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Do you need a roadmap or can someone give you directions: When school-focused possible identities change so do academic trajectories

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ABSTRACT

Introduction: Despite the assumed importance of school-focused possible identities for academic motivation and outcomes, interventions rarely assess the effect of intervention on possible identities. This may be due to difficulty coding open-ended text at scale but leaves open a number of questions: 1) how do school-focused possible identities change over the course of the school year, 2) whether these changes are associated with changes in school outcomes, and 3) whether a machine coding approach is viable.

Methods: In Study 1 (n = 247 Chicago 8th-graders) we assess fall-to-spring change in school-focused possible identities. We test whether change in school-focused possible identities predicts 8th-grade academic outcomes. We include robustness checks. Then we examine school context effects. In Study 2 (n = 1006 Chicago 8th-graders) we address the problem of coding at scale, using a separate data set to train a machine-learning algorithm.

Results: On average, school-focused possible identities decline over the school year. But nearly a third of students have increasing school-focused possible identity scores. Increase is associated with improved grades. School context influences whether linked strategies matter. Our machine-learning algorithm accurately classifies school-focused possible identities in our original sample and this school-focused classification reliably predicts academic trajectories.

Conclusions: Change in school-focused possible identities is normative over the course of the school year, interventions should take this into account. On average, students have fewer school-focused possible identities by spring. This decline is associated with declining academic trajectories. However, when school-focused possible identities increase, so do grades. Whether strategies matter is context dependent.

September:"[Next year I expect to be]… helpful (Whenever my friends ask me a question about the homework or about a class assignment and try to explain more.) paying more attention (This year I have been taking more notes and writing down anything I need to to help me understand what we are working on.) unstoppable (I'm trying to do anything I possibly can to get the best grades and to graduate. Next year I will do the same and no one will stop me from achieving my goals.) less distracted (I'm focusing more on my work and asking any questions I need to.)" …… "[Next year I want to avoid]… trouble (Instead of for example laughing in class like I always do, I will do my best to be more serious and do nothing bad.) detention (I have never got

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detention and I will still try to avoid that because I do not want that affecting me.) fights (Instead of arguing with my friends I will try to reason with them and not let anything get physical and no matter what anyone says to me I'll talk to them instead of being physical.) bad grades (I have gotten bad grades last year and I know that really affected me and my future so this year and next year I will do my best to get good grades.)

May: "[Next year, I expect to be]… successful (Focusing on my classwork and focusing on how to improve my grades.) peaceful"… "[Next year I want to avoid]… chaos (Ignore people who want to start something.) fakes (Ignore all fake people, just say hi and bye.) drama (Ignore all rumors.) fights (Make the right choice and step off.)"

— The full response of a female 8th-grader in September and May to probes [in square brackets] about her possible identities and (in parenthesis) her strategies to work toward expected and to avoid becoming like her feature possible identities.

Interventions to improve academic outcomes often assume that the way a student imagines herself over the coming year matters for how much she engages with schoolwork. In the current paper we address three core gaps in the literature on these possible future identities, each of which is revealed in our opening quote. First, students have rich images of their *possible identities*—the identities they might attain for the coming year and they can describe an array of strategies—things they are doing now to work on these possible identities, but coding this rich idiographic text is difficult. Second, possible identities and strategies may change over the course of the school year, but as we describe below, the empirical literature has yet to provide a guideline regarding the likelihood of change or stability over the course of the school year. Third, though the literature describes an association between possible identities and academic outcomes, the empirical literature has yet to provide a guideline regarding the effect of upward or downward trajectories of change in possible identities on academic outcomes. These knowledge gaps are important for a number of reasons, as detailed next.

First, lack of an efficient mechanism for coding rich ideographic data hampers advances in understanding which aspects of possible identities matter for motivation and behavior. Second, lack of knowledge regarding change and stability in possible identities over the course of the academic year means that theories about the process by which possible identities matter are necessarily vague. For example, given the current literature, it may be that possible identities sustain motivation, feeding hope for the future, when they are stable. But the reverse may also be true—possible identities may sustain motivation when they are likely to change. Third, lack of knowledge regarding the effect of change or stability in possible identities on future academic outcomes means that theories of change—the process models on which interventions are based—are also necessarily vague. Yet such change (e.g., an increase in school-focused possible identities, an increase in links between these possible identities and strategies for action) is often explicitly evoked as the active ingredient in interventions that do not measure possible identities at all (Elliott, Choi, Destin, & Kim, 2011; Lee, Husman, Scott, & Eggan-Wiggins, 2015; Rinaldi & Farr, 2018; Wooley et al., 2013). Furthermore, even when not an explicit active ingredient, change in possible identity content and link to strategies is often implicit in intervention process assumptions (Ansong et al., 2018; Destin & Svoboda, 2017; Lewis & Yates, 2019; Stephens, Hamedani, & Destin, 2014; Stephens, Townsend, Hamedani, Destin, & Manzo, 2015). After reviewing the extant literature, we report on the results of our field research.

1. Do school-focused possible identities change over the course of the school year?

As reviewed by Oyserman and James (2011), some of the earliest empirical research on the future or possible self focused on who school children were trying to become. Early researchers assumed that a taxonomy of development could be deduced from differences across gender, age and grade groups. This early taxonomy attempt was largely abandoned. Since then, a large literature suggests that though school is a dominant theme, students differ in the extent to which their possible identities are related to school (are "school-focused"). However, the literature does suggest that, at any point in time, students with school-focused possible identities attain better grades than those who do not and that having school-focused possible identities linked to strategies predicts better subsequent grades (for a review, Oyserman & James, 2011).[1]

Knowing that academic success is associated with current or prior images of future possible academic success is important. But without a sense of whether possible identities are likely to change or remain stable over time, it is hard to know how to interpret these results. We looked for, but did not find, studies examining change (without intervention) over the course of the school year in child and adolescent school-focused possible identities. We also did not find studies examining whether change (or stability) in school-focused possible identities matters for academic trajectories, and whether school context affects the aspects of possible identities that matter. Instead, the studies we found examining change in possible identities without intervention focused on the relationship between changing health-focused possible identities and health outcomes among elderly and aging individuals (Frazier, Hooker, Johnson, & Kaus, 2000; Smith & Freund, 2002). These seemed too far removed from our focus. Moreover, as detailed next, the studies we found regarding change in children's, adolescents', and young adult's school-focused possible identities focused on researcher-

[1] Operationalizations differ in whether possible identities are defined by content (e.g., school-focused or relationship-focused content) alone or are defined by content in combination with strategies. When operationalized in terms of content, researchers report on counts of school-focused identities (Bi & Oyserman, 2015), or counts of 'balanced' positive and negative school-focused identities (Oyserman et al., 1995), or code possible identities in other ways, such as concreteness (Rathbone, Salgado, Akan, Havelka, & Berntsen, 2016). When operationalized in terms of strategies, researchers report on counts of the number of possible identities students say they were "doing something" about (Oyserman & Saltz, 1993), or counts of the number of student-generated strategies to attain school-focused possible identities (Oyserman et al., 2004), or code strategies in other ways, such as a score of the 'plausibility' possible identity roadmaps (Oyserman et al., 2004).

directed rather than naturally-occurring change and context studies we found did not actually examine differences in possible identities across context.

1.1. Intervening to change possible identities: does changing possible identities affect academic trajectories?

We found one randomized intervention trial documenting that changing school-focused possible identities affects subsequent academic outcomes (Oyserman, Terry, & Bybee, 2006). This study is important because it has a measure of change in possible identities and a measure of change in academic outcomes. We found six additional experiments or interventions focused on changing possible identities which report measuring possible identities (each in a different way, Carroll, Shepperd, & Arkin, 2009; Kerpelman & Pittman, 2001; Kortsch, Kurtines, & Montgomery, 2008; Lee, Husman, Scott, & Eggum-Wilkens, 2015; Oyserman, Terry, & Bybee, 2002; Stake & Nickens, 2005). None documented that changing possible identities changed academic trajectories. This gap in the literature is important because the idea that change in possible identities occurs and matters is, implicitly or explicitly, the basis for a large number of interventions taking place in middle schools (Destin & Svoboda, 2017; Woolley, Rose, Orthner, Akos, & Jones-Sanpei, 2013), high schools (Rinaldi & Farr, 2018), and colleges (Stephens et al., 2014; 2015).

1.2. How might context matter?

We looked for studies examining how contexts might shape the relationship between school-focused possible identities and students' academic outcomes. As detailed next, we found studies examining students in high poverty contexts and studies examining family social and economic resources. The poverty context studies suggest that having strategies linking school-focused possible identities to strategies for action may be particularly important for children living in high poverty contexts (Bi & Oyserman, 2015; Oyserman, Bybee, Terry, & Hart-Johnson, 2004; Oyserman, Bybee, & Terry, 2006; 2007). In these studies, having linking strategies, not just school-focused possible identities, predicted subsequent grades. All of these studies were in poverty contexts, so it is possible that the key finding—that possible identities alone are not enough and that students need linking strategies for action in order for possible identities to matter for grades, is context sensitive. It is possible that students in lower resourced contexts need to generate their own strategies for action while students in higher resourced contexts just need the school-focused possible identities because their schools provide the strategies for action.

That said, the family social and economic resource studies suggest that families affect whether students generate these linking strategies (Oyserman, Brickman, & Rhodes, 2007; Oyserman, Johnson, & James, 2011). Thus, Oyserman et al. (2011) report data from a four-state sample, which revealed that family social resources mattered not for whether children had school-focused possible identities but for whether these identities were linked to strategies for action. In these data, children from middle-income families were more likely to have strategies to work on their school-focused possible identities than were children from low-income families or children from families living in low-income neighborhoods. Second, Oyserman et al. (2007) report that low parent involvement with school was associated with worse grades for children in the school-as-usual control group but not for children randomly assigned to receive Oyserman's identity-based intervention. The implication these authors drew is that low parent involvement in school undermines the links students make between their school-focused possible identities and strategies for action.

2. Current studies

2.1. Study 1

In Study 1 we address each of the open questions highlighted in our review of the literature: do school-focused possible identities (and link to strategies) change over the course of the school year, does change matter by affecting academic outcomes, and does school context affect whether students need strategies in addition to possible identities. We focused on students who might be at risk of poor academic outcomes due to their minority background and socioeconomic status who attend schools varying in resources. Our schools were high poverty and high minority enrollment. We used core grade point average as our academic outcome measure given its centrality in discussion of academic outcomes. To increase the usefulness of our results, we used the four operationalizations of school-focused possible identities empirically linked to academic outcomes in our review, each operationalization is provided in our measure section.

2.1.1. Sample

The 8th-grade students (N = 461) attending 7 high-poverty, high-minority-enrollment Chicago public schools participated with written parental consent. We excluded students whose parents refused consent (n = 50) or who entered classrooms after consent forms were collected (n = 91).[2] Of the remaining 320 children 40 were missing possible identity data and 33 were missing school records, yielding a final sample of n = 247 (55% female, 92% poor, 83% Latinx, 14% African American, 3% White or other race-ethnicity).

[2] Consent entailed a lengthy process to fit school district requirements. Students who returned a signed form (whether parents signed 'no' or 'yes') were given movie tickets. Once completed, it was too disruptive to the classrooms to start the process again.

3. Method

Students signed assent forms and logged onto an online survey in their classrooms in September and May.

3.1. Human subjects and power

We obtained IRB approval (UP-14-00287 University of Southern California). Our planned sample was sufficient to detect a small effect ($f^2 = .02$; Cohen, 1988) with a power of .80 at $p < .05$, for which, according to our sensitivity analysis, we needed a sample of 394. Our sample size of 247 is smaller than planned. However, our effects were larger than the minimum we planned for, with f^2 values ranging from .033 to .051 for our analyses without controls. Post-hoc sensitivity analyses suggest that at these effect sizes, our power to detect the effects that we found ranges from .81 to .94. Even with all of our controls added, our effects are larger than planned at .028, .036, .039, .041. Post-hoc sensitivity analyses suggest that at these effect sizes, our power to detect the effects that we found are powered at 0.74, .85, .87, and .89 respectively at $p < .05$. Hence, except for the smallest of our effects, we are powered to find the effects we found. Full analyses of post hoc effects are found in our Supplemental Materials.

3.2. Possible identities and linked strategies

The survey began with the expected and feared possible identity prompts detailed in Fig. 1. The prompts allowed students to describe up to four expected ($n = 1{,}527$ obtained responses) and four ($n = 1{,}473$ obtained responses) feared possible identities and asked students to click if they were doing anything about each possible identity. Students were shown each of the possible identities they were doing something about and reported for each what they were doing.

After training to reach 90% agreement, the first author and a research assistant, both blind to other student information, read the full possible identity and strategies entry of each student. Working alone, each categorized each student response following the online coding scheme (https://dornsife.usc.edu/daphna-oyserman/measures/). After coding was complete, agreement was calculated and revealed that average agreement was 89.6%. The coders met to discuss to agreement each case of disagreement.

Table 1 shows the percentage of student responses in each possible identity category from most to least common. The most commonly generated possible identity categories were school/achievement (e.g. “on the honor roll” 70% of fall, 56% of spring responses), interpersonal relationships (e.g. “bad friends” 10% fall, 18% spring responses), and off-track (e.g. “doing drugs” 11% fall, 16% spring responses). Fewer than 10% of responses described possible identities focused on personality traits (e.g. “more honest”), physical/health (e.g. “thinner”), material/lifestyle (e.g. “making Youtube videos”), or negative responses to the to-be-expected prompt (e.g. [I expect to be] “homeless”).

4. Measures

4.1. School-focused possible identity count

The first way that we operationalized school-focused possible identities was as a simple count of the number of school-focused possible identities. This did not require any recoding of the content-coded data described above.

4.2. Balanced school-focused possible identities count

The second way we operationalized school-focused possible identities was as a compound score, termed ‘balance’ (e.g., Aloise-Young, Hennigan, & Leong, 2001; Oyserman, Gant, & Ager, 1995). Balance is a count of the pairs of positive (expected, e.g., “on the honor roll”) and negative (feared, e.g., “getting bad grades”) possible identities that are school-focused. To obtain this score, first author and a research assistant separately coded balanced pairs and then discussed to agreement any disagreement.

4.3. School-focused possible identities with strategies

The third way we operationalized school-focused possible identities was as a count of the number of school-focused possible identities that included at least one linked strategy (Oyserman & Saltz, 1993). To obtain this score, the first author and a research assistant pulled the content-coded data described above and limited their count to only those possible identities that had been content-coded as school-focused and which, on further examination, also had a strategy, that is a response to the last question (what are you doing) students were asked about their possible identities.

4.4. School-focused possible identity plausibility score

The fourth way we operationalized school-focused possible identities was as a compound score termed ‘plausibility’ (Oyserman, Oyserman, Bybee, Terry, & Hart-Johnson, 2004). Plausibility is the that extent school-focused possible identities and linked strategies were concrete and detailed enough to provide a roadmap forward. We scored plausibility using the rubric developed by Oyserman and colleagues (Oyserman et al., 2004). In this rubric yields scores between 0 = No school-focused possible identities or one vague and general school-focused possible identity without any strategies to get there, and 5 = Four or more school-focused possible

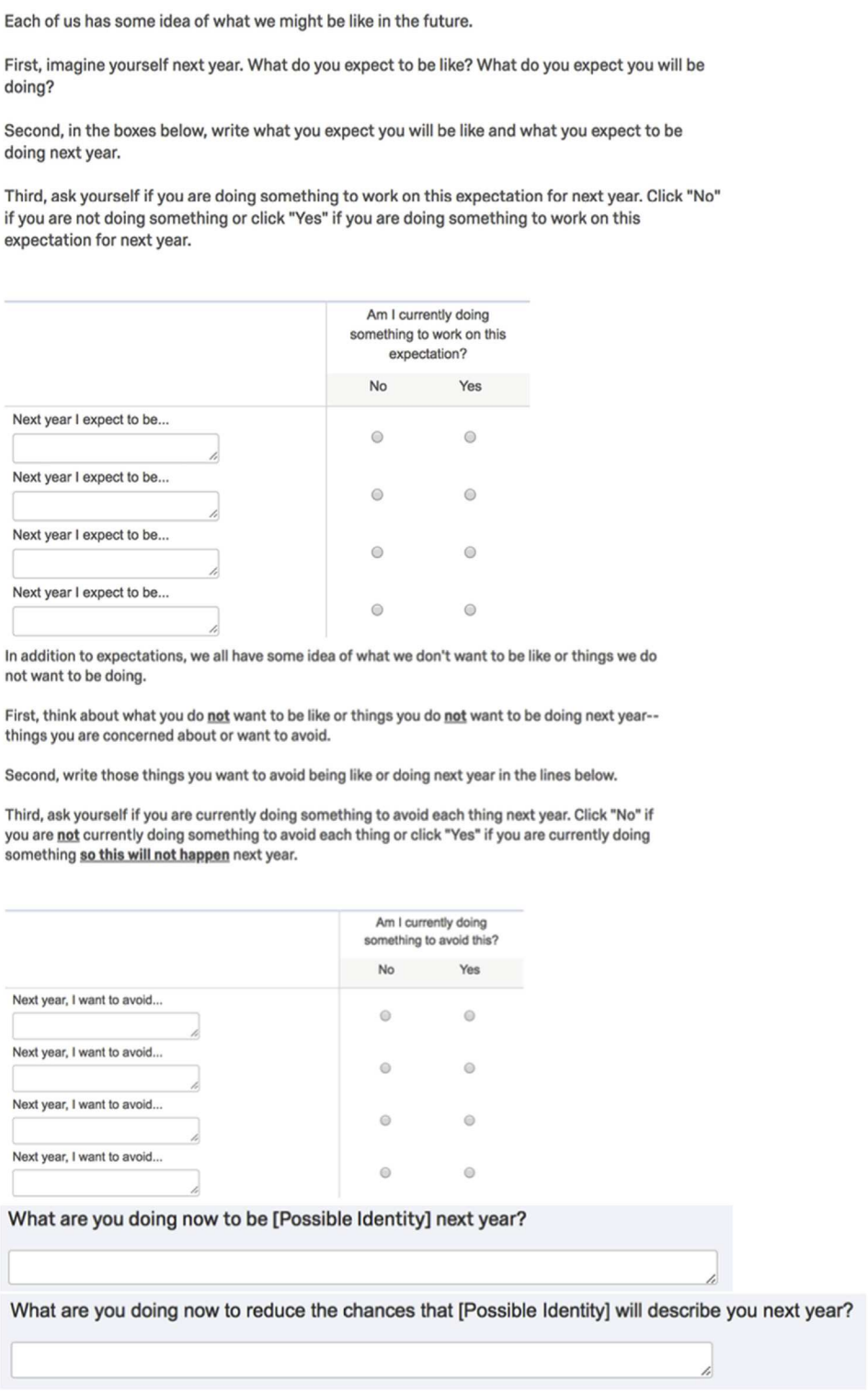

Fig. 1. Full instructions for possible identity and strategies, adapted from Oyserman et al., 2006.

identities with four or more linked strategies with at least one of these strategies focusing on interpersonal aspects of school context (e.g., getting along with teachers). We detail this coding rubric in Table 2. The first author coded plausibility and to obtain a reliability score, a research assistant double-coded a random sample of 10% responses. Our Cohen's Kappa (Fleiss & Cohen, 1973) was 0.85, reflecting substantial agreement following Landis and Koch's (1977) Cohen's Kappa rule-of-thumb that scores between 0.61 and

Table 1
Percentage of student possible identity responses in the fall and spring reflecting each possible identity domain.

Possible Identity Domain	Fall	Spring
School-focused	70%	56%
Off-track	11%	16%
Interpersonal Relationships	10%	18%
Material/Lifestyle	5%	3%
Personality Traits	2%	3%
Health/Physical	2%	3%
Negative but expected	< 1%	< 1%

Note: School-focused include possible identities focused on school and on achievement.

Table 2
Coding school-focused possible identity plausibility, adapted from Oyserman et al., 2004.

Plausibility Score	Based on		Explanation of Score
	Count school-focused possible identities (SFPI)	Count SFPI linked strategies	
0	0	0	0 SFPI
	1	0	OR 1 vague or general SFPI AND 0 SFPI strategies
1	1	1	1 SFPI and 1 SFPI strategy
	2	0	OR 2 SFPI but no SFPI strategies
2	1	2* or more	1 SFPI and 2 or more SFPI strategies*
	2	1- 2	OR 2 SFPI and 1- 2 SFPI strategies
	3	0* or 1	OR 3 SFPI and 0*-1 SFPI strategies
	4 or more	0	OR 4 or more SFPI and 0 SFPI strategies
3	2	3* or more	2 SFPI and 3 or more SFPI strategies*
	3	2 or 3	OR 3 SFPI and 2-3 SFPI strategies
	4 or more	1* or 2	OR 4 or more SFPI and 1*-2 SFPI strategies
4	3	4 or more	3 SFPI and 4 or more SFPI
	4 or more	2*, 3 or 4	OR 4 SFPI and 2*-4 SFPI strategies
5	4 or more	4 to 5 or more	4 or more SFPI AND 4 or more strategies AND at least one strategy for an SFPI is focused on interpersonal aspects of school context.

Note: Include all possible identity content, including responses to expected and feared possible identity probes. Codes noted with * mean code at this level only if at least one of the possible identities and/or strategies that are provided are detailed or concrete, that is if specific action is implied and possible identities are not redundant, otherwise code at the next lower level of plausibility.

0.8 reflect substantial agreement. Because small disagreements are qualitatively different from large disagreement, we also calculated a weighted Cohen's Kappa in which small disagreements (codes that differed by a single point) were weighted to reflect 80% agreement. This yielded a Cohen's Kappa of .96. An alternative form of reliability, percentage agreement, yielded a score of 88%. No interrater disagreement was larger than a single point on the 0–5 plausibility scale.

4.5. Student demographics and academic outcomes

Chicago Public Schools provided 6th, 7th, and 8th-grade course grades, student gender, free/reduced lunch status (poverty), and racial-ethnic heritage as part of a data sharing agreement with the American Institutes for Research. We computed final 6th, 7th, and 8th-grade core grade point average (GPA) by computing the average final grades in Math, Science, English, History, and Social Studies (0 = F, 1 = D, 2 = C, 3 = B, 4 = A).

4.6. School-level context

We calculated each school's student-to-teacher ratio, percentage of students in poverty, and percentage of students who identified as Latinx or African American using the Common Core of Data (https://nces.ed.gov/ccd/pubschuniv.asp).

5. Analysis plan

5.1. Testing whether school-focused possible identities change

We used four paired t-tests (September, May) to test whether possible identities changed over the course of the school year for each of the four school-focused possible identity scores.

5.2. Testing effects of change in school-focused possible identities on academic outcomes, and whether effects context-dependent

We used hierarchical multiple regression equations to test our prediction that trajectories of change in school-focused possible identities affect trajectories of change in academic outcomes. First, we created a change score for each of the four school-focused possible identity scores by regressing May scores on September scores and saving the residuals. Second, we standardized these change scores and student GPA. We chose residualized change scores rather than raw change scores because this method is better at accounting for differences in expected changes that result from differences in baseline (September) possible identity scores. Third, we created four sets of hierarchical multiple regression models for each of the four possible identity scores. In each model, 8th-grade core GPA was our dependent variable.

In the first model for each possible identity score we entered our residualized school-focused possible identity change score. In the second model we included dummy codes for six schools to control for school effects. In the third model we added 6th and 7th grade core GPA to control for prior academic performance. In the fourth model, we entered contrast codes for gender, for being Latinx, and for receiving free or reduced priced lunch in order to control for student-level characteristics.

We ran a series of follow-up regression models to test how specific aspects of the school context might influence the effect of possible identities. In these models, instead of entering school dummy codes at the second step, we entered school-level measures of Latinx ethnicity, free or reduced priced lunch eligibility, and student-teacher ratios.

6. Preliminary analyses

Before conducting our planned analyses, we conducted preliminary analyses which are detailed in our on-line Supplemental materials. In these analyses, we examined the association between child-level demographics and school-level variables and possible identity and academic outcome variables to ascertain which demographic and school-level variables should be included as controls. In brief, we found that being a girl was positively associated with (better) grades and with (positive) change in count of school-focused possible identities, balance, and plausibility of school-focused possible identities. We found less consistent negative effects of race (being Latinx, going to a Latinx-dominated school), poverty (being poor, going to a school with many other poor children) on grades, and of (larger) student-teacher ratios on (worse) grades. Only race was (negatively) associated change in count of school-focused possible identities. Hence, we include individual demographics and school-context variables as detailed in our analyses below.

7. Results and discussion

Do school-focused possible identities change over the course of the school year? Yes, on average, school-focused possible identities do change—they tend to decline. But this average decline conceals individual differences. Table 3 presents September–May paired t-tests with 95% confidence intervals and Table 4 presents the percentage of students experiencing stability, a decrease, or an increase in school-focused possible identities. As can be seen, school-focused possible identity scores decline on average by a small but significant amount (d = -.25 balance, d = -.17 count of school-focused possible identities with strategies, d = -.18 school-focused roadmap plausibility score, and d = -.11 count of school-focused possible identities). However, this decline is not found in all students—school-focused possible identity scores remain stable among nearly a quarter of students and increase among nearly a third of students.

Do changes in school-focused possible identities predict academic outcomes and are effects context-dependent? Change in school-focused possible identity scores matter, significantly predicting 8th-grade Core GPA. When school-focused possible identities decline so do grades, and the reverse is true when school-focused possible identity scores increase. These results are detailed in Table 5. Moreover, change in possible identity scores matters even when controlling for school, prior core GPA, and individual demographics. As can be seen in Table 5, Model 1, possible identity plausibility score is the strongest predictor of 8th-grade GPA, explaining at least 25% more variance in 8th-grade core GPA than any of the other possible identity scores.

However, once we take school-context effects into account, the possible identity metrics do not differ meaningfully in how well they predict GPA. This suggests that schools may differ in the extent to which they help students self-regulate and craft strategies to

Table 3
Mean (SD), 95% confidence intervals (CI), and paired-sample *t*-test results for change in school-focused possible identity metrics.

Measure of School-Focused Possible Identities	Fall	Spring	*t*-test of Change (df = 246)	95% *CI* of Change	*p*
	M (SD)	*M (SD)*			
Simple Count (0 = none, 8 = all)	3.86 (2.09)	3.59 (1.85)	-.1748	-.586, .035	.082
Balance Count (0 = none, 4 = all)	1.35 (1.04)	1.05 (0.95)	−3.869	-.458, −.149	.000
With Strategies Count (0 = none, 8 = all)	3.42 (2.12)	3.00 (1.91)	−2.614	-.738, −.104	.009
Plausibility Score (0 = none, 5 = all)	3.54 (1.49)	3.20 (1.58)	−2.759	-.583, −.097	.006

Note: Count scores range from a theoretical minimum of 0 to a theoretical maximum of 8, balance relies on pairs of possible identities so the theoretical maximum is 4, and plausibility is a score with a theoretical maximum of 5. Note, *p*-values do not correct for multiple comparisons because our goal was to ask if authors using the different scoring methods would have found different results.

Table 4
Percentage of participants who had an increase, no change, or a decrease in their school-focused possible identity scores.

Measure of School-Focused Possible Identities	Increase	No Change	Decrease
Simple Count of School-Focused Possible Identities	34%	19%	47%
'Balanced' School-Focused Possible Identities Count	23%	35%	42%
Count of School-Focused Possible Identities With Strategies	34%	16%	49%
School-Focused Possible Identities Plausibility Score	30%	28%	42%
AVERAGE ACROSS MEASURES	30%	25%	45%

Table 5
Effect of change in school-focused possible identity scores on 8th-grade core GPA.

Predictor	Model 1			Model 2			Model 3			Model 4		
	B	*95% CI*	*p*	B	*95% CI*	*p*	B	*95% CI*	*p*	B	*95% CI*	*p*
School-focused possible identity count	.190	.066, .314	.003	.210	.099, .322	.000	.089	.032, .145	.002	.087	.030, .145	.003
School-focused possible identity balance count	.178	.054, .302	.005	.207	.097, .318	.000	.085	.028, .141	.003	.084	.027, .140	.004
School-focused possible identities with strategies count	.183	.059, .307	.004	.179	.066, .291	.002	.090	.033, .146	.002	.089	.033, .146	.002
School-focused possible identities plausibility score	.220	.097, .343	.001	.211	.099, .323	.000	.078	.021, .135	.008	.075	.017, .133	.011

Notes: In each model the dependent variable is 8th-grade core grade point average; Model 1 includes no additional predictors; Model 2 includes school dummy codes; Model 3 includes prior core GPA in 6th and 7th grades; Model 4 includes student-level demographic and poverty data; When B is positive, the possible identity predictor is associated with higher core grade point average in 8th-grade.

attain their school-focused possible identities. Some schools may provide opportunities to engage in strategies for anyone with sufficient school-focused possible identities, other schools do not. These results are detailed in Table 5, Model 2, which shows that once school context is accounted for, the lower end of the 95% confidence intervals jumps up for the regression coefficients of the two scores that do not account for strategies so that change in plausibility score is no longer a better predictor of 8th-grade core GPA.

As can be seen in Table 5, Models 3 and 4, change in school-focused possible identities remains a significant predictor of 8th-grade core GPA even after prior academic attainment and demographics are accounted for. Indeed, the real-world effect of change in school-focused possible identities is meaningful when considering the size of the effect of demographics on grade trajectories. In our sample, demographics (gender, poverty, and being Latinx) explained 11.9% of the variance in 8th-grade core GPA. These factors are either not changeable or largely outside the purview of intervention. Changing school-focused possible identities is not as difficult and explains about 3.6% of the variance in 8th-grade core GPA. After controlling for prior core GPA, school, and individual poverty and demographics, change in the count of students' school-focused possible identities still explains about 3.8% of the remaining variance in 8th-grade core GPA. This strongly suggests that possible identities are a unique source of academic motivation, not redundant with prior academic success or social-economic factors.

We conducted follow-up analyses with models controlling for specific aspects of the school context. These analyses reveal that change in possible identities matters even after controlling for these aspects of school context. Specifically, these results (detailed in Model 5 in Table 6) show robust effects on 8th-grade core GPA for each of our possible identity scores. That is, even the few school-level resource factors we can assess matter, shifting up the relative predictive power of the simplest count score relative to the more complex plausibility score. However, as detailed in our on-line Supplemental Materials Table S4, we found no evidence of a context by possible identity score interaction (though we are underpowered to find such an effect).

Our core Study 1 findings are that school-focused possible identities typically change over the course of the school year and this change predicts end-of-year academic outcomes, even controlling for past academic performance, demographics, and school factors. School-focused possible identities do not change for everyone, but when they do, it matters. If school-focused possible identities decline, grades go down, and if school-focused possible identities increase, grades go up. This is an important finding for developmental researchers and good news for interventionists who had assumed this to be the case.

Table 6
Effect of change in possible identity scores on 8th-grade Core GPA, controlling for school level context.

Predictor	Model 5		
	B	*95% CI*	*p*
School-focused possible identity count	.222	.101, .343	.000
School-focused possible identity balance count	.205	.084, .326	.001
School-focused possible identities with strategies count	.206	.085, .327	.001
School-focused possible identities plausibility score	.243	.123, .362	.000

Notes: The dependent variable is 8th-grade core grade point average; Model 5 controls for three measures of school context: (less) school-level free and reduced price lunch rate, (higher) student-teacher ratio, and (smaller) percentage of students in the school that identify as Latinx.

7.1. Study 2

Study 2 addresses the obstacle to using these results in future studies: Coding open-ended textual data is time-consuming, resource intensive, and may not be possible in scaled up research or interventions. So, to create an economical and feasible alternative, we developed a machine-learning classification algorithm that could computationally code the content of students' possible identities. Machine-learning classification algorithms acquire their knowledge from source data, learning how things are classified from examples of previously classified data—in this case, possible identity responses whose content has been coded by researchers. The algorithm is then used to classify new cases (whose classification is unknown). To be effective, training data sets need to contain sufficiently rich content. The literature on machine learning algorithms for classifying real world categories mostly entail samples of a thousand or more (e.g., Chang, Chen, Chang, Chung, & Lai, 2012; Kessler et al., 2016; Nelson et al., 2012). The "training" data is used to develop and test an algorithm, which optimally (as in our case) can then be used in a completely different sample. We provide our Python code and details of the development and testing process in our online Supplemental Materials.

7.1.1. Sample

Our algorithm training sample (n = 1146) was separate from our Study 1 sample. It included 8th-graders from 10 Chicago Public Schools, as in Study 1, children were mostly Latinx or African American and the schools enrolled mostly children from low income families as detailed next. As in Study 1, we excluded children whose parents refused consent (n = 58), who entered school after consent forms were collected (n = 75) or who were missing possible identity data (n = 7). We retained the remaining 85.91% (n = 1006, 52% female, 87% free/reduced price lunch, 65% Latinx, 18% African American, 12% White, 4% Asian, 1% other race-ethnicity) for algorithm development.

8. Method

8.1. Data collection and coding

We used the same methods as in Study 1, collecting data in September and May, coding n = 6189 expected and n = 6060 feared possible identity responses. We (first author, two research assistants) double-coded 80% of all responses, discussing disagreements to agreements. The first author coded the remaining 20% of responses and a research assistant double coded a subset of 20% of these responses (89.55% agreement before discussion). Table 7 shows the distribution of responses.

8.2. Training the classifier

We trained a classifier on our researcher-coded responses as follows. First, we combined possible identity and strategy text for a given response into a single block of text as in Study 1. Second, we trained separate classifiers for expected and feared possible identities because the language children use to describe expected and feared possible identities is quite distinct. Third, we trained on the three categories ("school-focused", "off-track", and "interpersonal") that each had at least 10% of all responses and added an "other" category for the remaining responses.

Our algorithm used linear support vector machines (SVM; Joachims, 1998) and Distributed Dictionary Representations (DDR; Garten et al., 2018; Hoover, Johnson, Boghrati, Graham, & Dehghani, 2018). With DDR, words are represented as points in a "low-dimensional" space (generally 10–2000 dimensions) based on their locations relative to other words in real world texts. Our word embeddings in this space were based on a large corpus of Google News articles (Word2Vec, Mikolov et al, 2013). Constructs (e.g., school-focused possible identity) are represented in this space based the locations of the words coded as being associated with these constructs. Following Garten, Sagae, Ustun, and Dehghani (2015) we generated a response-level representation of each written possible identity and strategy response and spatial representations of each possible identity category (school-focused, off-track, interpersonal, and "other") based on the locations of the responses we coded as belonging to each category. We used this location to train an SVM classifier, which attempted to classify new, uncoded responses (e.g., skip classes) based on the location of the response in space relative to the locations of already coded representations of each category of possible identity. We evaluated how well our classifier did at coding possible identity responses into school-focused, off-track, interpersonal, and "other" using 10-fold cross

Table 7
Content of possible selves: Percentage of responses in each domain in algorithm development sample (as coded by researchers).

Content Domain	Development Sample Fall and Spring Combined
School/Achievement	59%
Off-track	16%
Interpersonal Relationships	14%
Material/Lifestyle	4%
Personality Traits	3%
Health/Physical	3%
Negative but expected	< 1%

Table 8
Coding the Opening Example: of Researcher Codes vs. Machine Codes.

Student Open-Ended Response		Code	
Possible Identity	Strategy	Researcher	Machine
helpful	Whenever my friends ask me a question about the homework or about a class assignment and try to explain more.	Interpersonal	School
paying more attention	This year I have been taking more notes and writing down anything I need to help me understand what we are working on.	School	School
unstoppable	I'm trying to do anything I possibly can to get the best grades and to graduate. Next year I will do the same and no one will stop me from achieving my goals.	School	School
less distracted	I'm focusing more on my work and asking any questions I need to.	School	School
trouble	Instead of for example laughing in class like I always do, I will do my best to be more serious and do nothing bad.	School	School
detention	I have never got detention and I will still try to avoid that because I do not want that affecting me.	School	School
fights	Instead of arguing with my friends I will try to reason with them and not let anything get physical and no matter what anyone says to me I'll talk to them instead of being physical.	Off-track	Interpersonal
bad grades	I have gotten bad grades last year and I know that really affected me and my future so this year and next year I will do my best to get good grades.	School	School
successful	Focusing on my classwork and focusing on how to improve my grades	School	School
peaceful	–	Personality	Interpersonal
–	–	–	–
–	–	–	–
chaos	Ignore people who want to start something	Off-track	School
fakes	Ignore all fake people, just say hi and bye	Interpersonal	Interpersonal
drama	Ignore all rumors	Interpersonal	Interpersonal
fights	Make the right choice and step off	Off-track	Off-track

Note: – = no response, no code. For this particular student, the researcher and machine code disagreed four times. The 1st response the machine coded as school likely while the human coders focused on interpersonal because the discussion of homework was in the context of helping a friend. A second disagreement came in the 7th response. Here the algorithm gave more weight to the strategy, which mentioned friends, rather than the "fight" possible identity, which researchers code as off-track. A third disagreement came in the 10th response – given only a single unique and rarely-used word ("peaceful"), the algorithm essentially had to guess. The fourth disagreeemnt came in the 13th response. Here the possible identity was another unique and rarely used word ("chaos"), and without many other keywords, the algorithm again had to take a somewhat uneducated guess.

validation. That is, the full set of training data was partitioned into 10 subsets with each used to test the accuracy of an algorithm trained on the other nine subsets. The final result, an overall classification accuracy based on the average of all 10 tests, is 89.18% for expected possible identity responses and 85.64% for feared possible identity responses. To concretize what the method looks like, Table 8 provides an example of machine-coding and researcher coding of the possible identities of the student quoted at the beginning of the paper.

9. Results

Preliminary analyses. We used our algorithm to classify Study 1 school-focused possible identity responses. This tested if a machine-coded version of our school-focused possible identity score could be used in situations in which human coding is too expensive and burdensome. We found that the school-focused, interpersonal, off-track, or "other" algorithm-generated classifications matched our researcher coding for expected (90.9% match) and feared (88.3% match) possible identities. Moreover, mean machine-coded school-focused possible identity count score showed the same Fall (M = 3.95, SD = 2.00) to Spring (M = 3.78, SD = 1.89) decline we saw in our researcher coding, paired t-test, t = −1.09, 95% CI [-.477, .137], p = .276, d = .069.

Do changes in machine-coded school-focused possible identities predict academic outcomes? Machine-coding works. As Table 9 details, change in our machine-coded possible identity metric—a residualized changes score, as in Study 1—predicted end of

Table 9
Effect of change in machine-coded school-focused possible identities on 8th-grade Core GPA.

Predictor	Model 6			Model 7			Model 8			Model 9		
	B	*95% CI*	*p*	B	*95% CI*	*p*	B	*95% CI*	*p*	B	*95% CI*	*p*
Machine-coded school-focused possible identity score	.162	.038, .287	.011	.155	.042, .267	.007	.073	.016, .129	.012	.073	.016, .131	.012

Notes: The dependent variable in each model is 8th-grade core grade point average and the predictor is machine-coded school-focused possible identity school; Model 6 includes no additional predictors; Model 7 includes school dummy codes as the additional predictor; Model 8 includes the students' own prior core GPA in 6th and 7th grades in addition to school dummy codes as the additional predictors; Model 9 includes student-level demographic and poverty data in addition to prior core GPA as the additional predictors; When B is positive, the possible identity predictor is associated with higher core grade point average in 8th-grade.

8th grade core GPA, even after controlling for school, demographics, and prior academic performance. Specifically, we used the four regression models from Study 1 (detailed in Table 5) to test if change in machine-coded possible identities predicts 8th-grade core GPA (Model 6), and if effects remain after adding dummy codes for school (Model 7), after adding 6th and 7th-grade core GPA (Model 8), and after adding student-level demographics and poverty (Model 9).

10. Discussion

Our review highlighted three open questions and an obstacle to progress in the possible identity literature. In Study 1 we addressed the open questions, which are: do school-focused possible identities remain stable or change over the course of the school year, does change matter for school grades, and does school context matter for whether students need to have strategies to attain their school-focused possible identities? Then, in Study 2 we addressed the obstacle to progress, which is that coding open ended responses is difficult to do at scale, by developing a machine learning algorithm to code open-ended possible identities data.

We found that most students experienced change in their school-focused possible identities over the course of the school year and that change mattered, affecting students' core grade point average even when controlling for two prior years of grades. When school-focused possible identities declined so did grades, and when school-focused possible identities increased, so did grades. Each of the possible identity scores we tested were useful predictors of 8th-grade academic outcomes, including our machine-coded version. We found that change in school-focused possible identities is consequential; variance explained by change in student's school-focused possible identities is about a third of the variance explained by their gender, poverty, and race-ethnicity combined. We also found that school context matters. In some school contexts, not others, strategies add to the motivational force of school-focused possible identities. It might be that strategies matter less in higher resources contexts, but future research is needed to test this prediction.

Our results also imply that interventions targeting changing possible identities and strategies should take into account that varying proportions of students might otherwise have stable, declining, or increasing school-focused possible identities. This heterogeneity might imply that different subgroups of students are receptive to different kinds of intervention activities. It may also be good news for group-based interventions if interveners can leverage this to foster a norm of having and developing school-focused possible identities and linked strategies.

That said, we focus on a particular time phase, the last year of middle school, such that students are asked to imagine their transition to high school. Most of our participants are 13–14 years of age. Each of these aspects of development is likely to matter. Indeed, it would be hard to argue that development does not matter for the content of possible identities—to do so would be to suggest that age, pubertal development, changing societal expectations, and the acquisition of adult social roles do not matter. In our own lab (O'Donnell & Oyserman, 2019), we are examining each of these factors, finding that each does matter. Specifically, students who are closer to high school completion have fewer school-focused possible identities—it is as if they are counting down to the end of high school when school will no longer matter. In contrast, greater pubertal development is associated with more school-focused possible identities—it is as if they are experiencing adulthood as closer and needing to get going on adult roles. Regarding stability, it might be that declines in school-focused possible identities are steeper in the middle school years, with past academic outcomes narrowing students' sense that change is possible in the high school years.

The accuracy of our machine learning classification algorithm is also good news because coding open-ended responses is a stumbling block for researchers, especially those who wish to use large data sets and evaluate scaled up interventions. We share our newly developed machine-coding algorithm code so that others can use it in their own research. The implication is that researchers wanting to study possible identity effects at scale can use an ideographic measure that allows students to express their possible identities and quantify results without costly coding.

Any study, of course, has limitations. Here, we consider three: lack of experimental control, limited access to school context variables, and use of a single geographic region (Chicago). First, with regard to experimental control, our results do address an important gap regarding the temporal stability of possible identities and the consequences of change—we document temporal change in possible identities over the course of the school year and effects of this change on change in academic trajectories. However, we cannot make causal claims because even though we controlled for two prior years of academic attainment, child-level demographics, and school-level factors, we did not manipulate change in possible identities. Hence, our research is informative of developmental trajectories, not of causal processes.

Second, with regard to school context variables, our study obtained data from seven schools, allowing us to begin to test school context effects. However, our school-level variables were limited. That meant that although we could document that school context matters, we were not powered to fully unpack why. Future research is needed to better understand what about schools differs, such that in some schools students need their own roadmap (the strategies to get going and keep on track), while in other schools someone else can provide directions as long as students have the school focused possible identities. Our hunch is that in some schools, parents, teachers, and classmates are able to provide students with needed directions, while in other schools, students need to carry their own roadmap with them.

Third, with regard to geographic region, our study documented effects in one geographic region, Chicago, and developed a machine coding algorithm from students in the same large urban school district. While these are important first steps, future research is needed to test the stability of our results in different settings and the ability of our algorithm to code responses from students in different regions, schools, age ranges, and settings.

Irrespective of these limitations, our results are important because they provide evidence that changes in school-focused possible identities and strategies over the school year change students' academic trajectories. These results are congruent with the theorized but typically not tested process of behavior change underlying numerous interventions. Our results document that developmental

trajectories in school-focused possible identities are heterogeneous, implying that interventions should take this into account. This could be done by learning more about the situations that predict downward rather than upward or stable trajectories or by learning more about the forces interventions can harness to stabilize positive and turn around negative trajectories.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.adolescence.2019.12.013.

Declarations of interest

None.

References

Aloise-Young, P. A., Hennigan, K. M., & Leong, C. W. (2001). Possible selves and negative health behaviors during early adolescence. *The Journal of Early Adolescence, 21*(2), 158–181.
Ansong, D., Chowa, G., Masa, R., Despard, M., Sherraden, M., Wu, S., et al. (2018). Effects of youth savings accounts on school attendance and academic performance: Evidence from a youth savings experiment. *Journal of Family and Economic Issues,* 1–13.
Bi, C., & Oyserman, D. (2015). Left behind or moving forward? Effects of possible selves and strategies to attain them among rural Chinese children. *Journal of Adolescence, 44*, 245–258.
Carroll, P. J., Shepperd, J. A., & Arkin, R. M. (2009). Downward self-revision: Erasing possible selves. *Social Cognition, 27*(4), 550–578.
Chang, Y. J., Chen, L. J., Chang, Y. J., Chung, K. P., & Lai, M. S. (2012). Risk groups defined by Recursive Partitioning Analysis of patients with colorectal adenocarcinoma treated with colorectal resection. *BMC Medical Research Methodology, 12*(1), 2.
Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
Destin, M., & Svoboda, R. C. (2017). A brief randomized controlled intervention targeting parents improves grades during middle school. *Journal of Adolescence, 56*, 157–161.
Elliott, W., Choi, E. H., Destin, M., & Kim, K. H. (2011). The age-old question, which comes first? A simultaneous test of children's savings and children's college-bound identity. *Children and Youth Services Review, 33*(7), 1101–1111.
Fleiss, J. L., & Cohen, J. (1973). The equivalence of weighted kappa and the intraclass correlation coefficient as measures of reliability. *Educational and Psychological Measurement, 33*(3), 613–619.
Frazier, L. D., Hooker, K., Johnson, P. M., & Kaus, C. R. (2000). Continuity and change in possible selves in later life: A 5-year longitudinal study. *Basic and Applied Social Psychology, 22*(3), 237–243.
Garten, J., Hoover, J., Johnson, K. M., Boghrati, R., Iskiwitch, C., & Dehghani, M. (2018). Dictionaries and distributions: Combining expert knowledge and large scale textual data content analysis. *Behavior Research Methods, 50*(1), 344–361.
Garten, J., Sagae, K., Ustun, V., & Dehghani, M. (2015). Combining distributed vector representations for words. *Proceedings of the 1st workshop on vector space modeling for natural language processing* (pp. 95–101). .
Hoover, J., Johnson, K., Boghrati, R., Graham, J., & Dehghani, M. (2018). Moral framing and charitable donation: Integrating exploratory social media analyses and confirmatory experimentation. *Collabra: Psychology, 4*(1), 9.
Joachims, T. (1998). Text categorization with support vector machines: Learning with many relevant features. In C. Nédellec, & C. Rouveirol (Vol. Eds.), *Machine learning: ECML-98. ECML 1998. Lecture notes in computer science (Lecture notes in artificial intelligence): Vol. 1398*. Berlin: Springer.
Kerpelman, J. L., & Pittman, J. F. (2001). The instability of possible selves: Identity processes within late adolescents' close peer relationships. *Journal of Adolescence, 24*(4), 491–512.
Kessler, R. C., van Loo, H. M., Wardenaar, K. J., Bossarte, R. M., Brenner, L. A., Cai, T., et al. (2016). Testing a machine-learning algorithm to predict the persistence and severity of major depressive disorder from baseline self-reports. *Molecular Psychiatry, 21*(10), 1366.
Kortsch, G., Kurtines, W. M., & Montgomery, M. J. (2008). A multistage longitudinal comparative (MLC) design stage II: Evaluation of the changing lives program (CLP): The possible selves questionnaire—qualitative extensions (PSQ-QE). *Journal of Adolescent Research, 23*(3), 342–358.
Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics, 33*(1), 159–174.
Lee, J., Husman, J., Scott, K. A., & Eggum-Wilkens, N. D. (2015). Compugirls: Stepping stone to future computer-based technology pathways. *Journal of Educational Computing Research, 52*(2), 199–223.
Lewis, N. A., Jr., & Yates, J. F. (2019). Preparing disadvantaged students for success in college: Lessons learned from the preparation initiative. *Perspectives on Psychological Science, 14*(1), 54–59.
Mikolov, T., Sutskever, I., Chen, K., Corrado, G. S., & Dean, J. (2013). Distributed representations of words and phrases and their compositionality. In C. J. C. Burges, L. Bottou, M. Welling, Z. Ghahramani, & K. Q. Weinberger (Eds.). *Advances in neural information processing systems* (pp. 3111–3119). Redhook, NY: Curran Associates Inc.
Nelson, J. C., Zhang, Q., Deberdt, W., Marangell, L. B., Karamustafalioglu, O., & Lipkovich, I. A. (2012). Predictors of remission with placebo using an integrated study database from patients with major depressive disorder. *Current Medical Research and Opinion, 28*(3), 325–334.
Oyserman, D., Brickman, D., & Rhodes, M. (2007). School success, possible selves, and parent school involvement. *Family Relations, 56*(5), 479–489.
Oyserman, D., Bybee, D., & Terry, K. (2006). Possible selves and academic outcomes: How and when possible selves impel action. *Journal of Personality and Social Psychology, 91*(1), 188–204.
Oyserman, D., Bybee, D., Terry, K., & Hart-Johnson, T. (2004). Possible selves as roadmaps. *Journal of Research in Personality, 38*(2), 130–149.
Oyserman, D., Gant, L., & Ager, J. (1995). A socially contextualized model of African American identity: Possible selves and school persistence. *Journal of Personality and Social Psychology, 69*(6), 1216.
Oyserman, D., & James, L. (2011). Possible identities. In S. Schwartz, K. Luyckx, & V. Vignoles (Eds.). *Handbook of identity theory and research* (pp. 117–145). New York, NY: Springer.
Oyserman, D., Johnson, E., & James, L. (2011). Seeing the destination but not the path: Effects of socioeconomic disadvantage on school-focused possible self content and linked behavioral strategies. *Self and Identity, 10*(4), 474–492.
Oyserman, D., & Saltz, E. (1993). Competence, delinquency, and attempts to attain possible selves. *Journal of Personality and Social Psychology, 65*(2), 360–374.
Oyserman, D., Terry, K., & Bybee, D. (2002). A possible selves intervention to enhance school involvement. *Journal of Adolescence, 24*, 313–326.

O'Donnell, S. C., & Oyserman, D. (2019). *Developmental trajectories of possible identities: Competing effects of puberty, age, and grade level.* Los Angeles, CA: University of Southern California Unpublished manuscript.
Rathbone, C., Salgado, S., Akan, M., Havelka, J., & Berntsen, D. (2016). Imagining the future: A cross-cultural perspective on possible selves. *Consciousness and Cognition, 42*, 113–124.
Rinaldi, R. L., & Farr, A. C. (2018). Promoting positive youth development: A psychosocial intervention evaluation. *Psychosocial Intervention, 27*(1), 22–34.
Smith, J., & Freund, A. M. (2002). The dynamics of possible selves in old age. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 57*(6), P492–P500.
Stake, J. E., & Nickens, S. D. (2005). Adolescent girls' and boys' science peer relationships and perceptions of the possible self as scientist. *Sex Roles, 52*(1–2), 1–11.
Stephens, N. M., Hamedani, M. G., & Destin, M. (2014). Closing the social class achievement gap: A diversity education intervention improves first-generation students' academic performance and all students' college transition. *Psychological Science, 25*, 943–953.
Stephens, N. M., Townsend, S. S., Hamedani, M. G., Destin, M., & Manzo, V. (2015). A difference-education intervention equips first-generation college students to thrive in the face of stressful college situations. *Psychological Science, 26*(10), 1556–1566.
Woolley, M. E., Rose, R. A., Orthner, D. K., Akos, P. T., & Jones-Sanpei, H. (2013). Advancing academic achievement through career relevance in the middle grades: A longitudinal evaluation of CareerStart. *American Educational Research Journal, 50*(6), 1309–1335.