

The Relationship Between Parents' and Children's Automatic Thoughts in a College Student Sample

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Abstract Research demonstrates the importance of early social interactions in the development of schemas and automatic thoughts. It does not appear, however, that the existing research examines intergenerational correlations in automatic thoughts. As a result, this study explores the relationship between the automatic thoughts of parents and those of their college-age children in a sample of 252 college students and their mothers and fathers. Results of this study suggest that there are significant relationships between parents' and college students' positive automatic thoughts. Different trends by gender also are noted in the relationships among variables for male and female college students with their mothers and fathers. Further, mothers' positive ATs predicted the positive ATs of their college students, with mothers' ratings of their own communication with their college students mediating partially this relationship. Finally, college students' anxiety and self-esteem is predicted significantly by their mothers' anxiety and self-esteem (respectively) as well as their own positive and negative ATs. These findings suggest the possibility that ATs play a role in the intergenerational transmission of certain domains of psychological functioning.

Keywords Automatic thoughts · Depression · Anxiety · Self-esteem · Communication

Introduction

With the advent of the cognitive era, research began examining more covert cognitive processes [1] in addition to more overtly behavioral processes. Among these cognitive

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processes, automatic thoughts (ATs) emerge as a valuable area of study in differentiating individuals who experience dysphoria from those who do not and in altering distorted beliefs and perceptions [2, 3]. ATs embody “what just ran through [the] mind” and can be defined as spontaneous, evaluative cognitions about oneself, the future, and the world [4, p. 11]. Although ATs have become a focus of study, little is understood regarding the intergenerational transmission of ATs and how parents may share their automatic thought processes with their children. Gaining an understanding of how ATs are acquired and possibly transmitted from parents to children may be important in improving the targets of cognitive treatments. As a result, this study explores the relationships among the ATs of parents and their college-age children, communication, and the psychological functioning of parents and their college-age children.

Based on cognitive theory, ATs are ideations that reflect individuals’ core beliefs and schemas [2]. Core beliefs are basic convictions about the self, the future, and the world, whereas schemas are the structures or processes through which stimuli are interpreted based on core beliefs [4]. Although ATs are difficult to measure because of their internal, unobservable nature, research provides support for individuals’ experience of both positive and negative ATs across different cultures [5]. Research also demonstrates that ATs are correlated with affective states. For instance, depression is associated with ATs that contain negative evaluations, and anxiety is associated with ATs that contain content about future threats [3, 6]. The ratio of positive to negative ATs also is predictive of affective states. For example, inpatients with depression and other disorders have more negative ATs, whereas nonclinical adults have more positive ATs [7].

Further, theory and research suggest that individuals’ ATs and affect are related in specific ways. For example, individuals with core beliefs that they are not effective (e.g., “I never do anything right”) are thought to interpret their efforts negatively. These ATs, in turn, appear to create emotional states, such as hopelessness and dejection. In support, current research suggests that ATs mediate partially the relationship between irrational beliefs and distress [8], with the possibility of increased levels of useful inner speech being related to lower levels of psychological distress [9]. Current research also suggests that ATs mediate the relationship between self-criticism and affect, such that higher levels of self-criticism are related to negative ATs and negative ATs are related to negative affect [10]. Thus, ATs may play an important role in individuals’ experience of specific psychological symptoms as well.

Consistently, research notes a relationship between modifying ATs and improving psychological functioning. In particular, techniques for modifying ATs are effective in treating depression, anxiety, low self-esteem, and rage; improving poor task performance in adults [11, 12]; and improving academic [13] and cognitive [14] task performance in children. For example, decreases in negative ATs and increases in anxiety control are related to a reduction in anxiety symptoms [15]. Further, meta-analyses of self-statement modification, a related cognitive process, find treatment effect sizes of .74 for adults and .35 for children. These treatment gains appear stable over time, with the length of follow-up accounting for only .5% of the variability in effect sizes [1, 16].

Considering the significant relationship between ATs and affect, it is important to understand the origin of ATs. As already noted, cognitive theory posits that ATs reflect core beliefs and schemas, both of which develop throughout childhood as children attempt to organize and make sense of life events [4]. Although genetic factors may influence the development of ATs, negative early experiences increase the likelihood that children will form negative concepts about the self, the future, and the world [2]. These negative concepts will result in more negative ATs and negative affective states. Beck and

colleagues [2] also note that interpersonal relationships can be influential in the activation of ATs, suggesting that experiences with mothers and fathers may be important for understanding ATs. Nonetheless, there are few studies examining the relationships of ATs in parents and those of their children.

There is some research on inner speech (i.e., self-talk), a related concept, that may be helpful in understanding ATs, however. Inner speech includes ATs as well as cognitions beyond evaluations of the self, the future, and the world. Some would define inner speech further as an internalized form of word-based self-regulation [17]. Because ATs are a form of inner speech, their development may be similar. Further, the developmental theories of cognition, which describe the development of schemas, language, and inner speech, originally formed the basis for the cognitive model and its description of AT development [2]. In describing the development of inner speech, Vygotsky [18] claims that children initially learn social speech through sociocultural interaction. Private speech, or spoken verbalization that is intended for the self [18], then is internalized in the form of inner speech [19]. In general, research supports this process. For instance, studies show that social speech is similar to private speech in both style and structure [18, 20], suggesting that social speech provides the basis for private speech. Further, Berk and Garvin [20] indicate that children's private speech increases through the age of 7 years during a simultaneous increase in social language development. Research also demonstrates that inner speech begins to develop during the first years of school, just as private speech declines [21]. Overall, children's private speech is similar to the inner speech that is reported in later development [18, 22], with some private speech appearing in later childhood and adulthood [23].

Considering the importance of social interaction for ATs, one important research question is whether parents' ATs are related to those of their children. Social interactions with parents, which appear to be related to children's ATs, may be guided by parents' own ATs. Although no studies examine this possibility directly, research examines several tangential relationships. For example, research suggests that inner speech is related to self-awareness [24] and that self-statements (i.e., ATs regarding the self) are related to statements that are made to other individuals [25]. In turn, *perceived* positive and negative statements from others (e.g., mothers, fathers, teachers, peers) are related to the positive and negative self-talk of elementary school children [26, 27].

These relationships also may apply to parent–child transactions involving ATs. For example, research suggests that perceived statements from parents account for more of the variance in children's positive self-talk than negative self-talk and for more of the variance in boys' self-talk than girls' self-talk [26]. Further, male children may rely on parental interactions in the development of their self-talk more than female children, who may rely on other social interactions more heavily [26]. Given these findings and those of other studies suggesting that differential cross-gender effects occur commonly when examining different family dynamics (e.g., the relationship of parent-adolescent interactions, conflict, and adolescent adjustment [28]; the relationship of parent-college student communication and college student outcomes [29, 30]), cross-gender effects also should be considered in the relationships among ATs.

Studies also show that parents' depression and anxiety symptoms are related to the occurrence of these symptoms in their children [31, 32]. Further, depression and anxiety are related to negative ATs [6, 10, 33]. Although there is a genetic component to the transmission of mood and anxiety disorders [34], and possibly related ATs, there also may be a social transmission. In particular, parents' ATs may be related to their affect, which, in turn, is related to their children's ATs and affect. There are no known studies that assess

such mechanisms between parents' ATs and those of their children; however, studies find that parents who are depressed have more negative perceptions of and negative verbalizations in response to their children [35]. Further, parent communication that is negative and infrequent also is related to adolescents' depression [36, 37]. As depression is related to negative ATs [6], these findings suggest that parents' ATs and affect likely are related to that displayed by their children.

The Current Study

If it is possible that parents transmit their own ATs through their affect and their communication with their children, research should examine ATs in the context of parent–child interactions. Given the lack of research on this topic, the purpose of this exploratory study is to examine the correlations between parents' ATs and those of their college-age children. The relationships among these ATs and both parents' and college students' psychological functioning also are examined. An emerging adult college student population was selected specifically for this study. Because younger children are more limited than adults in their metacognitive abilities [38], they consequently may be less able to report their own ATs. As a result, emerging adults who are metacognitively mature but still close to their parents appeared to be a more feasible sample to examine. Further, emerging adults are in a distinct developmental period where they are experiencing many changes in the lives as they transition to adulthood (e.g., identity exploration, completing their educations, beginning work pursuits, building relationships [39]). Each of these changes is related to the pursuit of identity exploration [39], with such a pursuit prompting increased experiences of affective distress (e.g., depression, stress [40]). Research also suggests that emerging adults still are susceptible to their parents' expectations for them, with discrepancies in their expectations for themselves and those of their parents and their communication reciprocity proving to be important predictors of emerging adults' psychological adjustment [29] and affective distress [30]. Each of these characteristics fit nicely with the goals of this study, prompting this examination of emerging adults who are in college.

With regard to hypotheses, it was hypothesized that college students' ATs and those of their parents would be related significantly, with stronger relationships for positive ATs relative to negative ATs and for male college students relative to female college students. Further, it was expected that parents' ATs and their communication would predict college students' ATs, with parents' communication possibly mediating this relationship. Finally, it was hypothesized that parents' psychological functioning and their ATs in conjunction with college students' own ATs would predict college students' psychological functioning.

Method

Participants

Participants were 252 (99 Male and 153 Female) undergraduate college students attending a Southeastern suburban university. College student participants ranged in age from 17 to 23 years ($M = 18.30$ years, $SD = .77$ years). The majority of the college student participants indicated that they were Caucasian (68.7%), whereas the remainder of the sample indicated that they were ethnically diverse (i.e., 9.4% were Hispanic, 4.3% were African

American, and 2.9% were Asian American). The majority of the college student participants were single (86.3%), whereas the remainder of the sample varied in their relationship status (i.e., .4% indicated that they were married, 2.5% indicated that they were living with a partner, 1.8% had some other relationship status, and 9% did not endorse a relationship status). In addition, most college student participants reported that they did not live with their parents (77.3%) but that their parents did pay for all their living expenses (45.3%). Most of the college student participants (80.2%) indicated, however, that they had contact with their mothers at least once per week, and 60.8% indicated that they had contact with their fathers at least once per week. The majority of the college student participants indicated that they were reporting on their biological mothers (86.0%) and biological fathers (80.6%) as part of this study.

As part of their participation, college student participants were asked to provide permission for their parents to be contacted so that their parents might participate in this study as well. Parents who participated in this study were 212 mothers (of 249 who were sent packets) and 179 fathers (of 227 who were sent packets). Of these parents, 169 mother-father pairs provided ratings for their college students. Mothers ranged in age from 34 to 65 years ($M = 47.41$ years, $SD = 4.91$ years), and fathers ranged in age from 36 to 73 years ($M = 50.09$ years, $SD = 5.94$ years). Mothers and fathers indicated that they were Caucasian (63.7 and 51.8%, respectively), Hispanic (6.8 and 7.2%, respectively), African American (2.2 and 1.4%, respectively), and Asian American (2.5 and 1.4%, respectively). The majority of the mother participants indicated that they were married (62.6%), whereas the remainder of these mothers varied in their relationship status (i.e., 1.8% indicated that they were single, 3.2% indicated that they were divorced, and .8% endorsed some other relationship status). Similarly, the majority of the father participants indicated that they were married (59.0%), whereas the remainder of these fathers varied in their relationship status (i.e., 3.2% indicated that they were single, 6.5% indicated that they were divorced, .7% indicated that they were living with their partner, 1.4% indicated that they were widowed, and 1.4% endorsed had some other relationship status). Both mothers and fathers varied in their educational achievements (i.e., fathers: 11.9% had some high school or had graduated high school, 15.8% had completed some college or earned an Associate's degree, 21.2% had earned a Bachelor's degree, 10.1% had earned a Master's degree, 4.7% had earned a Doctoral degree, and 36.3% did not report their educational information; mothers: 16.5% had some high school or had graduated high school, 27.0% had completed some college or earned an Associate's degree, 20.9% had earned a Bachelor's degree, 10.8% had earned a Master's degree, .8% had earned a Doctoral degree, and 24.1% did not report their educational information).

Measures

Automatic Thoughts Questionnaire-Revised (ATQ-R)

College student and parent participants completed the ATQ-R as a measure of the frequency of their positive and negative ATs [7]. The ATQ-R consists of 30 negative AT statements and ten positive AT statements. Participants rated the frequency with which they say each statement to themselves on a 5-point Likert scale ranging from *Not At All* to *All The Time*. The ATQ-R is similar to the original Automatic Thoughts Questionnaire (ATQ) [41] but contains ten additional positive AT statements that were not part of the original ATQ. These ten positive statements on the ATQ-R account for significantly more variability ($p < .01$) than the negative AT statements alone, as indicated by a hierarchical

multiple regression analysis [7]. In a previous study, the Cronbach alpha for this measure was .90 [7]. In the current study, college student participants' responses have adequate internal consistency (i.e., .84 for positive ATs and .95 for negative ATs). Mothers' responses (i.e., .91 for positive ATs and .95 for negative ATs) and fathers' responses (i.e., .92 for positive ATs and .93 for negative ATs) also have adequate internal consistency.

Manifest Anxiety Scale (MAS)

College student and parent participants completed the MAS as a measure of their overt symptoms of trait anxiety [42]. The MAS consists of 50 statements that participants rate as *True* or *False*. This scale was developed from a pool of anxious statements found on the Minnesota Multiphasic Personality Inventory. The test–retest reliability of the MAS is adequate in a previous study, with a Pearson's product-moment coefficient of .89 for a three-week interval and a coefficient of .82 for a five-month interval [42]. In the current study, responses have adequate internal consistency (i.e., Cronbach alphas of .88 for college students, .86 for mothers, and .89 for fathers).

Beck Depression Inventory—Second Edition (BDI-II)

To assess symptoms of depression, college student and parent participants completed the BDI-II [43]. The BDI-II is a 21-item self-report measure of emotional and physical symptoms of depression. These symptoms correspond to the criteria for depression in the *Diagnostic and Statistical Manual of Mental Disorders*. In previous studies, the BDI-II has a coefficient alpha of .92 for an outpatient sample and .93 for college student controls. In addition, the test–retest reliability is .93 across a 1-week period for 26 outpatients. The BDI-II has adequate content, construct, and convergent validity, as the BDI-II correlates positively with other measures of depression and has high item-intercorrelations [43]. In the current study, responses have adequate internal consistency (i.e., a Cronbach alpha of .88 for college students, .89 for mothers, and .88 for fathers).

Rosenberg Self-Esteem Scale (RSES)

College student and parent participants also completed the RSES as a measure of their self-esteem [44]. The RSES consists of ten items that are rated using a Likert scale ranging from *Strongly Agree* to *Strongly Disagree*. The RSES is coded so that higher overall scores reflect lower self-esteem. The RSES has demonstrated reliability and validity in previous studies and is one of the most widely used measures of global self-esteem [45, 46]. For example, in previous analyses, the RSES yields Cronbach alpha coefficients ranging from .77 to .88 and correlations with other common scales of self-esteem ranging from .55 to .83 [45, 46]. In addition, the test–retest coefficient for the RSES is .85 (during a two-week interval) for 28 college students examined in a previous study [46]. In the current study, responses have adequate internal consistency (i.e., a Cronbach alpha of .90 for college students, .90 for mothers, and .88 for fathers).

Family Self-Talk Strategies (FSTS), Parent and College Student Versions

College student and parent participants completed the FSTS as a measure of the degree to which mothers and fathers shared self-talk strategies (i.e., ATs and self-directive

statements) with their children during their childhoods (e.g., during new tasks, in approaching or solving a problem, in dealing with feelings, in general). This measure is an unstandardized survey that is based on information in the extant literature and that was created for this study. This survey has eight items that are rated on 5-point Likert scale ranging from *Never* to *Almost Always*. Four items pertain to parents' sharing of ATs during college student participants' childhoods (e.g., "In general, how often did you share with your college student what you would say to yourself (think to yourself)?"), and four items pertain to the other parents' sharing of ATs during college student participants' childhoods (e.g., "In general, how often did your spouse share with your college student what he would say to himself?"). Higher scores on the FSTS indicate greater endorsement of parents' sharing of ATs. Normative data, reliability estimates, and validity estimates have not been studied for this survey. In this study, however, participants' responses have adequate internal consistency (i.e., .87 for college students' ratings of mothers and .91 for college students' ratings of fathers; .85 for mothers' ratings of themselves and .92 for mothers' ratings of fathers; and .87 for fathers' ratings of mothers and .91 for fathers' ratings of themselves).

Parent–Child Relationship Inventory (PCRI)

Finally, parents completed the PCRI as a measure of their attitudes toward their children and parenthood [47]. The scale has 78 items that are rated using a four-point Likert scale. Seven content scales can be derived from parents' ratings; however, only one scale (i.e., Communication between parents and their children) was used in this study. Higher scores on this scale indicate more adaptive parenting and communication characteristics. Although this measure is used generally with parents of young children, it was felt that parents could adequately rate the items of the Communication scale for their college students given the amount of contact that college students reported in this study. The PCRI has demonstrated reliability and validity in previous studies. For example, the coefficient alphas for its subscales range from .70 to .88, and the one-week test–retest reliabilities range from .68 to .09 [47]. In the current study, responses to the Communication scale have adequate internal consistency (i.e., .74 for mothers' responses and .74 for fathers' responses). Although no studies examine the direct relation of parents' communication and ATs in their children, studies show that parents who experience dysphoria use more negative verbalizations [35] and that children are more likely to be depressed when such maladaptive communication is used [37]. Therefore, this measure was selected as an exploratory assessment of the relationship between parents' ATs, their adaptive communication, and their college students' ATs.

Procedure

After receiving Institutional Review Board approval, college student participants were recruited from undergraduate-level psychology classes to complete a survey packet in exchange for extra credit. College student participants signed an informed consent form, completed the packet with assistance (if needed), and were given a debriefing form and a form to request the results of the study. College student participants also were asked to provide their parents' addresses so that similar information could be collected from their mothers and fathers. When college student participants provided their parents' addresses, a survey packet was mailed to their mothers and fathers. The parent packet included a postage-paid return envelope for return of completed packets. Packets also included an

informed consent, instructions for completing the surveys with assistance by phone (if needed), the questionnaires themselves, a debriefing form, and a form for receiving study results. College student and parent packets were linked by a family identification number only upon return of all the packets.

Results

The data were analyzed using SPSS for Windows version 11.5 using an alpha level of .05, unless otherwise noted. All data were screened for violations of the assumption of normality and for outliers. Although some of the measures showed a skewed distribution (i.e., the MAS, BDI, and RSES), they were not adjusted, as such distributions were expected for these scales given the nonclinical nature of the sample examined in this study.

Descriptive Statistics

Means and standard deviations for each of the measures are detailed in Table 1. Because research on the ATQ-R demonstrates that ratios of positive to negative ATs are predictive of psychological functioning [7], ATQ-R ratios were calculated. Ratios of 1:1.6 with positive ATs being greater are associated with healthy functioning, whereas ratios of 1:1.6 with negative ATs being greater are associated with more problematic functioning. Given this rubric, average ATQ-R ratios for college students, mothers, and fathers are similar to those found in nonclinical populations. Consistently, mean MAS scores fall within the nonclinical range. Likewise, mean BDI-II scores are in the range associated with no to minimal depressive symptoms (i.e., 10 or less) for college students, mothers, and fathers [43]. With regard to the RSES, scores are relatively consistent across college students, mothers, and fathers as well. Finally, on the communication scale of the PCRI, mean scores translate to T scores that fall within normal limits for mothers ($T = 47$) and for fathers ($T = 46$) [47].

Correlations Between College Students' ATs and Those of Their Parents

To examine the relationships among college students' ATs and those of their parents, Pearson correlation coefficients were calculated. All correlations are provided in Tables 2

Table 1 Mean scores and standard deviations on variables of interest

	All college students	Male college students	Female college students	Mothers	Fathers
Positive ATs	33.79 (7.98)	33.41 (8.21)	34.07 (7.85)	33.94 (8.56)	34.11 (8.81)
Negative ATs	17.43 (5.96)	17.45 (5.46)	17.39 (6.28)	13.68 (4.14)	23.68 (6.59)
Ratio of positive to negative ATs	.66 (.11)	.65 (.10)	.66 (.11)	.70 (.10)	.59 (.10)
MAS-anxiety	19.07 (8.20)	18.26 (8.30)	19.54 (8.12)	13.23 (7.70)	11.92 (7.30)
BDI-depression	10.02 (7.51)	8.96 (7.35)	10.63 (7.56)	6.58 (6.20)	5.62 (5.42)
RSES-self-esteem	17.71 (5.16)	18.25 (5.36)	17.41 (5.01)	15.42 (6.20)	15.09 (4.29)
PCRI- communication	N/A	N/A	N/A	28.00 (3.22)	26.49 (3.50)

Mean (SD)

(for the entire sample) and 3 (by college student gender). Because this study was considered to be exploratory in nature, a Bonferroni correction was not used. These correlations suggest that there is a significant relationship between college students' and mothers' positive ATs but not between college students' and mothers' negative ATs. Contrary to the hypotheses, the correlation between college students' and mothers' positive ATs is not significantly greater than that between college students' and mothers' negative ATs according to a Fisher's *r*-to-*z* comparison ($Z = 1.14, p < .13$).

These relationships also were considered in the context of college students' gender. Sons' positive ATs are not related to their mothers' positive ATs but are correlated significantly with their mothers' negative ATs. In contrast, sons' negative ATs are not related to mothers' positive or negative ATs. For daughters, daughters' positive ATs are not correlated with mothers' positive or negative ATs. Similarly, daughters' negative ATs are not correlated with mothers' positive or negative ATs. Contrary to the proposed hypotheses, the correlation between sons' and mothers' positive ATs is not significantly greater than that between daughters' and mothers' positive ATs according to a Fisher's *r*-to-*z* comparison ($Z = .58, p < .28$). Further, the correlation between sons' and mothers' negative ATs is not significantly greater than that between daughters' and mothers' negative ATs according to a Fisher's *r*-to-*z* comparison ($Z = 1.12, p < .13$).

With regard to college students' and fathers' ATs, there is a significant relationship between college students' and fathers' positive ATs but not between fathers' and college students' negative ATs. Contrary to the proposed hypotheses, the correlation between college students' and fathers' positive ATs is not significantly greater than that between college students' and fathers' negative ATs according to a Fisher's *r*-to-*z* comparison ($Z = .89, p < .19$).

The relationship between college students' and fathers' ATs also was examined in the context of college students' gender. Sons' positive ATs are not related to either fathers' positive or negative ATs. Similarly, sons' negative ATs are not related to either fathers' positive or negative ATs. For daughters, daughters' positive ATs are not correlated with fathers' positive or negative ATs. Similarly, daughters' negative ATs are not correlated with either fathers' positive or negative ATs. A Fisher's *r*-to-*z* comparison ($Z = .40; p < .34$) suggests that the correlation between sons' and fathers' positive ATs is not significantly greater than that between daughters' and fathers' positive ATs. In contrast, the correlation between sons' and fathers' negative ATs is significantly greater than the correlation between daughters' and fathers' negative ATs according to a Fisher's *r*-to-*z* comparison ($Z = 4.87, p < .01$).

Using Parents' ATs and Communication to Predict College Students' ATs

To test the hypothesis that parents' ATs and communication predict their college students' ATs, hierarchical regression analyses were conducted. Separate regression analyses were conducted using mother and father variables because the rate of return was not uniform across mothers and fathers. The predicted variable was either college students' positive or negative ATs. College students' gender was entered in Block 1 given the differential relationships across student gender. As it was expected that parents' ATs would be a major contributing factor to college students' ATs, mothers' or fathers' ATs were entered in Block 2. Finally, as communication between parents and their children may be one mechanism by which ATs are shared, communication variables were entered in Block 3. These regression analyses are provided in Table 4.

Table 2 Correlations among variables of interest (total sample)

	1	2	3	4	5	6	7	8	9	10	11
College student variables											
1. Pos. auto. thoughts											
2. Neg. auto. thoughts	-.41**										
3. Anxiety	-.41**	.70**									
4. Depression	-.46**	.74**	.70**								
5. Self-esteem	-.62**	.69**	.67**	.63**							
6. Family self-talk-mom	.21**	-.15*	-.12	-.10	-.16**						
7. Family self-talk-dad	.22**	-.17**	-.16*	-.14*	-.15*	.31**					
Mother variables											
8. Pos. auto. thoughts	.17*	-.03	-.03	-.05	-.13	.02	-.12				
9. Neg. auto. thoughts	-.03	.05	.01	-.01	.06	.03	-.05	-.34**			
10. Anxiety	-.11	.19**	.21**	.11	.19**	-.03	-.02	-.26**	.50**		
11. Depression	-.15*	.19**	.11	.09	.14*	-.04	-.11	-.38**	.60**	.70**	
12. Self-esteem	-.22**	.17*	.19**	.12	.26**	-.17*	-.06	-.51**	.51**	.66**	.61**
13. Family self-talk	.12	-.09	-.04	-.09	-.16*	.17**	-.08	.22**	-.05	-.06	-.10
14. PCRI communication	-.27**	.15*	.07	.17*	.24**	-.33**	-.12	-.24**	.14	.21**	.23**
Father variables											
15. Pos. auto. thoughts	.16*	.03	-.04	-.01	-.02	.06	.18*	.27**	-.12	-.05	-.18*
16. Neg. auto. thoughts	-.08	.06	.18*	.13	.19*	-.10	-.00	-.17*	.11	.17*	.16*
17. Anxiety	-.12	.15	.25**	.16*	.20**	-.08	-.10	-.16	.11	.17*	.18*
18. Depression	-.10	.10	.18*	.15*	.16*	-.07	-.01	-.16*	.12	.15	.21**
19. Self-esteem	-.11	.07	.10	.01	.18*	-.06	-.06	-.27**	.21**	.22**	.20**
20. Family self-talk	.08	.04	.10	.07	.00	.07	.22**	.11	-.16*	-.08	-.11
21. PCRI communication	-.04	.08	.03	-.05	.10	-.11	-.23**	-.08	.17*	.09	.19*

Table 2 continued

	12	13	14	15	16	17	18	19	20	21
College student variables										
1. Pos. auto. thoughts										
2. Neg. auto. thoughts										
3. Anxiety										
4. Depression										
5. Self-esteem										
6. Family self-talk-mom										
7. Family self-talk-dad										
Mother variables										
8. Pos. auto. thoughts										
9. Neg. auto. thoughts										
10. Anxiety										
11. Depression										
12. Self-esteem										
13. Family self-talk	-.21**									
14. PCRI communication	.42**	-.29**								
Father variables										
15. Pos. auto. thoughts	-.20**	.09	-.20**							
16. Neg. auto. thoughts	.21**	-.14	.13	-.22**						
17. Anxiety	.17*	-.10	.18*	-.33**	.64**					
18. Depression	.19*	-.09	.22**	-.29**	.70**	.80**				
19. Self-esteem	.24**	-.16*	.16*	-.41**	.62**	.65**	.58**			
20. Family self-talk	-.16*	.22**	-.18*	.40**	-.20**	-.21**	-.21**	-.24**		
21. PCRI communication	.13	-.22**	.35**	-.25**	.21**	.20**	.26**	.31**	-.36**	

* $p < .05$; ** $p < .01$

Table 3 Correlations among variables of interest (by college student gender)

	1	2	3	4	5	6	7	8	9	10	11
College student variables											
1. Pos. auto. thoughts		-.42**	-.50**	-.50**	-.61**	.27**	.29**	.13	.18	-.08	-.03
2. Neg. auto. thoughts	-.38**		.71**	.75**	.69**	-.19*	-.27**	-.02	-.02	.24**	.18
3. Anxiety	-.28**	.70**		.69**	.70**	-.15	-.24**	-.06	-.06	.29**	.17
4. Depression	-.42**	.75**	.72**		.63**	-.16	-.21**	-.06	-.08	.13	.05
5. Self-esteem	-.64**	.72**	.65**	.65**		-.18*	-.21**	-.06	-.11	.14	-.01
6. Family self-talk-mom	.10	-.05	-.16	-.06	-.09		.35**	.00	.10	-.07	-.06
7. Family self-talk-dad	.11	.06	-.03	.01	-.08	.28**		-.22*	.02	.01	-.09
Mother variables											
8. Pos. auto. thoughts	.21	-.03	.04	-.04	-.18	.02	.07		-.36**	-.24**	-.29**
9. Neg. auto. thoughts	-.32**	.19	.13	.14	.29**	-.05	-.16	-.32**		.34**	.39**
10. Anxiety	-.14	.13	.13	.12	.25*	.08	-.06	-.31**	.71**		.66**
11. Depression	-.26*	.22*	.08	.18	.28**	.03	-.13	-.48**	.84**	.75**	
12. Self-esteem	-.25*	.09	.07	.10	.29**	-.16	-.14	-.56**	.72**	.65**	.73**
13. Family self-talk	.08	.01	-.04	-.07	-.11	.04	-.05	.24*	-.11	-.01	-.02
14. PCRI communication	-.28**	.18	.06	.23*	.27*	-.11	-.13	-.41**	.39**	.20	.41**
Father variables											
15. Pos. auto. thoughts	.11	.00	.01	-.09	-.04	-.03	.18	.26*	-.25*	-.11	-.21
16. Neg. auto. thoughts	-.09	.11	.23*	.31**	.25*	-.21	-.03	-.19	.13	.21	.13
17. Anxiety	-.09	.24*	.32**	.37**	.25*	-.15	-.19	-.16	.09	.17	.13
18. Depression	-.06	.23*	.28*	.42**	.21	-.10	-.06	-.26*	.11	.16	.20
19. Self-esteem	-.16	.18	.10	.19	.25*	-.23*	-.22	-.31**	.11	.14	.06
20. Family self-talk	.03	.21	.15	.10	.10	.03	.40**	.25*	-.17	-.07	-.10
21. PCRI communication	-.13	-.02	-.10	-.07	.02	-.04	-.23*	-.30**	.24*	-.07	.17

Table 3 continued

	12	13	14	15	16	17	18	19	20	21
College student variables										
1. Pos. auto. thoughts	-.19*	.13	-.23**	.18	-.06	-.14	-.13	-.04	.11	.05
2. Neg. auto. thoughts	.22*	-.14	.14	.05	.03	.09	.02	-.01	-.07	.13
3. Anxiety	.31**	-.03	.10	-.06	.12	.17	.07	.09	.08	.11
4. Depression	.16	-.11	.16	.05	-.04	-.01	-.07	-.14	.04	.02
5. Self-esteem	.24**	-.16	.21*	.03	.09	.15	.11	.07	-.03	.12
6. Family self-talk-mom	-.16	.22*	-.38**	.05	.02	-.04	-.06	.10	.08	-.10
7. Family self-talk-dad	.01	-.09	-.09	.18	.01	-.07	-.00	.05	.12	-.24*
Mother variables										
8. Pos. auto. thoughts	-.48**	.18	-.14	.28**	-.15	-.16	-.08	-.24*	-.02	.10
9. Neg. auto. thoughts	.35**	-.01	-.03	-.03	.09	.14	.14	.29**	-.14	.11
10. Anxiety	.68**	-.10	.21*	-.01	.15	.22*	.19	.30**	-.06	.20
11. Depression	.49**	-.18*	.07	-.16	.21*	.27*	.25*	.36**	-.10	.18
12. Self-esteem	-.17	-.23**	.38**	-.15	.22*	.21*	.17	.30**	-.23*	.12
13. Family self-talk	.48**	-.28**	-.31**	.09	-.09	-.13	-.10	-.09	.33**	-.17
14. PCRI communication				-.23*	.15	.14	.21*	.11	-.24*	.34**
Father variables										
15. Pos. auto. thoughts	-.29**	.09	-.09	-.14	-.28**	-.30**	-.24*	-.41**	.32**	-.15
16. Neg. auto. thoughts	.22	-.21	.08	.23	.08	.73**	.76**	.66**	-.29**	.21*
17. Anxiety	.18	-.05	.23	-.37**	.59**	.78**	.78**	.67**	-.11	.11
18. Depression	.28*	-.07	.24*	-.33**	.67**	.81**	.63**	.62**	-.21*	.25*
19. Self-esteem	.20	-.25*	.19	-.37**	.59**	.63**	.50**	.62**	-.14	.28**
20. Family self-talk	-.11	.05	-.09	.51**	-.10	-.38**	-.20	-.33**	-.14	-.29**
21. PCRI communication	.16	-.29**	.33**	-.35**	.19	.35**	.29**	.33**	-.44**	

Correlations for ratings of sons are below the diagonal, whereas ratings for daughters are above the diagonal

* $p < .05$; ** $p < .01$

Table 4 Hierarchical regressions predicting college students' automatic thoughts

	Mothers				Fathers			
	<i>B</i>	SE <i>B</i>	β	R^2	<i>B</i>	SE <i>B</i>	β	R^2
College students' positive ATs								
Block 1				.01				.01
Gender	1.41	1.21	.09		1.33	1.31	.08	
Block 2				.05				.04
Gender	1.25	1.20	.08		.97	1.31	.06	
Parents' positive ATs	.20	.07	.22**		.15	.08	.16	
Parents' negative ATs	.17	.15	.09		-.06	.11	-.05	
Block 3				.13				.07
Gender	.12	1.20	.01		.95	1.31	.06	
Parents' positive ATs	.16	.07	.18*		.13	.08	.14	
Parents' negative ATs	.18	.15	.10		-.08	.12	-.06	
Students' family self-talk	.30	.18	.13		.47	.21	.19	
Parents' family self-talk	-.11	.25	-.03		-.03	.27	-.01	
Parents' communication	-.58	.21	-.23**		.10	.22	.05	
College students' negative ATs								
Block 1				.00				.01
Gender	.29	.94	.02		-.93	.96	-.08	
Block 2				.00				.01
Gender	.33	.95	.03		-.84	.97	-.07	
Parents' positive ATs	-.02	.06	-.03		.02	.06	.03	
Parents' negative ATs	.04	.12	.03		.08	.08	.08	
Block 3				.04				.05
Gender	.97	.98	.08		-.68	.98	-.06	
Parents' positive ATs	.00	.06	.00		.02	.06	.03	
Parents' negative ATs	.05	.12	.03		.08	.09	.08	
Students' family self-talk	-.21	.14	-.12		-.32	.15	-.19*	
Parents' family self-talk	-.08	.20	-.03		.18	.20	.09	
Parents' communication	.17	.17	.09		.08	.17	.05	

* $p < .05$; ** $p < .01$

Predicting College Students' ATs from Mothers' ATs and Communication

With regard to college students' positive ATs, analyses suggest that college students' gender does not account for significant variance in Block 1, $F(1, 176) = 1.34, p < .25$. In Block 2, mothers' ATs contribute significantly to the prediction of college students' positive ATs, $F(3, 174) = 3.09, p < .03$, with mothers' positive ATs serving as a significant individual predictor ($p < .006$). Finally, in Block 3, the equation remains significant, $F(6, 171) = 4.17, p < .001$, with the addition of mothers' communication. In this Block, mothers' positive ATs serve as a significant (albeit attenuated) predictor ($p < .03$). In addition, mothers' ratings of their communication with their college students are a significant individual predictor ($p < .005$).

Given this pattern of findings, follow-up regression analyses were conducted to examine mothers' communication as a mediator in the relationship between mothers' ATs and college students' positive ATs using the guidelines described by Baron and Kenny [48]. First, regression analyses suggest that mothers' ATs are significant predictors of college students' positive ATs, $F(2, 183) = 3.51, p < .03$, with mothers' positive ATs accounting for a significant amount of variance ($p < .009$). Next, regression analyses suggest that mothers' ATs are significant predictors of mothers' communication, $F(2, 186) = 5.89, p < .003$, with mothers' positive ATs again accounting for a significant amount of variance ($p < .005$). Further, mothers' communication is a significant predictor of college students' positive ATs, $F(1, 198) = 15.17, p < .001$. Finally, regression analyses suggest that, when entered together, mothers' ATs and communication predict significantly college students' positive ATs, $F(3, 178) = 7.71, p < .001$. In this regression, both mothers' positive ATs ($p < .03$) and communication ($p < .001$) are significant predictors. Given that mothers' positive ATs are still significant but attenuated, this pattern suggests that mothers' communication is a partial mediator in the relationship between mothers' ATs and college students' positive ATs. This finding was confirmed with a significant Sobel test ($2.29, p < .02$).

With regard to college students' negative ATs, analyses suggest that college students' gender does not account for significant variance in Block 1, $F(1, 172) = .09, p < .76$. In Block 2, mothers' ATs do not contribute significantly to the prediction of college students' negative ATs, $F(3, 170) = .15, p < .93$. Finally, in Block 3, the equation also is not significant, $F(6, 167) = 1.00, p < .43$, suggesting that mothers' ATs and communication are not significant predictors of college students' negative ATs.

Predicting College Students' ATs from Fathers' ATs and Communication

With regard to college students' positive ATs, college students' gender does not account for significant variance in Block 1, $F(1, 146) = 1.04, p < .31$. In Block 2, fathers' ATs do not contribute significantly to the prediction of college students' positive ATs, $F(3, 144) = 1.88, p < .14$. Finally, in Block 3, the equation also is not significant, $F(6, 141) = 1.81, p < .10$, suggesting that fathers' ATs and communication are not significant predictors of college students' positive ATs.

With regard to college students' negative ATs, analyses suggest that college students' gender does not account for significant variance in Block 1, $F(1, 141) = .94, p < .34$. In Block 2, fathers' ATs also do not contribute significantly to the prediction of college students' negative ATs, $F(3, 139) = .61, p < .61$. Finally, in Block 3, the equation also is not significant, $F(6, 136) = 1.28, p < .27$, suggesting that fathers' ATs and communication are not significant predictors of college students' negative ATs.

Using Parents' Psychological Functioning and ATs to Predict College Students' Psychological Functioning

Finally, hierarchical regression analyses were conducted to determine whether parents' psychological functioning and ATs as well as college students' own positive and negative ATs account for significant variance in college students' psychological functioning (i.e., anxiety, depression, and self-esteem). Separate regression analyses were conducted using mother and father variables because the rate of return was not uniform across mothers and fathers. In this set of regression equations, college students' gender was entered in Block 1. Then, parents' functioning and ATs were entered in Block 2. Finally, college students' ATs were entered in Block 3. These regression analyses are provided in Table 5.

Table 5 Hierarchical regressions predicting college students' psychological functioning

	Mothers				Fathers			
	<i>B</i>	SE <i>B</i>	β	<i>R</i> ²	<i>B</i>	SE <i>B</i>	β	<i>R</i> ²
College students' anxiety								
Block 1				.00				.00
Gender	.92	1.30	.06		.63	1.35	.04	
Block 2				.06				.05
Gender	1.06	1.28	.07		.56	1.35	.04	
Parents' anxiety	.25	.09	.24**		.24	.13	.22	
Parents' positive ATs	-.08	.08	-.08		.06	.08	.06	
Parents' negative ATs	-.25	.17	-.13		.02	.14	.02	
Block 3				.55				.50
Gender	1.57	.89	.10		1.14	.98	.07	
Parents' anxiety	.13	.07	.12*		.09	.09	.08	
Parents' positive ATs	-.01	.06	-.01		-.00	.06	-.00	
Parents' negative ATs	-.08	.12	-.04		.06	.10	.05	
Students' positive ATs	-.15	.06	-.15*		-.06	.07	-.06	
Students' negative ATs	.86	.08	.64**		.92	.09	.66	
College students' depression								
Block 1				.01				.01
Gender	1.55	1.16	.10		1.08	1.20	.07	
Block 2				.03				.02
Gender	1.71	1.16	.11		.99	1.22	.07	
Parents' depression	.19	.11	.17		.03	.07	.03	
Parents' positive ATs	-.03	.07	-.04		-.02	.14	-.02	
Parents' negative ATs	-.15	.17	-.09		.15	.17	.11	
Block 3				.59				.56
Gender	1.63	.76	.11*		1.40	.82	.10	
Parents' depression	-.07	.08	-.06		.01	.05	.01	
Parents' positive ATs	-.02	.05	-.02		-.01	.09	-.01	
Parents' negative ATs	.01	.11	.00		.01	.11	.00	
Students' positive ATs	-.21	.05	-.23**		-.15	.05	-.17**	
Students' negative ATs	.80	.07	.65**		.82	.07	.67**	
College students' self-esteem								
Block 1				.01				.02
Gender	-1.21	.79	-.12		-1.28	.82	-.13	
Block 2				.10				.05
Gender	-1.04	.76	-.10		-1.15	.82	-.11	
Parents' self-esteem	.37	.10	.33**		.03	.05	.05	
Parents' positive ATs	.00	.05	.01		.07	.09	.08	
Parents' negative ATs	-.13	.10	-.11		.16	.14	.13	

Table 5 continued

	Mothers				Fathers			
	<i>B</i>	SE <i>B</i>	β	R^2	<i>B</i>	SE <i>B</i>	β	R^2
Block 3				.62				.59
Gender	-.94	.50	-.09		-.93	.55	-.09	
Parents' self-esteem	.14	.07	.12*		.03	.03	.06	
Parents' positive ATs	.01	.03	.02		.06	.06	.08	
Parents' negative ATs	-.04	.07	-.04		.05	.09	.04	
Students' positive ATs	-.22	.03	-.35**		-.23	.04	-.37**	
Students' negative ATs	.46	.04	.55**		.45	.05	.53**	

* $p < .05$; ** $p < .01$

College Students' Anxiety

In examining college students' anxiety in the context mothers' anxiety and ATs as predictors, analyses suggest that college students' gender does not account for significant variance in Block 1, $F(1, 160) = .50$, $p < .48$. In Block 2, mothers' anxiety and ATs contribute significantly to the prediction of college students' anxiety, $F(4, 157) = 2.47$, $p < .05$, with mothers' anxiety serving as a significant individual predictor ($p < .006$). Finally, in Block 3, the equation remains significant, $F(6, 155) = 31.76$, $p < .001$. In this Block, mothers' anxiety remains a significant predictor ($p < .05$). In addition, both college students' positive ($p < .02$) and negative ($p < .001$) ATs are significant predictors.

Further, in examining college students' anxiety using fathers' anxiety and ATs as predictors, analyses suggest that college students' gender does not account for significant variance in Block 1, $F(1, 141) = .22$, $p < .64$. In Block 2, fathers' anxiety and ATs do not contribute significantly to the prediction of college students' anxiety, $F(4, 138) = 1.74$, $p < .15$. Finally, in Block 3, the equation becomes significant, $F(6, 136) = 22.88$, $p < .001$. In this Block, college students' negative ATs ($p < .001$) account for a significant amount of variance.

College Students' Depression

In examining college students' depression with mothers' depression and ATs as predictors, analyses suggest that college students' gender does not account for significant variance in Block 1, $F(1, 169) = 1.80$, $p < .18$. In Block 2, mothers' depression and ATs do not contribute significantly to the prediction of college students' depression, $F(4, 166) = 1.39$, $p < .24$. Finally, in Block 3, the equation becomes significant, $F(6, 164) = 38.75$, $p < .001$. In this Block, college students' gender ($p < .04$) as well as college students' positive ($p < .001$) and negative ($p < .001$) ATs are significant predictors.

Further, in examining college students' depression with fathers' depression and ATs as predictors, analyses suggest that college students' gender does not account for significant variance in Block 1, $F(1, 150) = .82$, $p < .37$. In Block 2, fathers' depression and ATs do not contribute significantly to the prediction of college students' depression, $F(4, 147) = .55$, $p < .70$. In Block 3, the equation becomes significant, $F(6, 145) = 31.16$,

$p < .001$, with college students' positive ($p < .004$) and negative ($p < .001$) ATs serving as significant predictors.

College Students' Self-Esteem

In examining college students' self-esteem using mothers' self-esteem and ATs as predictors, analyses suggest that college students' gender does not account for significant variance in Block 1, $F(1, 174) = 2.36, p < .13$. In Block 2, mothers' self-esteem and ATs contribute significantly to the prediction of college students' self-esteem, $F(4, 171) = 4.50, p < .002$, with mothers' self-esteem serving as a significant individual predictor ($p < .001$). Finally, in Block 3, the equation remains significant, $F(6, 169) = 45.91, p < .001$. In this Block, mothers' self-esteem remains a significant predictor ($p < .05$). In addition, both college students' positive ($p < .001$) and negative ($p < .001$) ATs are significant predictors.

In examining college students' self-esteem with fathers' self-esteem and ATs as predictors, analyses suggest that college students' gender does not account for significant variance in Block 1, $F(1, 152) = 2.41, p < .12$. In Block 2, fathers' self-esteem and ATs do not contribute significantly to the prediction of college students' self-esteem, $F(4, 149) = 1.92, p < .11$. In Block 3, the equation becomes significant, $F(6, 147) = 35.17, p < .001$, with college students' positive ($p < .001$) and negative ($p < .001$) ATs serving as significant predictors.

Discussion

Cognitive and developmental theories suggest the importance of social interaction in the development of ATs as well as in the influence of ATs on psychological and social functioning [2, 18, 25]. It does not appear, however, that any existing research has examined the relationship between parents' ATs and those of their children. As a result, this study explores the relationships among college students' ATs and psychological functioning, the ATs and psychological functioning of their mothers and fathers, and characteristics of the communication that transpires in the context of the parent–child relationship. The findings of this study suggest that there are significant relationships between the positive ATs of college students and those of their mothers and fathers. Further, sons' positive ATs are correlated to mothers' negative ATs; however, a similar pattern of results did not occur for daughters. In terms of predicting college students' psychological functioning, mothers' variables (but not fathers') also proved to be important predictors in some cases. Overall, these results suggest that parents' variables may have unique relationships to the ATs and psychological functioning of their college students, suggesting that future studies should examine ATs more closely.

Thus, findings of this study support partially the primary hypothesis that college students' ATs and those of their mothers and fathers would be related. Only college students' positive ATs and those of their mothers and fathers are related significantly. In contrast, the hypothesis that college students' positive ATs and those of their parents would be related more closely than their negative ATs is not supported. Similarly, the hypothesis that the relationship of sons' ATs and those of their parents would be greater than that of daughters' ATs and those of their parents is not supported. Overall, the relationships of college students' ATs and those of their parents are similar to those of previous research, however, in that college students' positive, but not negative, ATs are related to parents'

perceived self-talk [26, 27]. Generally, these findings suggest the importance of positive ATs in families, particularly in this sample of nonclinical families [7]. Other results may have been derived if families who were experiencing more significant psychological symptoms were examined.

In addition, the hypothesis regarding the role of parents' ATs and communication in predicting college students' ATs is supported partially. In particular, mothers' positive ATs and communication with their college students are important predictors of college students' positive ATs. Further, mothers' own communication with their college students is a partial mediator of the relationship between mothers' positive ATs and those of their college students. It may be that mothers who endorse more positive ATs also feel that they need to communicate with their children less frequently. In turn, this pattern may provide college students with a sense of confidence and more positive ATs. This pattern of findings may be specific to the emerging adult college student sample examined in this study. As emerging adults are in the process of transitioning to adulthood [39], mothers may feel that they need to provide less support to their college students if they themselves are experiencing positive ATs and they feel that their college students are managing things well. Such relationships should be examined in children and adolescents of other ages to determine if this pattern is specific to emerging adults who are completing college. It also may be the case, however, that mothers and college students who are communicating with each other less frequently require positive ATs as part of the cognitive dissonance that they are experiencing with regard to their relationship. Given these findings, these relationships should be examined further in future research.

The final hypothesis for this study regarding the predictive value of parents' psychological functioning and the ATs of both parents and their college students for college students' psychological functioning also is supported partially. Generally, college students' positive ATs were predictive of more adaptive psychological functioning, whereas their negative ATs were predictive of poorer psychological functioning (except when examined in the context of the anxiety of fathers and college students). Further, given that both positive and negative ATs accounted for unique and significant variance in college students' psychological functioning, positive and negative ATs appear to be separate dimensions, as indicated in previous research [7]. Overall, these findings support the importance of ATs in psychological functioning and suggest that cognitive interventions that attempt to alter individuals' ATs may be vitally important to making changes in individuals' psychological functioning (e.g., [4]).

When examining mothers' psychological functioning, mothers' anxiety and self-esteem serve as significant predictors of college students' anxiety and self-esteem, respectively, even in the context of college students' ATs. Certainly, these findings may be related to the genetic transmission of certain characteristics related to psychological functioning. It also may be the case, however, that mothers' psychological functioning plays a role in the ATs experienced by college students, which then may play a role in the psychological functioning exhibited by college students. Interestingly, mothers' positive ATs predict college students' positive ATs in one of the regression analyses examined in this study but do not serve as predictors in the regression analyses examining college students' psychological functioning. This pattern of results may suggest that mothers' ATs play only an indirect role in predicting college students' psychological functioning, particularly in the context of mothers' own psychological functioning. Nonetheless, these findings suggest the importance of untangling individuals' family history from their own ATs and psychological functioning in the course of psychotherapeutic interventions. Such information may

highlight that either ATs or certain characteristics of psychological functioning should serve as the direct target of such interventions.

As the developmental transmission of ATs could not be examined directly in this study, future research should determine whether the pattern of results described in this study exist between the ATs of younger children and adolescents and those of their parents. Future research also would need to examine whether there is a potential causal path between parents' ATs and those of their children and adolescents. If such an intergenerational transmission is found, future research then would need to examine whether there are different mechanisms of transmission to sons and daughters and whether there are sensitive periods, or optimal periods of influence, in the development of children's ATs. It may be the case, however, that relationships among multi-generational ATs reflect the genetic transmission of certain domains of psychological functioning [34], with ATs only playing an indirect role. Overall, future research needs to parse out potential genetic versus social contributions to the development of ATs.

Future research also will need to overcome several limitations that hamper the findings of this study. The population selection and the use of one-time sampling result in a conceptual problem. Namely, because ATs are sampled at one point in emerging adulthood in this study, there is no guarantee that the ATs reported by parents are similar to those that they exhibited when their college students were still children and adolescents. Although research indicates that ATs can remain similar across time [49], it is likely that the ATs of these parents at the time of this study are not fully representative of their ATs during their college students' childhoods. As a result, future research would benefit from using a longitudinal design to examine the relationship between early parent–child ATs and the course of ATs that children exhibit over time. Further, this study does not account for the amount of parental contact that these parents and their college students had when these college students were younger. Although the FSTS was designed to give an estimate of college students' exposure to their parents' self-talk, future research needs to determine whether the degree of actual interaction is related to the development of ATs.

The participant sample and survey methods of this study also include some limitations. All the college student participants were attending a large Southeastern university and had parents who reported relatively high levels of education. Generally, high education levels are related to a higher socioeconomic status and to lower levels of psychopathology [50, 51]. Thus, this study likely had a sample of high functioning college student and parent participants. This distribution may have limited the degree of the relationships noted between college students' ATs and those of their parents due to restricted range. As a result, future research should examine whether a wider range of psychological functioning would produce a different pattern of results. A final limitation of this study was the exclusive use of self-report surveys (even though multiple informants were used). Future research should examine ATs, communication, and psychological functioning using other methods of measurement, such as behavioral observation, time-interval sampling, and physiological markers. Such research would ensure that the relationships are a function of similarities between parents' ATs and those of their children, rather than an artifact of measurement technique (e.g., social desirability in self-reports).

Summary

Despite its limitations, the findings of this study suggest that college students' positive ATs and those of their parents are related. Different patterns of relationship also are noted for

ATs in the context of male and female college students with their mothers and fathers. Further, mothers' positive ATs predicted the positive ATs of their college students, with mothers' ratings of their own communication with their college students mediating partially this relationship. Finally, college students' anxiety and self-esteem is predicted significantly by their mothers' anxiety and self-esteem (respectively) as well as their own positive and negative ATs. These findings suggest the possibility that ATs play a role in the intergenerational transmission of certain domains of psychological functioning. In combination with previous research on the importance of social relationships in the development of ATs [18, 22, 26], these findings are encouraging for the future study of the social and genetic influences of ATs.

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