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When Discrimination Hurts: The Longitudinal Impact of Increases in Peer Discrimination on Anxiety and Depressive Symptoms in Mexican-origin Youth

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Abstract

Life course models of the impact of discrimination on health and mental health outcomes posit that the pernicious effects of discrimination may not be immediate, but instead may become apparent at later stages in development. This study tests whether peer discrimination changes at particular transition points (i.e., transition to middle and high school) predict subsequent internalizing symptoms in Mexican-origin youth. In a sample of 674 Mexican-origin youth (50% female), this study used a latent change score framework to model changes in peer discrimination across time and to test whether changes in peer discrimination at 7th and 9th grades predicted greater depressive and anxiety symptoms in 12th grade controlling for 5th grade symptoms. Irrespective of longitudinal changes, greater peer discrimination in 5th grade predicted greater depressive and anxiety symptoms in 12th grade. Further, significant increases in peer discrimination from 7th to 8th grade and in 9th to 10th grade uniquely predicted greater anxiety symptoms in 12th grade. These findings suggest that longitudinal research on peer discrimination needs to take into account unique periods of risk. Future research implications are discussed.

Keywords

Latinx; Peer discrimination; Internalizing

Introduction

Experiences of peer racial/ethnic discrimination in late childhood and adolescence are associated with a host of negative outcomes, including greater symptoms of depression

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(Delgado, Nair, Updegraff, & Umaña-Taylor, 2017) and internalizing problems (Berkel et al., 2010). Longitudinal examinations of the link between discrimination and internalizing symptoms typically examine either covarying trajectories over time (e.g., Bellmore, Nishina, You, & Ma, 2012) or how baseline discrimination influences trajectories of internalizing symptoms (e.g., Delgado et al., 2017). Although these approaches provide important information on longitudinal patterns, they fail to capture whether changes at specific points in development (i.e., transition points) influence subsequent functioning (i.e., at the end of high school). Scholars have posited that experiences of discrimination may influence outcomes differentially across the life course, and that increases in discrimination at certain points in development may serve as "sensitive periods" predicting later functioning (Gee, Walsemann, & Brondolo, 2012). This article leverages a novel statistical technique (i.e., latent change score (LCS) framework; Castro-Schilo, Ferrer, Hernandez, & Conger, 2016) to examine whether there are specific timepoints across early to late adolescence where increases in peer discrimination have a greater impact on internalizing symptomatology in a sample of Mexican-origin youth.

Peer Discrimination and Internalizing Symptoms

Multiple socioecological models of development in youth of color have focused on the processes through which families successfully navigate the oppressive and discriminatory landscape in the United States (i.e., Garcia Coll et al., 1996). These models highlight the damaging effects of discrimination on developmental outcomes in youth of color and the critical need to understand how these experiences influence youth across development. Broadly, depressive symptoms serve as the most widely studied outcome associated with discrimination in youth, with fewer studies examining anxiety (Priest et al., 2012). Peer discrimination may be particularly harmful for youth as it serves as an interpersonal stressor that impacts developmental processes central to adolescents (e.g., ethnic-racial identity, peer acceptance, self-concept, and emerging abstract reasoning; Hughes, Watford et al., 2016). Peer discrimination encompasses direct biased mistreatment by peers due to race/ethnicity and also indirect experiences, such as hearing classmates make jokes about racial groups, contributing to a climate where youth feel devalued in schools (Douglass, Mipuri, English, & Yip, 2016). There has been variability across past studies on the aspects of peer discrimination assessed, including direct biased treatment (i.e., Niwa, Way, & Hughes, 2014) or more indirect experiences (i.e., Berkel et al., 2010). Indeed, indirect and direct peer discrimination are associated with greater depressive symptoms and anxiety symptoms in Mexican-origin youth across time. Greater peer discrimination in 5th grade was associated with more internalizing symptoms two years later (Berkel et al., 2010). Similarly, greater peer discrimination in 7th grade predicted greater depressive symptoms in 9th grade that declined over time across high school (Delgado et al., 2017). Yet, neither of these studies tested how longitudinal changes in peer discrimination influenced subsequent outcomes.

Longitudinal Studies of Peer Discrimination

The majority of research on the longitudinal trajectories of peer discrimination across early and mid-adolescence in multiethnic samples has found declines in middle school (Niwa et al., 2014; 27% Latinx), declines throughout high school (e.g., Bellmore et al., 2012; 54% Latinx) or no changes in high school (e.g., Greene et al., 2006;45% Latinx). Only one study

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has examined trajectories of peer discrimination in a solely Latinx sample, finding that the trajectories depended on neighborhood context (increases for youth living in neighborhoods with fewer Latinx co-ethnics) and nativity status (no changes for U.S. born youth vs. declines for youth born outside of the U.S. (White, Zeiders, Knight, Roosa & Tein, 2014; 100% Mexican-origin). Other studies in Latinx samples examined trajectories using global measures of discrimination (including peer discrimination) finding more variability. One study documented increases from 9th to 10th grade (i.e., Benner & Graham, 2011; 62% Mexican-origin). Other studies found no changes across 10th to 12th grades (Sirin et al., 2015; no information on country of origin), or different classes of trajectories across 9th grade to three years post high school (i.e., increasing, decreasing, and two stable; Unger, Schwartz, Huh, Soto, & Baezconde-Garbanati, 2014; no information on country of origin)). Regardless of mean level trajectories, there has been significant individual variability in trajectories such that greater levels of discrimination across time have been associated with worse depressive (Stein et al., 2016; 19% Latinx) and/or anxiety (Sirin et al., 2015) symptoms in multiethnic samples. However, no past study has examined how peer discrimination longitudinally relates to depressive and/or anxiety symptoms in a solely Latinx sample.

These disparate findings of peer discrimination trajectories are likely in part due to differences in methodology (i.e., age ranges, measurement), population (i.e., ethnic/racial makeup) and context (i.e., diversity of school, urbanity). Yet, longitudinal changes in peer discrimination appear to depend on age range, with a recent study documenting that peer discrimination increases in middle school and decreases in high school (e.g., Hughes, Del Toro, Way et al., 2016; 24% Latinx). Understanding longitudinal changes in discrimination may require modeling approaches that are able to capture change with a higher level of granularity (Benner, 2017), including testing differences across specific transitions.

Transition Points in Adolescence

School transition points have long been posited as critical periods linked to increased risk for negative outcomes in adolescence due to the convergence of changes across the individual and environment (i.e., role demands, class sizes, shifts in social networks, educational expectations, cognitive development; Barber & Olson, 2004). In particular, the mismatch of the adolescent's developmental needs for interpersonal connections and support with school environments that are inherently less personal and rife with social stress may serve to place youth at risk for internalizing symptoms across time (Eccles et al., 1993). Additionally, transitions to middle and high school are usually associated with changes in student demographics where youth are more likely to have greater exposure to other racial/ethnic peers (Aud, Fox, & Kawal Ramanim, 2010). In one study, the transition to high school was associated with increases in Latinx students' reports of discrimination, which translated to worse academic functioning (Benner & Graham, 2011; 62% Mexican-origin), and these increased reports were higher for youth in schools with greater ethnic diversity. The changes in the school context at transition points, together with shifts in cognitive processes, likely set the stage for changes in the experience of peer discrimination (Hughes, Watford, et al., 2016).

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Increases in stressful peer experiences at critical transition points may translate to longitudinal risk in internalizing symptomatology, as these experiences constitute interpersonal rejections that build over time, interact with psychobiological risk, and in turn, lead to greater symptomology (Hankin, 2015). A life course perspective on the impact of racism highlights the importance of understanding how changes in settings may serve as risks for increased exposure, and how this exposure may have psychological impacts across time (Gee et al., 2012). Specifically, it is important to understand "sensitive periods" where exposure to discrimination affects functioning at later stages in development (i.e., at the end of adolescence). For peer discrimination, changes in these experiences may be uniquely damaging over time given the intersection of peer salience and emerging identity processes (i.e., grappling with oppression and unfair treatment; Hughes, Watford, et al., 2016).

Understanding the differential impact of transition points on the development of internalizing symptoms necessitates an individual differences approach that allows modeling of both within person change at specific points in time and how those changes predict subsequent adjustment (Rudolph, Lambert, Clark, & Kurlakowsky, 2001). The current article takes advantage of a latent change score (LCS) framework that explicitly models changes across time allowing for unique change-to-outcome prediction across time (Castro-Schilo et al., 2016). In other words, an LCS can test whether there are specific increases that are more problematic or "risky" for particular psychological outcomes over time. For the current article, this allows a test of how changes at specific time points (increases or decreases in peer discrimination) relative to other time points influence subsequent anxiety and depressive symptoms later in development. This article examined how changes in the interpersonal context at key transition points influence subsequent symptomatology, to decipher whether increases overall are more harmful or there is unique harm from changes at the start of an educational experience. Increases in peer discrimination that are timed at the transition points are hypothesized to be particularly harmful, as these would be foundational for engagement in school, potentially leading youth to perceive school as an "inhibiting environment" (Garcia Coll et al., 1996).

Current Study

The transitions to middle and high school serve as key developmental milestones that are associated with increased psychosocial risk, including potential experiences with peer discrimination associated with these transitions. Building off past longitudinal work on peer discrimination predicting internalizing symptoms longitudinally, this study tests the impact of changes in discrimination at specific points in development in a Latinx sample. The current article used an LCS framework to test whether increases in peer discrimination at these educational transition points were associated with greater internalizing symptoms in 12^{th} grade.

It was hypothesized that Mexican-origin youth would experience increases in peer discrimination at both the middle school and high school transitions (i.e., 6^{th} to 7^{th} and 8^{th} to 9^{th}). In order to test the uniqueness of the timing effect, changes were examined for every grade, as has been done in previous tests of transition points (e.g., Barber & Olson, 2004). Because past work has found greater increases in discrimination in boys relative to girls

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(e.g., Benner & Graham, 2011), the analyses also tested whether biological sex affected these increases. Moreover, it was hypothesized that baseline peer discrimination would be related to more anxiety and depressive symptoms overall, and that increases at the transition to middle and high school would be associated with greater depressive and anxiety symptoms at 12th grade controlling for symptoms in 5th grade and socio-economic status and nativity.

Method

Participants and Procedures

The current article used data from the California Families Project (CFP), which was granted approval by the University of California at Davis Institutional Review Board (Protocol # 217484-21). CFP is a longitudinal study of Mexican-origin youth and their parents (N=674) that started in 2006. Children were drawn at random from rosters of students from the Sacramento and Woodland, CA, school districts (83 different elementary schools). Across the first four waves of data collection, the Sacramento school district served a high percentage of low-income students (64%–71% of students were eligible for free or reduced lunch) and a very diverse ethnic demographic (32%–36% Hispanic, 18%—21% White, 18%—21% Asian, 18%—21% African American, 5%–9% other; DataQuest, 2013). The Woodland school district also served a high percentage of low-income students (49%–63% of students were eligible for free or reduced lunch) and a diverse ethnic demographic (57%–63% Hispanic, 28%–33% White, 5% Asian, 1% African American, 3%–6% other; DataQuest, 2013). The focal child had to be in the 5th grade, of Mexican origin, and living with his or her biological mother to participate in the study. Approximately 72.6% of the eligible families agreed to participate in the study. The children (50% female) were assessed annually from 5th (*Mage* at Wave 1 = 10.86, *SD* = 0.50) through 12th grade (*Mage* at Wave 8 = 17.73, *SD* = 0.52). Data collection occurred from 2006 to 2015 for the waves in the present study. Family-level retention rates (relative to the original sample) were 85% at 6th grade, 86% at 7th grade, 89% at 8th grade, 91% at 9th grade, 89% at 10th grade, 90% at 11th grade, and 92% at 12th grade. To investigate the potential impact of attrition, individuals who did and did not participate in the 12th grade assessment on study variables assessed in the 5th grade were compared. No significant differences were found in the study variables or gender, all *p's* > .10.

Participants were interviewed in their homes in Spanish or English, depending on their preference. Interviewers were bilingual and most were of Mexican heritage. Across Waves 1 to 8, between 3.9% and 15.0% of the focal children were interviewed in Spanish. Sixty-three percent of mothers and 65% of fathers had less than a high school education (median = 9th grade for both mothers and fathers); median total household income was between $30,000 and $35,000 at Wave 1 (overall range of income = < $5,000 to > $95,000). With regard to generational status, 83.6% of mothers and 89.4% of fathers were first generation (born outside the United States), and 16.4% of mothers and 10.6% of fathers were born in the United States. Also, 28.5% of children were first generation and 71.5% were born in the United States. At Wave 1, 124 of the families were single-parent households (mothers only), and 549 of the families were two-parent households. Ninety-seven percent of youth

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transitioned to middle school in 7th grade and the high school transition occurred at 9th grade for all youth.

Measures

Peer discrimination.—Three items assessed peer global experiences of discrimination reported by youth at every wave of data collection (Johnston & Delgado, 2004), and this measure of peer discrimination has been used in other samples of Mexican-origin youth reviewed above (Delgado et al., 2017). Youth responded on a 4-point Likert-type scale (1 = *not at all true* to 4 = *very true*) on items assessing direct and indirect discrimination from peers (i.e., You have heard kids at school making jokes or saying bad things about Mexicans/Mexican-Americans; Kids at school think bad things about Mexicans/Mexican Americans; Kids at school dislike Mexicans/Mexican Americans). Coefficient alpha across waves ranged from .74 to .81.

Anxiety and depressive symptoms.—The National Institute of Mental Health (NIMH) Diagnostic Interview Schedule for Children-IV (DISC-IV) is a commonly used measure that assesses 30 different psychiatric diagnoses for children and adolescents (Shaffer, Prudence, Lucas, Dulcan, & Schwab-Stone, 2000). This measure has been validated in both English and Spanish. This study used the child reported Generalized Anxiety Disorder (GAD; 65 items/12 symptoms) diagnostic section from the Anxiety Disorders module and the Major Depression Disorder (MDD, 256 items/ 22 symptoms) portion of the Mood Disorders section from the DISC-IV. Children reported whether they had experienced a symptom within the past year (0 = no, 1 = yes). Symptom counts variables were calculated for both GAD and MDD per wave. Only child-reported symptoms were collected in this data set.

Covariates.—The analyses included education, income, and youth nativity (born in Mexico or born in the US) as control variables for the key outcomes of anxiety and depression. Mothers' and fathers' educations were reported by mothers in years of schooling (M = 9.26, SD = 3.31) and were included as the average across mothers and fathers, or only mothers when data for fathers were not available. Mothers reported family income in the first wave of data collection using a 20-point scale with $5,000 increments ($M$ = $30,000-$35,000, SD = $15,000-$20,000).

Data Analysis

A latent change score (LCS) framework was used to explicitly model changes in reported global discrimination from peers across waves of assessment (5th to 12th grades). Higher-order LCS models (Ferrer, Balluerka, & Widaman, 2008) allowed for modeling of time-specific, error-free changes that were used as predictors of subsequent psychological outcomes (e.g., Castro-Schilo, Ferrer, Hernández, & Conger, 2016). This was particularly useful for this investigation because change-to-outcome effects could vary over time. Traditional linear latent growth curve models summarize rates of change in one latent variable (i.e., slope) across all waves of measurement, whereas LCS models enable specification of rates of change from one wave to the next. The multiple change factors provide more granularity to the overall trajectory and can be used to predict future outcomes.

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To account for measurement error in the latent change factors, a measurement model for discrimination was specified at each measurement occasion. Tests of factorial invariance (Widaman & Reise, 1997) were then conducted as a preliminary step to establish that the same construct was modeled over time.

The higher-order LCS model can be written as

$$\begin{aligned} X_{(t)n} &= \tau_x + \lambda_x f_{(t)n} + e_{x(t)n}, \\ Y_{(t)n} &= \tau_y + \lambda_y f_{(t)n} + e_{y(t)n}, \text{ and} \\ W_{(t)} &= \tau_w + \lambda_w f_{(t)n} + e_{w(t)n}, \text{ with} \\ \Delta f_{(t)n} &= \mu_{\Delta(t)} + \beta \cdot f_{(t-1)n} + z_{\Delta n}, \end{aligned} \quad (1)$$

where X, Y, and W, are manifest variables for person n at time t, τ, λ, and e are the intercepts, factor loadings, and unique factor scores, respectively, for each observed variable, Δf represents change in factor f at time t, μ_Δ is the intercept of the change factors at time t, β is a coefficient representing the effect of the factor at the previous state on the change, and $z_{\Delta n}$ is the residual of latent change. Thus, the score of the latent factor f for person n at any given time t can be written as a function of its initial state plus all the changes accumulated up to time t, as

$$f_{(t)n} = f_{0n} + \left(\sum_{i=1}^{t} \Delta f_{(i)n}\right). \quad (2)$$

Figure 1 provides a path diagram for the higher-order LCS model. This figure depicts three manifest variables measured across eight occasions. For the repeated assessments, new latent variables $f_{(t)}$ are specified to facilitate the higher-order LCS parameterization. With these new latent variables, $\Delta f_{(t)n}$ are specified, which represent latent changes from one occasion to the next. Latent change factors at each occasion are influenced by the status in a previous time point and by the average trajectory. The degree to which the previous status influences changes is captured by the β coefficients. Analogous to latent growth curve models, means of change factors ($\mu_{\Delta f(t)}$) are also estimated (the mean of the higher-order level is fixed at zero for identification). The factor's longitudinal trajectory is modeled through latent, error-free changes. Outcomes of change factors and covariates can be included as depicted by the gray boxes.

Model Fit and Model Comparisons

A chi-square, χ^2, comparative fit index (CFI; Bentler 1990) and root mean square error of approximation (RMSEA; Steiger, 1990) was used to assess model fit. The χ^2 statistic is sensitive to sample size (Bollen, 1989), such that models with larger sample sizes tend to result in a significant χ^2 (interpreted as significant misfit) despite having appropriate fit to the data; thus, CFI and RMSEA estimates were assessed when considering model fit and conducting model comparisons. CFI values of .95 or greater and RMSEA values of .10 or lower are interpreted as adequate fit (MacCallum et al., 1996). With regard to model

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comparisons, a change in CFI and RMSEA of .01 or greater suggests a substantial change in model fit (Cheung & Rensvold, 2002).

Results

Descriptive Statistics and Factorial Invariance

Three items were available at each wave from 5th to 12th grade, and means varied across items and time points (item means=1.189-1.639; SD = 0.440-0.856; sample sizes=565-661). These values suggest that, overall, participants reported low levels of peer discrimination across the duration of the study. Standard recommendations for assessing longitudinal factorial invariance (Widaman & Reise, 1997) were followed. After specifying a configural invariance model – that is, one in which the same set of items over time are indicators of multiple time point peer discrimination latent variables – equality constraints were placed on the factor loadings and there was support for weak factorial invariance ($\Delta\chi^2 = 33.15$, $\Delta df = 14$, $p = .002$, ΔCFI = .003, ΔRMSEA = .000). Next, a test for strong factorial invariance was conducted by placing equality constraints on intercepts over time and found these restrictions tenable ($\Delta\chi^2 = 30.42$, $\Delta df = 14$, $p = .006$, ΔCFI = .003, ΔRMSEA = .000). Equality constraints on uniquenesses, however, resulted in large deterioration of model fit, as assessed by much larger changes in chi-square, CFI and RMSEA ($\Delta\chi^2 = 354.49$, $\Delta df = 21$, $p < .001$, ΔCFI = .058, ΔRMSEA = .018). Thus, strict factorial invariance did not hold and the strong invariance model was retained. Strong factorial invariance suggests comparable conceptualization of peer discrimination over time and enables a meaningfully assessment of longitudinal changes in this process (Widaman & Reise, 1997).

Peer Discrimination Trajectories

A higher-order LCS model was fit to these data to capture the year-to-year changes in peer discrimination. The LCS framework captures error-free changes to get a more accurate picture of the trajectories over time. The first specified model was estimated such as that portrayed in black in Figure 1 (i.e., focusing only on the longitudinal trajectories of perceived peer global discrimination). This model provided good fit to the data, $\chi^2(250) = 518.32$, CFI = .953, RMSEA = .040. This model was compared to one in which the auto-proportion parameters (the beta coefficients in Figure 1) were constrained to be equal over time, $\chi^2(256) = 534.46$, CFI = .951, RMSEA = .040, and these constraints did not affect the fit of the model substantially, $\Delta\chi^2(6) = 16.14$, ΔCFI = .002, ΔRMSEA = .000. However, comparing the model in Figure 1 to one with equal means of latent change factors over time, $\chi^2(256) = 625.31$, CFI = .935, RMSEA = .046, suggested such constraints were not tenable, $\Delta\chi^2(6) = 106.99$, ΔCFI = .016, ΔRMSEA = .006. In sum, the model comparisons suggested that peer discrimination trajectories were best characterized by the model portrayed in Figure 1 but with equal auto-proportion estimates.

Parameter estimates from the final model pointed to significant changes, on average, from 5th to 6th grade, $\mu_{\Delta f2} = -0.165$, $SE = 0.03$, $p < .001$, followed by non-significant average changes from 6th to 7th and 7th to 8th grades, $\mu_{\Delta f3} = -0.031$, $SE = 0.03$, $p = .219$ and $\mu_{\Delta f4} = 0.016$, $SE = 0.02$, $p = .483$, respectively. Thereafter, all changes were statistically significant, including those from 8th to 9th grade, $\mu_{\Delta f5} = 0.090$, $SE = 0.02$, from 9th to 10th, $\mu_{\Delta f6} =$

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−0.069, *SE* = 0.02, 10th to 11th grade, $\mu_{\Delta f7}$ = 0.091, *SE* = 0.02, and 11th to 12th grade, $\mu_{\Delta f8}$ = −0.144, *SE* = 0.02, all *p*s < .001. Importantly, there was significant variability in peer discrimination at baseline (5th grade) $\sigma^2_{f0\ =\ 0.123}$, *SE* = 0.02, *p* < .001, and also in the residual variance of latent changes, $\sigma^2_{\Delta\ =\ 0.04}$, *SE* = 0.01, *p* < .001, pointing to significant departures from the average trajectory across all time points. Furthermore, the auto-proportion coefficient was also significant, *b* = −0.15, *SE* = 0.02, *p* < .001. This effect suggests significant negative influences between status on peer discrimination on a given grade and subsequent changes in this construct. Because there are two "forces" dictating individual trajectories of peer discrimination – namely, the auto-regressive effect and the mean changes – plotting the model-predicted latent trajectories can be useful for interpreting results. These trajectories, from grades 5 to 12 for a random sample of 100 individuals (to facilitate interpretation of the plot), are shown in Figure 2.

The average trajectory in Figure 2 shows the average decreases in peer discrimination in the first year of the study, followed by two years of stability and a further increase, decrease, increase, and a final decrease during the last year. However, the individual trajectories in this plot also illustrate the departures from the average trajectory for a subset of individuals. For example, some individuals increase in peer discrimination from 5th to 6th grade, which is contrary to the average trajectory. Similar discrepancies with the average trajectory are apparent across time for some individuals, reflecting the significant variability in change over time.

To investigate whether girls and boys differ in their perceived peer global discrimination, an additional model was fit in which a binary predictor (0 = male, 1 = female) of the initial level and subsequent latent change factors of peer discrimination were included. Results from this model suggested null effects of gender on baseline (*b* = −0.08, *SE* = 0.05, *p* = .147) and changes in trajectories overtime (*b* = 0.04, −0.05, 0.03, −0.06, 0.01, 0.06, −0.01, *SE*= .0.05, 0.06, 0.05, 0.04, 0.04, 0.04, 0.04, 0.04, *p* = .147, .452, .326, .555, .160, .776, .143, .800, for changes from 5th to 6th, 6th to 7th, 7th to 8th, 8th to 9th, 9th to 10th, 10th to 11th, and 11th to 12th grade, respectively).

Outcomes of Peer Discrimination Changes

The last step in this investigation consisted of unveiling the associations of youths' patterns of change in peer discrimination with future internalizing outcomes. These analyses tested whether levels of peer discrimination at 5th grade and ensuing changes in this construct through 12th grade were predictive of anxiety and depressive symptoms at 12th grade. These analyses accounted for the effect of parental education, family income, nativity, and anxiety and depressive symptoms measured at 5th grade (see gray boxes in Figure 1). Fit indices for this model suggested good fit to these data, $\chi^2(403) = 700.49$, CFI = .951, RMSEA = .033. Regression estimates for the model are listed in Table 1. In line with the hypotheses, results suggest that baseline levels of peer discrimination at 5th grade significantly predicted anxiety, β = .26, *b* = 1.09, *SE* = 0.35, *p* < .005, and depressive symptoms, β = .25, *b* = 2.35, *SE* = 0.76, *p* < .005, 7 years later. Importantly, changes in peer discrimination between grades 7 and 8 (1 year after the transition to middle school) and grades 9 to 10 (1 year after the transition to high school) predicted future anxiety symptoms at 12th grade, β = .25 and .

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31, $b = 1.70$ and 2.07, $SE = 0.70$ and 0.73, $p < .05$ and $< .01$, respectively. Specifically, increases in peer discrimination during those years, and not at other timepoints, were associated with higher levels of anxiety symptomatology in 12th grade. In contrast, none of the latent change factors were predictive of future depressive symptoms.

It is important to note the analyses originally also attempted to include teacher discrimination. However, the distributions of the items were highly skewed and initial models either did not converge or produced non-positive definite matrices, thus leading to the focus on peer discrimination.

Discussion

Due to the negative psychological impact of peer discrimination across adolescence, research has attempted to understand the trajectories of peer discrimination in middle and high school aged youth and their relation to mental health functioning, with multiple studies supporting this longitudinal association (Benner et al., 2018). Public health models attempting to understand health inequities have argued for a life course perspective testing whether experiences of discrimination at earlier points in development may serve as sensitive periods predicting later functioning (Acevedo-Garcia et al., 2013). Similarly, transitions to middle and high school have been suggested to serve as potential risks to adolescent functioning (Barber & Olson, 2004). However, no past longitudinal study of peer discrimination has taken this approach and examined how increases at transition points (i.e., transition to middle and high school) impact subsequent mental health functioning (i.e., depressive and anxiety symptoms). To fill this gap in the literature, this article examined changes in peer discrimination across 5th to 12th grades in a Mexican-origin sample. Using a novel statistical technique (LCS), the current study was able to test whether increases in reports of peer discrimination at particular points in development (i.e., transition to middle school or high school) uniquely predicted internalizing symptom at the end of high school. Consistent with past work, peer discrimination in 5th grade predicted greater symptoms of both depression and anxiety in 12th grade, contributing to the literature on the negative impact of these experiences across adolescence (Benner et al., 2018). Further, there were significant differences in the year-to-year changes in reports of peer discrimination, supporting the need for research to consider how experiences of discrimination may change across schooling periods and the need to take a life course perspective that tests potential "sensitive periods" (Acevedo-Garcia et al., 2013). Although there was no support for the hypothesis that increases in peer discrimination immediately after the transitions to middle and high school impact subsequent functioning, increases in peer discrimination in the year *after* the transition points in schooling were uniquely predictive of greater anxiety symptoms in 12th grade, while this was not the case for depressive symptoms.

Peer Discrimination Trajectories

The average trajectory of peer discrimination from 5th to 12th grade suggested stability at the initiation of middle school and an increase at the transition to high school. Overall, this pattern of findings is opposite to what has been documented in recent work examining both schooling periods, suggesting increases in peer discrimination in middle school and

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decreases in high school (Hughes, Del Toro et al., 2016). The different set of findings across both studies could be due to statistical modeling approaches, as the Hughes et al., study did not examine each transition point independently, but instead modeled discontinuous trajectories across both time frames. Additionally, the measures of peer discrimination were different with the current measure assessing an overall sense of discrimination relative to the frequency of peer discrimination in the Hughes study. However, it may also be that the discrepant findings resulted from important differences in the samples' demographics (i.e., multi-ethnic vs. Mexican-origin), location (New York City vs. central valley CA), and schooling contexts (the timing of the transition) that potentially influence the experiences of peer discrimination (Hughes, Waterford, et al., 2016). The Hughes et al., study purposefully selected middle schools based on diversity indices which was not the case for the CFP sample as youth were recruited from two large school districts. Thus, there may have been significant differences in the ethnic/racial composition changes associated with the middle school transition across both samples, which has been shown to be important for the transition of youth of color (Benner, 2011). Finally, work done in California has generally documented increases in peer discrimination, particularly in the high school period (i.e., the current results, Benner & Graham, 2011), but work done in New York has failed to find mean level increases (i.e., Hughes, Del Toro, et al., 2016; Sirin et al., 2015; Niwa et al., 2014). Indeed, ethnic concentration in neighborhoods has been shown to influence peer discrimination trajectories (White et al., 2014) suggesting that it will be critical for future work on peer discrimination at school transitions to further consider how context plays a role in the experiences of peer discrimination.

The results align with other studies of Latinx adolescents that find increases in reported discrimination during high school (Benner & Graham, 2011), and suggest the transition to high school may bring specific risk through increases in discrimination for Latinx youth. However, this risk was not specific to either boys or girls in the current sample, whereas Benner & Graham demonstrated a difference for boys. This may be due to the measures of discrimination, as Benner & Graham did not focus just on peer discrimination and included items that may be more salient for boys (i.e., people were suspicious of you; disciplined unfairly and given detention), as there are demonstrated gendered discipline disparities for Latinx youth (Wallace, Goodkind, Wallace & Bachman, 2008). Further, the analyses controlled for nativity in our analyses, but future work should consider what other factors (i.e., language use, SES) influence peer discrimination.

Peer Discrimination and Symptomatology

Not surprisingly, and in line with a growing body of research, baseline peer discrimination predicted worse symptoms in 12^{th} grade, controlling for 5^{th} grade symptoms. As theorized in models of non-White youth child development (i.e., Garcia Coll et al., 1996), negative peer discriminatory experiences can have far-reaching consequences in development. This is one of the few studies that has longitudinally established this relation across such a large range of adolescence (5^{th} to 12^{th} grades) for both symptoms of anxiety and depression and in a solely Latinx sample (see Delgado et al., 2017 for another paper testing depressive symptoms).

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Future work should unpack the individual and contextual risk and resilience mechanisms that lead to this longitudinal association. For example, a negative perception of school climate may be an important mediator that is associated with changes in the racial/ethnic compositions of school environments and peer discrimination (Benner & Graham, 2011) and merits further research attention. Concomitant changes in discrimination and perceptions of school climate may negatively impact psychosocial and academic functioning for Latinx youth. Similarly, school attachment and ethnic-racial identity exploration in middle adolescence served to protect Mexican-origin youth from internalizing symptoms in late adolescence (White, Zeiders, & Safa, 2018), and these processes may be important sources of resilience. Further, recent work suggests that the relation between internalizing symptoms and discrimination across adolescence is bidirectional (Hou, Kim, Wang, Shen, & Orozco-Lapray, 2015), and more work should endeavor to examine how these processes relate across time, especially for depressive symptoms for which there was no evidence of timing effects.

The analyses, however, did find timing effects for symptoms of anxiety and suggests that increases in experiences of peer discrimination at specific points may be critical to understanding the longitudinal interplay of these symptoms and discrimination, albeit not occurring at the year immediately after the transition. Nevertheless, this finding falls in line with life course theories of the impact of racism and suggests that timing effects are important to test (Gee et al., 2012). Increases in peer discrimination in the years after both the middle and high school transitions were associated with greater anxiety symptoms in 12^{th} grade suggesting that it is important to consider how experiences of discrimination at these two different schooling intervals function to set up developmental pathways across the remainder of adolescence. Although the transition points did not function as the point of risk, the findings do suggest that both middle and high school may serve as a "sensitive period" where changes have longitudinal ramifications for anxiety symptoms. Overall, adolescence has been posited to serve as a "sensitive period" to social rejection due to functional and structural changes in brain development (Blakemore & Mills, 2014). Yet, there has not been a significant amount of work examining "sensitive periods" involved in experiences of discrimination. Transition changes may be particularly demanding for youth with risk for anxiety, as these youth may feel more wary of navigating the changing social landscape of their new environment. For example, teasing about ethnicity and race led to greater daily anxiety for youth with already high anxiety and also feelings of social anxiety that were evident for days after the incident (Douglass et al., 2016; 43% Latinx).

The findings of the current study suggest, however, that the risk of the transition was not immediate but that changes in the year following the transition were most detrimental. Perhaps this may be due to the fact that youth had to have some significant peer experiences within the new school context for them to characterize their peers as holding these beliefs. Consistent with this notion that it is not the immediate transition that is most detrimental, in a study by Benner and Graham (2009), the transition to high school resulted in increases in school belonging that started dissipating in the year following the transition. This suggests that interactions with peers and teachers were necessary to inform their experience of school belonging, which may operate similarly for experiences of peer discrimination.

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As youth begin to assimilate these experiences, this may lead to increases in the race-based rejection sensitivity (Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002), withdrawal from peer networks due to avoidance, and disengagement from the school environment culminating in greater symptomatology over time (Erath, Flanagan, & Bierman, 2007). Models of health disparities have also highlighted that rumination and anticipation of future discrimination exert a toxic effect on health (i.e., racial vigilance; race rejection sensitivity, Hicken, Kravitz-Wirtz, Durkee, & Jackson, 2017). Recent experimental work by Huyhn et al. (2017) with Latinx emerging adults suggests that exposure to indirect discrimination resulted in greater cortisol output in a stress task and poorer recovery, suggesting that altered stress responsivity may be involved in the continued risk for anxiety symptoms overtime. Thus, these changes may be particularly problematic for changes in anxiety symptoms and not as relevant for depressive symptoms, which have more immediate impact. Indeed, using the same measure in different samples of Latinx youth, Berkel and colleagues (2010) demonstrated increases in depressive symptoms in the following time point (2 years later), and Delgado and colleagues (2017) showed that discrimination in 7th grade impacted increases in depressive symptoms in 9th grade that then had downward trajectories. Future work should continue to examine how peer discrimination serves as risk differentially for depressive and anxiety symptoms, especially given that there is much less work examining anxiety symptoms specifically (Priest et al., 2012), and whether there are other potentially “sensitive period” for other outcomes. Further, future work should also start to identify moderators and mediators of these associations to help lead to preventive efforts.

Limitations and Implications

The current study contributes to the literature on the life course and peer discrimination through the unique examination of changes across adolescence and their relation to internalizing symptomatology, but there are significant limitations to this current study. First, the data set does not have a measure of changes in the racial/ethnic composition of the schools to test whether these changes were related to changes in reports of peer discrimination. Second, the current measure of peer discrimination was global in nature and did not capture nuanced experiences of peer discrimination that would potentially be different across gender and nationality. These potential nuanced experiences would be important to consider from an intersectional perspective. In the same vein, this measure did not capture the source of peer discrimination (i.e., other Latinx peers vs. non-Latinx white peers, see Stein et al., 2018) which may also have implications for mental health functioning. Finally, the measure included overall perceptions of peer discrimination (indirect and direct) instead of frequency of personal experiences of discrimination from peers. Thus, changes found in this study related to overall perceptions of peer discrimination and bias are not changes in frequency of personal discrimination, which would also be important to test using LCS. Yet, this measure of discrimination has been used to test developmental trajectories of discrimination in other Latinx samples between 5th and 7th grades (Berkel et al., 2010), 7th grade to post high school (Delgado et al., 2017), and 5th to 10th grades (White et al., 2014).

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Conclusion

Peer discrimination negatively impacts Latinx youth across development in multiple ways, including increasing risk for internalizing symptoms (Berkel et al., 2010). Using a life course perspective, the current study tested whether increases in peer discrimination associated with the transitions to middle and high school impacted anxiety and depressive symptoms at the end of high school. This study significantly contributes to the literature on longitudinal trajectories of peer discrimination across adolescence by leveraging a novel statistical technique that allowed for the explicit modeling of changes across time and unique change-to-outcome prediction. The study offers new insights into the understanding of the negative ramifications of peer discrimination by suggesting that increases between 7th and 10th grades predict worse anxiety symptoms across time, pointing to a potentially "sensitive period" that warrants further investigation. However, contrary to our prediction, increases in peer discrimination in the year after the transition were particularly harmful for later anxiety symptoms but not depressive symptoms. This suggests two things: 1) additional work on the impact of schooling transition examining peer interactions should further examine when the risk is most pronounced (i.e, immediately or after some time) and 2) it is important to continue to examine the unique developmental pathways through which discrimination impacts depressive and anxiety symptoms as the current finding suggests that there may be cumulative effects of peer discrimination on anxiety symptoms. Additionally, these findings highlight the importance of schools addressing issues of peer discrimination and adopting zero-tolerance policies about discrimination. Given that one of the three items focused on peers making jokes or saying bad things about Mexicans/Mexican Americans, this suggests that experiences that may be viewed as less harmful or do not involve physical threats still take a significant toll on the mental health of Mexican-origin youth and warrant intervention. Youth in general need help from adults to navigate social contexts and create peer ecologies that are supportive, and, given the findings related to peer discrimination in this article, it is clear that adults in schools need to foster supportive school cultures where all youth can thrive. In particular, it may be essential for schools to support youth in the year after the transition to new school contexts to assess their experiences of discrimination and pay special attention to interventions at these points.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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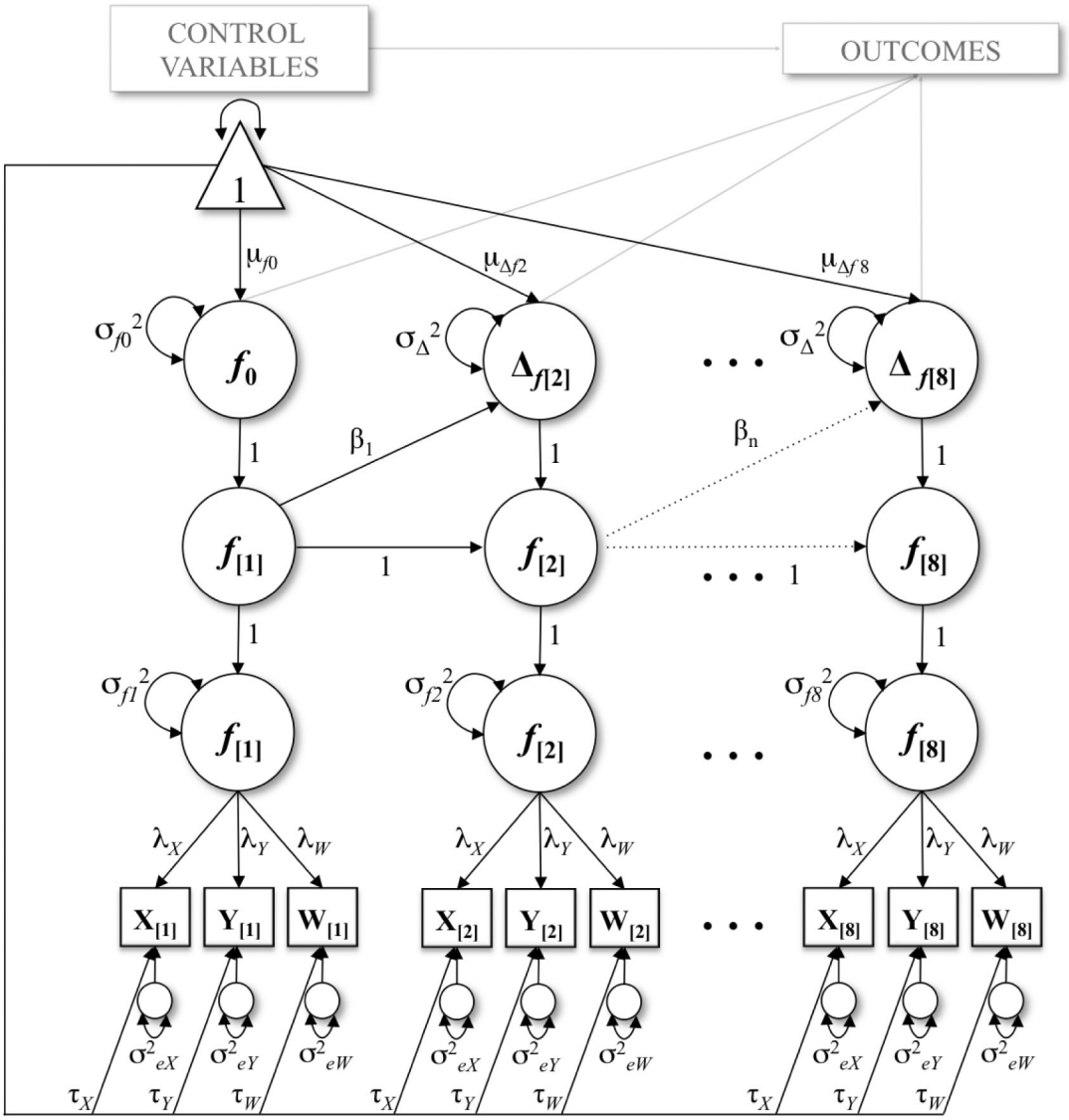

Figure 1.

Path diagram of higher-order latent change score (LCS) model across eight waves of assessment. Manifest variables are represented by squares. Latent variables are represented by circles. The triangle represents a constant to estimate means and intercepts. Although not depicted in this figure, covariances among unique factors of same manifest variables across time are estimated. Factor loadings, manifest variable intercepts, unique variances, and change factor residual variances are represented as invariant over time. Covariates and outcomes are represented as a group in the gray boxes. The second row of factors is specified to facilitate estimation of the model.

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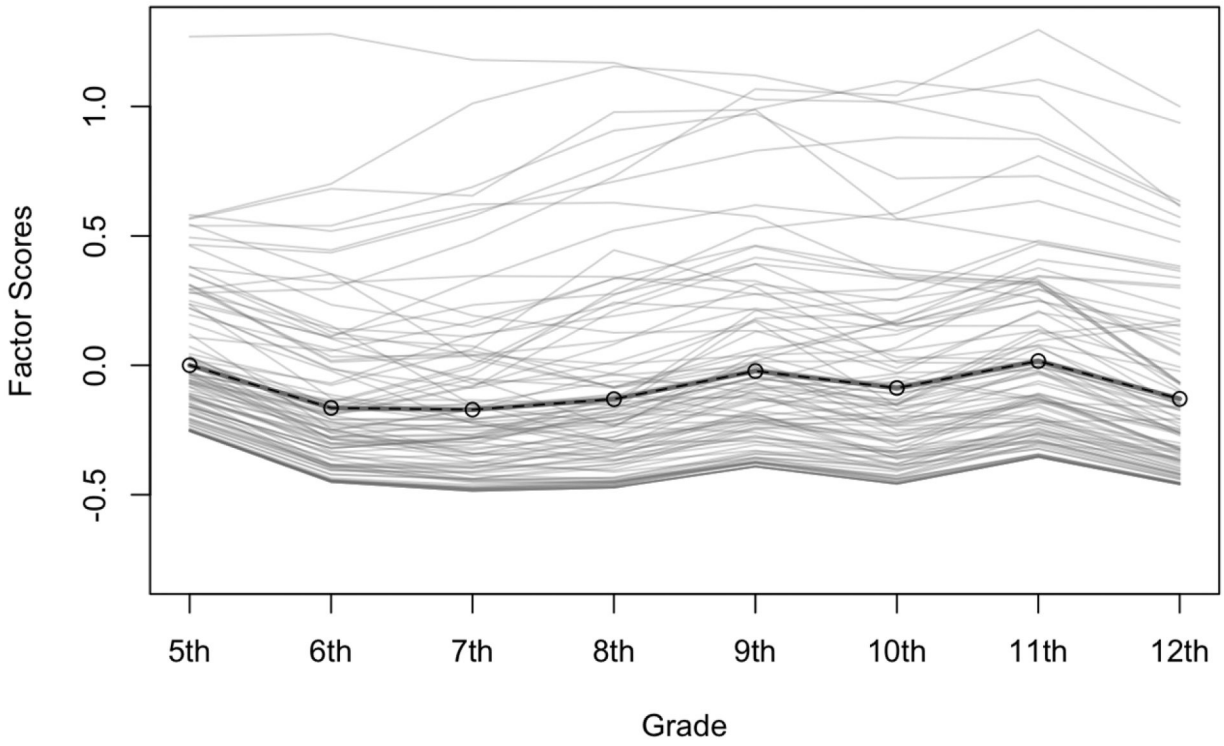

Figure 2.
Implied model trajectories of peer discrimination from 5th to 12th grades for a randomly selected sample of 100 participants. The thick dotted line represents the average model implied trajectory.

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Table 1.

Regression Estimates from Higher-Order Latent Change Score Model with Internalizing Outcomes.

Predictors of Grade 12 Anxiety Symptoms	**β**	***b***	***SE***	***z***	***p***
Baseline Grade 5	.26	1.09	0.35	3.17	.002
Changes Grade 5-6	−.17	−1.12	0.95	−1.19	.236
Changes Grade 6-7	.14	0.94	0.73	1.29	.197
Changes Grade 7-8	.25	1.70	0.70	2.42	.015
Changes Grade 8-9	.00	0.02	0.69	0.03	.973
Changes Grade 9-10	.31	2.07	0.73	2.84	.005
Changes Grade 10-11	−.16	−1.09	0.72	−1.51	.130
Changes Grade 11-12	−.07	−0.46	0.64	−0.73	.466
Anxiety Symptoms Grade 5	−.02	−0.01	0.04	−0.29	.771
Depression Symptoms Grade 5	.12	0.05	0.02	2.52	.012
Income	−.02	−0.01	0.02	−0.39	.694
Family Education	.09	0.04	0.02	1.89	.059
Nativity	−.06	−0.20	0.14	−1.40	.162
Predictors of Grade 12 Depression Symptoms					
Baseline Grade 5	.25	2.35	0.76	3.10	.002
Changes Grade 5-6	−.01	−0.09	1.99	−0.04	.966
Changes Grade 6-7	.13	1.96	1.62	1.21	.225
Changes Grade 7-8	−.03	−0.41	1.53	−0.27	.791
Changes Grade 8-9	.07	0.99	1.50	0.66	.508
Changes Grade 9-10	.18	2.71	1.54	1.76	.079
Changes Grade 10-11	−.13	−1.96	1.57	−1.25	.212
Changes Grade 11-12	−.03	−0.49	1.42	−0.34	.732
Anxiety Symptoms Grade 5	.04	0.07	0.08	0.80	.426
Depression Symptoms Grade 5	.13	0.11	0.04	2.68	.007
Income	−.03	−0.03	0.04	−0.74	.462
Family Education	.02	0.02	0.05	0.31	.754
Nativity	−.11	−0.85	0.32	−2.66	.008