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Culturally Responsive School Discipline: Implementing Learning Lab at a High School for Systemic Transformation

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Youth from racially minoritized communities disproportionately receive exclusionary school discipline more severely and frequently. The racialization of school discipline has been linked to long-term deleterious impacts on students' academic and life outcomes. In this article, we present a formative intervention, Learning Lab that addressed racial disparities in school discipline at a public high school. Learning Lab successfully united local stakeholders, specifically those who had been historically excluded from the school's decision-making activities. Learning Lab members engaged in historical and empirical root cause analyses, mapped out their existing discipline system, and designed a culturally responsive schoolwide behavioral support model in response to diverse experiences, resources, practices, needs, and goals of local stakeholders. Analysis drew on the theory of expansive learning to examine how the Learning Lab process worked through expansive learning actions. Implications for research and practice are discussed.

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Located in a large Midwestern city that has been ranked among one of the top places to live in the United States, Martin Luther King Jr. (MLK) High School has been considered one of the city's most desirable public schools. Many MLK graduates have gone on to attend top universities. However, not all students' experiences were positive. The students from minoritized communities, especially African American students, have faced large disparities in opportunities and outcomes. Gisella Milton, a parent and after-school program coordinator, explained the experiences of African American students and parents powerfully:

> I've incredible heartbreak as a parent with my kids at MLK. And it's been ironic, because I'm a grad of MLK High School and had very fond memories and a love for MLK. So, to see my sons who are Black go through the school and not ever, in my opinion, claim their true potential to achievement and excellence was heartbreaking. My experience with Black kids at MLK was that you were fighting a beast. … It was like they were in the belly of the beast and you were like "Oh my God! You have been chewed and swallowed and I don't know how to help you."

A major contributor of the racial disparities at MLK was disproportionality in school discipline. African American students made up 13.5 % of the student population and received 61% of the suspensions, and 78% of the students were sent to detention. In the 2013–2014 academic year, Gisella and a group of teachers, administrators, parents, a former student, community representatives, and a research team from a local university formed a problem-solving team called *Learning Lab*. Learning Lab united a diverse group of local stakeholders, specifically those who had been historically excluded from the school's decision-making activities. Members collectively examined the existing discipline system and its outcomes (racial disproportionality) and designed a new schoolwide behavioral support system that was culturally responsive to diverse experiences, practices, and goals of their school community. In this study, we ask how Learning Lab worked as a collective knowledge production activity at MLK High School.

Literature on Racial Disproportionality in School Discipline

The racialization of school discipline has a long history in the United States (Children's Defense Fund, 1975). Nationally, African American, Latino, and Native American youth receive exclusionary discipline more frequently and severely for more subjective reasons such as disrespect and insubordination (American Psychological Association [APA] Zero Tolerance

Task Force, 2008; Losen & Gillespie, 2012; Skiba et al., 2014). For example, African American students made up 18% of the student population yet they accounted for 39% of all expulsions in US schools (Office for Civil Rights, 2012). Disproportionality in school discipline is a significant problem of equity that contributes to negative consequences in the lives of millions of youth, families, educators, and the society as a whole (Gregory, Skiba, & Noguera, 2010). More than three million learners lost instructional time due to exclusionary discipline in the 2009–2010 school year; that is "about the number of children it would take to fill every seat in every major-league baseball park and every NFL stadium in America, combined" (Losen & Gillespie, 2012, p.6). Exclusionary discipline exacerbates behavioral problems and diminishes academic engagement and safety (APA Zero Tolerance Task Force, 2008). It may weaken the student-school bond that is correlated with higher dropout rates (Rumberger, 2011). Additionally, exclusionary discipline has an impact on the likelihood of involvement in the juvenile justice system (Gregory et al., 2010; Krezmien, Leone, & Achilles, 2006).

In the literature, racial disproportionality has been overwhelmingly conceptualized from an individualistic, outcome-oriented perspective that locates the problem within individuals-at the expense of targeting systems: Either youth from minoritized communities are prone to behavioral problems due to their social and physical environment (e.g., poverty, trauma, and lead poisoning) or educators have racial biases. As a result, researchers have taken the individual as the unit of intervention and aim to change individuals' discrete acts and thoughts (e.g., educators' subconscious or implicit biases). In this study, we conceptualize racial disproportionality from a systemic, process-oriented perspective: a symptom of the opportunity gap in education and the other disparities in health, law, finance, housing, access to clean water, and nutrition. Disproportionality is a multifaceted, cyclical, adaptive systemic contradiction, whose patterns and predictors change across and within states, districts, and schools (Bal, Betters-Bubon, & Fish, 2017; National Research Council, 2002; Krezmien et al., 2006; Skiba et al., 2014). For example, in Wisconsin, student race predicted discipline disparities, irrespective of family income, school demographics, academic achievement, teacher race, language, and level of education (Bal et al., 2017). Yet, in another Midwestern state, some school-level protective factors buffered the risk for disproportionality such as mean school achievement, percentage African American student enrollment, and principal perspectives (Skiba et al., 2014). Although it is vital to understand the extent of outcome disparities, interventions are needed to transform the institutional processes that reproduce those disparate outcomes as situated in their local contexts.

The disproportionality studies rely mainly on descriptive analyses and lack intervention research. Cavendish, Artiles, and Harry (2014) identified the urgent need for intervention that "helps us understand the complex technical, cultural, historical, and political processes that mediate practitioners'

efforts to remedy disproportionality" (p. 9). To conduct effective, locally meaningful, and systemic interventions, the entire school community should be included in problem solving and design (Donovan, 2013; Frattura & Capper, 2007; Fullan, 2003; Snow, 2015; Sugai, O'Keeffe, & Fallon, 2012). Then the question is how to facilitate process-oriented, inclusive interventions for systemic transformation? Who should be included? How to form, run, and sustain teams with multiple and often opposing goals? How to examine collective knowledge production? The education research literature has not answered those questions adequately (Gutiérrez & Penuel, 2014; Snow, 2015). The present study addresses this gap.

Schoolwide Interventions to Address Racial Disproportionality

In the United States, Positive Behavioral Interventions and Supports (PBIS) has become the primary means of behavioral support and early intervention services. It is the only schoolwide behavioral support model recommended in the Individuals with Disabilities Education Act (IDEA, 2004). PBIS has been implemented in more than 21,000 schools with more than 10.5 million students (Sugai, Horner, & McIntosh, 2016). In PBIS, each school forms a multidisciplinary team that oversees discipline system, determines schoolwide behavioral expectations and consequences, and analyzes outcomes such as office discipline referrals (McIntosh, Girvan, Horner, & Smolkowski, 2014; Sugai et al., 2016). Although the promise of PBIS is to help reduce behavioral outcome disparities, PBIS has not impacted racial disproportionality (Vincent & Tobin, 2011). In response, it was recommended that PBIS implementations should be culturally responsive (Sugai et al., 2012; Vincent & Tobin, 2011).

In the past decade, there were growing efforts among researchers, technical assistance centers, education leaders, and policy makers to integrate *cultural responsiveness* into PBIS. These recent efforts often use a determinist, categorical approach to culture and use race, language, and religion as proxy indicators of culture (Bal, 2017). Academicians and technical assistance centers have created various rubrics and professional development (PD) workshops with lists of recommendations for "culturally responsive PBIS schools" or "culturally responsive practitioners." The ideal characteristics of cultural responsiveness are listed as acontextualized and static products. For example, Banks and Obiakor (2015) listed six characteristics of the culturally responsive PBIS schools such as enhancing staff members' cultural knowledge and self-awareness, and validating "other cultures." Vincent, Randall, Cartledge, Tobin, and Swain-Bradway (2011) provided another list including "culturally responsive evidence-based practices," data-based decision making, and educators' "cultural awareness." McIntosh, Moniz, Craft, Golby, and Steinwand-Deschambeault (2014) listed educators' self-awareness about implicit biases in discipline referrals. These checklists

include the authors' self-directed selections of concepts based on their theoretical orientations, knowledge, and interests (e.g., publications or grants). The products have not been developed nor tested in practice. Yet, they are imposed on practitioners as solutions through technical assistance centers. In these product-based solutions, students and families are positioned as passive objects of systemic change (Bal, 2018). Finally, these products do not offer operational definitions of key concepts and a specific methodology to include the whole school community in decision-making activities in schools and education agencies. For example, what do "cultural self-awareness" and "implicit biases" mean in everyday practices and diverse contexts of schools? Who determines them?

There are only a few empirical studies on culturally responsive implementations of PBIS (Bal, 2017; Vincent et al., 2011). To illustrate, Jones Caravaca, Cizek, Horner, and Vincent (2006) conducted a case study at a rural school serving the Diné (Navajo) students in New Mexico. Educators in the school's PBIS team determined the schoolwide expectations (PAWS: Be positive and polite, achieve your goals, work hard and stay safe). They then used a Diné word, T'aahwiajiiteego, meaning one is responsible and accountable and included biographical information about important Native American figures as role models in order to teach school's behavioral expectations to the Diné students. The authors found that students easily identified the behavioral expectations. McIntosh and colleagues (2014) conducted a study at a K–12 school serving predominantly Indigenous students in Canada. Community members and leaders participated in the school PBIS team and worked on progress, monitored school data, and made recommendations. These studies exemplify a positive movement in the PBIS literature and show the importance of including families and community members and considering local context in PBIS implementations. However, there are major limitations with those studies. First, they used a hegemonic conceptualization of school-family-community partnership in which students and families were the objects while researchers and educators were the subjects who led the organizational change efforts and determined outcomes. Cultural practices and languages of local communities were utilized to teach students the predetermined expectations. Moreover, these studies did not state the specific roles and responsibilities stakeholders played in schools' decision-making activities nor report how the collaboration process worked. As Vincent and Tobin (2011) observed about the PBIS literature, "the mechanisms and strategies necessary for culturally responsive implementation … remain unclear" (p. 2).

The present study addresses this critical gap. Instead of offering a fixed product (e.g., a rubric or PD workshop), we provide a process, *Learning Lab*, through which local stakeholders develop their own culturally responsive behavioral support system in response to the everyday realities and histories, needs, resources, and goals of their school community. In other

words, Learning Lab was the operational definition of cultural responsiveness in this study. We utilized the theory of expansive learning (Engeström, 1987, 2016), which provided a robust theoretical framework and an intervention methodology for facilitating collective knowledge production in organizations facing complex systemic contradictions such as racial disproportionality. Below we provide an overview of the theory of expansive learning with its key concepts—activity system, contradictions, expansive learning, expansive learning actions, formative intervention, and the functional method of double stimulation—which informed the intervention design and analysis.

Theoretical Framework

The theory of expansive learning was developed by Yrjö Engeström (1987). This theory is considered as a third generation of cultural-historical activity theory grounded in the work of historical materialist psychologists and philosophers (Vygotsky, Leont'ev, Davydov, Ilyenkov, Bakhtin, Marx, and Engels; Engeström, 1987, 2015). The key tenet of the theory is that culture mediates all human acts via ideal and material artifacts (Vygotsky, 1978). A psychological phenomenon (e.g., learning and ability) is examined as *a process* as situated in collective activity systems (Leont'ev, 1974). As a result, the theory of expansive learning takes activity systems as the unit of analysis and intervention.

Activity System

An activity is a object-oriented, culturally mediated system, in which a subject (e.g., an individual or group) works on an object to achieve desired outcomes. Here, culture is defined as the residue of a group's collective problem-solving activities and historically accumulated artifacts that reflect the group's efforts to survive and prosper in ever-changing circumstances (Gallego, Cole, & the Laboratory of Comparative Human Cognition [LCHC], 2001). Engeström (1987) formulated that an activity system amalgamates the following elements: subject, object, ideal and material artifacts, rules, division of labor, and community. The object holds together an activity system and gives its form, motivation, and direction (Leont'ev, 1974). As compared to an action, an activity system is a relatively durable formation. The whole structure of an activity system mediates the subject's actions and gives actions their meanings (Engeström, 2008).

Contradictions

Contradictions are the mutual influence of opposites in activity systems (Marx & Engels, 1998). Activity systems are always in motion. Contradictions are the historically accumulated force behind this motion. They are "a key to

understanding the source's trouble and as well as the innovative and developmental potentials of an activity" (Engeström, 2008, p. 27). The larger, societal contradictions cause inner contradictions in an activity system (e.g., a school) as novel objects, artifacts, and rules enter the system (Engeström, 2016). An inner contradiction manifests itself as daily dilemmas, conflicts, and double-binds that indicate how the activity system is organized, functions, and does not meet its emerging needs (Engeström, & Sannino, 2011; Haapasaari & Kerosuo, 2015; Virkkunen & Newnham, 2013). The inner contradiction produces an urge among the participants of an activity system to get out of the conflictual situation (Sannino, Engeström, & Lemos, 2016). Inner contradictions cannot be effectively addressed merely by combining and balancing competing priorities. They must be "creatively and often painfully resolved by working out a new 'thirdness,' something qualitatively different from a mere combination or compromise between two competing forces" (Engeström, 2017, p. 32). The new form of activity can be achieved through a qualitative transformation in the foundational practices, assumptions, and visions of an activity system (Virkkunen & Newnham, 2013). This qualitative transformation is called *expansive learning*: "the formation of a new, expanded object and pattern of activity oriented to the object" (Engeström, Sannino, & Virkkunen, 2014, p. 122).

Traditionally, in education research, learning is conceptualized as located within the subject as manifested through changes in the thoughts and acts of an individual (Greeno, 2006; Gutiérrez & Rogoff, 2003). The theory of expansive learning has a situated perspective. Expansive learning is manifested as an expansion in the object that results in changes in other components of the activity system in successful cases. The expansive learning process consists of a cycle of seven actions: questioning, analyzing, modeling, examining, implementing, reflecting on the process, and consolidating the new practice (Engestrom, 2015, 2016). The first expansive action, questioning, involves criticizing or rejecting some aspects of the existing practice and common wisdom. Analyzing includes mental or practical transformation of the situation in order to find out causes or explanatory mechanisms. In modeling, the newly found explanatory relationship is represented in observable and transmittable mediums. Examining involves running, operating, and experimenting on the new model in order to fully understand its dynamics, promises, and limitations. The next action is implementing the model by means of practical applications and corrections. The sixth action is reflecting on the learning process. The final action includes consolidating the outcomes into a new stable form of practice (Engeström, 2016). Each expansive action consists of various subtypes. For example, Engeström, Rantavuori, and Kerosuo (2013) found that the examining action included two subtypes (discussing the model critically and enriching the model). While a cyclic sequence is proposed, expansive actions may appear differently but not as fully random iterations in reality (Engeström, et al., 2013).

Contradictions are necessary but not sufficient for expansive learning (Engeström, 2016). In order to systematically and intentionally facilitate, accelerate, and intensify the expansive learning process in activity systems facing complex inner contradictions, the theory of expansive learning offered the formative intervention methodology. In formative interventions, local stakeholders partner with researchers/interventionists to transform their activity systems through articulation, examination, and resolution of systemic contradictions. The role of the interventionists is to stimulate and support an expansive learning process in practice led and owned by local stakeholders (Sannino et al., 2016).

Formative Intervention

The formative intervention methodology is radically different than the randomized controlled trials associated with notions of experimental control, universality, completeness, and finality that dominated psychology and education research. In traditional randomized controlled trials, researchers design, conduct, and analyze the interventions for predetermined outcomes. There are five principles guiding formative interventions: (1) the unit of analysis is the object-oriented collective activity systems; (2) systemic contradictions are both motives and sources of systemic redesign; (3) members collectively engage in expansive learning actions for designing new systems; (4) a dialectic method is the key for mastering cycles of expansive learning actions; (5) an interventionist methodology aiming to push forward, record, and analyze cycles of expansive learning is needed (Engeström, 2015).

To facilitate expansive learning, formative interventions use Vygotsky's (1978) *functional method of double stimulation*: "the subject is put in a structured situation where a problem exists … and the subject is provided with active guidance toward the construction of a new means to the end of a solution to the problem" (van der Veer & Valsiner, 1991, p. 169). The starting point of a formative intervention is the manifestations of the inner contraction (e.g., conflicts) as experienced by participants in their everyday practices (Marx & Engels, 1998). These data serve as *first stimuli*. First stimuli may trigger a paralyzing conflict of motives (Sannino et al., 2016). In gaining control of and addressing the conflict of motives, participants develop and appropriate ideal or material artifacts as *second stimuli* (Engeström, 2016). In this process, a simple idea, a *germ cell*, helps stakeholders to expand the object and develop a new form of practice through a cycle of expansive learning actions (Engestrom, 1987). The germ cell is a new concept initially generated for the resolution of the contradiction. This initial abstraction is enriched and materialized. Step by step, the germ cell evolves into an expanded object and a concrete model with a new form of practice (Engeström, 2015). The expansive learning process also contains nonexpansive learning actions that are often directed by the interventionists.

Nonexpansive actions can be supportive, neutral, and digressing such as clarifying or summarizing the prior sessions (Sannino et al., 2016).

Formative interventions were found effective in facilitating systemic change in large organizations (e.g., hospitals and factories) and social movements (e.g., co-management of natural resources; Haapasaari & Kerosuo, 2015; Sannino, Daniels, & Gutiérrez, 2009; Sannino et al., 2016; Virkkunen & Newnham, 2013). For example, a formative intervention called *Change Laboratory* was conducted at the University of Helsinki Central Campus Library (Engeström et al., 2013). The inner contradiction was that the library services had become irrelevant for researchers whose use of services had been decreased significantly due to the digitization of information and Web-based tools of data storing, searching, and dissemination. Through eight sessions, the interventionists worked with the staff and the representatives of four research groups and transformed the services and organization of the library. Change Laboratory members expanded the existing object—an individual researcher's request for publications. The expanded object was a long-term partnership with a research group needing support in managing data, publishing, and following the global flow of publications. This new object required a new organization. The interventionists suggested the concept of knotworking that served as a germ cell for the new kind of library services. The concept was appropriated by members, who then designed a new organization chart to be implemented for actualizing knotworking among librarians and between librarians and research teams. The analysis of expansive learning actions showed that six of the seven expansive actions transpired throughout the process (questioning, analyzing, modeling, examining, implementing, and reflecting on the process) and three nonexpansive learning actions (informing, clarifying, and summarizing; Engeström et al., 2013).

The theory of expansive learning has been increasingly used in education in the United States. A majority of those studies focused on teacher education and PD workshops. Researchers retrospectively used Engeström's (1987, 2015) theory as a heuristic tool to interpret their teacher education or PD programs from a systemic analytical perspective. For example, Yamagata-Lynch and Haudenschild (2009) interviewed teachers and administrators before and after a university-district led PD workshop to examine educators' perceptions of the PD workshop and how the workshop affected their practice. The authors identified that teachers perceived that there was a conflict between their motivation and goals for participating in PD and those of the school district and universities. The authors concluded that this conflict became an obstacle for teachers to change their classroom practices (Yamagata-Lynch & Haudenschild, 2009). In a recent study, Turner Christensen, Kackar-Cam, Fulmer, and Trucano (2017) used the theory of expansive learning to analyze the process of how teacher leaders built a professional learning community and changed their perceptions, roles, and goals through a 2-year PD program. The authors stated that in the project,

they "positioned teacher leaders as change agents, but leaders did not initially feel agentic. It was only through the dialectical process described here that leaders resolved some tensions and transformed the original object" (Turner et al., p. 35). Those studies have important contributions to the literature. They provided critical evidence about the utility of the theory of expansive learning for systemic analyses in education. However, the interventionist stance of the theory of expansive learning has yet to be fully utilized in the United States. To our knowledge, this is the first formative intervention study in U.S. schools (Bal, 2011, 2018).

Research Questions

We examined the work of Learning Lab at MLK High School in the 2013–2014 academic year. The method of analysis of expansive learning actions was used to conduct a full-scale analysis of a formative intervention (Engeström et al., 2013). We analyzed how Learning Lab members expanded the object of the discipline system and designed a culturally responsive system around the expanded object. We answered the following questions:

Research Question 1: What learning actions emerged in the MLK Learning Lab?
1.1 Which actions are identified as expansive learning actions?
1.2 What are the frequencies of expansive learning actions?
1.3 Which actions are identified as nonexpansive learning actions?
1.4 What are the frequencies of nonexpansive learning actions?
Research Question 2: How did Learning Lab members design the culturally responsive (CR) school discipline system through expansive learning actions?

Method

We conducted a qualitative case study on how expansive learning emerged in the Learning Lab at MLK High School. To conduct a rigorous, trustworthy study, we followed the commonly accepted quality indicators for qualitative research (evidentiary adequacy, immersion data triangulation, member check, ecological validity; Ashing-Giwa 2005; Brantlinger, Jimenez, Klingner, Pugach, & Richardson, 2005) and culturally responsive experimental intervention research (Bal & Trainor, 2016). Multiple data generation methods (participant observation, interview, and video and artifact analysis) were used. Learning Lab members actively participated in all phases of the study from inception to dissemination.

The Study

The present study is part of a statewide, mixed-methods research project, the Culturally Responsive Positive Behavioral Interventions and Supports (CRPBIS) project. The CRPBIS project was founded in the state

of Wisconsin in close collaboration with Wisconsin Department of Public Instruction (WDPI), two school districts, and local civic organizations (e.g., Centro Hispano) between 2012 and 2015. WDPI funded the project. The goal of the project was to examine the extent of disproportionality in behavioral outcomes and build school communities' capacities to address disproportionality by remediating discipline systems to be culturally responsive (for more information about CRPBIS, see Bal, 2018). Wisconsin has provided an important context for this work. It was identified as one of the worst states for nondominant youth in terms of educational and life outcomes (Wisconsin Council on Children and Families, 2014).

In the first phase of the CRPBIS project, the research team conducted descriptive and multilevel logistic regression analyses to examine the extent of disproportionality using the state's entire student- and school-level data. The analyses showed African American students were seven times and Native American and Latino students were two times more likely to receive exclusionary discipline (Bal et al., 2017). Consistent with the goal of the project to inform and transform practice, the CRPBIS team shared the results with local education agencies and practitioners and developed two interactive data maps: *the map of risk* and *the map of opportunities*. These maps have important practical use for educators, students, and families to examine the evidence about their respective school and gain new insights from the distribution of disproportionality as well as available resources in their community (http://www.crpbis.org/).

In the second phase, the research team moved to local schools that reproduced these disparities. The literature on racial disproportionality lacks intervention studies (Cavendish et al., 2014). We chose PBIS as a lever to address this gap and implemented Learning Labs at three schools (one elementary, one middle, and one high school) experiencing disproportionality. The moral purpose of the Learning Lab was participatory social justice (Bal, 2012). Participatory social justice is about developing tools and processes for minoritized communities' equal access and influence on decision-making activities in institutions and social movements. Learning Labs had a clear goal to change the structure of schools so that students from minoritized communities would have equitable opportunities and outcomes (Banks & Banks, 2009). An additional elementary school served as a comparison site where we studied the work of the PBIS team without Learning Lab. Three schools formed and sustained Learning Labs and engaged in root cause analyses (Bal, Kozleski, Schrader, Rodriguez, & Pelton, 2014). Two of them were able to design new systems. In this study, we analyzed how Learning Lab worked at the high school site.

Setting

MLK High School was invited to participate in the study based on the following criteria: (1) increasing cultural, linguistic, and economic diversity within

the school, (2) an ongoing PBIS implementation, (3) experiencing racial disproportionality in behavioral outcomes (e.g., office discipline referrals, suspension, expulsion, and emotional disturbance [ED] identification), and (4) school administrators' desire to transform the discipline system and increase family-school collaboration. MLK is located in a midsize Midwestern city that has been consistently ranked among one of the top places to live in the United States. The neighborhood where MLK is located was originally settled in the late 1800s and is within walking distance of a large, state university, several major hospitals, as well as the downtown business district. The neighborhood has historically attracted university and government workers and business people as long-time residents. It is considered one of the city's most desirable neighborhoods. MLK is often touted as the city's finest high school. Many students at MLK are from outside of the neighborhood. Approximately 86% of neighborhood population is White. Yet, the student population is noticeably different.

During the 2013–2014 school year, the total student population was 2,035, composed of 55.3% White, 13.5 % African American, 15.5% Latino, 9.2% Asian, 6.1% two or more races, and less than 1% Native-American or Pacific Islander students (WDPI, 2017). Thirty-five percent of students were from low-income families eligible for free or reduced-priced lunch, 11.4% were identified as English language learners, and 16.1% received special education services (WDPI, 2017). There were significant racial disparities. African American students made up 13.5% of the total student population. Yet they were the recipients of 60% of the suspensions. Since the early 2000s, the state of Wisconsin has promoted PBIS as the primary approach for addressing behavioral issues and school discipline. The district leadership identified MLK as the site leading the PBIS implementation in the district. MLK had a working PBIS team that had been implementing PBIS for 5 years. However, PBIS has not addressed racial disproportionality neither in the state nor at MLK. The school leadership was concerned about the stark disparities in school discipline. They decided to bring Learning Lab to MLK.

Participants

Learning Lab comprised 14 members (10 female and 4 male). Two administrators: Rosa, assistant principal (White, female) and Emily, dean of students and internal PBIS coach (White, female). Five teachers: Harriet, language teacher (Hmong American, female); Donyell, multicultural education coordinator and basketball coach (African American, male); Edwin, special education teacher (White, male); Belinda, physical education teacher (White, female); and Ruby, history teacher (White, female). Five parents, two of whom had worked in afterschool programs as paraprofessionals at MLK: Alana, parent (African American, female); Gisella, parent and Boys and Girls Club representative (African American, female); Gloria, parent

(Latina, female); Tony (Hmong American, male); and Yolanda, parent and tutor (White, female). One student: Grant (Latino, male) who graduated from MLK in Spring 2013 and was attending a local community college as a freshman. One community representative: Susanna, the director of an organization serving the city's Latino community (Latina, female).

The research team included the following members: Brian, a male faculty member of color in the area of special education from a local university, and Minah, a White, female master's student receiving her teaching certification in special education. Brian and Minah facilitated the Learning Lab meetings. Since the beginning, Learning Lab was strategically implemented as a part of school's everyday life as organically as possible. The research team sought to obtain commitment and active involvement from administrators throughout. For one year before implementation, Brian worked closely with the assistant principal, PBIS coach, as well as with the district leadership in order to adopt Learning Lab to the local school context. This included tailoring study design, logistics (e.g., meeting place, food, and interpreters), and recruitment. Minah completed her student teaching at MLK, so she immersed herself in the setting as a practicum teacher and researcher. She participated in school's PBIS meetings before and during Learning Lab. Four research team members worked on data collection: One male African American master's student, one female master's student from Indonesia, one male master's student from Turkey, and one male doctoral student from Turkey. The team members worked as visual ethnographers and participant observers and were also responsible for arranging food, transportation, childcare, and data collection equipment.

Sessions began in September 2013 and ended in May 2014. Members met 11 times (see Table 1 for the date, purpose, and participants of each session). The first three meetings took place at a public library and a community center located in a working-class neighborhood where a majority of students of color lived. Brian, Rosa, and Emily wanted to take the participants outside of the existing power structure to increase members' comfort as they engaged in forming the group and questioning the school's existing system and racial disparities. At the fourth meeting, Learning Lab moved to MLK to be close to the "shop floor" where members wanted transformation to happen (Engeström, 2008).

Data Sources

In order to understand the institutional context and maintain immersion, the research team conducted participant observations of the school's PBIS committee meetings, met with the staff, and conducted observations and interviews in the prior academic year before Learning Lab meetings began. This continuous engagement provided opportunities to determine how Learning Lab would fit with the school's needs, align with its existing

Table 1
Learning Lab Sessions and Participants (Fall 2013–Spring 2014)

Meeting	Date	Purpose of the Session	Rs	Te	Pa	Sp	St	T
LL #1	09/30	Introduction the project and data sharing	5	3	4	4		16
LL #2	10/23	Description of LL and sharing expectation and goals	5	1	3	4		13
LL #3	11/25	Focusing on membership and disproportionality data	4	3	3	3		13
LL #4	01/13	Reviewing disciplinary data and disproportionality discussion	5	1	4	4	1	15
LL #5	02/04	Mapping out behavior support system	5	2	2	4	1	14
LL #6	02/25	Mapping out behavior support system	5	2	3	4	1	15
LL #7	03/25	Creating and developing new behavior support model	5	2	3	3	1	14
SubCom #1	04/01	Developing new behavior support model based on small group works in LL7 (Ideal system maps)	3	1	2	1		7
LL #8	04/29	Finalizing new behavior support model	5	2	4	3		14
SubCom #2	05/14	Finalizing new behavior support model	2	1	2	1	1	7
LL #9	05/20	Reviewing and discussing new model and Learning Lab process	5	2	1	3	1	12

Note. LL = Learning Lab; Rs = Researcher; Te = Teacher; Pa = Parent; Sp = School personnel; St = student; T = Total participants in the sessions; SubCom = subcommittee meeting.

activities, and develop a reciprocal partnership. After making the initial determination to proceed with Learning Lab, Rosa and Emily met with Brian to identify Learning Lab members. A list of potential members who represented the school's racial, linguistic, and economic diversity was compiled. Preference was given to those who were historically underrepresented in the school's decision-making activities such as immigrant parents, classroom teachers, and paraprofessionals.

The composition of the PBIS team that was responsible for school's behavioral support system was considerably different than that of Learning Lab. The PBIS team included 15 school staff, all of whom were White. The photo on the left in Figure 1 shows a PBIS team meeting from Spring 2013. The composition of the PBIS team was similar to other PBIS teams across the United States that often lack diverse representation: Students and families—specifically those from nondominant racial backgrounds—are not given opportunities to participate in decision-making activities (Bal, Sullivan, & Harper, 2014). In contrast, the photo on the right shows diverse composition of Learning Lab (from left to right; three educators, one student, and two parents). Learning Lab did not replace the PBIS team; rather, it provided a space for an inquiry-based reflection and collaboration beyond the scope of the PBIS team. We recruited four PBIS team members who participated in both the PBIS team and Learning Lab: Assistant Principal (Rosa), PBIS coach (Emily), and two teachers (Ruby and Belinda). This helped to establish an active link between the PBIS team and Learning Lab.

We generated 95.5 hours of data through 11 sessions (23.5 hours), 14 PBIS meetings (41.5 hours), entry, follow-up, and exit interviews (12 hours), and agenda meetings and school observations (18.5 hours). In this study, we analyzed the video recordings of the sessions. The length of the sessions varied between 90 and 180 minutes. There were 3,692 speaking turns.

Data Analysis

Four research team members analyzed the data. We employed the method of analysis of expansive learning actions to study expansion of the object (Engeström et al., 2013). Analyzing the evolution of the expanded object served as a basis for reaching a deeper understanding of otherwise fragmented pieces of data related to the collective knowledge production process and the design of a new system to make what is conceptual (cultural responsiveness) operational (Kaptelinin, 2005). We conducted the analysis by categorizing data according to three levels of data nodes: (1) expansive and nonexpansive learning actions, (2) subtypes of expansive learning actions, and (3) speaking turns.

Each learning action was identified based on (1) discerning the conversational episodes based on their substantive contents (2) analyzing the speaking turns within each episode in terms of actions and formulating

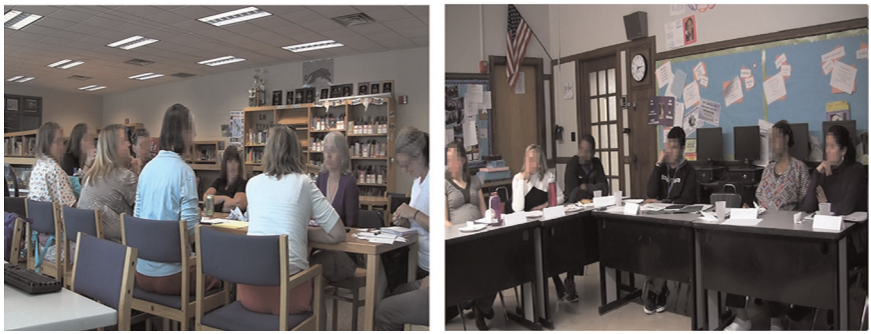

Figure 1. **Left: A school PBIS team meeting (08/06/2013). Right: Members in Learning Lab #4 (1/13/2014).**

a preliminary description of the actions, and (3) specifying the epistemic function of each action. At the first level, we distinguished expansive and nonexpansive learning actions in the transcripts. We defined expansive learning actions as new types of learning that emerged as members worked on developmental transformation. The data were analyzed using NVivo 10. We set raw definitions of each expansive action in NVivo 10 and then continuously revised these definitions. For example, *modeling* involved modifying the existing system by collectively drafting a design and generating ideas to improve the new model. We examined the contents and epistemic functions of the actions that were not coded as expansive to identify nonexpansive actions. We identified nonexpansive actions inductively and named them descriptively based on their content (e.g., session summaries and directing/redirecting) without a theoretical categorization (Engeström et al., 2013). Technicalities and off-topic conversations were excluded.

All four analysts individually coded session transcripts. We identified expansive and nonexpansive actions and collectively coded transcripts of all sessions in NVivo after an interrater reliability was established. While engaging in the first level analysis, we generated ideas about the subtypes for the second level analysis. At the second level, we analyzed the data within each expansive action to identify subcategories of expansive actions. At the third level of analysis, we used speaking turns. A speaking turn is the moment when one person finishes speaking and another person begins speaking. Using speaking turns provided a tool to identify the frequencies of each expansive action and locate where subcategories occurred. Below we present the results.

Results

This study examined the expansion of MLK High School's discipline system through Learning Lab. The school was going through a major transformation regarding its increasing diversity in student population and the implementation of PBIS. The inner contradiction that MLK High School faced was racial disproportionality in school discipline that had persisted even after the implementation of PBIS. Through Learning Lab, members shared their experiences and perspectives; created a collective consciousness toward marginalizing institutional practices, social climate, and outcome disparities; engaged in historical and empirical root cause analyses; made their existing system visible; and developed locally meaningful systemic solutions to address the racialization of school discipline. The results revealed a complex yet effective process of cultural re-mediation and a discursive movement from individual acts, concerns, and perspectives toward collective agency.

Types and Frequency of Learning Actions

To answer the first research question, we analyzed the types and frequencies of expansive and nonexpansive learning actions. We found that the expansive learning process occurred through a cycle of six expansive learning actions: (1) Questioning, (2) analyzing the discipline system in place, (3) modeling a CR discipline system, (4) examining the CR system, (5) implementation planning, and (6) reflecting on the Learning Lab process and the new system (Figure 2). The frequency and evolution of expansive learning actions are presented in Figure 3. For all speaking turns and corresponding expansive learning actions, see Appendix A online. [EQ] As seen, expansive actions took place over the course of multiple sessions, for example questioning began in the first Learning Lab session (Learning Lab #1) and continued but decreased over time until Learning Lab #8. Analyzing was the most frequent expansive learning action with a total of 105 instances that peaked at 26 occurrences in Learning Lab #5.

Expansive actions included 26 subtypes. Table 2 shows all subtypes of expansive learning actions placed into their respective sessions. As seen, analyzing had the widest variety of subtypes (n = 6). During six consecutive sessions, the majority of time was spent on the analyzing action (51% of all expansive actions). Then, through modeling and examining, members began to fully develop the new object. Reflecting and implementing were the least frequent expansive actions. This is likely due to the fact that as the school year drew to a close, members were just beginning planning for implementation of the CR system.

Table 3 provides a detailed analysis of expansive and nonexpansive actions. The number of expansive learning actions was considered alongside speaking turns to understand what occurred both during each session as well

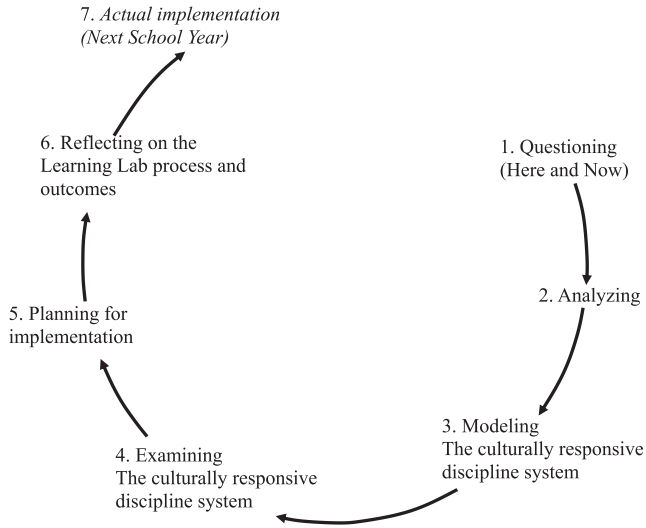

Figure 2. **Cycle of systemic transformation at the MLK High School Learning Lab (Adopted from Engestrom, 1987).**

as within each expansive learning action. For example, in Learning Lab #1, a total of 17 incidents of expansive actions (14 questioning and three analyzing) took place, and in Learning Lab #8, a total of seven incidents (two analyzing and five modeling) occured. This did not mean members gradually engaged in fewer expansive actions. Rather, members' actions became progressively more focused as they moved from expressing their individual perspectives to forming collective agency. They engaged in collective knowledge production and problem solving that led to the creation of the CR system.

Our analysis confirmed an important feature of expansive learning in formative interventions that the expansive learning actions take place intermingled with nonexpansive actions, some supportive, some neutral, and some deviating (Engeström et al., 2013; Sannino et al., 2016). In the Learning Lab, six nonexpansive actions were identified. Informing and directing/redirecting were the most frequent nonexpansive actions, occurring 52 and 40 times respectively. Informing involved presentation of a topic (e.g., the school-level behavior outcome data) prepared for participants. In directing/redirecting, interventionists led members to keep the group on task avoiding off-topic conversations or repetitions and moving forward to the next topic on the agenda. As Table 3 shows, the occurrence of informing was high at the first four sessions (10, 4, 8, and 8 respectively). Its frequency decreased starting with the fifth session as members moved from informational presentations to collective work on the discipline system. In this

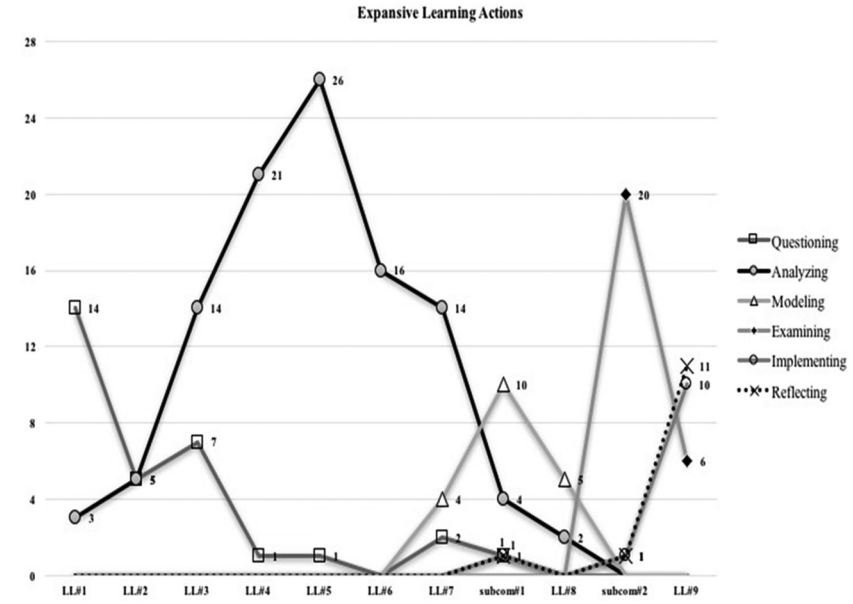

Figure 3. **Frequencies of expansive learning actions in MLK Learning Lab.**

article, we focused on expansive actions. The role of nonexpansive actions is an area for future investigation that may provide a deeper understanding of the relationship between interventionists and members and diversions from interventionists' intentions (Engeström, 2008).

Expansive Learning in a Cycle of Change

To answer the second research question, we examined how members expanded the object of their activity system and designed the CR discipline system through expansive learning actions. In a cyclical movement ascending from the abstract to the concrete, Learning Lab members (the subject) co-constructed MLK's discipline system and expanded it as a culturally responsive system. The inner contradiction, racial disproportionality, was the main motive for members. This inner contradiction manifested itself as a severe double-bind for teachers, families, students, and administrators, "a social, *societally essential dilemma which cannot be resolved through separate individual actions alone – but in which joint co-operative actions can push a historically new form of activity into emergence*" (Engeström, 1987, p. 165, italics in the original). The research team's hypothesis was that the entire discipline system reproduces

Table 2
Subtypes of Expansive Learning Actions in the Learning Lab

Questioning
Q1: Questioning the school's existing behavioral support system
Q2: Questioning disproportionality in school
Q3: Questioning school's social climate
Q4: Questioning school's academic, curricular practices
Q5: Questioning LL process, procedures, composition, and outcomes
Analyzing
A1: Analyzing historical-genetic
A2: Analyzing actual-empirical
A3: Analytical summary
A4: Identifying problems and the manifestations of the contradiction
A5: Identifying, weighing, and rejecting alternative solutions
A6: Mapping out the existing behavior support system
Modeling
M1: Drafting the initial design of the new improved model
M2: Generating new ideas regarding the new improved model
M3: Operationalizing the different components of the new model
M4: Discussing the new model critically
Examining the improved model
E1: Enriching the new model
E2: Running, operating, and experimenting on the new model
E3: Discussing support resources, practices, and strengths
E4: Engaging in reality check
Implementing
I1: Demonstrating implementation
I2: Analyzing constraints and strengths within school
I3: Preparing and planning for the implementation
I4: Discussing actions and considerations to execute the new model
Reflecting on the process
R1: Comments about the LL process and compositions
R2: Comments on LL outcomes
R3: Review of the overall LL process

Note. Q = questioning; A = analyzing; M = modeling; E = examining; I = implementing; R = reflecting; LL = Learning Lab.

disproportionality — not individual students or educators—and that the school needed a new object and a corresponding new system.

The object of the existing school discipline system at MLK—indeed the entire existence of the MLK discipline system—depended on identifying and disciplining a disturbing student. A punishing and exclusionary discipline system had been organized around that object. Cultural responsiveness was introduced by the research team as a new concept to capture the need and motive of

Table 3

Types and Frequency of Expansive and Nonexpansive Learning Actions in Learning Lab Sessions

Expansive Learning Actions	LL#1	LL#2	LL#3	LL#4	LL#5	LL#6	LL#7	Subcom#1	LL#8	Subcom#2	LL#9	Total
Questioning	14	5	7	1	1	0	2	1	0	0	0	31
Analyzing	3	5	14	21	26	16	14	4	2	0	0	105
Modeling	0	0	0	0	0	0	4	10	5	0	0	19
Examining	0	0	0	0	0	0	0	0	0	20	6	26
Implementing	0	0	0	0	0	0	0	1	0	1	10	12
Reflecting on the process	0	0	0	0	0	0	0	1	0	1	11	13
TOTAL	17	10	21	22	27	16	20	17	7	22	27	206
Nonexpansive Learning Actions	LL#1	LL#2	LL#3	LL#4	LL#5	LL#6	LL#7	subcom#1	LL#8	subcom#2	LL#9	Total
Informing/Introduction	10	4	8	8	3	3	5	3	3	2	3	52
Icebreakers	1	1	1	1	1	1	1	0	1	0	1	9
Clarifying	0	0	2	1	0	0	1	0	0	0	0	4
Summarizing	0	1	1	1	0	0	1	0	1	2	0	7
Directing/redirecting	0	2	6	5	4	6	2	9	2	0	4	40
Planning for the future LL	2	1	2	3	3	1	1	2	1	1	0	17
TOTAL	13	9	20	19	11	11	11	14	8	5	8	129
All Learning Actions	LL#1	LL#2	LL#3	LL#4	LL#5	LL#6	LL#7	subcom#1	LL#8	subcom#2	LL#9	Total
TOTAL	30	19	41	41	38	27	31	31	15	27	35	335

Note. LL = Learning Lab; SubCom = Subcommittee.

the new system. The concept of cultural responsiveness functioned as a germ cell to collectively imagine new ways of working. Through an expansive learning process, the prior object was expanded from discrete disturbing acts of a single student to the whole school context. Designed to mediate future actions related to preventing and managing behavioral issues and provide support to both adults and students at MLK, the new system materialized cultural responsiveness. Below, we present how this process transpired through six expansive learning actions.

Questioning

Questioning was the first expansive learning action that emerged in the cycle of change. It began with members reviewing the school's data (discipline referrals and suspensions disaggregated by race), which showed significant disproportionality at the school. Rosa and Emily presented the data for MLK.

> Rosa (assistant principal): 20% of our students are African-American. 60% of our suspensions last year went to African-American students, whereas 55% White, and only 15% of our suspensions went to White students. (Learning Lab #1)

This was the first time that the school shared the data about disproportionality directly with families and community representatives. Discussing this information in detail was new for the teacher members as well. Usually, the PBIS team had examined the data and been given only a few minutes each month to share summaries with the staff. MLK's behavioral outcome data prompted a conflict of motive about the purpose and effectiveness of the discipline system:

> Yolanda (parent/tutor): Not having any homework to do. And being allowed to use their iPod and cellphone. It was a complete waste of their time and mind.
> Emily (PBIS coach/dean of students): There was a data point that talked about how much instructional time students were missing. This isn't included in there. (Learning Lab #1)

Members found out the extent of racial disproportionality might be even worse because the data that the school had collected did not include detention. Detention referrals were not entered into the data management software. Parents were not notified. There was little communication among teachers, detention staff, and assistant principals about detention.

Members also shared their experiences of social climate and negative attitudes toward students of color as seen in the opening extract. Emily gave an account of one instance when a teacher attempted to humiliate an African American student:

> One teacher telling an African American kid. She yelled at him in class because he had spelled Lincoln incorrectly and [the teacher said] "of all the names in the world that you should know how to spell." You don't forget stuff like that. (Learning Lab #2)

This kind of violence toward African American students was a grave concern as members were developing a deeper understanding of the existing system and social climate:

> Belinda (health teacher): To me it looks like obviously there's something not working in the school for a big chunk, especially the African-American kids like obviously we need to figure out how we can reach out to them whether it is in the classroom or engage them but that's what I see when I look at all this. (Learning Lab #4)

Belinda's comment shows that the behavioral outcome data and the experiences of parents and teachers (e.g., racial disproportionality, missing instructional time, and negative social climate) served as primary stimuli that mediated a comprehensive understanding of the problem: The school system at MLK offered a disabling education context for African American students. The knowledge generated in questioning also facilitated members' active involvement and the establishment of a shared motive to change the system.

Addressing racial disproportionality was the original motive for the school leaders, who initiated Learning Lab partially due to the pressure from the district that prioritized addressing racial disparities in behavioral outcomes (Bal, Sullivan, & Harper, 2014). Through questioning, the motive became shared and stabilized. More importantly, having members from minoritized communities created a sense of urgency for systemic change. Gisella expressed this with a powerful metaphor: "MLK High School chews, chews minority kids up" (Learning Lab #2).

Questioning included a subtype called questioning the Learning Lab process, procedures, composition, and outcomes (Table 2). This action involved reflecting on the composition of the members as well as conflicts of motives. For example, after analyzing qualitative and quantitative data on racial disproportionality, Ruby, history teacher, stated the need to increase representation of African American parents in Learning Lab:

> I don't think we have a strong enough representation of our African-American parents. ... To me it's obvious that we don't have that representation. I think especially since that's the major group that we're talking about. (Learning Lab #3)

In agreement with Ruby, Learning Lab members identified potential members to invite during and after the Learning Lab session. The intervention

team approached an African American parent (Alana) and two students of color—an African American student and a Latino student (Grant) who graduated from MLK in 2013. Alana and Grant were recruited. The African American student could not participate in the study due to his schedule. New members joined Learning Lab at the fourth session. Alana and Grant brought valuable experiences and expertise.

Questioning was a vital action that stimulated members' increasing critical awareness toward the inner contradiction and ownership of Learning Lab. Through questioning, members co-constructed the contradiction at MLK from multiple perspectives.

Analyzing

Analyzing was the lengthiest expansive action that started in the first session, peaked at the fourth session, and continued until the last session (Figure 3). In analyzing, members engaged in a root cause analysis of the inner contradiction and began generating different solutions. Analyzing started with *mapping out the discipline system*. The discipline system at MLK had never been charted before Learning Lab. Mapping involved analyzing how a behavioral problem was defined and managed. The purpose of this action was to create a mediating artifact to reveal the object and the organizational structure of the discipline system (e.g., rules, division of labor, artifacts) step by step. Facilitators used a nonexpansive action, directing/redirecting, to begin the mapping process and to prompt a systemic analysis:

> Brian (facilitator): Let's talk about how you handle behavioral issues. Start with the classroom level. What happens?
> Alana (parent): So the kid comes in and is misbehaving then what happens?
> Emily (PBIS coach/dean of students): The first step is we've said every teacher handles every situation in their class. (Learning Lab #4)

The system mapping was completed during the fourth session. The PBIS coach and the assistant principal volunteered to finalize the map prior to the next session. They created a graphic organizer (a flow chart) starting with how a behavioral incident in the classroom should be handled and showing the alternative actions within the ideal structure of the existing system. The research team printed out an enlarged map. Emily and Rosa presented the first draft of the system map in the next meeting. The analysis of the institutional context and the map of the discipline system revealed breakdowns:

> Emily (PBIS coach/dean of students): The student leaves class, they're either in detention, principal's office, or maybe they've just left and we don't know where they are and we're trying to locate them. After the principal has addressed them it might just end.

Brian (facilitator): Do you inform teachers about those actions?
Rosa (assistant principal): There is a breakdown in the system right there. A lot of times they [teachers] don't know. (Learning Lab #5)

Members worked through the conflicts that arose as they analyzed the system in a critical dialogue. Administrators were not defensive. They took a collective problem-solving stance to unearth and address those conflicts:

Emily (PBIS coach/dean of students): We could also say that it's mandated. The expectation is that it gets written, but the reality. … The other issue is that for some of these kids it's a daily occurrence, right? Does the teacher write the student up every day? Sometimes I think again out of lots of reasons they may not write it up every time.
Grant (student): Let's say the teacher writes them every day. After five days, I think someone should look and say, "Well, I think this kid needs more attention than he's getting."
Emily: Right. And it comes up to the surface a little higher. I did put an asterisk here, and the asterisk says that places that we see breakdown of system so we know that this is one of those issues that's a problem, but it's there. If we're looking at the system, that's the kind of what we've got right now. (Learning Lab #5)

These instances are indicators of the emergence of collective agency. Through taking the system as the unit of analysis and making the system visible, members were united and started to move beyond their individual perspectives and interests. Accordingly, in the fifth session, analyzing actions peaked with 26 actions (Figure 3).

In the sixth session, facilitators formed small groups and asked them to discuss the object and purpose of the existing system, identify problems, and brainstorm changes considering the entire system. Each group recorded their thoughts on sticky notes that were placed on one collective map at the front of the room. The following are the ideas generated by two groups:

Small Group 1 (health teacher, parent, and PBIS coach/dean of students): More professional development or training for staff on classroom managed behaviors and relationship building. Maybe some teacher mentoring—just working on teachers being, having more strategies. We thought for the detention room to have a different model that it's not really working how it is so maybe more of a restorative justice model.

Small Group 2 (assistant principal, parent, student, and researcher): Parents could get a robot-call or anything, some notification even if it wasn't all the detail but something that would at least help create a feedback loop between parent and student and parent and school doesn't seem like there's much of that at this point. (Learning Lab #6)

The analyses and ideas from the small groups were used as A: the second stimuli (Figure 4). As analyzing actions advanced, an urgency to develop a new system began to emerge. Teachers stated that the existing system was not helping them keep students in the classroom. The system allowed teachers to send students out of the classroom without using any alternative behavioral support and classroom management strategies. There were also no further follow-up actions to repair strained teacher-student relationships or to adequately address the needs of students and teachers for preventing future incidents. The daily conflicts or dilemmas were identified as coupled with the fact that the overrepresentation of nondominant students had detrimental consequences including missing instructional time and impairing the student-teacher-school bond. As the urgency for systemic change built up, members continued generating discrete solutions:

> Grant (student): I mean MLK works with university or college to bring in more student teachers and have like one student teacher for each classroom maybe. (Learning Lab #7)

But those discrete ideas were yet to be organized systematically and strategically.

> Alana (parent): In my mind, how it looks is like parent involvement piece, teachers and cultural part, cultural sensitivity training or whatever it is, those are the three components that I see being what needs to be worked on, but I don't know how that can be worked on systematically. (Subcommittee #1)

On the surface, the analyzing actions seem more technical and race-free compared with the ones in questioning that revealed race-related conflicts, dilemmas, and double-binds. This may be due to the fact that in analysis, members focused on the system. And systems are often perceived as technical and dull (Bowker & Star, 2000). Edwin identified a related turning point:

> It seemed like there wasn't a lot of talk about racial issues once we got past the first two or three meetings. Like about the last three or four meetings were just really focusing on students and making this thing work. (Learning Lab #9)

Members agreed that their collective work moved from questioning on the surface of manifestations to analyzing the racialized infrastructure in the school. From a historical-materialist perspective, we conceptualized racism as an everyday event that cannot be understood solely focusing on the manifestations of contradictions. Therefore, race and racism should be understood through deep and meticulous inquiry of the systemic infrastructure to answer such questions as who benefits from the system, who makes decisions, and whose knowledge and perspectives are privileged (Gramsci, 1989; Lefebvre,

1988; Leonardo, 2009). Collective mapping was the key action in that move from the surface to root cause analysis. Facilitators directed members to reflect critically on two questions: *Who is the existing system for?* and *what is the goal of the existing system?* As a result, the race-conscious analyses did not disappear, but they took a systemic form such as the broken "feedback loop" between school and minoritized families:

> Donyell (multicultural education coordinator/basketball coach): This has been something that I've had on my plate and my agenda since the day I started: It's how do we get more parents of color involved here? How do we get their voice heard here? ... In the most part, when there's a problem, you see the parent and but you know we can't just see them when there's a problem, when there's an issue that arises and a kid is on the verge of being suspended, a parent come in not happy about the kid being suspended. We have to have three moves prior to that with the parent or you know some type of contact ongoing something with parents. (Learning Lab #7)

Donyell highlighted a hegemonic relationship of school with parents of color and suggested the communication with parents should be established early and regularly. Overall, analyzing served as a function of problem identification and generated actionable knowledge. In the next expansive action, modeling, MLK Learning Lab moved from problem identification to problem solving and assembled the solutions systematically.

Modeling

In modeling, members focused on designing a new model of system that was responsive to everyday functions and experiences of their school community. Members worked in dyads and were asked to create an ideal discipline system. The dyads were formed to bring together members with diverse roles, for example pairing an administrator with a parent. Facilitators encouraged members to think outside of the box without considering practicality.

Dyads presented the sketches of their ideal systems. For example, Harriet and Gloria in a teacher-parent dyad presented their ideal system including the operations for maintaining accurate and timely documentation of behavioral incidents and continuous information flow between parents and school. They suggested that when a student is sent out of class, the documentation of the incident should be written by the end of the day. The parents of the student should be promptly informed. Regarding the conflict resolution process that lacked in the old system as teachers indicated in questioning, Harriet and Gloria suggested dissolving the detention room and repurposing it as a space for mindfulness practices. In the same academic year, the district offered mindfulness training to teachers to reduce "stress and improve their health and teaching practices" (Document

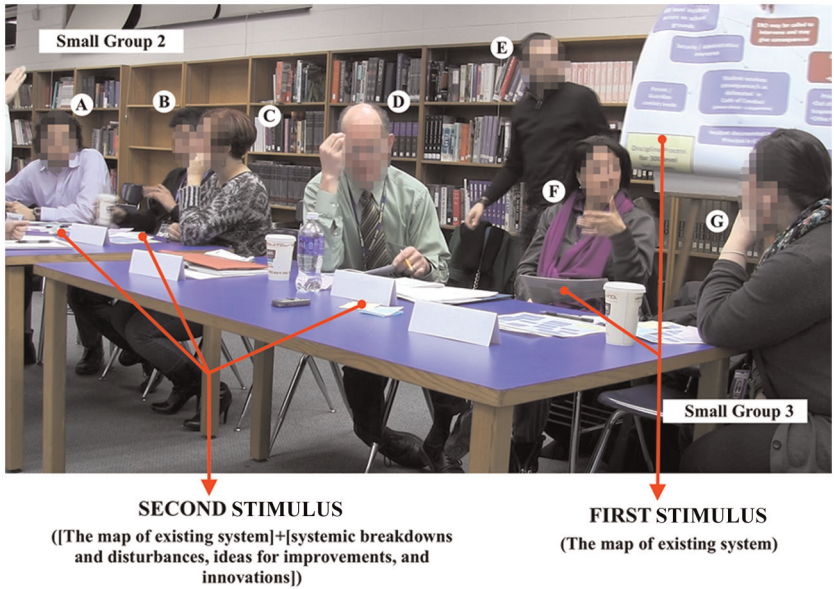

Figure 4. **Members working with small groups on modeling and examining processes in Learning Lab #6 (02/25/2014). A: Brian (facilitator), B: Grant (student), C: Gisella (MLK parent/Boys and Girls Club Representative), D: Edwin (special education teacher), E: Jesse (researcher), F: Gloria (parent), G: Harriet (teacher)**

Analysis). Harriet and Gloria proposed tapping into that district-wide initiative. They expanded Grant's earlier suggestion regarding using student volunteers from the local university as a potential resource:

> Harriet and Gloria: We thought a cute name would be the mindfulness zone instead of detention room. Students that are sent out of class they will go to the mindfulness zone. Ideally this will be staffed with an adult. We were also thinking it would be great to have adult university student volunteers, counseling volunteers, or even retired teachers to be in there and have the students go through this process of reflecting. (Learning Lab #7)

The name "mindfulness zone" was not ultimately used, but the actions this dyad proposed were adopted as a core component in the final version of the CR system. After the dyads presented their ideal models, a subcommittee was formed to create a unified model. Two parents (Gloria and Alana) and two staff (Emily and Edwin) volunteered to draft the unified CR model.

The subcommittee suggested for the CR system to be effectively implemented, the school needed to provide continuous professional learning opportunities for all adults at MLK:

> Gloria (parent): I can be trained for multicultural education and all that but then we have guards that have these stereotypes. My son was stopped just because his hands were in his pockets. He was really upset and I could understand why he would just snap and say "You know what's wrong with you?" Because he wasn't carrying a weapon or anything like that. … They [students of color] already feel being attacked and this place is supposed to feel like a safe environment and so security people need to also be trained to be culturally sensitive. (Subcommittee #1)

Gloria's experience and the following discussions informed the CR system. Two pillars of the CR system included actions to restore school climate through continuous professional learning opportunities for cultural responsiveness: classroom management and family-school collaboration. This is another indicator of the importance of having inclusive problem-solving teams and sustaining equal access and power in schoolwide teams. The subcommittee created the first version of the CR model with the following innovations: (1) informing students about school resources to prevent behavioral issues, (2) initiating immediate communication with parents and staff when a behavioral incident occurs, (3) transforming the detention room to a restorative justice room, and (4) restoring relationships between adults and students to prevent future problems.

In the next session, the whole group worked together to refine the CR system. The four big ideas became the pillars to keep the new system adaptive, innovative, and responsive. Members operationalized the components of the new system and coordinated their work with the existing initiatives and resources in the school, district, and the larger community. In the same year, the district was revising the behavioral education program (BEP) with a goal to replace exclusionary discipline with a restorative justice approach. Restorative justice emphasizes peacemaking and community healing rather than punishment and uses victim-offender conferences (circles) for conflict resolution and restoring relationships (Singleton & Linton, 2005). The district involved administrators in creating the new BEP. Rosa had participated in this process and informed Learning Lab about these meetings about the new BEP. In the CR model, the practices in the detention room that had already been identified as punitive and ineffective were replaced with restorative practices. Making restorative justice an institutionalized practice, however, required much more than a name change of the detention room. Members operationalized the rules, division of labor, and logistics for incorporating restorative justice in their new system:

> Rosa (assistant principal): One piece of information I got was that to help in the restorative justice process there's always the university students doing service hours that might be a resource to tap out. (Learning Lab #8)

This illustrates how Learning Lab created a space for individuals from multiple activity systems to serve as boundary crossing agents that cross-pollinate ideas between activity systems (e.g., school and district). In the next expansive action, members worked on examining the CR model.

Examining

Examining involved members operating with the newly designed system to fully grasp its dynamics, potentials, and limitations. A majority of examining actions took place at the second subcommittee meeting (Figure 3). The subcommittee examined the new model using various imaginary disciplinary incidents. Facilitators supported the examining process by providing imaginary situations wherein participants would assume another role (e.g., a teacher assuming the role of parent) and check the system. Gloria identified a potential conflict of motive with the new system regarding the amount of time it would take for parents to be notified:

> Rosa (assistant principal): I think it should be somebody, it can be the secretary that makes the phone call, and just say, "So and so, your son, was sent out of class, or he walked out of class, security is unable to locate him, we're just calling you to notify you."
> Emily (dean of students/PBIS coach): So we thought that maybe the following hour we make the phone call. Second hour the kid walked out, the third hour we check, if they don't show up at that point, that could be part of the system.
> Rosa (assistant principal): I would rather almost do it right away. (Subcommittee #2)

Emily and Rosa continued to discuss this particular dilemma and generate solutions building off each other's ideas and experiences. Discursively, members clearly acted as a united group. Gloria invited Grant as a former student to share his perspectives about this issue:

> Gloria (parent): What do you think, Grant? Whether you have to make the phone call to your parents and let them know that you misbehaved or did something wrong in the class. Do you think the students would be able to do that?
> Grant (student): If I were, no. I wouldn't do it. And I'm responsible. But I wouldn't want my parents to know something bad I did.
> Harriet (language arts teacher): So, then mandatory phone call home?
> Grant: We can have both, if you think about it. If you just make a call to the parent that kid gets sent out without being explicit, saying why, what time, when, that's when the parent will be like, asks his son or daughter what happened and then that's when the student gets involved and says, "Oh, this is what

> happened." And then he's probably going to do something "that's not fair" or something but obviously, the parents going to at least know or is going to be on the side of the teacher. And if that parent wants to know more obviously, he or she can call back to the administration. (Subcommittee #2)

Grant's point of view regarding the planned operations informed the design. The CR model now included a practice of informing parents about each step of the process and communication among educators and families via timely phone calls. Practical challenges such as updating parents' phone numbers regularly, who would be responsible for making phone calls, and the limitations of existing software that they had for collecting discipline data including detention referrals were also examined.

Members finalized the CR model (see Figure 5 for a simplified illustration). In the CR system, if a behavioral issue cannot be resolved in the classroom and a student ends up in the restorative justice room, a prewritten message is sent to a student's guardian. After a restorative justice process, the teacher who writes the referral follows up with the student in order to restore the adult-student relationship. Members also planned future actions for implementation such as presenting the system to the school staff.

Implementing

In planning for implementation, assistant principal shared how new staffing structure in the following year could support implementation:

> Rosa: Sounds like we're gonna have two full time deans and a PBS coach full time. Those three people can do some of that calling home. There has to be a bringing back of the student and teacher before they come back into classroom. That has to happen because if kids go back, the teacher doesn't know what happened to the kid. That's where I can see the dean or the PBS coach really helping to facilitate that. (Learning Lab #9)

Additional support staff that would be joining the school the following year could carry some of the operations in the CR system. Members also discussed how to introduce the system to the school. Rosa anticipated that buy-in among administrators and staff would be high due to the diverse representation and ground-up process of collective systemic design in the Learning Lab:

> Rosa: The voices that we have on this team, I mean parents, former students, are so helpful. … I want to give the staff and really framing this as one step to the solution to our out of control hallways, behavior problems, disproportionality. … This wasn't something Rosa and Emily made up. This was something that took nine meetings of a lot of different stakeholders. (Learning Lab #9)

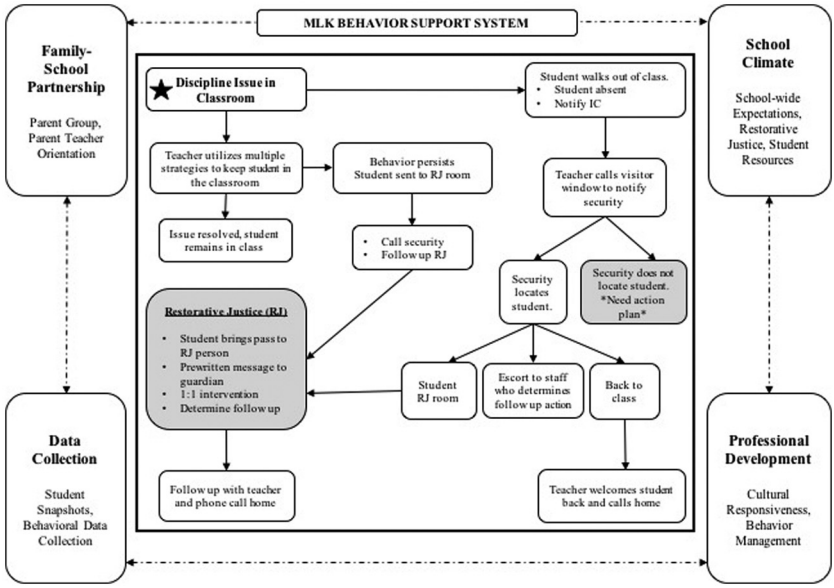

Figure 5. **The MLK High School culturally responsive behavior support system.**

Rosa recommended that in addition to the school leadership, the PBIS team should be well versed in the new system. Yet, Rosa was worried that it might not be easy to present the new system to all teachers who were already overwhelmed by multiple initiatives. Rather, she suggested working only with the administrators on planning implementation. Gloria rejected Rosa's idea on the grounds of the importance of working with all teachers from the very beginning:

> Gloria (parent): It might look like a lot of work for the teachers at that moment. If the teachers are fed up with some discipline problems. If they work really hard in the beginning and put some time into that, it'll change the culture.
> Rosa (assistant principal): I agree. (Learning Lab #9)

Two intended outcomes of formative interventions are the emergence of a critical dialogue and collective agency (Engeström et al., 2013). This exchange indicates the existence of critical dialogue. Gloria played an important role in the implementation plan. When initially forming Learning Lab, Rosa had invited Gloria as a representative of Latino parents. Later, members learned she had a graduate degree in education. Moreover, Gloria and her husband ran a nonprofit organization that built health centers in South America. Gloria's expertise was a vital resource that illustrates the generative notion of inclusive problem-solving teams that can utilize the

funds of knowledge that students, families, and community members bring into school when their equal power and participation are maintained (Moll, Amanti, Neff, & Gonzalez, 1992).

Reflecting

Reflecting was the final expansive action. During the last session, on May 20, 2014, facilitators presented a summary of the entire Learning Lab process, artifacts (the system maps), and the CR model that had been created. In the first session, members had been asked to identify their hopes and fears related to Learning Lab on September 30, 2013. In the last session, members compared their initial hopes and fears with their actual experiences. In addition, the research team conducted exit interviews to collect members' reflections. Reflecting is important as it helps forming an institutional memory about an inclusive and productive problem-solving team. Members highlighted Learning Lab's success in creating a new participatory process:

> Grant (student): We did something, you know. A sense of accomplishment. And then another thing is how for example we brought all sorts of parties to the table, so like admins or like parents and students and they all have different views or like problems that they see and how they should be fixed, even though it might not be the real solution. …They just bring just that one piece of information that can be crucial to what we are trying to accomplish. (Exit Interview)

Grant saw the CR system as a collective achievement that was a result of members' contributions of diverse perspectives. Similarly, Rosa, assistant principal, and Es, a Hmong refugee parent, explained how including multiple stakeholders allowed collective renovation of the system:

> Rosa: I would love the idea of having all different stakeholders at the table and now really is the time … to get that PBS team more diverse and getting community people, parents, students. (Learning Lab #9)
>
> Es: I graduated from MLK, my kids graduated from there, and I think this is the first time I heard about having a group with teachers, parents, and administrators get together to talk about what we should do to improve or keep the kids in school. (Exit Interview)

With reflection, Learning Lab members completed their task. They finalized the CR system and developed an implementation plan for rolling it out in the following year.

Discussion

Today educators find themselves in a severe double-bind: They need to address deepening disparities in opportunities and outcomes while

experiencing limited power, resources, and processes to critically reflect on their practice and collaborate, experiment, and innovate with other practitioners, community members, and researchers. Over the past two decades, schoolwide multitiered support programs such as PBIS emerged as solutions to academic and behavioral outcome disparities. However, PBIS and the other systemic interventions have not been able to solve the racial disparities. These programs use schoolwide teams to increase standardization, control, individual accountability, and improve effectiveness. The decision-making teams often exclude students, families, and community members, especially those from historically marginalized communities. This article presents the findings from a formative intervention that aimed to facilitate democratic participation in a school's decision-making activities and form a critical, productive, and sustained family-school-community-university collaboration at a high school. The study showed the potential power of Learning Lab that united families, educators, students, community members, and researchers to analyze disproportionality and design a culturally responsive schoolwide behavioral support model. Below, we discuss the findings and implications.

Expansive Learning at MLK High School

The education research literature lacks studies on *how* collective knowledge production and institutional change occur (Turner et al., 2017; Virkkunen & Newnam, 2013). We examined how Learning Lab worked at MLK High School through the method of analysis of expansive learning actions (Engeström et al., 2013). Our analysis revealed a complex yet effective process of cultural re-mediation and a movement from individual perspectives toward collective agency. Local stakeholders brought diverse experiences, interests, and goals, created a critical consciousness of marginalizing institutional practices and designed a locally meaningful behavioral support model for systemic transformation.

Freire (2000) recommended that a transformative learning process start in establishing a *here and now*, which "constitutes the situation within which learners are submerged, from which they emerge, and in which they intervene. Only by starting from this situation—which determines their perception of it—can they begin to move" (p. 171). Establishing a here and now may create a collective consciousness among stakeholders toward the object of their activity system in a specific space-time (Hegel, 2003). Facilitating a critical understanding of the existing social order is also a key principle of culturally relevant pedagogy (Ladson-Billings, 1995). We utilized this principle. Learning Lab members reviewed the behavioral outcome data and shared their experiences with the discipline system, social climate, and academic practices. Those data generated by members served as first stimuli, which mediated the establishment of a collective here and now: The existing discipline system and its racialized opportunities and outcomes.

Systems are seen as static, dismal, and taken for granted; thus, they are often invisible (Bowker & Star, 2000). Learning Lab members made the discipline system visible; hence transferable. In this process, collective mapping was the most pivotal expansive action. The map of the system served as a first stimulus that mediated members' acts in the design of a new model for the discipline system they needed to transform (Engeström, 2015). As the system became visible piece by piece, the map later served as a stabilizing artifact uniting members' diverse perspectives (Sannino et al., 2009). System maps mediated members' collective understanding and how their individual acts, experiences, and struggles were related to the same system.

Organization studies showed that moving from problem identification to problem solving is a major challenge in systemic redesign (Virkkunen & Newnam, 2013). In the CRPBIS project, the first Learning Lab established at an elementary school faced the same problem and could not develop systemic solutions (Bal et al., 2014). Consequently, the research team developed and tested the mapping-out action in the second Learning Lab site at a middle school (Bal, 2017). This action facilitated problem solving in the MLK Learning Lab. In short, Learning Labs served as innovation sites for the school communities as well as the CRPBIS team. This illustrates the generative and unpredicted function of formative interventions.

Through modeling actions, members reconceptualized the object of the new CR system not as a single individual (a disturbing student) but as a systemic process and social relationship in their everyday material practice. The object of the prior system was *a disturbing student* that held the entire system together and determined its need and function: a ceaseless effort for identifying, categorizing, and changing the disrupting student. The discipline system functioned as a machine designed to produce and manage disrupting students that in turn justified the acts of punishment and exclusion. There was also a well-established, intermediary link between the school's discipline and special education systems and their objects: "*a disturbing student*" and "*a disturbed student*," respectively. Students from minoritized communities were overrepresented in special education for behavioral disorders at MLK. The same relationship was identified in the district and the state of Wisconsin (Bal et al., 2017). In the CR model, the subject was expanded from school staff to the entire school community addressing the behavioral issues together. Therefore, rules, artifact, and division of labor were reorganized to increase communication and collaboration, coordinate resources, and build an infrastructure to support students and adults experiencing behavioral difficulties.

Cultural Responsiveness as a Germ Cell

Cultural responsiveness is a floating signifier in the field of education (Lévi-Strauss, 1987). It signifies different things to different people—from

acts of educators (e.g., greeting students in their home languages), to "celebrating" minoritized communities' holidays and to more comprehensive curricular arrangements in classrooms (e.g., Gay, 2002). The concept of cultural responsiveness can also denote the revitalization of minoritized communities' identities and languages such as culturally responsive schooling for indigenous youth (Castagno & Brayboy, 2008). As a floating signifier, cultural responsiveness is "all those things together; but is that not precisely because it is none of those things, but a simple form, or to be more accurate, a symbol in its pure state, therefore liable to take on any symbolic content" (Lévi-Strauss, 1987, p. 64). The concept enables communication and coordination between multiple subjects (e.g., educators, administrators, families, policy makers, funding agencies, publishers, technical assistance centers, and researchers). In the CRPBIS project, cultural responsiveness met the needs of the activity systems involved in the project and created a motive for collaboration. In the MLK Learning Lab, it functioned as a germ cell that gave stakeholders a shared sense of purpose and direction. The CRPBIS research team did not impose a set definition of cultural responsiveness to the MLK Learning Lab. Instead, we facilitated the solidification of cultural responsiveness by local stakeholders in their context. Step by step, they enriched and materialized and turned a fluid concept into a concrete model in response to their specific social-historical-spatial context.

Democratic Decision-Making Through Learning Lab

Diverse representation and democratic participation are the foundations of change efforts in schools (Artiles, 2011; Frattura & Capper, 2007; Fullan, 2003; Snow, 2015). Dewey (1938) asserted that scientific inquiry for democratic education should utilize and foster diversity in a school community. In this study, we deliberately fostered multivocality (Bakhtin, 2004). Stakeholders who lived and worked in the same community participated in a knowledge production activity. This is particularly salient in the field of special education that has neglected minoritized families, students, and community members as capable partners for analyzing and transforming education systems and practices (Harry, 2008). Though it is required in the special education law (IDEA, 2004), collaboration with families and students remained an elusive goal (Cavendish et al., 2014; Harry & Klingner, 2014).

In order to facilitate and sustain a reciprocal family-school-community partnership, Learning Lab crossed the boundaries between research and practice and built an equity-oriented coalition among multiple communities of practice (school, families, districts, civic organizations, and university). Learning Lab utilized members' funds of knowledge: "historically accumulated and culturally developed bodies of knowledge and skills essential for household or individual functioning and well-being" (Moll et al., 1992,

p. 133). Students and families were positioned as change agents (the subjects). Diversity was the main resource of systemic transformation. Including diverse perspectives increases the ecological validity of the intervention and the CR model (Cole, Hood, & McDermott, 1997).

Implications for Praxis

There is a *practice to research gap* in education. The central paradigm in education research is to conduct studies *about* and *for* practitioners, students, and families. The research design and outcomes are predetermined under the influence of socio-political institutions and the experiences and interests of researchers. Education research has major limitations for understanding and utilizing the complexities of everyday realties, systemic contradictions, innovations, and agency among local stakeholders. An urgent need was identified for designing equity-oriented, locally meaningful, and sustainable interventions *with* stakeholders (Donovan, 2013; Gutiérrez & Penuel, 2014; Snow, 2015).

In the past two decades, there have been significant efforts to conduct interventions with stakeholders such as design-based research (Brown & Campione, 1996). While this movement represents a paradigm expansion, it still has limitations. Zavala (2016) stated "the dominant paradigm is one that places design in the hands of learning scientists (who often work in tandem with institutional bureaucracies and large funding agencies)" (p. 237). The formative intervention methodology may address those issues such as the limited impact of participants in the design, implementation, and dissemination (Gutiérrez & Penuel, 2014; Penuel, 2014). Formative interventions may facilitate the development of adaptive and ecologically valid systemic solutions for complex and fluid contradictions that local school communities face. The present study reported on a formative intervention in which local stakeholders led an expansive learning process to re-mediate their activity systems.

Cultural re-mediation has important implications as it relates to the study of racial disparities. Within the historical materialist conceptualization of culture, we defined race as a cultural artifact signified by racism. Race has been invented, materialized, policed, and made consequential through the everyday workings of racism in education, law, urban planning, health, and finance (Alexander, 2012; Anyon, 2005; Gilmore, 2002; Hogrebe, & Tate, 2012; Lefebvre, 1988; Sampson & Winter, 2016; Soja, 2010). As an object-forming activity, racism has been a central tenet of formal schooling in the United States (Apple, 2013; Ladson-Billings & Tate, 2006; Leonardo, 2009; Valenzuela, 1999). Therefore, racial disparities in education should be examined and disrupted in the everyday workings of schools. The specific process presented in this study may be used to remediate schools as democratic institutions that foster emancipatory possibilities. In terms of generalizability, other

school communities may adopt the tools, visions, and procedures in the CR model developed by the MLK community. Moreover, practitioners may implement Learning Lab as an activity-producing activity to develop their own culturally responsive model for other systemic problems they face.

Since 2015, two additional schools have implemented Learning Labs and developed their CR behavioral support models in the district where MLK is located (Bal, 2018). Additionally, the Learning Lab methodology is being adopted in and outside of the United States with various goals. For example, a group of activists, civic organizations, state agencies, and university partners in the United States and El Salvador formed a coalition to develop a culturally responsive health promotion and rehabilitation system in Arcatao for El Salvadorans with chronic illness and disability. Finally, the present study has potential contributions to emerging formative intervention literature. Prior formative interventions have been implemented in single classrooms, schools, or after-school programs (Engeström et al., 2014; Sannino et al., 2009). Accordingly, their impacts were compact. Leveraging a federally sanctioned education program (PBIS) that is being implemented nationally and internationally may increase the generalizability of Learning Lab. Systemic change is multifaceted, messy, and often unfinished (Frattura & Capper, 2007; Fullan, 2003). We found the analysis of expansive learning actions was a useful analytical tool for understanding how an organizational transformation takes places.

Limitations and Future Research

The present study did not include data about the actual implementation of the CR system. An area of future research is examining the implementation of the new model and its impact at MLK High School. Another limitation is related to negotiation of the Learning Lab methodology between interventionists and the other Learning Lab members. This article does not include resistance and diversions between the intentions of interventionists and the actual actions of members. Examining the negotiations and orchestrations of multiple goals and interests is another area for inquiry. The CRPBIS research team is working on an analysis of the discursive manifestations of the contradiction in MLK Learning Lab that may inform the future implementations of Learning Lab and other formative interventions.

Conclusion

The racialization of school discipline or policing Black or Brown bodies is a complex and adaptive systemic problem. It requires complex and adaptive systemic solutions that are responsive to interests and everyday realities of the local school communities. Historically, nondominant communities' ways of acting, speaking, and knowing have been devalued and pathologized in the United States (APA, 2008; Erickson, 2009; Valenzuela, 1999;

West, 1998). The default mode of the formal education and other knowledge-production activities (e.g., academia or media) is maintaining dominant groups' economic, political, and ideological power and generating nondominant groups' consent (Apple, 2013; Gramsci, 1989). Schools often do not function to challenge but to reproduce the existing social order based on race, class, gender, sexual orientation, and ability differences. If schools are not intervened strategically and collectively, they are likely to reproduce similar outcomes that have been produced for centuries.

To examine and transform marginalizing education systems with local stakeholders necessitates building strategic and sustained equity-oriented coalitions among researchers, practitioners, students, families, and community members (Soja, 2010). While engaging in historical-materialist inquiries on disabling education systems, an emancipatory imagination for minoritized communities' joy and prosperity is also necessary (Freire, 2000; Giroux, 2014; Leonardo, 2009; Marx & Engels, 1998; West, 1988). Such radical-realism may challenge the impractical dichotomies in education research (e.g., human|context, individual|social, knowledge|action, and equity|efficiency). It may also go beyond acontextual technicalism as well as mental criticism that offer an endless chain of abstraction on abstraction and often result in cynicism, despair, and inaction.

Forming democratic and inclusive schools demands bold and persistent experiments in practice. Learning Lab may be instrumental in creating and sustaining inclusive knowledge-production activities, collective agency, and transformation that are culturally responsive to diverse needs, goals, and experiences of the whole school community. Learning Lab utilizes and fosters diverse perspectives, experiences, and interests—rather than forcing homogenization of multivocality for the sake of harmony that may mean silencing minoritized communities. Through Learning Lab, school communities can engage in organizational redesign and future making that embraces and in fact incorporates systemic contradictions and diversity to facilitate expansive learning and participatory social justice for all.

Notes

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Appendix A. *Speaking Turns and Corresponding Expansive Learning Actions in Learning Lab Sessions*

Turns	Actions	Turns	Actions	Turns	Actions	Turns	Actions	Turns	Actions	Turns	Actions	Turns	Actions
LL#1		69	Q2	197-207	A2	472	A5	123	A1	427-435	I2	548-583	E2
10	Q3	71	Q5	208	A3	473-477	A1	123-126	A5	436-438	R1	585-589	R2
15	Q5	73-81	Q5	211	A2	481-498	Q5	127	A3	**LL#8**		**LL#9**	
17	Q5	84-114	Q5	212	A3	499-501	A5	127-129	A1	154-194	M3	96	E2
24	Q5	133-136	A1	215-228	A6	502-503	A3	130-131	A5	196-264	M3	97-100	E3
25	Q5	137	Q5	229-236	A2	504-523	A5	132-135	A2	265	A3	101-105	E2
26	Q5/Q4	138	A4	238-245	A6	525	A3	136	A5	266	M4	106-107	I1
34	Q5	139	A1	246-259	A5	537-544	A4	137-139	Q5	268-272	M3	108-132	E2
40	Q5	150-170	A2	260	A3	**LL#6**		140-146	A4	273-301	M4	132-134	R2
42-44	Q3	171	A3	266-274	A1	85	A3	148-150	A5	302	A3	135-138	I4
46-47	Q5	174	A1	283-291	A2	86-123	A6	152-157	A5	**Subcom#2**		139-152	E3
80-85	A1	175-185	A2	**LL#5**		124	A3	162-175	M1	2	E1	153-170	E4
86	Q1	186-190	A1	183-187	A3	125-128	A1	176-178	M4	4-11	E1	171-178	I4
95-103	Q1	191	A2	188-191	A1	128-129	A3	179-181	M1	12-26	I2	179	I2
104-106	A1	192-215	A1	192	A4	156-160	A4	182-188	M4	27-99	E2	180-189	I1
107-110	A4	217-220	A2	193-199	A1	161-172	A5	**Subcom#1**		100-107	E4	191-193	I3
119	Q2	221-232	A1	200-202	A2	174-203	A4	8-48	A1	108-114	E2	194-225	I4
LL#2		233-242	A2	218-289	A6	204-217	A5	48	A3	115	E4	227-242	I3
58	Q4	243	A3	290-292	A2	219-249	A1	49-69	A5	116-134	E2	243-263	I3
66	Q5	**LL#4**		293	A6	251-255	A1	70-79	A1	135-137	E4	273	R3
89-101	Q1	76	Q1	294-301	A5	257-280	A5	81-86	M2	138-198	E2	274-281	R2
104-112	A1	77	A1	302-309	A1	281-308	A1	88-119	M2	199-206	E4	282-284	I4
113-115	A2	78-88	A4	310-335	A6	310-311	A1	121-141	M2	214-251	E2	284-289	R3
116	A1	110-113	A4	336-353	A5	312-320	A5	143-189	M2	252	E4	290	R2
117-155	A2	114	A3	354	A3	321	A1	212-275	M1	253-327	E2	291	R3
157-162	A1	122-125	A1	355-371	A5	**LL#7**		277-328	M1	328-339	E4	292	R2
166	Q5	127	A4	372-409	A6	63-65	A4	330-385	M1	340-367	E2	293	R3
168-174	Q5	128-140	A1	410-451	A4	66	A3	386-404	M1	368	E4	294-308	R1
LL#3		145	A1	452-462	A5	67-93	A5	408-419	M1	377-513	E2	309-311	R3
60-64	Q5	149-161	A1	463-466	A1	94	A3	424	M2	514-520	E3	312-348	R1
65-68	Q5	163-196	A1	467-471	A4	120-122	Q5	426	Q5	521-541	E2		

Notes. Turns: Speaking turns; LL= Learning Lab; Subcom= Sub-committee meeting; Q=Questioning; A=Analyzing, M=Modeling; E=Examining; I=Implementing; R=Reflecting on the Learning Lab process