A leadership-level culture cycle intervention changes teachers’ culturally inclusive beliefs and practices

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Despite an abundance of support for culturally inclusive learning environments, there is little consensus regarding how to change educational contexts to effectively and sustainably foster cultural inclusion. To address this gap, we report findings from a research–practice partnership that leveraged the Culture Cycle Framework (CCF) to expand educators’ praxis to include both independent and interdependent models of self. Most U.S. schools validate independent cultural models (i.e., those that prioritize individuality, uniqueness, and personal agency) and overlook interdependent models (i.e., those that prioritize connectedness, relationality, and collective well-being), which are more common among students from marginalized racial and socioeconomic backgrounds. Using a quasi-experimental longitudinal design, we trained school leadership to integrate ideas about cultural inclusion (i.e., validating the importance of both independent and interdependent cultural models) into school-wide flagship practices. We assessed downstream indicators of culture change by surveying teachers and students across the district and found that a) leadership-level trained teachers’ school-wide beliefs about cultural inclusion, b) teachers’ endorsement of culturally inclusive beliefs predicted their use of culturally inclusive practices, and c) teachers’ use of culturally inclusive practices predicted enhanced psychosocial and academic outcomes among students. This research represents a comprehensive culture change effort using the CCF and illustrates a means of fostering inclusion-focused educational culture change and assessing downstream consequences of culture change initiatives.

Although the United States’ K-12 student population has grown increasingly diverse, the prevailing values, policies, and practices in schools across the country remain rooted in cultural norms that are common in the social contexts of White and middle- and upper-class people (1–4). A robust and interdisciplinary literature illustrates that cultural differences between students’ homes and schools often undermine educational outcomes for Black, Latino/a, and Native American students, and for students from low-income households, regardless of racial/ethnic background (5–11). This cultural mismatch can degrade students’ sense of belonging and, ultimately, their academic engagement, motivation, persistence, and performance (12–17). For decades, scholars have argued that remedying this mismatch and advancing educational equity necessitates the creation of culturally inclusive learning environments (5, 7, 18–22). However, there is little consensus around what these learning environments look like or how to effectively and sustainably bring about this change.

We advance the discussion by reporting findings from a research–practice partnership (RPP) (23) designed to support educators in changing the cultures of their schools to foster inclusion and belonging for students from diverse cultural backgrounds. Research provides ample evidence of strategies for enhancing students’ academic experiences, particularly their sense of belonging, through direct-to-student interventions (12–17). Our approach differs in that we sought to change elements of school environments (e.g., values, policies, and practices) that set the stage for students’ experiences (24). Changing school environments is a complex process that requires buy-in and active participation by a variety of people (e.g., administrators, teachers, staff members). To navigate this complexity, we used a train-the-trainer model to support schools’ equity leadership teams (ELTs; i.e., staff who led schools’ equity efforts) in conceptualizing and initiating school-wide change to create culturally inclusive learning environments. This approach allowed for school culture change to spread outward from a few staff members and ensured that the change was guided by theory but applied in ways that worked for each school’s staff and students.

Significance

Culturally inclusive learning environments enhance outcomes for students from marginalized racial and socioeconomic backgrounds, but no consensus exists regarding how to effectively and sustainably create these environments. Through a research practice-partnership, we demonstrate the utility of the Culture Cycle Framework (CCF) for initiating district-wide culture change toward inclusion. The CCF is a culture change model with four interrelated levels: Ideas, Institutions, Interactions, and Individuals. We examined how a school leadership training focused on integrating culturally inclusive ideas into school-wide flagship practices facilitated cascading effects in educators’ beliefs (Institutions), classroom practices (Interactions), and students’ academic experiences and performance (Individuals). Results illuminate the process of creating educational culture change and identify practices associated with enhanced learning experiences and academic performance for students.
Creating Culturally Inclusive Learning Environments Using the Culture Cycle Framework (CCF). While there are many frameworks for conceptualizing cultural inclusion (5, 8, 25, 26), we leveraged a well-established psychological framework describing two prevalent and influential cultural models of self, or ways of understanding the self and interpreting the social world: independence (i.e., a view of the self as separate from others and motivated to prioritize individual interests, goals, and agency) and interdependence (i.e., a view of the self as connected to others and motivated to prioritize roles, responsibilities, shared goals, and relationships to important others) (27–33). These cultural models prove consequential in educational settings because they vary systematically across students (e.g., independence is often more prevalent among students from White and higher-income households, while interdependence is often more prevalent among students from racial minority and lower-income households) (34), and they shape students’ cognition, motivation, emotion, and behavior (35–37). For example, students with greater familiarity with interdependence (e.g., racial minority students) tend to be relatively more motivated by opportunities to contribute to their families and communities, while students with greater familiarity with independence (e.g., middle-class students) tend to be relatively more motivated by opportunities to explore their individual interests and passions (21, 34, 38).

Both independence and interdependence are prevalent and viable cultural models; however, mainstream US educational values, policies, and practices are centered on independence and often exclude interdependence (34). This disparity creates learning environments that are not culturally inclusive for students from interdependent backgrounds, and this lack of inclusion is a key driver of underperformance for students from interdependent backgrounds, such as racial minority students and students from lower-income households (38–41). Building on this research, we conceptualized culturally inclusive learning environments as those that validate both independence and interdependence.

To create these environments in a systematic and sustainable way, we leveraged the CCF (Fig. 1) (27, 42, 43), which identifies four interconnected levels of culture (Ideas, Institutions, Interactions, and Individuals) that give rise to different patterns of values, expectations, and behaviors. The CCF has been proposed as a tool for creating culture change in diverse contexts, including education (44–48), and a growing body of research supports the idea that fostering a desired change at one level of culture can create changes at other levels (43, 49, 50). For example, research illustrates that culturally inclusive messaging about the purpose of education (Ideas level) enhances working-class students’ psychological experiences and academic performance (Individuals level) (38, 51–53). While this research provides evidence of the CCF’s utility in creating isolated changes across levels of culture, particularly among Individuals, large-scale and sustainable culture change involves parallel and mutually reinforcing changes across multiple levels (45, 47). This is the type of culture change we sought to create in service of fostering culturally inclusive learning environments.

We focused our culture change efforts at the Ideas level by training ELTs to understand cultural models of self and how educators can integrate these models into practices and policies to create culturally inclusive learning environments. We then supported ELTs in integrating this idea at the Institutions level by strategically enhancing three of their schools’ practices, policies, or values. ELTs shared these changes with colleagues at their schools, and we assessed the impact of these changes on teachers’ practices (Interactions level) and students’ academic experiences and outcomes (Individuals level). In other words, we sought to create culture change by targeting the core Ideas, scaffolding the integration of these ideas at the Institutions level, and examining the cascading effects of these changes at the Interactions and Individuals levels (Fig. 1).

Culture Change Hypotheses. Three overarching hypotheses guided this culture change initiative. First, we hypothesized that using a train-the-trainer model would facilitate the spread of the Idea that both independent and interdependent models of self are valuable in educational contexts, thereby fostering change at the

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Footnote: See (34, 35, 39, 42) for some sources of these differences.

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**Fig. 1.** Conceptual model: Using the CCF to create inclusion-focused culture change in educational contexts. Note: The CCF is adapted from the model described by Markus and Kitayama (27) and Markus and Conner (42) 2014.
This change would be reflected by greater school-wide endorsement of culturally inclusive beliefs among educators (i.e., Ideas to Institutions effect; see Fig. 1 Path A). We anticipated that this change would be pronounced in schools with more racial minority educators and students, and more students from lower-income households, as ideas about cultural inclusion would be particularly relevant to these schools’ educators and/or students. Second, we hypothesized that educators’ endorsement of culturally inclusive beliefs would predict greater use of culturally inclusive practices (i.e., Institutions to Interactions effect; see Fig. 1 Path B). Third, we hypothesized that educators’ use of culturally inclusive practices would predict more positive psychosocial experiences (i.e., teacher trust, identity safety, academic motivation) and academic performance among students (i.e., Interactions to Individuals effects; see Fig. 1 Path C). We also explored the potential of inclusive practices to close racial and socioeconomic achievement gaps.

**RPP Method**

Our exploration of culture change occurred within an RPP in a small school district in Oregon, which was initiated in 2017, when the Superintendent requested support in closing racial achievement gaps. The district’s student population (N ~ 6,000) was predominantly Hispanic/Latino (54%) and White (41%), with 58% qualifying for free or reduced-price lunch and 36% classified as English Language Learners. The district’s teachers (N ~ 300) were primarily White (74%) and Hispanic/Latino (14%), and 78% of licensed teachers had more than 3 y of experience.† The RPP research team (i.e., three PhD-level researchers, one graduate student, two research coordinators) designed a contextualized approach to implementing culture change that leveraged the practitioner team’s (i.e., the Superintendent, a district liaison, and a rotating group of administrators, teachers, and other staff members) expansive knowledge of the district’s systems, staff, students, families, and community. The research and practitioner teams collaboratively identified the district’s strengths and challenges and articulated an RPP goal of enhancing student belonging and success by creating culturally inclusive learning environments. The research and practitioner teams decided to integrate the culture change work into the district’s robust equity infrastructure, which included preexisting ELTs. ELTs were composed of an administrator (i.e., principal or assistant principal) and approximately 5 to 10 staff members from each school, including teachers, para-professionals, and counselors. Following their training by the RPP team, ELTs led equity-related programming for their schools (e.g., created and delivered equity-focused professional development for all staff in their building) and participated in a district-wide equity steering committee, which coordinated the district’s equity efforts across schools. Given their leadership role in the district’s equity efforts, knowledge of their school contexts, relationships with staff and students throughout their schools, and their presence in all schools in the district, ELTs were an ideal group to engage in a culture change intervention.

**Design and Implementation.** The district’s nine schools were divided into two cohorts that were roughly matched by grade level. The research team designed a 5-d training focused on creating culturally inclusive learning environments (see Table 1 for brief summary of each day’s focal topics, key insights, and activities; see SI Appendix for further details) and assigned ELTs to participate in a) an initial training session in July of either 2017 (Cohort 1; n = 26) or 2018 (Cohort 2; n = 30), and b) a 2-d booster session during July of the year following their training session. The design was quasi-experimental: Cohort 2 served as a control group for Cohort 1 during the first year of the study, but as of July 2018, there was no longer a control group, as all schools had participated in the training.

We used a train-the-trainer model to initiate culture change: ELTs participated in the training and then taught the content to their colleagues in staff meetings and professional development sessions over the course of the following school year. During the training, ELTs learned a framework for advancing cultural inclusion by validating both independent and interdependent cultural models at school (i.e., Ideas level change), planned to integrate these ideas about cultural inclusion into school-wide flagship practices (i.e., Institutions level change), and received resources for teaching their colleagues to understand and use culturally inclusive practices in the classroom (i.e., Interactions level change). ELT members also reflected on their own experiences with independence, interdependence, and the influence of these cultural models on their cognition, motivation, emotion, and behavior (i.e., Individual-level change).

Thus, the training supported ELTs in working across all levels of the Culture Cycle and producing a plan to create school-wide culture change. By implementing school-wide flagship practices and teaching their colleagues the framework for understanding cultural inclusion and its importance, ELTs created conditions whereby their colleagues played an active role in creating inclusive learning environments, even without having attended the training. The research team held quarterly check-ins with ELTs and provided additional support as needed (e.g., brainstorming approaches for generating buy-in among colleagues who were initially resistant; providing feedback on the professional development materials ELTs created).

**Assessment: Testing Immediate and Cascading Effects of Culture Change.** To assess culture change, we invited all teachers (N = 281 to 287) to complete an annual survey in May, beginning the year after the first training. We surveyed students (N = 5,776 to 5,809) annually in May and June using an opt-out consent procedure,† beginning in the year following the first training, and collected administrative data from the district (i.e., GPA, test scores, demographics). For detailed information about teacher (Year 1: n = 167; Year 2: n = 157) and student samples (Year 1: n = 4,513; Year 2: n = 4,301), recruitment procedures, measurement details (e.g., all items and correlations), and analytic approach, see SI Appendix, Table S2 and Supporting Text. This project was granted exempt status from the Institutional Review Board Human Subjects Committee of the University of Michigan, as it examined standard educational practices.

We tested our hypotheses regarding culture change in three steps, using multilevel path analyses to account for differences between schools and classrooms. First, we explored the path from Ideas to Institutions (i.e., Path A) by examining whether leadership-level training created school-wide change in teachers’ culturally inclusive beliefs. We operationalized this change through two sets of items—decreased endorsement of color blindness (54)

†These demographics were reported in the district’s state report card for 2017 to 2018. Over the course of the study, there was a slight increase in the percentage of Latino/Hispanic students (57% in 2021 to 2022) and decrease in the percentage of White students (37% in 2021 to 2022). All other demographics remained relatively stable. This demographic shift aligns with the area’s overall shift as growth in agricultural industries attracted Latino workers with relevant experience.

†We asked all teachers to send a letter home to families explaining the purpose of the study, what their child would be asked to do (i.e., complete a paper/online survey), and what demographic and performance data we would request from the district concerning their child (e.g., grades, behavior reports, attendance, demographics). If parents did not wish for their child to participate, they returned a form indicating that they did not consent. If a student’s family withheld consent, the student was given a different task to work on while other students took the survey. Fewer than 10 families opted out of the study.
### Table 1. Brief outline of the train-the-trainer cultural inclusion curriculum

<table>
<thead>
<tr>
<th>Day</th>
<th>Focal topics</th>
<th>Key insights</th>
<th>Example activities</th>
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<tbody>
<tr>
<td>1</td>
<td>The culture cycle</td>
<td><em>Individual</em> teachers’ and students’ assumptions and behaviors are shaped by their experiences in many different cultural contexts; their everyday interactions, the <em>Institutions</em> they belong to, and the prevailing cultural <em>Ideas</em>.</td>
<td>Reflection and discussion: What assumptions do you hold about students who talk a lot or are quick to raise their hands (vs. those who don’t)? What about students who smile and those who don’t?</td>
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|     | Independent and interdependent cultural models of self | *Independent*: A view of the student as a separate, independent self whose behavior prioritizes individual interests and personal choice.  
*Interdependent*: A view of the student as a connected, interdependent self whose behavior prioritizes roles, responsibilities, and relationships to important others in a given situation. | Reflection and discussion: When does independence/interdependence show up at school, with your family, and with your friends? |
| 2   | Interpretive power | Educators can build interpretive power by understanding how independent and interdependent models of self shape student emotions, cognition, motivation, and behavior. Interpretive power helps teachers engage students more effectively. | Reflection and discussion: Can you think of a time as an educator when having more interpretive power and more information about a student’s cultural context may have changed the way you responded to the student? |
|     | Cultural mismatches in educational contexts | Mainstream educational contexts often prioritize independent cultural models to the exclusion of interdependent cultural models. As a result, students from interdependent cultural backgrounds (e.g., racial minority students) can experience a lack of belonging, which undermines performance. | Application: Use the Culture Cycle to analyze your school’s core cultural ideas, policies, practices, and individual experiences. To what extent do you see independence and interdependence reflected throughout the Culture Cycle? |
| 3   | Transforming classroom cultures | Educators can enhance belonging and engagement for historically marginalized students by implementing inclusive classroom practices (i.e., validating both independent and interdependent cultural models). | Application/case study: What leads students from marginalized backgrounds to disengage? How can inclusive practices prevent disengagement or instigate re-engagement? |
|     | 7 key practice domains | Culturally inclusive practices can be embedded in Planning, Framing, Feedback, Learning Strategies, Assessment, Culture Building, and Engagement. | Application: Practice providing culturally inclusive feedback on your colleagues’ work; process and incorporate feedback from colleagues. |
| 4   | Developing school flagship practices for cultural inclusion | Flagship Practices at Different Levels of Culture Ideas: Uplifting independent and interdependent ideas and values  
*Institutions*: Interrogating how school policies and practices validate both independence and interdependence  
*Interactions*: Devising ways for students to use both independent and interdependent models of self while learning | Implementation planning: Flagship Practices Activity  
Describe what the practices look and sound like  
Describe how you will know whether the practices are successful |
| 5   | Addressing resistance to culture change | Common Concerns About Pushback  
“Isn’t independence good and what America is about?”  
“Culture doesn’t matter; there’s only one right answer in Math.”  
“Group work takes away from individuals’ ability to shine.” | Group discussion about strategies for addressing common concerns |
|     | Implementing and monitoring culture change | Implementing flagship practices involves planning a roll-out, creating buy-in from other educators, and assessing uptake and effectiveness throughout the school. | Implementation support: Create Progress Monitoring Plan to assess implementation activities and outcomes |

See SI Appendix, Table S1 for more details and references.

(i.e., less agreement with the idea that cultural differences should be downplayed; example item: “Given the diversity of students, teachers should downplay and ignore racial and ethnic differences”) and *increased* endorsement of multiculturalism (55) (i.e., more agreement with the idea that cultural differences should be acknowledged or celebrated; example item: “Teachers should recognize and celebrate racial and ethnic differences”). In examining the effect of *Ideas on Institutions*, we aggregated teachers’ endorsement of multiculturalism and colorblindness at the school level to gauge institutional (i.e., school) effects.

Both logistical and theoretical considerations informed this operationalization of culturally inclusive beliefs. Previous research
offers validated means of assessing individuals’ experiences of independent and interdependent self-construal (56) or their endorsement of independent and interdependent educational motivations for pursuing higher education (38). Central to the ELT training was the inclusion and validation of both independent and interdependent cultural models in education. As no scale has been developed to assess this construct in the context of K-12 education, we employed a scale assessing multiculturalism (i.e., beliefs about the importance of acknowledging and valuing diversity in education) and colorblindness (i.e., beliefs that diversity should not be focal in education). Although diversity is often defined explicitly or implicitly in terms of the demographic composition of a group, demographic diversity also signals diversity in traditions and ways of being, such as independent and interdependent cultural models. Moreover, meta-analyses suggest that endorsement of these ideologies, in particular, multiculturalism, is predictive of intergroup outcomes, including prejudice, discrimination, and stereotyping (57, 58). Thus, we considered increased endorsement of multiculturalism and decreased endorsement of colorblindness as indicative of greater endorsement of culturally inclusive beliefs.

Second, we explored the path from Institutions to Interactions (i.e., Path B) by examining whether teachers’ endorsement of culturally inclusive beliefs predicted greater use of culturally inclusive classroom practices. In this case, we considered teachers to be representatives of their institutions (i.e., schools) and examined teachers’ individual endorsement of culturally inclusive beliefs in relation to their practices. We assessed three categories of culturally inclusive classroom practices: 1) including students’ cultural backgrounds in instruction (e.g., Having students reflect on their families’ and communities’ goals/interests/values), 2) supporting interdependent socioemotional development (e.g., Encouraging students to try to understand others’ perspectives), and 3) leveraging interdependent classroom management practices (e.g., Celebrating the class’s collective achievements). This measure focused specifically on the validation of interdependent cultural models, as independent cultural models are already widely validated in many educational contexts.

Finally, we explored the path from Interactions to Individuals (i.e., Path C) by examining the relationships between teachers’ use of culturally inclusive practices and students’ psychosocial (i.e., identity, safety, motivation, and teacher trust) and academic experiences (i.e., performance on standardized tests of Math, Language Arts, Reading, and Writing) (Fig. 1). Example items used to measure students’ psychosocial experiences included: “I feel like I belong in school” (identity safety); “I think it is important for me to go to school” (motivation); and “My teacher wants to help me” (teacher trust).

Results

We report the main findings below and include information about the focal teacher-level and student-level variables, including bivariate correlations, descriptive statistics, and intraclass correlation coefficients (ICCs) in SI Appendix (SI Appendix, Tables S3 and S4). Both teacher-level and student-level variables showed substantial clustering by school and classroom, necessitating a multilevel approach.

Ideas to Institutions Effect (Path A): Leadership-Level Training Increases Teachers’ Endorsement of Culturally Inclusive Beliefs. To examine whether training ELTs to lead create culturally inclusive learning environments instigated positive institutional changes, we conducted a series of multilevel path analyses to estimate school-level differences in teachers’ culturally inclusive beliefs as a function of ELTs’ participation in both the initial 5-d training and the 2-d booster session. We anticipated that ELTs’ participation would decrease endorsement of color blindness and increase endorsement of multiculturalism among other teachers at their schools. Models included teacher race and gender as covariates at both the school and teacher levels. All models demonstrated excellent fit to the data.

As predicted, training participation increased teachers’ endorsement of culturally inclusive beliefs at the school level. First, relative to the control condition, ELTs’ participation in both the initial training and booster session decreased school-wide endorsement of color blindness (Fig. 2A). This effect held across schools, regardless of the racial composition of their teaching staff and the racial and socioeconomic composition of their student population. Second, relative to the control condition, ELTs’ participation in both the initial training and booster session increased school-wide endorsement of multiculturalism (Fig. 2B). Unlike the effects on color blindness, school context moderated the effect of the training on teachers’ endorsement of multiculturalism: training effects were stronger in schools with more racial minority teachers, racial minority students, and students from low-income households. Plots of moderation effects are shown in SI Appendix, Fig. S2. Results of the covariates and ICCs are reported in SI Appendix (SI Appendix, Table S5).

Together, the effects of the training at the Institutions level supported our hypotheses: training ELTs to lead culture change efforts at their schools increased school-wide culturally inclusive beliefs among teachers. In the case of multiculturalism, these effects were pronounced in schools with greater racial and socioeconomic diversity among teachers or students.

Institutions to Interactions Effect (Path B): Teachers’ Culturally Inclusive Beliefs Predict Use of Culturally Inclusive Practices. To test the effects of the leadership-level training at the Interactions level (i.e., classroom-level), we focused on the practices teachers used to engage students. Using a series of multilevel path analyses with race and gender entered as covariates, we examined whether teachers’ increased endorsement of culturally inclusive beliefs following their ELTs’ participation in the training predicted greater use of interdependent teaching practices (i.e., practices that are less likely to occur in educational contexts that privilege independence over interdependence). We examined three dimensions of interdependent teaching practices: including students’ cultural backgrounds in instruction ($\alpha = 0.80$), supporting interdependent socioemotional development ($\alpha = 0.89$), and leveraging interdependent classroom management practices ($\alpha = 0.79$). We hypothesized that endorsement of color blindness would predict less frequent use of these practices, while endorsement of multiculturalism would predict more frequent use.

At the classroom-level, the relationships between teachers’ culturally inclusive beliefs and practices aligned with our hypotheses: greater teacher endorsement of color blindness predicted less use of the interdependent teaching practices, while greater teacher endorsement of multiculturalism predicted more frequent use of interdependent teaching practices (Fig. 3). The exception to this pattern was a nonsignificant relationship between color blindness and classroom management practices. Notably, multiculturalism beliefs demonstrated stronger effects than color blindness, suggesting that enhancing multiculturalism (vs. decreasing color blindness) may be a more efficient and effective means of increasing teachers’ use of interdependent teaching practices. All models...
Interactions to Individuals Effects (Path C): Culturally Inclusive Teaching Practices Predict Positive Student Psychosocial and Academic Outcomes. Finally, we examined the effects of the training at the Individuals level, by exploring the associations between students’ psychosocial and academic outcomes and the three dimensions of interdependent teaching practices. Overall, the results of multilevel path analyses supported our hypothesis. All three dimensions of interdependent teaching practices were positively associated with all psychosocial outcomes (i.e., students’ sense of identity safety, trust in teachers, and academic motivation), except for the relationship between classroom management and identity safety. At the classroom level, all three psychosocial outcomes were significantly and positively associated with students’ performance on state standardized tests of Math, Language Arts, Writing, and Reading. At the student level, all three psychosocial outcomes were significant predictors of students’ performance in Math, but only identity safety was associated with performance in Language Arts, Writing, and Reading. See Fig. 4 for standardized path coefficients. All models demonstrated good fit to the data (CFI = 0.98~0.99, TLI = 0.93~0.98, RMSEA = 0.03~0.07).

In addition to testing the relationships between interdependent teaching practices, students’ academic attitudes, and students’ academic performance, we investigated whether interdependent teaching practices were associated with reduced racial achievement gaps. After controlling for gender, grade level, and free or reduced price lunch status, teaching practices that validate students’ cultural backgrounds significantly moderated the relationship between race and students’ performance in Math ($p = 0.02$; see SI Appendix, Fig. S3 and Table S6). To better understand the interaction effect, we identified teachers who often (i.e., $Z$ Cultural Backgrounds $> 1$)
or rarely implemented these practices (i.e., $Z_{Cultural Backgrounds} < -1$). In classrooms where teachers rarely implemented practices that validate students’ cultural backgrounds, racial minority students had significantly lower Math scores than their White peers ($β = -0.53$, $p < 0.001$). In contrast, in classrooms where teachers frequently implemented these practices, White and racial minority students did not differ in Math performance ($β = -0.18$, $p = 0.15$), indicating an elimination of the racial achievement gap in Math. The racial achievement gaps in Language Arts, Writing, and Reading were not significantly altered by interdependent teaching practices, though they illustrated a similar pattern to the Math achievement gap (SI Appendix, Table S6).

**Discussion**

In the context of a RPP, we examined the viability of initiating culture change to create culturally inclusive learning environments in schools across an entire district. Using the CCF, we intervened most directly at the *Ideas* level by training school leadership (i.e., equity leadership teams, ELTs) to advance the idea that both independent and interdependent cultural models are valuable in educational contexts. We scaffolded the integration of this idea at lower levels of the CCF by supporting ELTs in developing and implementing three school-wide culturally inclusive flagship practices and providing materials to support them in teaching their colleagues the theoretical framework underlying these practices. Results illustrated a causal effect of Ideas-level change at the *Institutions* level, with downstream correlational effects at the *Interactions* and *Individuals* levels. Specifically, ELTs’ participation in the training decreased school-wide endorsement of color blindness and increased school-wide endorsement of multiculturalism among teachers. This effect was pronounced in schools with larger populations of racial minority students and/or teachers and students from low-income households, perhaps because ideas about cultural inclusion were particularly resonant with educators of color’s own experiences of marginalization in the educational system or their experiences working with students of color (59). In turn, teachers’ rejection of color blindness and endorsement of multiculturalism predicted greater use of culturally inclusive teaching practices, which predicted more positive psychosocial experiences and stronger academic performance among students.

**Theoretical Implications.** As a comprehensive culture change effort using the CCF, the research reported here yields several notable theoretical advances. Consistent with past theorizing (44–46), our findings suggest that initiating culture change using the CCF is both viable and effective in educational contexts (47). While past research has illustrated isolated effects between particular levels of the CCF (38, 51–53, 60), the current research demonstrated both causal and correlational effects across all levels, demonstrating the possibility of initiating cascading change through targeted action. Using a quasi-experimental design with delayed treatment for the control group, we found evidence that Ideas about culturally inclusive learning environments introduced to school leadership via a 5-d training spread to other educators, shaping how teachers throughout the school thought about the value of cultural diversity in the classroom and their role in validating diverse cultural models. We found positive downstream correlates of this change among both teachers and students, which suggests that initiating culture change by targeting key ideas and scaffolding their integration in institutions can create widespread effects throughout a cultural context. Indeed, by training approximately 56 school leaders, we observed change among approximately 300 teachers, who enhanced educational experiences and outcomes for more than 3,400 students. This approach differs from many interventions that seek to change individuals’ beliefs or behaviors. Instead of attempting to persuade every teacher in the district to change their beliefs and practices, we changed school contexts in a way that facilitated the desired change among teachers. In particular, the implementation of school-wide flagship practices created conditions such that teachers were automatically opted-in to participating in culturally inclusive practices, which may have facilitated alignment of teachers’ beliefs and practices (61, 62).

This work also advances understanding of the factors that predict teachers’ use of culturally inclusive teaching practices and the implications of these practices for students. First, while research has examined teachers’ endorsement of various beliefs related to cultural inclusion (63–67), relatively few quantitative studies have examined the relationship between teachers’ endorsement of color-blindness and multiculturalism and their use of culturally inclusive practices (68, 69). Our findings advance this literature, illustrating that both the rejection of color blindness and embrace of multiculturalism have positive implications for teachers’ use of inclusive...
practices. While our findings rely on self-reports rather than direct observations of teachers’ behavior, this is a common limitation in research on teaching practices (70, 71). Future studies could use a combination of self-report and observational data to provide a more comprehensive understanding of the relationship between teachers’ beliefs and practices, and students’ outcomes. Nonetheless, the current research provides encouraging evidence that in the context of a district-wide effort to create culturally inclusive learning environments, belief-behavior alignment is possible, if teachers are provided support for integrating inclusive practices into their everyday instruction. Second, although we did not find consistent evidence that culturally inclusive practices reduced racial achievement gains, our findings do provide support for the importance of creating culturally inclusive learning environments: students of all racial and socioeconomic backgrounds had more positive psychological experiences in school and performed better on standardized tests when their teachers used more culturally inclusive practices. Consistent with past research in higher education contexts (38, 51–53), these findings suggest that culturally inclusive practices are beneficial for students from both historically marginalized and historically advantaged backgrounds.

These theoretical advancements also come with limitations arising from the study design. First, for both practical and ethical reasons, we only retained a control group in the first year, as the RPP goal was to create change throughout the district. Withholding support from certain schools for an extended period of time could have exacerbated existing inequalities and created conflict among schools, as ELTs participated in district-wide equity steering events that would have made clear that schools received differential support for their equity work. Had we attempted to retain a control group for a longer period of time, it is also likely that this group would have been compromised, as ELTs frequently shared resources. Thus, the study design limits causal analyses to a particular time and set of variables, although we suspect that the causal impact likely extends beyond the first year following the intervention, particularly if the intervention set in motion processes that led to accumulating gains over time or time-delayed effects (72–74). Indeed, the additional effect of the booster session on teachers’ culturally inclusive beliefs, above and beyond the initial training, suggests that culturally inclusive ideas and practices may strengthen as educators continue to iterate on them.

Second, the study design is such that there are insufficient data to examine the effects of a particular culturally inclusive flagship practice. Schools implemented multiple practices simultaneously, and each practice was tailored to the school’s existing systems, goals, and community. In combination with the limited number of schools in our partner district, this design feature results in a sample that is underpowered to detect context-specific effects. Scaling this culture change approach to larger districts or replicating the approach with multiple districts would provide a larger sample in which context (e.g., school characteristics) and practice (e.g., affirmation of interdependent values; interdependent family engagement; culturally responsive discipline) effects could be evaluated.

Third, the data cannot speak to precisely how culturally inclusive ideas spread. While we collected artifacts from ELTs’ culture change work (e.g., slide decks from staff meetings where the framework was discussed or flagship practices were implemented), we did not record ELTs’ educational sessions with their colleagues or collect data regarding their colleagues’ comprehension of or receptivity to the ideas and practices ELTs introduced. This decision was strategic: the research team retained distance from school-level work to ensure that school-level effects were driven by ELTs’ work with their colleagues, as articulated under a train-the-trainer model. Future research could integrate social network analyses and document review of ELT-led educational sessions to shed light on how beliefs and practices spread within a school, and which community members and implementation practices carry the most weight in terms of initiating change.

**Practical Implications.** While the design and effects of this culture change initiative are likely limited in generalizability (e.g., to districts with similar equity systems and levels of readiness), the results suggest that the CCF is a viable approach for creating culture change. In efforts to expand this approach for use in other educational contexts and to address different types of culture change, we highlight several practical implications. First, this culture change initiative was designed around the district’s demographics and needs. While we offered a framework for understanding cultural differences across many different groups, the curriculum intentionally highlighted examples of how interdependence manifests among Latino/a and low-income populations, who constituted the majority of the district’s student population. Each ELT also developed and implemented flagship practices that were specific to their school’s communities, goals, and existing systems, and they had autonomy in terms of how and when they implemented and evaluated their practices. This specificity and autonomy likely increased both ELTs’ motivation and other teachers’ uptake of the ideas and practices (75, 76). Teachers may have been more receptive to the culture change initiative because it was both tailored to their schools and delivered via a trusted source: their colleagues (77).

Second, we recruited participants using the district’s existing systems. We used the district’s equity infrastructure to identify participants for the training (i.e., ELTs), and ELTs trained their colleagues during their schools’ dedicated professional development time. Thus, the culture change initiative did not require additional work or the creation of new teams and was likely perceived as part of normal operations. We also used the district’s existing systems for disseminating information to families to obtain consent and to provide teachers and students with access to online surveys. While the survey content differed from other surveys teachers and students regularly complete, the delivery was similar, thereby reducing barriers to participation. Finally, the district exhibited a high degree of readiness to engage in culture change work. Not only did the district have existing systems that could be leveraged to initiate and assess culture change, it also had a high level of support from district leadership throughout the duration of the project. Although the district had three different superintendents during the course of the project, all provided their full support for the culture change work, renewing research agreements with the research team, ensuring a sufficient budget for staff to attend trainings and project meetings, participating in trainings and RPP meetings, and integrating the cultural inclusion framework into district-wide initiatives, goals, and presentations (e.g., the district’s strategic plan). The superintendents’ involvement allowed the work to proceed uninterrupted and sent a clear and consistent message to administrators, teachers, and other staff that culture change efforts were a priority.

**Conclusion**

In any context, culture change is an ambitious goal (47). Yet, the persistent racial and socioeconomic disparities that span all aspects of education make the necessity of educational culture change readily apparent. For decades, scholars have documented countless ways in which U.S. educational systems fall short in serving racial minority students and students from lower-income families. The
Data, Materials, and Software Availability. Anonymized data have been deposited in OSF (79).
60. S. T. Brady, “A scarlet letter?: Institutional messages about academic probation can, but need not, elicit shame and stigma”, Stanford University (2023).