	164	17.2
2. \$10,000–19,999	148	15.5
3. \$20,000–29,999	173	18.1
4. \$30,000–39,999	147	15.4
5. \$40,000–49,999	119	12.5
6. \$50,000–59,999	88	9.2
7. \$60,000–69,999	61	6.4
8. \$70,000–79,999	46	4.8
9. \$80,000–89,999	22	2.3
10. \$90,000–99,999	25	2.6
11. >\$100,000	41	4.3

Note: Race and gender were contrast coded (1 represents White participants, –1 represents Minority participants; 1 represents male and –1 represents female).

we checked and found that our measures of interpretation of experienced difficulty (“difficulty means importance” $M = 4.08$, $SD = 1.28$, $\alpha = 0.93$, “difficulty means impossibility” $M = 3.23$, $SD = 1.22$, $\alpha = 0.88$) were reliable and that level of correlation ($r = -0.09$, $p = 0.002$) did not merit collapsing them into a single measure.

Fourth, we checked to see whether responses varied depending on which of the seven individual studies data came from. We did so both because smaller samples might have provided less reliable estimates and because each sample provided a different response context and the context in which a question is asked could plausibly influence results (Schwarz & Oyserman, 2001). As detailed in the online Supplemental materials, study did not significantly influence interpretation of experienced difficulty as importance or as impossibility. Controlling for study (as a variable) did not affect results.

5.2.2. Main analysis

We set up two regression equations, one to examine the effects of Education, Race, and their interaction on interpretation of experienced difficulty as importance score (first regression) and the other to examine interpretation of experienced difficulty as impossibility score (second regression). Throughout we present unstandardized regression coefficients represented as bs . The first regression revealed main effects of Education, $b = 0.16$, 95% CI [0.04, 0.28], $t(1025) = 2.68$, $p = 0.008$, $d = 0.17$, Race, $b = -0.13$, 95% CI [-0.23, -0.02], $t(1025) = -2.36$, $p = 0.018$, $d = 0.15$, and their interaction, $b = -0.23$, 95% CI [-0.35, -0.11], $t(1025) = 3.77$, $p < 0.001$, $d = 0.24$, on interpretation of experienced difficulty as importance score. Participants with higher levels of education

were more likely to agree that experiencing difficulty is a signal that tasks are important. Minority (mostly Black and Hispanic) participants drove this effect. The second regression revealed that neither Education, nor Race, nor their interaction significantly predicted interpretation of experienced difficulty as impossibility. We present the full regression equations in the [online Supplemental materials](#).

To better understand how Education and Race were associated with interpretation of experienced difficulty as importance, the effects of the first regression were decomposed in follow-up analyses examining the relative influence of different levels of education on interpretation of experienced difficulty as importance. These results are presented graphically in [Fig. 1](#), which shows the slope of the relationship between experienced difficulty as importance score and education. Change in education is associated with change in interpretation of experienced difficulty as importance score for minority but not for White participants. The size of the relationship between interpretation of experienced difficulty as importance score and education is moderated by level of education for minority participants. This moderated relationship has the following three characteristics: Minority participants with less than a high school education are less likely than their White counterparts to interpret experienced difficulty as a sign of importance. Next, having a community college education eliminates racial differences in interpreting experienced difficulty as importance. Finally, minority participants who obtain advanced degrees are more likely to interpret experienced difficulty as importance than their White counterparts.

With regard to the second regression equation, there is no significant effect of Education ($p = 0.84$) or Race ($p = 0.10$), or an Education by Race-Ethnicity interaction ($p = 0.12$) for experienced difficulty as impossibility scores. We interpret these significant and null results to mean that higher education increases productive interpretation of experienced difficulty by increasing interpretation of experienced difficulty as importance rather than by reducing interpretation of experienced difficulty as impossibility. The implication is that guiding at risk students to consider that their experienced difficulty might be a signal of task importance is likely to be useful (e.g., by bolstering their academic possible identities and increasing their academic engagement).

Next we tested the possibility that interpretation of experienced difficulty mediates the well-documented relationship between higher education and more income especially for minorities. A moderated-mediation analysis using PROCESS for SPSS v2.12 with 10,000 bootstrap samples ([Hayes, 2013](#)) reveals that the effect of Education on Income ($r = 0.29$, $p < 0.001$) is partially explained among minority participants by the effect of Education on interpretation of experienced difficulty as importance scores (95% Confidence Interval (CI) for Index of Moderated Mediation

[−0.1532, −0.0180]). Specifically for minority participants, level of education is positively related to higher experienced difficulty as importance score and this higher score is positively related to annual income (95% CI for Indirect Effect for Minority Participants [0.0145, 0.1342]). Experienced difficulty as importance score does not mediate the relationship between education and income for White participants (95% CI for Indirect Effect for White Participants [−0.0343, 0.0016]). Recall that for Whites this score is also not associated with education. We interpret our finding that education matters for interpretation of experienced difficulty among minority (but not White) Americans to mean that there are other ways in which Whites experience difficulty as implying importance beyond educational attainment (see also [Oyserman, Destin, & Novin, 2015](#)).

5.2.3. Discussion

Taken together, Study 1 demonstrates that level of education plays a significant role in how people interpret their experienced difficulty. Racial-ethnic minority adults with higher levels of education are more likely to interpret experienced difficulty as a signal of task importance. Minority adults who had completed community college ($M = 4.05$) had “difficulty as importance” scores that were 1.49 points higher than minority adults with less than a high school education ($M = 2.56$). Calculated as a percentage change ($(M_{\text{community college}} - M_{\text{less than high school}}) / M_{\text{less than high school}} \times 100$), this difference is 58.2%. This difference in interpretation of experienced difficulty as importance also partially predicts their annual income. These findings provide correlational support for the importance of educational attainment in interpretation of experienced difficulty as importance. To understand what this difference implies when translated back to dollars, we conducted the following calculations.

First, we set up a regression equation with income as the dependent measure and experienced difficulty as importance score as the predictor, obtaining an unstandardized beta of 0.16 ($p = 0.013$). This means that each 1-point increase in interpretation of experienced difficulty as importance score corresponds to a 0.16 increase in income level in our scale. Next, we multiplied the difference in interpretation of experienced difficulty as importance scores (1.49) by the effect of interpretation of experienced difficulty as importance score on income level ($1.49 \times 0.16 = 0.24$). This revealed that obtaining a community college degree versus not completing high school corresponds to a 0.24 increase in income level for minority participants on our income scale. Our income scale was designed so that each unit represents an increment up of \$10,000 per year. The product of the unit increase and the effect of interpretation of experienced difficulty on income unit is $\$10,000 \times 0.24 = \2400 . As can be seen in the demographics table, half of our sample reported earnings of \$29,999 or less. The implication is the higher interpretation of experienced difficulty as importance scores among community college graduates compared to those who did not finish high school may explain an income advantage that is substantial at the low income levels of this group.

Of course our analyses are importantly limited by their correlational and self-report nature. We did not manipulate interpretation of experienced difficulty or contrast the effect of manipulated interpretation of experienced difficulty to the effect of no guided interpretation of experienced difficulty or contrast the effect of state (guided) interpretation and trait (non-guided control). This limits our ability to infer the causal direction of these relations. We do not have a way to verify income so it is possible that self-report errors result in a noisy estimate of effects. Moreover our effect size ($d = 0.24$) is small, though we believe that it is consequential because of prior research showing that interpretation of experienced difficulty matters for academic outcomes. We base this idea that small effects can be important on a number of literatures. First as noted by [McCartney and Rosenthal \(2000\)](#) small

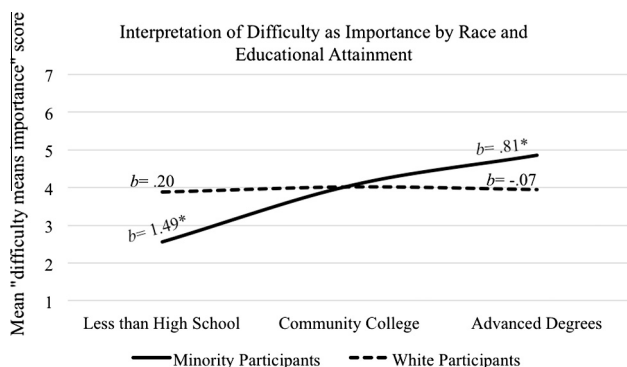


Fig. 1. Study 1: Mean “difficulty means importance” scores: Effect of participant race (Minority, White) and educational attainment. * $p < 0.05$.

effect sizes can matter for educational policy for a number of reasons, including the fact that error in measurement may guarantee small effects. Second, whether an effect, small or not, matters depends on its consequences (for a related discussion, see also Danaher & Crandall, 2008; Prentice & Miller, 1992). Our self-report measure is brief and surely contains measurement error and even small increments in shift in interpretation of difficulty matter if they increase the positive consequence of education on income.

In Study 2 we address limitations in causality arising from Study 1 in a number of ways. First, we examine the effect of guided (state) as compared to assessed (trait) interpretation of experienced difficulty. Second, we examine the effect of context, contrasting community college and university. Third, we examine the effect of level of endorsement of a productive interpretation of experienced difficulty – that is agreeing that experienced difficulty implies importance and disagreeing that experienced difficulty implies impossibility. Finally, we compare effects during a time that experienced difficulty should matter for community college students – when they are enrolled in summer semester.

6. Study 2

In Study 2 we test our third prediction, which is that community college students will be more likely to benefit from considering what experienced difficulty implies compared to university students and that productive endorsement of experienced difficulty will be more likely to benefit community college compared to university students.

6.1. Sample and procedure

Undergraduate research assistants approached students ($N = 293$; $M_{\text{age}} = 21.30$, $SD = 2.72$) at one of four community college campuses ($n = 135$) or a university campus at a highly selective university in southern California ($n = 158$) during summer term. Students who agreed to participate were handed a brief questionnaire from a pre-randomized stack containing four questionnaire orders as detailed below. Research assistants were blind to prediction.

Our goal was to obtain about 50 participants per condition and to have demographic diversity to allow for estimate of demographics effects. Our stop rule was time because we needed to obtain our data while community college students were still enrolled in classes and potentially experiencing coursework related difficulties. Prior research on interpretation of experienced difficulty demonstrates the effects of guiding interpretations of experienced difficulty are most pronounced when people are currently experiencing difficult situations (Lewis & Earl, in preparation; Oyserman, 2015). University students were approached at the same time, though they were not enrolled in classes during the summer. Demographic questions at the end of the questionnaire revealed that students approached on a community campus were sometimes university students. To avoid error, we classified students by their report of their enrollment rather than by whether they were approached on a community college or university campus, yielding this final distribution of students: $N = 112$ community college, $N = 181$ university. Table 2 provides participant demographics by college type. Sample size varies somewhat by analyses due to missing data on gender ($n = 2$), race-ethnicity ($n = 6$), parental education ($n = 4$), GPA ($n = 15$) and one participant who provided only demographics and the ratings for academic possible identities.

Experimental and control questionnaires contained the same dependent and demographic variables; order of presentation

Table 2
Study 2: Demographics.

	N	Community college	University
Gender			
Female	152	53	99
Male	139	58	81
Ethnicity			
African American	41	10	31
Asian/Asian American	45	20	25
Latino	124	58	66
White	77	22	55
Parents have a college degree			
No (neither)	129	57	72
Yes (one or both)	160	54	106

served as the experimental manipulation. Students were randomly assigned to one of four groups. Each group read and filled out an interpretation of experienced difficulty scale. Two groups (Groups 1 and 2) filled out the scale items before the dependent variables and so constituted the experimental groups. In Group 1, participants were presented with items describing experienced difficulty as implying importance (e.g. “I know in my gut that if a school task feels difficult it is really important for me”) and in Group 2, participants were presented with items describing experienced difficulty as implying impossibility (e.g. “I know in my gut that if a school task feels difficult it is really not possible for me”). The other two groups (Groups 3 and 4) filled out the same scale items, but did so after the dependent variables, and so constituted the control groups. To parallel Group 1, Group 3 filled out only the interpretation of experienced difficulty as importance items. To parallel Group 2, Group 4 filled out only the interpretation of experienced difficulty as impossibility items. Table 3 presents the sample size for each group. Finally, all students were asked their gender, racial-ethnic heritage, age, grade point average (GPA), and their parents’ level of education.

All our instructions and measures are presented in Appendix A. Because we were approaching students on campus, we made our questionnaire as brief as possible. For interpretation of experienced difficulty, we used four of the six Study 1 items and a 1 = strongly disagree, to 6 = strongly agree response scale ($M_{\text{experienced difficulty - means importance score}} = 3.69$, $SD = 1.27$, $\alpha = 0.92$, $M_{\text{experienced difficulty - means impossibility score}} = 2.46$, $SD = 1.29$, $\alpha = 0.91$). Our dependent variables were a seven-item likelihood (0 = extremely unlikely, 9 = extremely likely) of attaining academic possible identities scale (Kimmelmeier & Oyserman, 2001), $M = 7.30$, $SD = 1.19$, $\alpha = 0.88$, and a five-item willingness to sacrifice (1 = strongly disagree, to 6 = strongly agree) scale (Oyserman et al., in preparation), $M = 5.03$, $SD = 0.78$, $\alpha = 0.86$. We also included a six-item academic motives for attending college scale (0 = not at all determinant, to 9 = totally determinant, $M = 7.84$, $SD = 1.14$, $\alpha = 0.82$; e.g., *Learn more about my interests*) and a six-item social motives for attending college scale (e.g., “Give back to my community” $M = 7.09$, $SD = 1.90$, $\alpha = 0.86$), both from Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012. These scales were included to explore the pos-

Table 3
Study 2: Participants per experimental condition.

Condition	N	Community college	University
Importance (group one)	81	33	48
Impossibility (group two)	80	28	52
Control			
Group three (importance)	62	20	42
Group four (impossibility)	70	31	39

sibility of an alternative explanation for results, differing motives for attending college in the first place.

6.2. Results and discussion

6.2.1. Preliminary analyses

Preliminary analyses were conducted for three reasons: (1) to verify that our dependent variables were indeed related to academic attainment. (2) To determine if socio-demographic variables also predicted our dependent variables. (3) To determine if participants were more likely to agree with an interpretation of experienced difficulty as importance than with an interpretation of experienced difficulty as impossibility overall and if endorsement varied by presentation order, suggesting that level of endorsement be included as a factor in analyses (e.g., Fisher & Oyserman, 2016).

First we examined correlations between GPA and each of the measures in the control groups, finding that GPA was positively associated with certainty of attaining academic possible identities, $r = 0.30$, $p = 0.001$ and with willingness to sacrifice, $r = 0.20$, $p = 0.023$. This supports our use of these variables as dependent variables. We found no significant association between GPA and our alternative measures of academic ($r = 0.11$, $p = 0.225$) and social ($r = 0.05$, $p = 0.546$) motives for attending college so they are unlikely alternative explanations for our findings and hence are not included in our final analyses.

Next we examined the correlation between our dependent variables (academic possible identities, willingness to sacrifice scores), GPA, and socio-demographic variables (e.g., gender, race-ethnicity, parental education). Table 4 shows these correlations. Gender was associated with academic possible identities but race-ethnicity and parental education (whether either parent had a college degree of the type the participant was attempting to attain) were not correlated with the outcomes of interest.

Lastly we examined whether on average there were differences in how much participants endorsed the interpretation of experienced difficulty they were presented and whether these differences varied as a function of presentation order. Thus, we conducted an analysis of variance with the interpretation of experienced difficulty (importance vs. impossibility) and order of presentation (at the beginning of the questionnaire vs. as the end of the questionnaire) as factors and endorsement as the dependent variable. We found main effects of interpretation of experienced difficulty, $F(1, 291) = 63.56$, $p < 0.001$ and of order of presentation, $F(1, 291) = 5.60$, $p = 0.019$. Specifically, participants endorsed an interpretation of experienced difficulty as importance ($M = 3.66$, $SE = 0.10$) more than an interpretation of experienced difficulty as impossibility ($M = 2.46$, $SE = 0.10$), whether asked at the beginning or end of the questionnaire, Order $F(1, 291) < 1$, $p = 0.50$. They endorsed either interpretation more when presented before ($M = 3.24$, $SE = 0.10$) compared to after ($M = 2.88$, $SE = 0.11$) questions about academic possible identity and willingness to sacrifice.

Prior studies did not find an endorsement by guided interpretation of experienced difficulty (e.g., Oyserman et al., in preparation). However prior studies did not include no-guided prime control group participants (trait level interpretation of experienced

difficulty) as we did in Study 2. Therefore, we included endorsement (agreement score) in our main analyses. This allowed us to test the prediction that guided (state) interpretation of what experienced difficulty might imply benefited community college students over and above chronic (trait) endorsement.

6.2.2. Overview of the analyses

We set up two regression equations, one predicting certainty of attaining academic possible identities score and the other predicting willingness to sacrifice score. Both regression equations included the independent variables: College Type (university coded 1, community college coded -1), Assigned interpretation of experienced difficulty condition (importance coded 1, impossibility coded -1), Assigned interpretation of experienced difficulty order (as the first question, testing state effects, coded 1, or as the last question, assessing trait effects, coded -1), and Productive Interpretation of experienced difficulty score (interpretation of experienced difficulty score with endorsement of interpretation of experienced difficulty as impossibility scores reverse-coded so that higher scores always reflect productive endorsement of difficulty), GPA and gender (as controls).

6.2.2.1. Effects of interpretation of experienced difficulty

6.2.2.1.1. Academic possible identities. Regression analyses revealed three main effects: a large effect of College Type, $b = 0.43$, 95% CI [0.30, 0.56], $t(254) = 6.35$, $p < 0.001$, $d = 0.80$, and moderate effects of Order, $b = 0.29$, 95% CI [0.15, 0.42], $t(254) = 4.26$, $p < 0.001$, $d = 0.53$ and Productive Interpretation of experienced difficulty, $b = 0.19$, 95% CI [0.08, 0.30], $t(254) = 3.41$, $p = 0.001$, $d = 0.43$. These main effects show three results: university students were more certain that they could attain their academic possible identities. Second, students guided to consider what their experienced difficulty with schoolwork implies were more certain that they could attain their academic possible identities. Third students who interpret their experienced difficulty productively (agreeing with interpretation of experienced difficulty as importance, disagreeing with interpretation of experienced difficulty as impossibility) were more certain that they could attain their academic possible identities.

Four interaction effects moderated these main effects as detailed next. The first interaction was College Type \times Productive Interpretation of experienced difficulty, $b = -0.27$, 95% CI $[-0.37, -0.16]$, $t(254) = -4.80$, $p < 0.001$, $d = 0.60$. It revealed that certainty of attaining academic possible identities was higher for community college students who endorsed a productive interpretation of experienced difficulty, $b = 0.48$, 95% CI [0.27, 0.65], $t(254) = 4.84$, $p < 0.001$, $d = 0.61$ whereas the effect of endorsement was not significant for university students, $b = -0.07$, 95% CI $[-0.19, 0.05]$, $t(254) = -1.21$, $p = 0.226$. Means and standard errors are presented in Fig. 2.

The second interaction was Assigned interpretation of experienced difficulty condition \times College Type, $b = -0.13$, 95% CI $[-0.27, -0.01]$, $t(254) = -2.04$, $p = 0.042$, $d = 0.26$. It revealed that certainty of attaining academic possible identities was higher for community college students if they considered whether experienced difficulty implies importance rather than if they considered

Table 4
Study 2: Correlation matrix.

Variables	GPA	Gender	Race-ethnicity	Parental college	Possible identities	Willingness to sacrifice
1. GPA	–					
2. Gender	–0.15*	–				
3. Race ethnicity	–0.20**	–0.07	–			
4. Parents college degree	0.22**	–0.01	–0.25**	–		
5. Certainty of attaining academic possible identities	0.26**	–0.13*	–0.01	–0.04	–	
6. Willingness to sacrifice	0.26**	–0.10	–0.02	0.02	0.54**	–

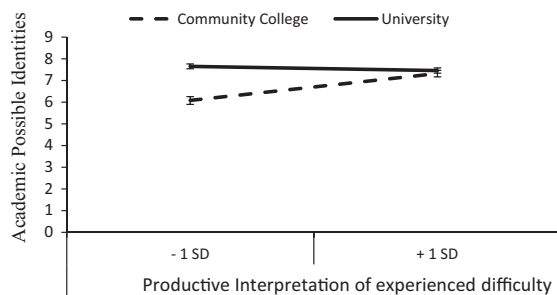


Fig. 2. The effect of Productive Interpretation of experienced difficulty (low = Mean - 1 SD, high = Mean + 1 SD) and college type (community college, university) on certainty of attaining academic possible identities, controlling for GPA and gender. *Note:* SD = Standard Deviation. The plot represents a visualization of the regression-based interaction effect presented in the paper.

it implies impossibility – separate from whether consideration was guided before (state) or assessed at the end of the questionnaire (trait), $b = 0.19$, 95% CI [-0.02, 0.39], $t(254) = 1.80$, $p = 0.073$, $d = 0.26$. This effect was not significant for university students, $b = -0.09$, 95% CI [-0.25, 0.08], $t(254) = -1.02$, $p = 0.307$. Means and standard errors are presented in Fig. 3.

The third interaction was Order \times College Type, $b = -0.15$, 95% CI [-0.28, -0.02], $t(254) = -2.26$, $p = 0.025$, $d = 0.28$. It revealed that certainty of attaining academic possible identities was higher for community college students if they first considered what interpretation of experienced difficulty might imply, $b = 0.44$, 95% CI [0.23, 0.64], $t(254) = 4.13$, $p < 0.001$, $d = 0.52$. No significant effect was found for university students, $b = 0.13$, 95% CI [-0.03, 0.30], $t(254) = 1.61$, $p = 0.108$. Means and standard errors are presented in Fig. 4.

While the two-way interaction effects all suggested that interpretation of experienced difficulty is significantly associated with academic possible identities for community college rather than university students, we did find a three-way interaction that did not include college type. This was the trend-level interaction of Order \times Assigned interpretation of experienced difficulty condition \times Productive Interpretation of experienced difficulty, $b = 0.10$, 95% CI [-0.01, 0.21], $t(254) = 1.82$, $p = 0.070$, $d = 0.23$. We decomposed this effect and found a positive consequence of considering interpretation of experienced difficulty as impossibility if students rejected this interpretation and if consideration of whether difficulty implies impossibility occurred after, rather than before, considering their academic possible identities. Students who were asked how much they endorsed the idea that experienced difficulty implies impossibility at the end of the questionnaire and disagreed with this interpretation (i.e., endorsed a productive interpretation) were more certain that they would

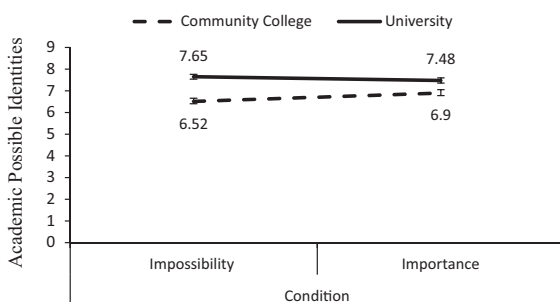


Fig. 3. The effect of interpretation of experienced difficulty condition (importance, impossibility) and college type (community college, university) on certainty of attaining academic possible identities, controlling for GPA and gender. *Note:* The plot represents a visualization of the regression-based interaction effect presented in the paper.

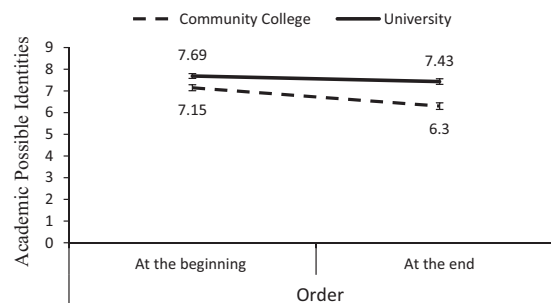


Fig. 4. The effect of when interpretation of experienced difficulty was brought to mind – as the first question (state) or the last question (trait) and college type (community college, university) on certainty of attaining academic possible identities, controlling for GPA and gender. *Note:* The plot represents a visualization of the regression-based interaction effect presented in the paper.

attain their academic possible identities, $b = 0.33$, 95% CI [0.14, 0.53], $t(254) = 3.36$, $p = 0.001$, $d = 0.42$. No higher order effects of interpretation of experienced difficulty as importance was found, $t < 1$, $p = 0.378$.

6.2.2.1.2. Willingness to sacrifice. Regression analyses revealed four main effects, three significant and one trend-level. The significant main effects were: A large effect of College Type, $b = 0.29$, 95% CI [0.20, 0.38], $t(253) = 6.55$, $p < 0.001$, $d = 0.82$, a medium-sized effect of Productive Interpretation of experienced difficulty, $b = 0.16$, 95% CI [0.09, 0.23], $t(253) = 4.35$, $p < 0.001$, $d = 0.55$, and a small effect of Order, $b = 0.10$, 95% CI [0.02, 0.19], $t(253) = 2.39$, $p = 0.018$, $d = 0.30$. The trend-level main effect was Assigned interpretation of experienced difficulty condition, $b = 0.09$, 95% CI [0, 0.17], $t(253) = 1.94$, $p = 0.053$, $d = 0.24$. University students and students guided to consider what their experienced difficulty with school-work implies were more willing to sacrifice to attain their academic goals. Students who interpret their experienced difficulty productively (agreeing with interpretation of experienced difficulty as importance, disagreeing with interpretation of experienced difficulty as impossibility) were more willing to sacrifice to attain their academic goals. At trend level, students who considered that experienced difficulty could be interpreted as importance (whether as a state or trait) were more willing to sacrifice to attain their academic goals.

Three interaction effects moderated these main effects as detailed next. First, College Type \times Productive Interpretation of experienced difficulty was significant, $b = -0.12$, 95% CI [-0.19, -0.05], $t(253) = -3.28$, $p = 0.001$, $d = 0.41$. Means and standard errors are presented in Fig. 5. It revealed that willingness to sacrifice to attain academic goals was higher for community

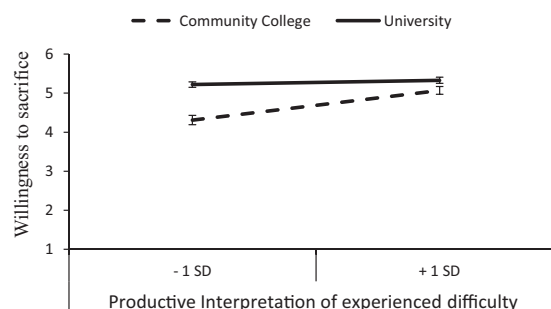


Fig. 5. The effect of Productive Interpretation of experienced difficulty (low = Mean - 1 SD, high = Mean + 1 SD) and college type (community college, university) on willingness to sacrifice, controlling for GPA and gender. *Note:* SD = Standard Deviation. The plot represents a visualization of the regression-based interaction effect presented in the paper.

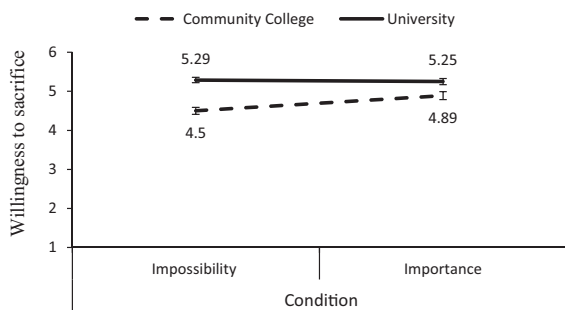


Fig. 6. The effect of interpretation of experienced difficulty condition (importance, impossibility) and college type (community college, university) on willingness to sacrifice (controlling for GPA and gender).

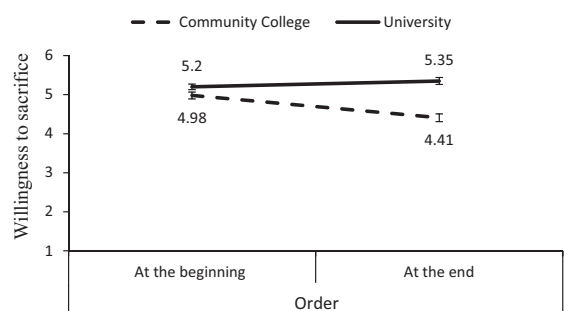


Fig. 7. The effect of interpretation of experienced difficulty order (first question or last question) and college type (community college, university) on willingness to sacrifice (controlling for GPA and gender).

college students who endorsed a productive interpretation of experienced difficulty, $b = 0.28$, 95% CI [0.16, 0.40], $t(253) = 4.52$, $p < 0.001$, $d = 0.57$. The effect of endorsement was not significant for university students, $b = 0.04$, 95% CI [-0.04, 0.12], $t(253) = 1.06$, $p = 0.288$.

The second interaction was Assigned interpretation of experienced difficulty condition \times College Type, $b = -0.10$, 95% CI [-0.19, -0.02], $t(253) = -2.42$, $p = 0.016$, $d = 0.30$. Means and standard errors are presented in Fig. 6. It revealed that willingness to sacrifice was higher for community college students if they considered whether experienced difficulty implies importance rather than if they considered it implies impossibility (independent from whether the question came first (suggesting state salience) or last (suggesting trait salience), $b = 0.19$, 95% CI [0.06, 0.33], $t(253) = 2.80$, $p = 0.006$, $d = 0.35$. This effect was not significant for university students, $b = -0.02$, 95% CI [-0.13, 0.09], $t < 1$, $p = 0.702$.

The third interaction was Order \times College Type, $b = -0.18$, 95% CI [-0.27, -0.09], $t(253) = -4.08$, $p < 0.001$, $d = 0.51$. Means and standard errors are presented in Fig. 7. It revealed that willingness to sacrifice was higher for community college students if they first considered what interpretation of experienced difficulty might imply, $b = 0.28$, 95% CI [0.15, 0.642], $t(253) = 4.12$, $p < 0.001$, $d = 0.52$. Assigned interpretation of experienced difficulty order did not have an effect among university students, $b = -0.08$, 95% CI [-0.18, 0.03], $t(253) = -1.37$, $p = 0.171$.

7. General discussion

7.1. Summary of findings

We presented the results of two studies. Study 1 documented an association between educational attainment and interpretation of experienced difficulty and showed that interpretation of experienced difficulty mediates the education-income association. Study

2 documented the causal effect of being guided to consider what experienced difficulty might imply, over and above chronic endorsement of an interpretation of experienced difficulty.

In Study 1 we used a large on-line sample of adults and found that higher levels of education were associated with more endorsement of the idea that experienced difficulty is a signal that a task is important, ‘no pain, no gain,’ especially among racial-ethnic minorities. This belief that experienced difficulty implies importance mediated the relationship between education and income among racial-ethnic minorities. That is, education was associated with increased belief that experienced difficulty can be productively interpreted as a signal of task importance and higher endorsement of this productive interpretation of difficulty was associated with higher earnings. The effect was small but we calculated that it was associated with a meaningfully different wage – about \$2400 in our low-income sample. We expected but did not find a parallel association with interpretation of experienced difficulty as implying task impossibility. That is, we expected that those with lower levels of education might be more likely to endorse the belief that experiencing difficulty implies that the odds are low and one should shift one’s attention to something else. We did not find this effect. However, as detailed next, in Study 2 we did find evidence that rejecting this belief is associated with better outcomes.

In Study 2 we focused on the effects of interpretation of experienced difficulty on students’ academic possible identities and their willingness to sacrifice to attain their academic goals. We predicted that community college (compared to university) students would be more likely to benefit from momentary interpretation of experienced difficulty. We tested three ways that this effect might occur. The first was being guided to consider (and agree with) an interpretation of experienced difficulty as importance or to disagree with an interpretation of experienced difficulty as implying impossibility. The second was focusing on experienced difficulty as sign of task importance; the third was productively interpreting experienced difficulty separate from whether the interpretation was guided or chronically accessible.

We found that interpretation of experienced difficulty influenced certainty of attaining academic possible identities and willingness to sacrifice to do so in four ways. First, students who specifically rejected an interpretation of experienced difficulty as impossibility had more academic possible identities. This relationship was not moderated by college type. However other effects of interpretation of experienced difficulty were moderated by college type – mattering more for community college than university students. Thus, community college students who endorsed a productive interpretation of experienced difficulty and those who focused on experienced difficulty as signaling task importance were more certain they would attain their academic possible identities and more willing to sacrifice to do so. Moreover, community college students induced to consider what experienced difficulty might imply before responding to the possible identities and willingness to sacrifice questions, were also more certain they would attain their academic possible identities and more willing to sacrifice to do so.

7.2. Implications for studies of possible identities

In our second study we focused on certainty of attaining academic possible identities and willingness to sacrifice to attain these academic goals. We did so because prior longitudinal and experimental research demonstrated that having academic possible identities and linked strategies to attain them predict better grades in school and less grade retention (Oyserman et al., 2002, 2006). School attainment, particularly graduation, has downstream consequences for employment, health and even family relation-

ships (for a review, [Oyserman, 2015](#)). Over time, controlling for their prior grades, students whose academic possible identities were linked to strategies for attaining them, attained better grades compared to their peers ([Oyserman, Bybee, Terry, & Hart-Johnson, 2004](#)). Academic possible identities increased for students guided to consider their gender as successful ([Elmore & Oyserman, 2012](#)). Moreover, intervention to increase the extent that students have academic possible identities linked to strategies resulted in improved school grades and reduced grade retention compared to control group students ([Oyserman et al., 2006](#)). We found an association between grade point average and certainty of attaining academic possible identities and willingness to sacrifice to do in our current study's control groups as well.

These results, combined with the prior literature on effects of possible identities (for reviews, [Oyserman & James, 2009, 2011](#)) imply that interventions that change students' interpretation of their experienced difficulties with schoolwork can influence academic outcomes via their effects on students' certainty of attaining their academic possible identities their willingness to sacrifice to do so. While some prior research has documented that guiding students to consider their possible identities can improve immediate and subsequent goal focused behavior ([Oyserman, Brickman, Rhodes, 2007](#)), research to date has largely been silent on factors influencing certainty of attaining academic possible identities (for a review, [Oyserman et al., 2015](#)). Findings from Study 2 suggest that reminding students to consider what their experienced difficulty implies may be beneficial in part by strengthening their resolve to use strategies and sacrifice to attain their academic possible identities.

7.3. Practical implications

In the U.S., low education is associated with all manner of negative outcomes, especially for racial-ethnic minority Americans. Having a college degree is associated with higher earnings and a better quality of life for oneself and one's children (for a review, [Oyserman, 2015](#)). Americans seem to understand this and as a result most start college. But as documented in our introductory review of the literature, starting college does not necessarily mean one will finish, particularly if one attends a community college, the prime entryway for racial-ethnic minority students. This means that better understanding of the pathways to completing college, especially community college, is needed. Prior synthesis of the research on the association between low education and health and mental health disparities suggests a mediating role of interpretation of experienced difficulty ([Lewis & Oyserman, in press; Lewis & Sekaquaptewa, 2016; Oyserman et al., 2014](#)). We found that interpretation of experienced difficulty as importance played a mediating role between education and income for minority students and could be easily cued with positive consequences for community college students even though it was otherwise lower in community college than university students. Indeed, there are a number of reasons that community college and racial-ethnic minority students may be less likely than university and white students to interpret their experiences of difficulty in college as implying that succeeding in college is important rather than that success is simply unlikely. These include competing demands due to working full time ([Hoachlander et al., 2003](#)) and poverty ([Conley, 1999](#)), as well as more experiences of college as a failure-likely context due to discrimination (e.g. [Bertrand & Mullainathan, 2003](#)), stereotyping, and consequent stereotype-threat (e.g. [Steele & Aronson, 1995](#)) and less past success with rigorous coursework ([Goldrick-Rab, 2010](#)).

Past research has consistently showed that interpretation of experienced difficulty matters for students' academic identity and performance, whether they are low income and minority

(e.g. [Oyserman et al., 2006](#)) or white and middle class ([Smith & Oyserman, 2015](#)). Yet research to date has not provided direct evidence of the relationship between years of education and interpretation of experienced difficulty or documented chronic (trait) or momentary (state) effects of interpretation of experienced difficulty among community college students. The current studies address both of these gaps. Our results suggest that success-likely contexts, such as those afforded by college education, may have positive effects in part by increasing the likelihood of interpreting experienced difficulty as implying task importance, and hence increases persistent engagement. Our results also suggest that a way to support sustained engagement among community college students in spite of uncertainty and need to sacrifice is to guide their focus on a productive interpretation of experienced difficulty. Moreover our findings extend the research on the predictors of student retention in the community college in an important way. Most studies in that literature document institutional factors impacting student retention, such as developmental education programs, the possibility to access financial aid, the participation in student support programs (requiring students to meet regularly with their advisors, complete mid-semester grade checks, and a long-term plan of study, for a review, [Fike & Fike, 2008](#)). Our research suggests another factor that might matter – the identity-based processes in the community college experience, namely, how experienced difficulty could be interpreted in a productive manner.

7.4. Limitations and future directions

A first limitation of our studies is that they focus on an association or a manipulation at one point in time. We found an association of interpretation of experienced difficulty as importance with level of education and also found that interpretation of experienced difficulty mediated the relationship between education and income. Both of these are important and should be replicated to insure stability. Follow-up studies could examine stability of these effects over time both with Mechanical Turk participants and with other survey panels necessary to obtain sufficient diversity in education, income, and other demographic factors.

Moreover, our results contained an element of surprise. We expected to find that community college students would be particularly bolstered by considering what experienced difficulty might mean or by focusing on difficulties as signs of importance compared to university students. Prior research with university students has found a significant effect of interpretation of experienced difficulty on academic identity and performance (e.g. [Smith & Oyserman, 2015](#)). However, we tested our effect in summer, a regular semester for community college students for whom the path to graduation is less clear but a time in which only the most motivated university students (or the most determined to finish quickly in spite of difficulties) were enrolled. These university students might have had an easily accessible productive interpretation of experienced difficulty regardless of our prime. Indeed, university students had a significantly higher productive interpretation of experienced difficulty than community college students. We did not succeed in increasing university students' certainty in attaining their academic possible selves or in their willingness to sacrifice to attain their goals by priming interpretation of experienced difficulty. However, we found that rejecting a proffered interpretation of experienced difficulty as signaling impossibility was just as motivating for community college as for university students, something also found for middle school students ([Elmore et al., 2016](#)).

A final limitation relates to our first limitation. That is, because our results focus on a single point in time, we cannot tell if our effect sizes, which range in size from small to moderately large, have practical consequence over time. Practical consequences may be inferred by examining effect sizes, but they can also be

inferred from two other sources that are relevant to our studies (McCartney & Rosenthal, 2000; Prentice & Miller, 1992). The first is that the effect is obtained as a result of a small intervention, and the second is that the effect is obtained on an important yet difficult to change outcome (Prentice & Miller, 1992). We obtain effects with a small intervention, we infer that our effects are consequential given that prior research has documented important immediate and over time consequences of having academic possible identities linked to strategies to attain them on academic outcomes (Oyserman et al., 2002, 2006). That said, the current study does not document a longitudinal process.

7.5. Conclusion

In spite of these limitations, our results are important because they suggest that interpretation of experienced difficulty is both consequential and malleable. Guiding community college students to consider what their experienced difficulty means can be an effective way to bolster their certainty in attaining their future academic identity and their belief that they should be willing to sacrifice to succeed in school. Both of these are associated with better grade point average. Because the intervention was so minimal (reading four statements), it is amenable to inclusion in introductory materials or as part of the placement testing process that is routine for community colleges. In this way our small intervention could be embedded into community college's routine processing of their students, producing a virtuous cycle of higher engagement and persistence (Oyserman et al., 2004).

Author note

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Author contributions

This work is the result of a collaborative effort. N.A. Lewis Jr. and D. Oyserman designed Study 1, C. Aelenei and D. Oyserman designed Study 2. All authors discussed how to analyze the data, N.A. Lewis Jr. managed data collection and analysis for Study 1; C. Aelenei managed data collection and analysis for Study 2. All discussed how to draft the manuscript, C. Aelenei and N.A. Lewis Jr. wrote a first draft of their parts that D. Oyserman revised and all authors approved the final version of the manuscript for submission.

Appendix A

Interpretation of Experienced Difficulty (Oyserman, Destin, & Novin, 2015). First 4 items used in Studies 1 and 2, last 2 items used only in the longer form of Study 1.

Difficulty is often experienced by people working at, close to, or above their peak capacity. There is no right or wrong answer. Please indicate how much you agree or disagree with each of the following statements (Study 1: 1 = strongly agree, 7 = strongly disagree, Study 2: 1 = strongly disagree, 6 = strongly agree).

Difficulty means Importance

1. Some school tasks feel easy and some feel difficult. My gut tells me that if it feels difficult, it is important for me.
2. I know in my gut that if a school task feels difficult it is really important for me.
3. I know that goals at school that feel difficult are the important ones for me.

4. A feeling of difficulty means that it's probably important.
5. If I am working on a task that feels difficult, it means that the task is important.
6. Struggling to complete a task reminds me that the task is important.

Difficulty means Impossibility

1. Some school tasks feel easy and some feel difficult. My gut tells me that if it feels difficult, it is impossible for me.
2. I know in my gut that if a school task feels difficult it is really not possible for me.
3. I know that goals at school that feel difficult are the impossible ones for me.
4. A feeling of difficulty means that it's probably impossible.
5. If I feel stuck on a task, it's a sign that my effort is better spent elsewhere.
6. Sometimes people work at things that just aren't meant for them. If a task feels too difficult, I should move on to something else.

Certainty of Attaining Academic Possible Identities scale from Study 2 (Kemmelmeier & Oyserman, 2001)

Each of us has some mental image of the person we are now and of the person we might become in the future. Take a minute to think about the coming year and the person you are expecting to become. How likely it is that the following statements will describe you in the coming year? (0 = extremely unlikely, 9 = extremely likely)

1. Doing well in school
2. Understanding the material in my classes
3. Getting good grades
4. Striving persistently towards my goals
5. Coping well with distractions
6. Using my time wisely
7. Handling problems that come my way successfully

Willingness to sacrifice scale from Study 2 (Oyserman et al., in preparation)

How much do you agree or disagree with the following statements? (1 = strongly disagree, 6 = strongly agree)

1. I put effort into attaining meaningful goals
2. What is important needs effort
3. I sacrifice to attain meaningful goals
4. What is important needs sacrifice
5. I accept difficulty to attain meaningful goals
6. What is important requires accepting difficulties along the way

Academic motives for attending college scale from Study 2 (Stephens et al., 2012)

Each of us has different motives for attending college. How determinant was each of the following for you? (0 = not at all determinant, to 9 = totally determinant)

1. Learn more about my interests
2. Expand my knowledge of the world
3. Have the career of my choice
4. Become financially independent
5. Explore my potential in many domains
6. Have an exciting job after college

Social motives for attending college scale from Study 2 (modified from Stephens et al., 2012)

Each of us has different motives for attending college. How determinant was each of the following for you? (0 = not at all determinant, to 9 = totally determinant)

1. Help my family out after I'm done with college
2. Provide a better life for my own children
3. Bring honor to my family
4. Give back to my community
5. Show that people with my background can do well
6. Be a role model for people in my community

Appendix B. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.cedpsych.2016.08.004>.

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