The Development of Shyness from Late Childhood to Adolescence: A Longitudinal Study of

Mexican-origin Youth

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Abstract

Shyness, or the tendency to feel awkward, worried, or tense during social encounters, especially with unfamiliar people, is a highly prevalent personality trait. The present study examined the development of shyness from late childhood (age 10) through adolescence (age 16) using data from a large, longitudinal study of Mexican origin youth ($N = 674$). Additionally, we examine whether symptoms of psychopathology (i.e., anxiety & depression) at age 10 are correlated with shyness trajectories across adolescence. Anxiety and depression symptoms were assessed at age 10 using the Anxiety and Depression modules of the NIMH Diagnostic Interview Schedule for Children-IV (*DISC-IV*). The study also utilized both self- and mother-reports of shyness assessed via the Early Adolescent Temperament Questionnaire-Revised. Overall, we found a mean-level decrease in shyness from age 10 to 16, as well as seeing that anxiety and depression were associated with higher initial levels of shyness, and anxiety was associated with smaller decreases in shyness from age 10 to 16. Thus, youth generally decline in shyness during adolescence, particularly those who are less anxious.

Keyword: shyness, development, longitudinal, anxiety, depression

Imagine one as an immigrant who has just moved into an entirely new country and is trying to adapt to a new culture and environment. This is a scenario that is incredibly prevalent today, especially in the United States where over 40 million people were not born there (Lopez & Connor, 2016). The transition from country to country is known to be a difficult one, especially for the youth who have to face new obstacles that previous generations in their lineage may not have faced.

An important aspect to consider in terms of how it can affect these youths' development is specifically in regard to shyness. Shyness is the tendency to feel awkward, uncomfortable, tense, concerned, and/or inhibited when engaging with others, especially strangers and casual acquaintances (Cheek & Buss, 1981). Although there is a robust literature on shyness and related constructs, few longitudinal studies have examined the development of shyness during adolescence, and even fewer have done so with a sample of ethnic minority youth. Addressing this gap is important, as there is robust literature linking shyness to clinical outcomes that rise in prevalence during adolescence.

In the present study, we examine the development of shyness from late childhood (age 10) through adolescence (age 16) using data from a large, longitudinal study of Mexican-origin youth ($N = 674$). Additionally, we examine whether symptoms of psychopathology (i.e., anxiety, depression) at age 10 are correlated with shyness trajectories across adolescence. For this study, we expected to find mean-level increases in shyness (i.e., a positive slope) from age 10 to 16. We do not have any predictions about whether the trajectory would vary by gender or self vs. parent report. For our psychopathology research question, we expected that youth with more anxiety and depression symptoms at age 10 would have higher initial levels of shyness and show greater increases in shyness across adolescence.

Shyness

Shyness is a complex trait that can be understood using multiple frameworks of personality/temperament. From a Big Five perspective, shyness is an interstitial trait involving low levels of Extraversion and Openness and high levels of Neuroticism (Baardstu et al., 2020; Kwiatkowska & Rogoza, 2019). Shiner and Caspi (2003) conceptualize shyness as a "multidimensional trait combining elements of low approach, high negative emotionality, and high behavioral avoidance" (p. 5). Further, according to Rothbart's model of temperament, shyness involves a slow or inhibited approach and discomfort in novel social situations (Rothbart et al., 2000). In the present study, we conceptualize shyness using Rothbart's temperament definition. The vast majority of research on the development of shyness as a temperamental trait has focused either exclusively on childhood or has tracked changes in shyness across decades of life, but using only a few assessments (e.g., Schmidt et al., 2017; Tang et al., 2017; Tang et al., 2020). Consequently, little is known about the more fine-grained development of shyness during the adolescent years.

Longitudinal Research on Stability and Change in Shyness during Adolescence

For the present study, we are defining mean-level change as changes in the average level of shyness in a population. Research on mean-level change in shyness across childhood and adolescence is much less consistent, with some studies finding increases (Karevold et al., 2012; Strickhouser & Sutin, 2020), some decreases (Barzeva et al., 2019; Laceulle et al., 2012; Zohar et al., 2019), and others no mean-level change (Brandes et al., in press). These inconsistencies may be due, in part, to variant assessment methods, specifically the use of self-reports (e.g., Zohar et al., 2019) versus parent-reports (Brandes et al., in press; Laceulle et al., 2012). Although the empirical evidence is mixed, theoretical considerations suggest that shyness should increase

during the adolescent years, given the dramatic increase in self-consciousness and prevalence of social anxiety disorder, increased hypersensitivity to social rejection, the many puberty-related hormonal and socioemotional changes, and the increasing importance of peer and romantic relationships (Andrews et al., 2021; Cheek et al., 1986; Hassan et al., 2021; Poole et al., 2020; Tang et al., 2017; Wright et al., 2020).

Gender Differences

Across many different cultures, girls tend to report higher levels of shyness than boys, which may be due to greater social acceptance of shyness for girls than boys (Doey et al., 2014). Similarly, there was low convergence between self- and parent-reports of shyness in boys, but higher convergence in girls (Putnam, 2001), which may reflect a tendency for some boys to underreport their shyness. However, previous longitudinal studies have not found evidence for gender differences in rank-order stability or mean-level change in shyness across adolescence (Brandes et al., in press; Karevold et al., 2012; Laceulle et al., 2012).

Shyness and Anxiety/Depression

Shyness is related both concurrently and longitudinally to anxiety and depression from toddlerhood through adulthood (Grose & Coplan, 2015; Masi et al., 2003; Oldehinkel, 2004; Poole & Schmidt, 2019). Examples in the literature can be seen by Murberg and colleagues (2009), who examined the relationships between shyness and depressive symptoms in adolescents between the ages of 14-16 and found that shyness was significantly positively associated with depressive symptoms. We also see similar associations from Prior and colleagues (2000), as they longitudinally assessed the association between children with shy temperament at toddlerhood and anxiety disorders at ages 13-14. They found that from infancy onward, shy temperament was associated with higher incidence of later anxiety problems (Prior et al., 2000).

Oldehinkel and colleagues (2004) looked into social withdrawal in adolescence and early adulthood, and found that those who were the most withdrawn had the highest shyness and anxiety. Overall, what longitudinal studies have shown is that shyness is prospectively associated with later anxiety and depression.

However, less is known about the reciprocal association; that is, the association of anxiety and depression with subsequent levels of shyness. Anxious youth may be fearful of negative social evaluation and depressed youth may have difficulty forging positive connections with peers, both of which could contribute to social isolation and increases in shyness (Hassan et al., 2021; Sherdell et al., 2012). Furthermore, there are few longitudinal studies that look into the developments of youth and shyness trajectories as they enter a new living environment in a different country. These drastic changes to social life could be incredibly challenging for the youth to adjust to, and there is the possibility that their shyness levels could be affected as a result.

Methods

Participants

This study used data from the California Families Project, an ongoing longitudinal study of Mexican-origin youth (N=674) and their parents. Children were drawn at random from rosters of students from the Sacramento and Woodland, CA school districts. To participate in the study, the focal child had to be in 5th grade, of Mexican origin, and living with his or her biological mother. Approximately 72.6% of eligible families agreed to participate in the study, which was granted approval by the [BLINDED] Institutional Review Board (Protocol # BLINDED). The children (50% female) were assessed annually from 5th grade to three years post-high school. The present study used data from when the children were in 5th grade (M_{age}=10.86, SD=0.50), 7th

grade (M_{age}= 2.81, SD=0.49), 9th grade (M_{age}=14.75, SD=0.49), and 11th grade (M_{age}=16.80, SD=0.51). Retention rates compared to the original sample are as follows: 86% (7th grade), 90% (9th grade), and 89% (11th grade).

Participants were interviewed in their homes in Spanish or English, depending on their preference. Interviewers were all bilingual and most were of Mexican heritage. The median education level was 9th grade for both mothers and fathers; median total household income was $32,500; and, 83.6% of mothers and 89.4% of fathers were 1st generation immigrants. We used data for all available participants (no exclusions were applied) and reported all analyses conducted to address our research questions.

Measures

Shyness. Shyness was measured via self-reports and mother-reports when the youth were 10, 12, 14, and 16 years old using the *Early Adolescent Temperament Questionnaire–Revised* (Ellis & Rothbart, 2001). The four shyness items are: "You [your child] feel[s] shy about meeting new people", "You [your child] are [is] shy", "You [your child] feel[s] shy with kids of the opposite sex", and "You [your child] are [is] not shy" (reverse-scored). Ratings were made on a 4-point scale ranging from 1 (*not at all true of you/your child*) to 4 (*very true of you/your child*). We computed latent variables using three parcels that combined both self- and mother-reports of shyness because parcels produce more reliable latent variables than individual items (Little et al., 2002). Descriptive statistics for composite, self-reports, and mother-reports of shyness are shown in Table 1. The reliability of child self-reports were lowest at age 10 and highest at age 16, consistent with previous studies (e.g., Göllner et al., 2017).

Table 1
Descriptive statistics of shyness

Shyness Variable	Mean	SD	α	*N*
Child-mom composite				

Age 10	2.44	0.58	.67	672
Age 12	2.23	0.57	.71	579
Age 14	2.14	0.57	.75	609
Age 16	2.06	0.54	.75	607
Child self-report				
Age 10	2.49	0.75	.61	668
Age 12	2.14	0.70	.72	578
Age 14	2.03	0.68	.75	604
Age 16	2.02	0.64	.77	600
Mom-report of child				
Age 10	2.41	0.77	.77	656
Age 12	2.33	0.73	.72	573
Age 14	2.25	0.73	.74	598
Age 16	2.10	0.70	.74	586

Anxiety and Depression. Anxiety and depression symptoms were assessed at age 10

using the Anxiety (12 items) and Depression (22 items) modules of the NIMH Diagnostic

Interview Schedule for Children-IV (*DISC-IV*). The *DISC-IV* is a comprehensive, psychiatric

interview that assesses mental health problems for children and adolescents using DSM-IV

criteria; it is the most widely-used mental health interview that has been tested in both clinical

and community populations and validated in both English and Spanish (Bravo et al., 1993;

Costello et al., 1985; Schwab-Stone et al., 1996). Responses were recorded dichotomously (0 =

no, 1 = *yes*) as the symptom being present or not in the past year. The Anxiety module inquired

about general worry and concern such as, "[Are you the] type of person who is tense and finds it

hard to relax?" and physical symptoms such as, "[Did you] often have stomach aches in the last

year?". The Depression module included questions about feeling sad such as, "[Was there] a time

in the past year when you were very upset or depressed?" and physical symptoms such as, "[Did

you] sleep more during the day than usual in the last year?".[1] We computed separate symptom

count variables for anxiety and depression by summing the responses for each symptom (present

vs. absent). Descriptive statistics are shown in Table 2.

Table 2
Descriptive statistics of anxiety, depression, and language proficiency at age 10

Covariate	Mean	SD	Range	N
Anxiety	3.81	2.19	0-11	644
Depression	5.50	4.12	0-21	643

Research Question 1 (Developmental Trajectory). To examine mean-level change in

shyness from age 10 to 16, we ran a univariate latent growth curve (LGC) model with four

timepoints (age 10, 12, 14, and 16). To select a growth trajectory, we conducted a series of LGC

model comparisons and evaluated changes in fit indices. Specifically, we compared three

models: (1) no growth model, where the slope is fixed to zero over time; (2) linear growth

model, where the slope increases linearly over time; and (3) latent basis model, where the first

and last time points of the slopes are fixed to zero and six, respectively, and the middle time

points are freely estimated in order to detect nonlinearities in the trajectory. We considered model

fit, as well as parsimony, when selecting a growth curve model.

To examine gender differences in the trajectory of shyness, we compared a multiple

group model that constrained the means and variances of the intercepts and slopes to be equal for

girls and boys to a multiple group model that allowed these parameters to be freely estimated

across gender. If the constrained model did not fit significantly worse than the freely estimated

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[1] Two anxiety symptoms overlap somewhat with shyness ("Have you often worried that you made a fool out of yourself in front of other people in the past year?" and "Have you often worried about whether other people liked you in the past year?"). No depression symptoms include shyness content. Anxiety results hold when removing these two overlapping items.

model, then we concluded that the developmental trajectory was the same for girls and boys. To examine differences in informants, we calculated mean-level change separately for self- and mother-reported shyness.

Research Questions 2 (Anxiety & Depression). To examine the influence of continuous correlates (anxiety and depression) measured at age 10 on the development of shyness, we regressed the level and slope of the retained shyness LGC model on the continuous correlates at age 10.

Results

Mean-Level Change of Shyness

We examined mean-level change in shyness by comparing three growth models (Table 3). The linear model fit the data well and wass more parsimonious than the latent basis model, so we retained this model. On average, shyness decreased linearly from age 10 to 16 and there were significant individual differences in both the level and slope of shyness (Figure 1). When we examined the linear model separately for self- and mother-reports of shyness, we found no evidence that the trajectory differs by informant (Table S3). Additionally, we found no evidence for gender differences in the trajectory of shyness (Table S4).

Table 3
Model Statistics for Best-Fitting Second-Order LGC Models for Shyness

	No Growth	**Linear Growth**	Latent Basis
Slope			
β_1	0	**0**	0
β_2	0	**2**	2.42
β_3	0	**4**	4.91
β_4	0	**6**	6
Means			
Level	.00	**.00**	.00
Slope	-	**-.04***	-.05*

Variances			
Level	.12*	**.14***	.15*
Slope	-	**.004***	.003*
Covariance $_{Level, Slope}$	-	**-.01***	-.01*
Goodness-of-Fit			
χ^2 (df)	268.26 (47)	**48.13 (44)**	39.38 (42)
RMSEA [90% CI]	.09 [.08, .10]	**.01 [.00, .03]**	.00 [.00, .03]
CFI	.93	**1.00**	1.00
Fit changes, $\Delta\chi^2/\Delta df$	-	**220.13/3**	8.75/2

Note. Values are unstandardized coefficients for the models. χ^2 = Chi-square. df=degrees of freedom. RMSEA=Root-mean-square-error of approximation. CI=90% confidence interval. CFI=Comparative fit index. * *p* < .05

Figure 1
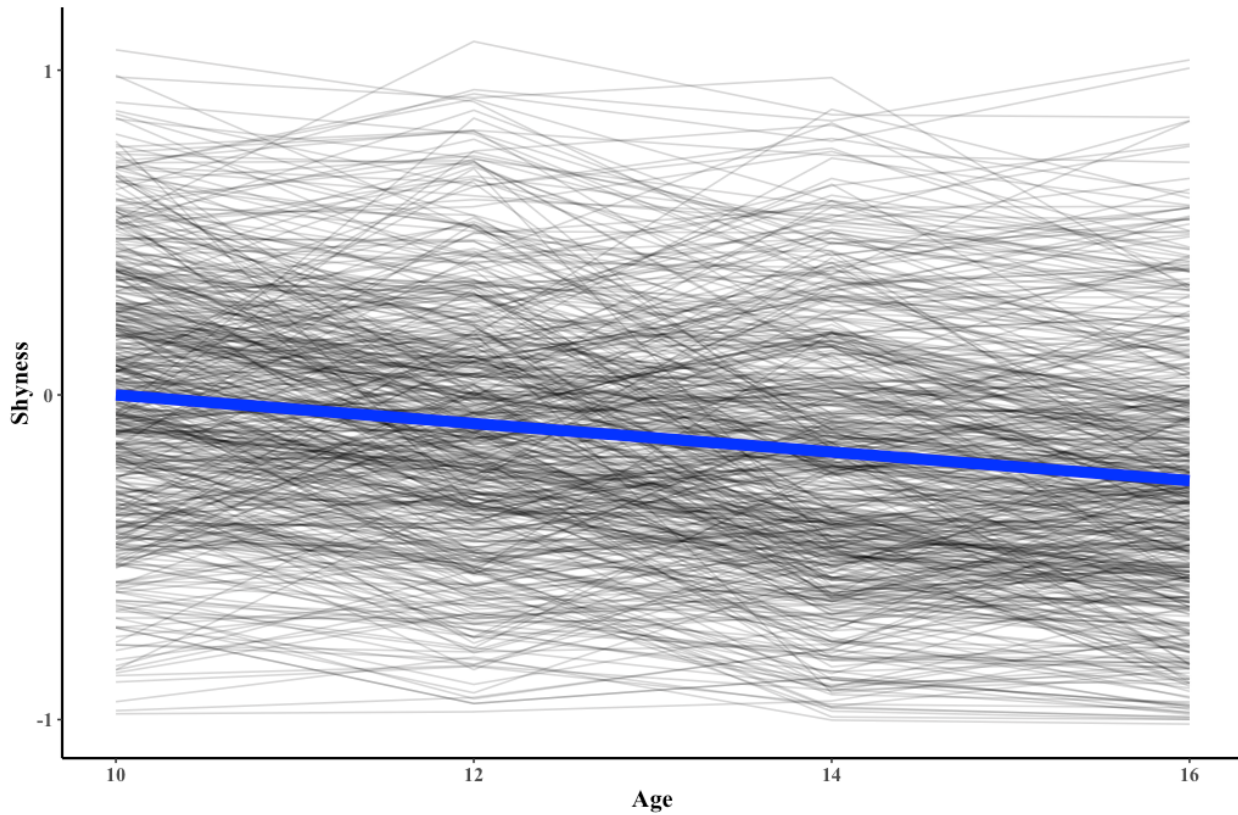
Note. The thin black lines depict each individual's shyness trajectory from age 10 to 16. The thick blue line depicts the average shyness trajectory from age 10 to 16.

Correlates of the Shyness Trajectory

We examined whether anxiety and depression were correlated with the level and slope of the shyness trajectories from age 10 to 16 (Table 4). Anxiety symptoms were related to the level ($\beta = .21$, $p < .001$) and slope ($\beta = -.13$, $p = .023$), suggesting that youth with higher levels of anxiety at age 10 were more shy at age 10 and experienced smaller decreases in shyness from age 10 to 16. Depression symptoms were related to the level ($\beta = .13$, $p = .017$) but not the slope ($\beta = .01$, $p = .824$), suggesting that youth with higher levels of depression at age 10 were more shy at age 10, but did not show any differences in their shyness development from age 10 to 16.

Table 4

Correlates of shyness trajectories

	Shyness Level	Shyness Slope
Anxiety	.21*	-.13*
Depression	.13*	.01

Note. Values are standardized regression coefficients (obtained using Std.all in lavaan).
* $p < .05$

Discussion

The present study looked into changes in shyness of Mexican-origin youth from age 10 to 16, and tested correlates of shyness trajectories across adolescence. Consistent with our hypothesis and prior research (e.g., Grose & Coplan, 2015; Masi et al., 2003; Oldehinkel, 2004), youth experiencing more symptoms of anxiety and depression at age 10 had higher initial levels of shyness. Moreover, youth with more anxiety (but not depression) symptoms tended to show smaller decreases in shyness from age 10 to 16. Thus, anxious youth tend to be more shy and maintain their shyness over time, suggesting that anxiety might be a risk factor for continued high levels of shyness into young adulthood.

With regards to mean level changes in shyness, we found that, on average, shyness decreased from age 10 to 16. The observed decrease in shyness is not consistent with research

and theory on adolescence that highlights increases in self-consciousness and heightened sensitivity to peer evaluation, both of which seem likely to increase shyness (Cheek et al., 1986; Hassan et al., 2021). However, our findings are consistent with a few previous studies that have found mean-level decreases in shyness across adolescence (Barzeva et al., 2019; Laceulle et al., 2012; Zohar et al., 2019). Notably, the mean-level decrease in shyness held for both self- and mother-reports, suggesting that these different informant types cannot explain inconsistencies in findings observed in previous studies. Instead, the replication across two different reporters enhances our confidence that the decrease in shyness is a true developmental trend, and not simply an artifact of a particular informant's unique perspective. Additionally, consistent with prior research (Brandes et al., in press; Karevold et al., 2012; Laceulle et al., 2012), we did not find any significant gender differences, suggesting that girls and boys show similar decreases in shyness from age 10 to 16.

Limitations and Conclusion

The present study has several limitations. First, our shyness measure only included four items and asked broadly about shyness (e.g., "I am shy") rather than specific behaviors (e.g., social awkwardness, difficulty talking to strangers; Cheek & Buss, 1981). Therefore, our findings may reflect lay people's perceptions of shyness rather than the construct of shyness as conceptualized in psychology. Second, our sample consists exclusively of Mexican-origin youth and the present findings may not generalize to other groups of adolescents. Third, although we found that various factors (i.e., anxiety, depression) were associated with the level and slope of the shyness trajectory, the passive longitudinal design precludes causal inference because we cannot rule out the possibility of third-variable confounds or reciprocal causation.

Despite these limitations, this study is novel and informative in revealing a decline in shyness across adolescence among Mexican-origin youth. In conclusion, our findings suggest that the Mexican-origin youth at age 10 would gradually decline in their absolute level of shyness from 10 to 16, especially if they entered with few symptoms of anxiety. These findings allow us to garner a better understanding of the experiences of Mexican-origin youth as they move to a new country and better understand how their overall shyness can be affected.

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