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Authors

Tsai, Katherine H
López, Steve
Marvin, Sarah
et al.

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Perceptions of family criticism and warmth and their link to symptom expression in racially/ethnically diverse adolescents and young adults at clinical high risk for psychosis

Katherine H. Tsai[1,*], **Steve López**[2], **Sarah Marvin**[3], **Jamie Zinberg**[3], **Tyrone D. Cannon**[3,†], **Mary O'Brien**[3,†], and **Carrie E. Bearden**[3]

[1]Joint Doctoral Program in Clinical Psychology, San Diego State University/University of California, San Diego

[2]Department of Psychology, University of Southern California, Los Angeles, California, USA

[3]Semel Institute for Neuroscience and Human Behavior at UCLA, Los Angeles, California, USA

Abstract

Aim—Little is known about the role of expressed emotion (EE) in early symptom expression in individuals at clinical high risk (CHR) for psychosis. In patients with established schizophrenia, the effects of EE on clinical outcomes have purportedly varied across racial/ethnic groups, but this has not yet been investigated among CHR patients. Furthermore, studies have traditionally focused upon caregiver levels of EE via interview-based ratings, whereas the literature on patient perceptions of caregiver EE on psychosis symptoms is relatively limited.

Methods—Linear regression models were conducted to examine the impact of criticism and perceived warmth in the family environment, from the CHR patient's perspective, on positive and negative symptom expression in non-Latino white (NLW; $n = 38$) and Latino ($n = 11$) adolescents and young adults at CHR for developing psychosis.

Results—Analyses examining the sample as a whole demonstrated that perceived levels of maternal criticism were negatively associated with negative CHR symptomatology. Additional analyses indicated that race/ethnicity moderated the relationship between criticism/warmth and clinical symptomatology. We found evidence of a contrasting role of patient perceived criticism and warmth depending upon the patient's race/ethnicity.

Conclusion—Family processes shown to impact the course of schizophrenia among NLWs may function differently among Latino than NLW patients. These findings have important implications for the development of culturally appropriate interventions and may aid efforts to improve the effectiveness of mental health services for diverse adolescents and young adults at CHR for psychosis. Given the small sample size of this study, analyses should be replicated in a larger study before more definitive conclusions can be made.

Corresponding author: Dr Katherine H. Tsai, San Diego Joint Doctoral Program in Clinical Psychology, San Diego State University/ University of California, 6363 Alvarado Court, Suite 103, San Diego, CA 92120, USA. katsai@ucla.edu.

*Present address: University of California, Los Angeles, 1611 Franz Hall, Los Angeles, CA 90095, USA.

†Present address: Yale University, 2 Hillhouse Ave., New Haven, CT 06520, USA.

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INTRODUCTION

Schizophrenia is estimated to affect 0.72% of the population,[1] yet those with schizophrenia account for approximately 2.5% of all U.S. health care expenditures, 10% of the permanently disabled and 25% of the people who are homeless.[2] Evidence of stress as a potential precipitant to a psychotic episode has led to increased focus upon psychological and psychosocial forms of intervention.[3] Particular emphasis has been placed on the concept of expressed emotion (EE). Families with high levels of EE are characterized as high in hostility, criticism and emotional over-involvement (EOI).[4] High EE has consistently been found to be a robust predictor of relapse in patients with schizophrenia.[5] Nevertheless, rates of EE appear to vary across different racial/ethnic groups. For instance, a review of the literature suggested that high EE is less common in families from collectivistic societies that emphasize group needs and cooperation over more individualistic societies that emphasize individual desires.[6] Some evidence for this may be found in a study indicating that the frequency of high EE in non-Latino white (NLW) families was three times as high as those in Latino families.[7]

Notably, the effects of EE on clinical outcomes have also purportedly varied across groups. Rosenfarb *et al.* found that high levels of relatives' criticism and intrusive behaviours led to reduced likelihood of relapse for African American patients with schizophrenia.[8] To explain this counterintuitive finding, the authors speculated that African Americans may perceive argumentative and confrontational behaviour as a sign of communication sincerity.[9] Thus, these behaviours may be perceived as indicating care and concern from family members, leading to decreased levels of stress for African American patients. Similarly, in a sample of Mexican Americans, high EE was not associated with relapse for schizophrenia or schizoaffective disorder, whereas high EE was significantly associated with relapse rates for NLWs.[10] Researchers have proposed that although EE may be perceived as a 'critical' behaviour by NLWs, it may not be so for ethnic minorities.[11] In various ethnic minority groups, greater levels of family involvement may be normative,[12] and so EE may potentially have a more adverse impact on NLWs when compared to ethnic minorities.

A better understanding of EOI, an integral component of EE, may also provide a more accurate depiction of the complexities that exist when examining EE across cultures. Although NLWs may indeed experience higher rates of EE, Mexican Americans have conversely been found to demonstrate higher levels of EOI.[13] Furthermore, a systematic review suggests that EOI may not be uniformly detrimental across all cultures.[14] Depending upon the outcome of interest (e.g. relapse, social functioning), findings on the relationship between EOI and mental health outcomes have been mixed, with some studies indicating a positive relationship and some studies indicating a negative relationship.[14] One potential explanation for these mixed findings may be that a linear function does not best capture the relationship between EOI and mental health outcomes. Among a Mexican American sample,

a curvilinear relationship between EOI and relapse rates has been found.[15] The authors found high levels of EOI to be associated with greater risk for relapse, whereas medium levels of EOI coupled with high levels of warmth were associated with the lowest likelihood for relapse. Although certain ethnic minority group members may expect greater involvement from caregivers, it has been hypothesized that there is a point at which levels of caregiver involvement may be detrimental across all cultures.[16] Although the current study was not able to address levels of EOI, it was able to examine the relationship between perceived parental criticism and symptoms of psychosis.

López *et al.* found family criticism to be associated with a significant risk of relapse for NLW patients with schizophrenia, but not for Mexican Americans.[17] Furthermore, warmth appeared to serve as a significant protective factor for Mexican Americans, but not for NLW patients. A potential underlying factor could lie in Mexican American's levels of acceptance of the patient's condition, which may help mitigate potential ill effects of 'overinvolvement'. In a sample of Mexican American adults with schizophrenia where 71% of the patients lived with their caregiver, researchers have found that, on average, caregivers interact with patients in a manner that suggests moderately high levels of acceptance.[18] Given that prior research has mainly focused upon the contribution of criticism and hostility to poor outcomes in those with schizophrenia, additional studies jointly examining the effects of risk factors *and* positive family factors on mental health outcomes may improve our understanding of mental health outcomes for individuals struggling with psychosis.

Although previous studies provide vital information on the role of EE in relation to outcomes in patients with established illness, less is known regarding how family environment contributes to clinical outcomes in youth at clinical high risk (CHR) for psychosis. CHR refers to those who have yet to develop overt psychosis, but who are currently experiencing distressing sub-threshold psychotic-like symptoms. Intervention efforts are increasingly targeted at youth experiencing putatively prodromal symptoms, given that shorter duration of untreated psychosis has been associated with better outcomes, such as decreased symptom severity and enhanced functioning and quality of life.[19] Among existing studies investigating the role of EE in CHR youth, findings indicate that parental reports of their warmth directed towards their ill relative predict improved social functioning over time,[20] whereas high EE and patient perception of parental criticism were found to be predictive of worsening positive symptoms.[21] However, to our knowledge, no studies have yet investigated the racial/ethnic differences in the impact of family factors on symptom expression in individuals at CHR for psychosis.

Furthermore, the majority of the literature has utilized the Camberwell Family Interview (CFI),[22] which yields ratings of EE that are based upon an interview with a key relative.[22] Although the CFI is generally recognized as the gold standard measure of EE in studies of schizophrenia,[23] some research suggests that the patient's perception of the existence of EE in the family environment may also provide unique and important information in understanding outcomes for those struggling with psychosis.[11,21] Thus, it may be valuable to examine the effects of the patient's perceptions of caregiver's criticism and warmth in relation to CHR symptomatology.

The current study investigated the impact of family factors on symptom expression in NLW and Latino CHR youth. As the knowledge based upon diverse CHR patients is limited, we predicted that, in both groups, higher levels of perceived parental criticism and lower levels of parental warmth would be associated with increased positive and negative symptom severity based upon evidence from prior studies of patients with established schizophrenia.[5] However, we hypothesized that race/ethnicity would moderate the relationship between criticism/warmth and CHR symptomatology such that youth of Latino origin would demonstrate a stronger association between perceived parental warmth and CHR symptomatology and a weaker association between perceived parental criticism and CHR symptomatology compared to youth of NLW origin. It is important to note that we are not suggesting that one's relative's pattern of communication causes psychosis; rather, we believe that one's relatives' communication patterns can result in both positive and negative effects on a patient's CHR symptomatology.

METHODS

Participants and procedure

Patients for this study encompassed a subsample of 110 outpatient participants who enrolled in a longitudinal study of at-risk youth at the Staglin Music Festival Center for the Assessment and Prevention of Prodromal States (CAPPS) at the University of California, Los Angeles, from 2002 to 2008. The larger longitudinal study, which investigated adolescents and young adults identified as clinical high risk for developing psychosis, received patient referrals through mental health providers, school personnel or through self-referrals via the website for the CAPPS. Upon obtaining informed consent and/or assent for the study, patients were screened using the Structured Interview for Prodromal Syndromes (SIPS)[24] for: (i) attenuated subthreshold psychotic symptoms (attenuated positive symptom prodromal syndrome (APS)); (ii) brief intermittent psychotic symptoms (brief intermittent psychotic symptom prodromal syndrome (BIPS)); or (iii) a significant drop in social/role functioning coupled with a diagnosis of schizotypal personality disorder or the presence of a first-degree relative with a psychotic disorder (genetic risk and deterioration syndrome (GRD)).[25] Patients were identified as CHR and included in the study if they endorsed a constellation of symptoms meeting criteria for any of the three aforementioned syndromes. CHR patients were deemed ineligible if they met criteria for an Axis I schizophrenia-spectrum diagnosis as assessed for by the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision.[26] Patients were also deemed ineligible if they demonstrated the presence of a neurological disorder, drug or alcohol abuse, or dependence within the past 6 months, or full-scale IQ below 70. Full study details are described in a previous article.[27]

Participants from the larger study only completed the perceived criticism (PC) and perceived warmth (PW) scales at study entry if they had another family member involved in the study. Thus, the current analyses included the 49 individuals (NLW = 38 and Latinos = 11) who completed the PCPW and who met the criteria for a putative prodromal syndrome. 69.39% (n = 34) of the subsample were included for APS, 28.57% (n = 14) were included for BIPS and 2% (n = 1) were included for GRD. In addition, 30.61% (n = 15) of the participants in

this subsample developed psychosis during their time in the study. Of those 15 individuals, 13.3% (n = 2) converted to schizophrenia, 20.0% (n = 3) converted to schizoaffective disorder, 6.7% (n = 1) converted to schizophreniform disorder, 33.3% (n = 5) converted to mood disorder with psychotic features, and 26.7% (n = 4) converted to psychosis, not otherwise specified. Diagnoses were determined through the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision.[26] Although all patients were required to speak English, caregivers could be primarily Spanish speaking. For frequencies and means of demographic variables, see Table 1.

Measures

Self-report information included demographic variables of age, gender, race/ethnicity and education for patients and caregivers. Patient levels of positive and negative CHR symptom severity were gathered at baseline using the Structured Interview for Prodromal Syndromes (SOPS/SIPS)[24] and were rated on the scale of prodromal symptoms. The mean scores on the SIPS/SOPS subscales in the present sample appear to be comparable to those in the literature (e.g.Velthorst *et al*.[28]). For specific values, see Table 1.

Patient perceptions of parental criticism (PC; e.g. How critical is your mother of you?)[29] and warmth (PW; e.g. How warm is your father towards you?)[21] were also captured at baseline using self-report questionnaires. Hooley and Teasdale's[29] PC scale has demonstrated moderately high test–retest reliability (r = 0.75). Furthermore, the PC scale has been shown to demonstrate excellent discriminate validity and moderate convergent validity.[30] Schlosser *et al*. adapted the PC scale to address warmth, which resulted in the PW scale.[21] Each scale included two questions rated on a scale of 1–10. The two questions were added together to create the total score for the scales ranging from 1 to 20.

Statistical analysis

Preliminary analyses were conducted using the Statistical Package for the Social Sciences, version 18 (SPSS Inc., Chicago, IL, USA). The Mann–Whitney test was used to determine if there were significant differences in age and CHR symptom severity across racial/ethnic groups. Chi-squared tests were run to determine if Latino participants differed from NLW participants in their gender, maternal education and inclusion categories. Lastly, the authors examined whether there were significant differences in patient perceptions of parental criticism and warmth across racial/ethnic groups using four oneway analyses of variance.

All primary analyses controlled for patient age, patient gender and maternal education, and were conducted using Mplus version 6.[31] Focusing upon the sample as a whole, one linear regression model was conducted with patient perceptions of maternal criticism and patient perception of maternal warmth as predictors and positive CHR symptomatology as a dependent variable. A second model included the same predictors, but examined their relationship to negative CHR symptomatology. Two parallel models examined the same relationships that were investigated in these first two models, but for patient perceptions of paternal criticism and warmth.

To investigate whether the relationship between parental criticism/warmth and outcomes was moderated by racial/ethnic group, linear regression models were examined. Predictors in the first model included patient perceptions of mother's criticism, patient perceptions of mother's warmth and interaction terms (Criticism × Race/ethnicity and Warmth × Race/ethnicity). The initial outcome examined was positive CHR symptomatology. A second model including the same predictors was examined, but the outcome specified was negative CHR symptomatology. Two additional models were analysed, investigating the same relationships, but for patient perceptions of paternal criticism and warmth. To determine the direction of the relationships for each racial/ethnic group, race/ethnicity was dummy coded as NLW = 0 and Latino = 1 for the aforementioned models. If the interaction terms were significant for these models, interpretation of the conditional effects provided us with the slopes for the NLW patients. Another four models with the same relations and variables were examined, but with race/ethnicity dummy coded as NLW = 1 and Latino = 0. If the interaction terms were significant for these models, interpretation of the conditional effects provided us with the slopes for the Latino patients. Continuous variables included within the interaction terms were grand mean centred in order to reduce nonessential collinearity.

RESULTS

Preliminary analyses

There were no significant differences in age, CHR symptom severity, gender, maternal education and inclusion categories across racial/ethnic groups (see Table 1 for details). There were no significant group differences for patient perceptions of maternal warmth and paternal warmth. However, there were significant group differences in patient perceptions of both maternal and paternal criticism. Specifically, Latino CHR patients reported significantly higher levels of maternal and paternal criticism compared with NLWs (see Table 2 for details).

Parental criticism/warmth and CHR symptomatology

Positive symptomatology—Maternal education was significantly associated with positive CHR symptomatology for both maternal ($\beta = -0.427$, $P < 0.01$) and paternal ($\beta = -0.358$, $P < 0.05$) models. No other covariates were significantly associated with positive CHR symptomatology. Patient's perceptions of maternal criticism ($\beta = 0.017$, $P > 0.05$) and maternal warmth ($\beta = -0.068$, $P > 0.05$) were not significantly associated with positive CHR symptomatology. Patient's perceptions of paternal criticism ($\beta = -0.118$, $P > 0.05$) and paternal warmth ($\beta = -0.131$, $P > 0.05$) were not significantly related to positive CHR symptomatology. See Table 3 for details.

Negative symptomatology—Across all models, no covariates were significantly associated with negative CHR symptomatology. Maternal warmth ($\beta = -0.159$, $P > 0.05$) was not significantly related to negative CHR symptomatology, but maternal criticism ($\beta = -0.384$, $P < 0.05$) was significantly associated with negative CHR symptomatology. Patient's perceptions of paternal criticism ($\beta = -0.204$, $P > 0.05$) and paternal warmth ($\beta = -0.252$, $P > 0.05$) were not significantly related to negative CHR symptomatology. See Table 3 for details.

Moderating role of race/ethnicity on the relationship between parental criticism/warmth and CHR symptomatology

Positive symptomatology—When examining models with patient's perceptions of maternal criticism and warmth, with the exception of maternal education (β = −0.046, $P < 0.01$), covariates were not statistically significantly associated with positive CHR symptomatology. Racial/ethnic group did not moderate the relationship between patient's perceptions of maternal criticism (β = 0.072, $P > 0.05$) or maternal warmth (β = −0.040, $P > 0.05$) and clinician's ratings of positive CHR symptomatology.

When examining models with patient's perceptions of paternal criticism and warmth, with the exception of maternal education (β = −0.560, $P < 0.01$), covariates were not statistically significantly associated with positive CHR symptomatology. Racial/ethnic group did not moderate the relationship between patient's perceptions of paternal criticism and clinician's ratings of positive CHR symptomatology (β = −0.176, $P > 0.05$); however, the relationship between patient's report of paternal warmth and clinician's ratings of positive CHR symptomatology depended upon one's racial/ethnic group (β = −0.530, $P < 0.01$). More specifically, NLW CHR patients demonstrated a negative slope (β = −0.443), whereas Latino CHR patients demonstrated a positive slope (β = 0.493). This pattern of findings indicates that higher levels of perceived paternal warmth are associated with lower levels of positive CHR symptomatology for NLWs, but higher levels of perceived paternal warmth are associated with *higher* levels of positive CHR symptomatology for Latino CHR patients (Fig. 1). Full results are shown in Table 4.

Negative symptomatology—With the exception of maternal education (β = −0.305, $P < 0.05$), covariates were not statistically significantly associated with negative CHR symptomatology. Racial/ethnic group did not significantly moderate the relationship between patient's perceptions of maternal criticism and negative CHR symptomatology (β = 0.111, $P > 0.05$). However, racial/ethnic group significantly moderated the relationship between patient perceptions of maternal warmth (β = −0.432, $P < 0.01$) and levels of negative CHR symptomatology. More specifically, NLW CHR patients demonstrated a negative slope (β = −0.360), indicating that higher levels of perceived maternal warmth were associated with lower levels of negative symptoms for NLWs. In contrast, Latino CHR patients demonstrated a positive slope (β = 0.629), indicating that higher levels of perceived maternal warmth were associated with higher levels of negative CHR symptomatology for Latinos (Fig. 2).

With the exception of maternal education (β = 0.356, $P < 0.05$), covariates were not statistically significantly associated with negative CHR symptomatology. Racial/ethnic group also significantly moderated the relationship between patient perceptions of paternal criticism (β = −0.745, $P < 0.01$) and paternal warmth (β = −0.461, $P < 0.05$) with levels of negative CHR symptomatology. More specifically, results indicated a negative slope for paternal criticism (β = −0.436) and warmth (β = −0.366) for NLW patients, indicating that higher levels of perceived paternal criticism (Fig. 3) and higher levels of warmth (Fig. 4) were associated with lower clinician ratings of CHR symptomatology for NLWs. In contrast, there was a positive slope for both criticism (β = 0.849) and warmth (β = 0.442) for

Latinos, indicating that higher levels of perceived paternal criticism (Fig. 3) and perceived paternal warmth (Fig. 4) were associated with higher levels of negative CHR symptomatology for Latinos. Full results are shown in Table 4.

DISCUSSION

This is the first study to investigate whether one's racial/ethnic group moderated the relationship between family factors and CHR symptom expression. Consistent with our hypotheses, the data indicated that race/ethnicity moderated the relationship between criticism/warmth and clinical CHR symptomatology. Contrary to hypotheses, the nature of the moderating relationships was not as we predicted in many cases.

All linear regression models controlled for patient age, patient gender and maternal education. Across a number of the models, lower levels of maternal education were linked to higher levels of CHR symptom severity. This is consistent with literature demonstrating a negative relationship between socio-economic status and psychopathology.[32,33] However, findings from the model, which included patient perceptions of maternal criticism/warmth and negative CHR symptomatology, showed that higher levels of maternal education was associated with higher levels of symptomatology. To the authors' knowledge, no prior research has revealed this relationship in individuals at CHR for psychosis. Additional exploration of these variables in larger samples may provide helpful insight into this relationship.

Analyses examining the relationship between parental criticism/warmth and CHR symptomatology across the entire sample only yielded a significant relationship between patient perceived maternal criticism and negative CHR symptomatology, such that higher perceived levels of maternal criticism was associated with lower levels of negative CHR symptomatology. Although this contradicts previous research demonstrating a positive relationship between EE and poor outcomes in individuals with schizophrenia, many of the studies that formulate the evidence base for this relationship stems from research on adult populations (see Butzlaff and Hooley[5] for sample studies). Although this finding may be quite robust among adults, the nature of this relationship may potentially differ for a younger sample who may not have yet established independence from their parents. Moreover, although EE has been widely conceptualized as a psychosocial stressor,[34] it is also possible that evidence of criticism also denotes parental involvement or engagement in the ill relative's life. Therefore, it may be that parental criticism could also potentially simultaneously serve as a protective factor for this group of individuals. Unfortunately, this study was not able to investigate these potential mechanisms and so additional research examining these variables may improve our understanding of the relationships found in this study.

Although the authors' overarching hypothesis posited that perceived parental criticism would be associated with higher levels of positive/negative symptoms and perceived parental warmth would be associated with lower levels of positive/negative symptoms across both groups, they also proposed that the magnitude of the relationship would differ by group. However, we found evidence of a contrasting role of warmth depending upon the

patient's ethnicity. For NLWs, higher paternal warmth was associated with lower levels of positive and negative CHR symptomatology and higher maternal warmth was also linked to lower levels of negative CHR symptomatology. In contrast, among patients of Latino origin, higher paternal warmth was associated with higher levels of positive and negative CHR symptomatology and higher maternal warmth was associated with higher levels of negative CHR symptomatology. This finding is surprising in light of a previous research showing warmth to be a protective factor, especially for Mexican Americans with schizophrenia.[17]

Furthermore, we predicted that criticism would bear a stronger link with increased symptomatology among NLWs as compared with patients of Latino origin. As expected, we found that higher levels of paternal criticism were associated with higher levels of negative CHR symptomatology among Latinos. However, the reverse was true among NLW, such that, contrary to our predictions, paternal criticism was actually associated with lower levels of negative symptoms among NLWs.[17]

To summarize, the majority of findings that were consistent with our initial hypotheses were found in relation to symptom expression in NLWs. López *et al.* noted that there remains a shortage of research on the role of culture in populations struggling with schizophrenia, despite an abundance of literature indicating the myriad ways in which culture affects families and the course of schizophrenia.[17] Having based our hypotheses upon studies with predominantly NLW populations, it is not surprising that our data on NLWs converge with previous findings. However, our results suggest that these family processes may not function similarly for Latinos.

This study found that for Latino patients, parental warmth was associated with higher levels of CHR symptomatology. For Mexican Americans, past research has shown that they may experience higher levels of EOI relative to NLWs and that this EOI may be linked to higher rates of relapse.[13] Thus, given previous findings of a positive association between warmth and EOI,[17] the relationship between parental warmth and CHR symptomatology may potentially be better explained by levels of EOI. This study did not contain a measure of EOI and so was not able to examine this possibility.

A potential explanation for the discrepancy in the direction of our findings relative to previous findings for Latinos may also be due to a difference in acculturation levels. Acculturation refers to the socialization process whereby immigrants adapt to the mainstream culture in which they reside.[35] Although this study did not collect data on acculturation levels, it did require patients to be English speaking, which may indicate a higher level of acculturation compared with the previously mentioned studies that did not require this of all of their patients.[10,15] Comparatively, although Breitborde *et al.*[15] did not describe sample characteristics related to acculturation, López *et al.*[13] drew their subjects from the same sample pool and reported that caregivers were approximately two-thirds Spanish speaking and two-thirds born in Mexico. Furthermore, more than half of the patients were born in Mexico and about 40% spoke mainly Spanish. Similarly, Kopelowicz *et al.* recruited their participants from the same clinic as those in Aguilera *et al.*'s study,[36] which noted that 45% of their patients and 70% of their caregivers were born in Mexico. Previous research has indicated that with higher levels of acculturation, EE can be associated with

increased symptomatology among Mexican Americans with schizophrenia.[36] Thus, it may be possible that the results from this study are indicative of how these relationships may function with individuals who have a higher level of acculturation.

Lastly, there may be non-cultural factors that were not measured in this study that account for differences across racial/ethnic groups. Although these analyses were able to account for warmth, there may be other factors that contribute towards the positive relationship between family factors and CHR symptomatology for NLWs and the negative relationship between family factors and CHR symptomatology for Latinos. For example, literature suggests that a stable social life and normal levels of social functioning may improve a patient's odds of obtaining stable remission.[37] Further research is necessary to see whether additional factors that were not measured in this study contribute to these relationships.

Limitations

With 38 NLWs and 11 Latinos, our sample size is small. Findings may potentially be due to chance as a result of small sample size. In addition, cross-sectional data were used, which limits our ability to infer causality between these constructs. By representing these constructs as static variables, we potentially overlook the dynamic nature of family processes over time. Furthermore, the study may have potentially been strengthened through the complementary use of a more objective measure for assessing EE (e.g. CFI) in addition to the use of the PCPW. Lastly, although we were able to simultaneously enter perceived criticism and perceived warmth into each model, which allowed us to control for the other when interpreting one, we were not able to examine whether a synergistic effect of perceived criticism and warmth existed in relation to symptomatology given the small sample size. It may be that these relationships are better explained by an interaction between criticism and warmth, rather than the individual impact of each separate factor. In light of these restrictions, these analyses should be considered exploratory and interpreted with caution. Despite these limitations, the majority of our results were quite robust and add to the limited knowledge regarding cross-cultural differences among patients with prodromal schizophrenia.

CONCLUSION

This is the first study to examine family processes of minority and non-minority adolescents and young adults at CHR for psychosis. Improved mental health outcomes may be possible when individuals with schizophrenia are treated early.[19] Thus, it is important to improve our understanding of processes that transpire during this high-risk period and impact symptom trajectories in order to better inform early intervention efforts for diverse patients. The results of this study indicate that family factors such as warmth and criticism relate to symptom expression among patients with prodromal syndromes. However, findings suggest that these characteristics may have differential effects on symptomatology depending upon one's racial/ethnic background. Interventions for prodromal patients should consider the cultural meaning of characteristics such as parental warmth and criticism in tailoring appropriate treatment targets for diverse patients. This study highlights the importance of

looking at cross-cultural factors in larger samples in future studies to determine whether these findings are generalizable to other CHR samples.

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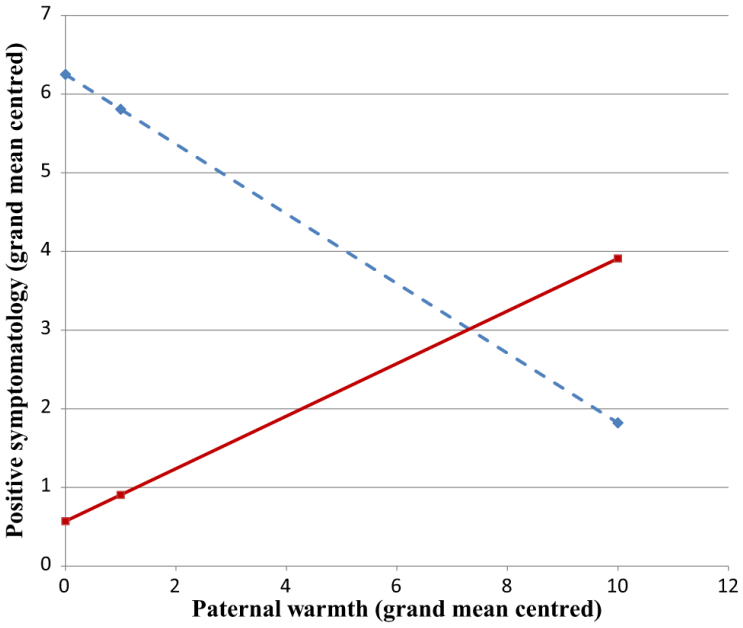

FIGURE 1.

Plot of linear regression models for paternal warmth and positive prodromal symptomatology by racial/ethnic category: non-Latino white; Latino.

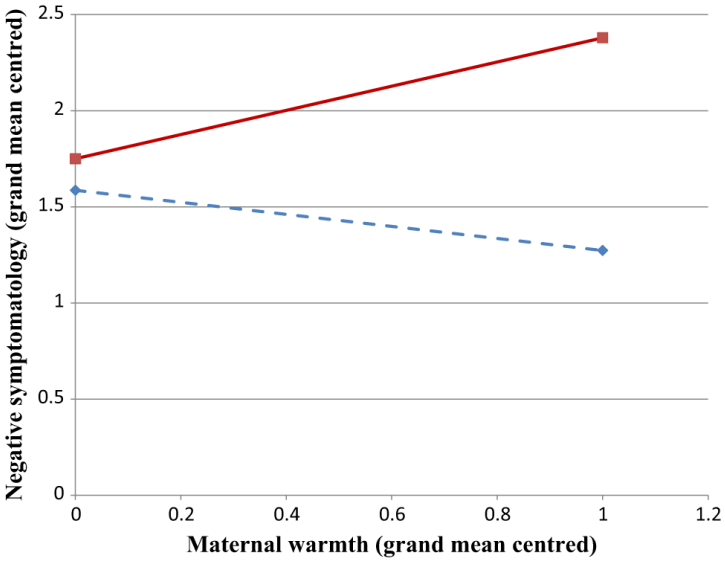

FIGURE 2.

Plot of linear regression models for maternal warmth and negative prodromal symptomatology by racial/ethnic category: non-Latino white; Latino.

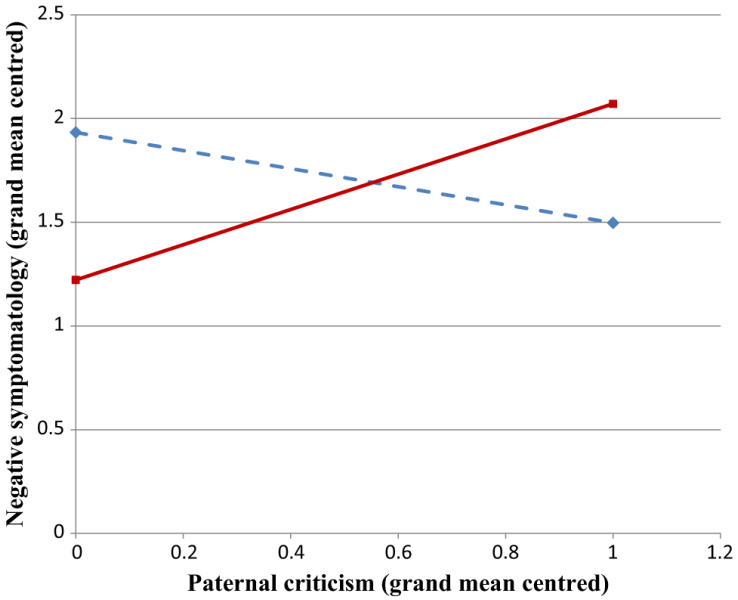

FIGURE 3.

Plot of linear regression models for paternal criticism and negative prodromal symptomatology by racial/ethnic category: non-Latino white; Latino.

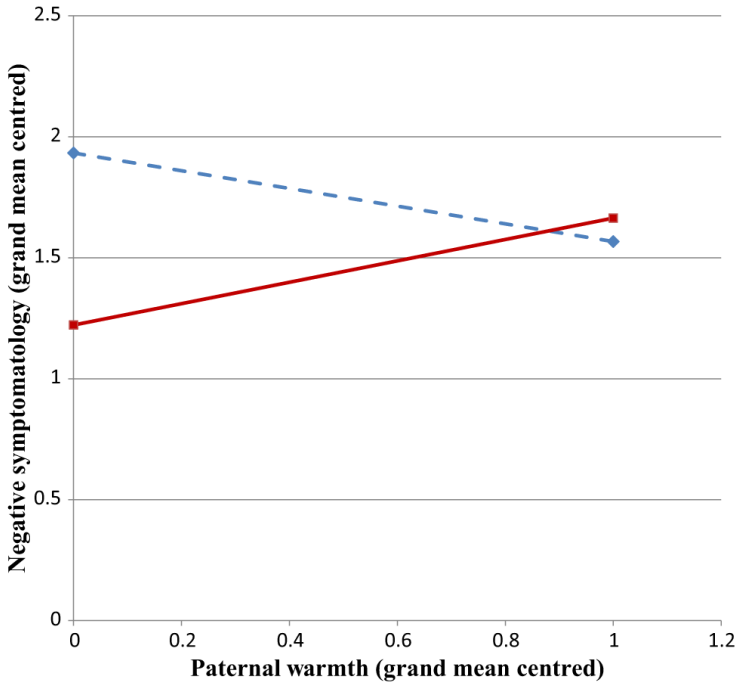

FIGURE 4.

Plot of linear regression models for paternal warmth and negative prodromal symptomatology by racial/ethnic category: non-Latino white; Latino.

TABLE 1

Statistical tests examining differences in demographic characteristics across Latinos and non-Latino whites (NLWs)

	Latino	NLW		
	Mean (SD)		*Z*-score	*P*-value[†]
Age	17.1 (2.1)	16.6 (3.3)	−1.11	0.27
CHR symptom severity				
Positive symptoms	13.3 (3.7)	13.7 (4.3)	−0.01	0.99
Negative symptoms	13.2 (7.1)	14.8 (6.9)	−0.85	0.40
Disorganized symptoms	5.2 (1.7)	7.2 (3.2)	–	–
General symptoms	8.1 (4.6)	9.9 (4.3)	–	–
	% (*n*)		χ^2	*P*-value[‡]
Gender				
Male	54.6 (6)	65.8 (25)	0.46	0.50
Maternal education				
High school degree or below	36.4 (4)	5.3 (2)	7.64	0.11
Partial college completion	27.3 (3)	31.6 (12)	–	–
Bachelors degree	18.3 (2)	15.8 (6)	–	–
Postbaccalaureate education	9.1 (1)	7.9 (3)	–	–
Graduate degree	9.1 (1)	28.9 (11)	–	–
Inclusion categories				
APS	72.7 (8)	68.4 (26)	0.32	0.85
BIPS	27.3 (3)	29.0 (11)	–	–
GRD	0.0 (0)	2.6 (1)	–	–

[†]Mann–Whitney test was used.

[‡]Chi-squared test was used.

APS, attenuated positive symptom prodromal syndrome; BIPS, brief intermittent psychotic symptom prodromal syndrome; CHR, clinical high risk; GRD, genetic risk and deterioration syndrome.

TABLE 2

Comparison of means of perceived criticism and perceived warmth by racial/ethnic group

	Mean (SD)	Range	*F*
Maternal warmth			
Latino	15.00 (5.02)	4–20	0.013
Non-Latino white	14.79 (6.77)	1–20	–
Paternal warmth			
Latino	12.90 (6.77).	2–20	0.001
Non-Latino white	12.85 (5.61)	2–20	–
Maternal criticism			
Latino	12.27 (4.52)	4–20	5.550*
Non-Latino white	8.79 (4.26)	0–18	–
Paternal criticism			
Latino	13.80 (4.83)	6–19	6.344*
Non-Latino white	9.66 (4.45)	1–18	–

*$P < 0.05$ level (two-tailed).

Scale is from 1 to 20.

SD, standard deviation.

TABLE 3

Results for linear regression models examining parental criticism/warmth and clinical high risk symptomatology

	Positive symptoms				Negative symptoms			
	Maternal		Paternal		Maternal		Paternal	
	Estimate	*P*-value	Estimate	*P*-value	Estimate	*P*-value	Estimate	*P*-value
Age	−0.192	0.157	−0.211	0.147	−0.090	0.528	−0.053	0.738
Gender	0.084	0.535	0.243	0.091	0.116	0.406	0.216	0.166
Maternal education	−0.427*	0.002	−0.358*	0.012	0.275	0.058	0.251	0.109
Racial/Ethnic	−0.172	0.243	−0.201	0.183	0.142	0.359	0.045	0.787
Perceived criticism	0.017	0.914	−0.118	0.448	−0.384*	0.011	−0.204	0.230
Perceived warmth	−0.068	0.642	−0.131	0.364	−0.159	0.286	−0.252	0.094
Intercept	5.346**	0.000	5.356**	0.000	1.874*	0.045	1.666	0.096

* $P < 0.05$ level (two-tailed);

** $P < 0.01$ level (two-tailed)

TABLE 4

β estimates and *P*-values for linear regression models examining racial/ethnic moderation

	Positive symptoms				Negative symptoms			
	Maternal		Paternal		Maternal		Paternal	
	Estimate	*P*-value	Estimate	*P*-value	Estimate	*P*-value	Estimate	*P*-value
Non-Latino whites†								
Age	−0.063	0.173	−0.219	0.090	−0.078	0.574	−0.155	0.281
Gender	0.077	0.606	0.163	0.235	0.112	0.440	0.356*	0.015
Maternal education	−0.460**	0.003	−0.560**	0.000	0.305*	0.048	0.260	0.108
Racial/Ethnic (R/E)	−0.251	0.157	−0.236	0.125	0.069	0.695	−0.305	0.100
PC	0.008	0.965	0.064	0.699	−0.360*	0.047	−0.436*	0.014
PW	−0.081	0.604	−0.443**	0.004	−0.313*	0.035	−0.366*	0.029
PC × R/E	0.072	0.762	−0.176	0.407	0.111	0.628	0.745**	0.002
PW × R/E	0.040	0.821	0.530**	0.002	0.432**	0.009	0.461*	0.018
Intercept	5.677**	0.000	6.251**	0.000	1.586	0.100	1.933*	0.044
Latinos‡								
Age	−0.189	0.173	−0.219	0.090	−0.078	0.574	−0.155	0.281
Gender	0.077	0.821	0.163	0.235	0.112	0.440	0.356*	0.015
Maternal education	−0.460**	0.003	−0.560**	0.000	0.305*	0.048	0.260	0.108
Racial/Ethnic (R/E)	0.251	0.157	0.236	0.125	−0.069	0.695	0.305	0.100
PC	0.008	0.965	−0.234	0.442	−0.360*	0.047	0.849*	0.020
PW	0.003	0.993	0.493	0.060	0.629	0.067	0.442	0.134
PC × R/E	0.072	0.762	0.234	0.407	0.111	0.628	−1.017**	0.002
PW × R/E	−0.074	0.821	−0.771**	0.002	−0.838**	0.009	−0.664*	0.017
Intercept	5.093**	0.000	5.710**	0.000	1.750	0.076	1.222	0.225

*$P < 0.05$ level (two-tailed);

**$P < 0.01$ level (two-tailed).

†Non-Latino whites = 0 and Latino = 1.

‡Latino = 0 and non-Latino whites = 1.

PC, perceived criticism; PW, perceived warmth.