Longitudinal links from attachment with mothers and fathers to adolescent substance use: Internalizing and externalizing pathways

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Abstract
The present study examined whether internalizing and externalizing symptoms may mediate the association between adolescent–mother and adolescent–father attachment and substance use. The sample included 167 adolescents (47% girls) who were assessed at five time points with approximately 1 year between each assessment, beginning in middle adolescence (M age = 14.07) and ending in the transition to young adulthood (M age = 18.39). The adolescents reported their perceived attachment with both their mother and father during middle adolescence (Times 1 and 2), their internalizing and externalizing symptoms during late adolescence (Times 3 and 4), and their alcohol use during the transition to young adulthood (Time 5). The results showed that less secure adolescent–father attachment, but not adolescent–mother attachment, was predictive of heightened externalizing and internalizing symptoms. In turn, heightened externalizing symptoms were predictive of heightened alcohol use. Despite the nonsignificant direct association between adolescent–father attachment and alcohol use, less secure adolescent–father attachment was indirectly predictive of greater alcohol use, mediated through heightened externalizing symptoms. The findings highlight the importance of close and trusting father–adolescent relationships in the development of psychopathology and substance use behaviors. The developmental cascade from a less secure adolescent–father attachment to greater externalizing symptoms and heightened substance use, as well as implications for prevention and intervention of young adult substance use, are discussed.

Research Highlights:
• The differential pathways from adolescent–mother and adolescent–father attachment to substance use during the transition to young adulthood are not well known.
Longitudinal data were used to test whether internalizing and externalizing symptoms may mediate the association between adolescent–mother and adolescent–father attachment and substance use.

Less secure adolescent–father attachment predicted heightened internalizing and externalizing symptoms, and less secure adolescent–father attachment predicted greater alcohol use, mediated through heightened externalizing symptoms. The findings suggest that addressing insecure attachment with fathers during adolescence may reduce unhealthy substance use during the transition to young adulthood.

KEYWORDS
adolescence, attachment, externalizing symptoms, internalizing symptoms, substance use

INTRODUCTION

From a developmental psychology perspective, attachment formed within parent–child relationships provides the foundation to evaluate themselves and others (Bowlby, 1973). It follows that insecure attachment contributes to the development of externalizing and internalizing symptoms (Madigan et al., 2016). Additionally, insecure attachment may be a critical antecedent of substance use problems if substances are used as a coping mechanism (Schindler, 2019; Volkow et al., 2011), particularly in the absence of a secure attachment relationship with the adolescent’s parents. As such, attachment may be not only directly related to substance use behaviors but also indirectly through externalizing and internalizing pathways. In the current study, we used five years of longitudinal data to investigate prospective links from parent–adolescent attachment in adolescence to substance use during the transition to young adulthood.

Specifically, our developmental cascade model examined the relative roles of adolescent–mother and adolescent–father attachment through two alternative pathways from attachment to alcohol use: one through internalizing symptoms and the other through externalizing symptoms.

1.1 Attachment theory

A fundamental component of the human experience is the capacity to form enduring affective connections, or “attachments,” to one another (Gustison & Phelps, 2022). Early attachment lays the groundwork for healthy development throughout an individual’s life (Thompson, 2008). Attachment theory explains the processes involved in creating and maintaining strong relationships (Bowlby, 1969, 1973, 1980). During development, children form secure attachments (based in part on receiving adequate amounts of predictable, responsive, sensitive caregiving) or insecure attachments (based in part on receiving low levels of such caregiving behaviors) (Ainsworth et al., 1978). Attachment theory posits that the emotional security provided by parents during childhood allows for the development of a secure internal working model, representations about the self and others that guide how one interacts with others across the lifespan (Bowlby, 1988). In adolescence, secure attachment is supported by sensitive, responsive parenting manifested through mutual trust, high-quality communication, and feelings of closeness that promote psychological security (Armsden & Greenberg, 1989). In adolescence and childhood alike, insecure attachment presents a vulnerability to psychopathology, such as internalizing or externalizing symptoms (Bakermans-Kranenburg & Van Ijzendoorn, 2009).

Adolescence is a period of consolidation in attachment that allows adolescents to see how they fit into society (Brown & Wright, 2001). The theoretical perspective of attachment implies that the attachment quality between a child and their parents is stable during adolescence (Thompson, 2000). Although research on attachment, in general, focused more on the early years, available research on attachment during adolescence has suggested the significance of adolescent attachment with parents with respect to internalizing and externalizing symptoms (Allen et al., 2003, 2007). Adolescence is a crucial time to examine the roles of attachment; not only does it involve the period of consolidation for attachment, heralding its long-lasting effect on the lifespan, but it also is a time when the clinical onset of most psychopathology peaks (Allen et al., 2007; Lee et al., 2014). In general, secure attachment in adolescence has been found to predict and promote the creation of positive relationships with peers (Allen et al., 1998; Delgado et al., 2022). Relationships with parents continue to be important during an adolescent’s life when they are exposed to many changes, and supportive parent–adolescent relationships have been found to be associated with reduced internalizing and externalizing symptoms and substance use (Allen et al., 2007; Branstetter et al., 2011; Brook et al., 2012; Buist et al., 2011), further highlighting the importance of secure attachment in adolescence.
1.2 | Attachment and substance use

The use of substances often begins in adolescence (Substance Abuse and Mental Health Services Administration, 2022), and parents have been found to have consistent and strong influences on adolescent substance use behaviors (Trucco, 2020). However, less is known about the role of parents in substance use behaviors during the transition to young adulthood. This is the time during which substance use behaviors peak (Steinberg & Chein, 2015), as adolescents often leave home and make more independent decisions including risky decisions without close parental monitoring. Within the current literature on substance use and addiction, theoretical work has argued that attachment can protect against addiction (Tops et al., 2014). For example, alcohol is often used by people experiencing difficulties with attachment as a self-medication agent (Khantzian, 1997). Indeed, systematic reviews and meta-analyses examining attachment and substance use from early childhood through adulthood found a link between the two, such that insecure attachment is associated with greater substance use concurrently and that attachment insecurity preceded increases in substance use longitudinally (Becofa et al., 2014; Fairbairn et al., 2018; Schindler & Bröning, 2015). Indeed, a review of adolescent and adult samples found strong support for the link between insecure attachment and substance use disorders (Schindler & Bröning, 2015). They suggested that further research was needed to address the associations between attachment and substance use, including through externalizing pathways. Additionally, it has been argued that insecure attachment increases neurogenetic vulnerability to substance use, highlighting that attachment insecurity may play a crucial role in the onset and severity of substance use disorders in concert with genetic factors (Gerra et al., 2021). Altogether, existing literature suggests that the link between attachment insecurity and the development of substance use needs further studying.

1.3 | Attachment and psychopathology

Previous work has established the link between attachment and psychopathology including internalizing symptoms, defined as problematic behaviors that are directed inward such as depression and anxiety, and externalizing symptoms, defined as problematic behaviors that are directed outward such as aggression and delinquency (Achenbach & Rescorla, 2001). Insecure attachment may give rise to internalizing symptoms due to repeated experiences of unresponsiveness or unavailability from attachment figures. These repeated experiences can lead to dysfunctional cognitions about the self that can promote depression symptoms (Dozois & Beck, 2008). Regarding attachment and externalizing symptoms, if a parent is rejecting or unresponsive, the child may form an internal working model that expects others to be rejecting or unresponsive as well. This working model can lead to treating others in an antagonistic manner including externalizing behaviors (Deneault et al., 2021). Turning to foundational symptoms of reactivity and dysregulation that are part of both internalizing and externalizing problems, when parenting is frequently unresponsive or rejecting, children and adolescents may not have adaptive beliefs and strategies for regulating emotions and behaviors (Fairbairn et al., 2018; Mikulincer & Shaver, 2019).

There is little prior work examining adolescent attachment and psychopathology. However, supporting the theoretical accounts for the link between attachment and psychopathology, a systematic review provided evidence that insecure early childhood attachment was associated with both internalizing and externalizing symptoms from preschool through middle childhood (Badovinac et al., 2021). One notable longitudinal study suggests that lower attachment security during early adolescence is linked to increasing patterns of externalizing symptoms and higher and stable trajectories of depression symptoms throughout early adolescence (Allen et al., 2007). This finding is consistent with a meta-analysis indicating that insecure attachment is associated with the development of depression in children and adolescents (Spruit et al., 2020). However, prospective studies linking developmental consequences of attachment in adolescence are rare, and especially, the role of attachment in the development of psychopathology beyond early adolescence is not clearly understood.

1.4 | Attachment and substance use via psychopathology

Reviewing prior research reveals two plausible developmental pathways through which adolescents’ attachment with parents is linked to substance use. For one, insecurely attached adolescents may not have the necessary self-regulation skills available (Mikulincer & Shaver, 2019), and the resulting disinhibited, externalizing behaviors may facilitate problematic substance use. Additionally, insecure attachment may lead to low self-esteem and high negative affect associated with the lack of positive social interactions, and the resulting internalizing behaviors may facilitate substance use as a maladaptive coping strategy (Kassel et al., 2007; Schindler et al., 2007).

Consequently, insecure attachment is often associated with various forms of psychopathology, which can give rise to substance use disorders (Ferdinand et al., 2001; Schindler, 2019). Indeed, the link between externalizing symptoms and substance use in adolescence is well-established, such that intrapersonal factors (e.g., sensation seeking) and interpersonal factors (e.g., deviant peer affiliation) facilitate the externalizing pathway to substance use (Colder et al., 2013; Dishion et al., 2010; Dodge et al., 2009; Edwards et al., 2016). In contrast, there are mixed findings for the internalizing pathways leading to substance use: Some literature suggests that having anxiety or depression may increase one’s risk for substance involvement in adolescence (Hussong et al., 2011). Other literature indicates that internalizing problems in adolescence without the presence of externalizing symptoms are a protective factor against substance use (Colder et al., 2013; Elder et al., 2019), in part due to less interaction with peers during adolescence (Siebenbruner et al., 2006). As such, although the existing literature indicates the important role of attachment as an interpersonal factor that contributes to substance use (Schindler & Bröning, 2015),
developmental processes that explain the link between attachment and substance use have not yet been understood. We propose that less secure attachment to parents during adolescence may serve as a precursor to later substance use during the transition to young adulthood. Further, we propose that internalizing and externalizing symptoms may serve as pathways in the developmental cascades from parent–adolescent attachment to substance use.

1.5 Mother and father attachment related to psychopathology and substance use

There is some debate in the literature suggesting potentially differential contributions of adolescent–mother and adolescent–father relationships to psychopathology or substance use (Deneault et al., 2021; Madigan et al., 2016). An independent model of attachment has been proposed, in which each attachment is considered to have independent effects (Howes & Speicker, 2008; Van Ijzendoorn et al., 1992). That is, adolescent–mother attachment and adolescent–father attachment may differently predict the adolescent’s adjustment throughout life (Dagan & Sagi-Schwartz, 2018). There is a gap in the literature on the role of father attachment, particularly in adolescence, as most existing studies focus on mother attachment and childhood. Research on childhood has shown that father attachment insecurity is more predictive of externalizing symptoms than mother attachment, whereas mother and father attachment insecurity were similarly associated with internalizing symptoms (Bureau et al., 2017; Deneault et al., 2021; Groh et al., 2012). Thus, further work is needed to elucidate the possible distinctive effects that mother and father attachment quality have on the development of internalizing and externalizing symptoms and substance use during adolescence, an important period for the emergence and development of psychopathology (Powers & Casey, 2015).

Existing literature has suggested that girls tend to experience more internalizing symptoms and boys more externalizing symptoms in adolescence (Achenbach et al., 1991; Ara, 2016). In adolescence, it has been found that girls had higher attachment security with their parents (Pace et al., 2011). Despite the gender differences shown in the levels of psychopathology and attachment security, prior research indicates nonsignificant gender differences with respect to the strength of the associations between adolescent–parent attachment and internalizing and externalizing symptoms among youths (e.g., Madigan et al., 2016). However, more work is needed to clarify possible gender differences in the association between adolescent–parent attachment and adolescent substance use.

1.6 Present study

Although current literature presents a clear link between attachment and substance use, developmental pathways linking these two have not been examined. In the present study, we integrate two separate areas of research indicating the significant roles of attachment in psychopathology and substance use and investigate whether attachment contributes to the development of substance use not only directly but also indirectly by facilitating psychopathology. Further, we aim to clarify distinct effects of adolescent–mother and adolescent–father attachment on psychopathology and substance use. Using prospective longitudinal data, we tested mediation models in which mother–adolescent and father–adolescent attachment during middle adolescence were associated with adolescent internalizing and externalizing symptoms during late adolescence, which in turn were associated with adolescent alcohol use an additional 2 years later during the transition to young adulthood. Specifically, we expected that less secure attachment would be associated with greater levels of internalizing and externalizing symptoms and further associated with greater use of alcohol (i.e., direct effects). We also expected that these pathways would be mediated by internalizing and externalizing symptoms (i.e., indirect effects). Additionally, we explored possible youth gender differences in the associations among attachment, psychopathology, and alcohol use.

2 METHODS

2.1 Participants

The sample included 167 adolescents (47% girls). Adolescents were between the ages of 13 and 14 at Time 1 and between the ages of 18 and 20 at Time 5 (M = 14.07, SD = 0.54 at Time 1; M = 15.05, SD = 0.54 at Time 2; M = 16.08, SD = 0.55 at Time 3; M = 17.02, SD = 0.55 at Time 4; and M = 18.39, SD = 0.67 at Time 5). About 78% of adolescents identified as White, 14% Black, 6% as more than one race, and 2% as other. See Supplemental Materials, section 1, for more details about demographic information and attrition.

2.2 Procedures

Adolescent participants and one of their caregivers (77.80% mothers) were recruited from a southeastern state in the United States using email announcements, flyers, and snowball sampling (word-of-mouth). The analyses here utilized only self-report data, but because the broader longitudinal study included functional magnetic resonance imaging (fMRI) tasks, individuals were not eligible for the study if they had any contraindications to fMRI. Data collection was completed at university offices where participants underwent fMRI scans and completed self-report questionnaires. All procedures were approved by the institutional review board of the university and written informed consent or assent was received from all participants.

2.3 Measures

Demographics. The primary caregivers provided information on adolescent gender, race, family annual income, and household size.
Attachment. Adolescents reported separately on their attachment with their mother and father using the Inventory of Parent and Peer Attachment (IPPA; Raja et al., 1992) at Times 1 and/or 2. This scale is a 12-item five-point Likert scale (from “1 = Almost Never or Never True” to “5 = Almost Always or Always True”). See Supplemental Materials, section 2, for more information about the creation of IPPA. There was good reliability at Times 1 and 2 (α = .85-.87 for adolescent–mother attachment; α = .85-.9 for adolescent–father attachment).

Internalizing and externalizing symptoms. At Times 3 and/or 4, adolescents reported on their internalizing and externalizing symptoms using the Youth Self-Report (YSR; Achenbach & Rescorla, 2001). This scale comprised 112 items covering adolescents’ symptoms and behaviors during the past 6 months. The items were combined into separate measures of internalizing symptoms (withdrawal, somatic complaints, and anxiety-depression) and externalizing symptoms (aggressive behaviors and delinquent behaviors). Three items involving substance use were excluded from the externalizing symptoms scale to preclude any potential inflation in the association between externalizing symptoms and alcohol use. There was good reliability at Times 3 and/or 4 (α = .85-.90 for internalizing symptoms; α = .84-.88 for externalizing symptoms).

Alcohol use. At Time 5, adolescents reported on their alcohol use frequency (i.e., “Which is most true for you about using alcohol?”) using a 6-point Likert scale ranging from “1 = never used” to “6 = usually use every day” (α = .70).

2.4 Data analytic plan

See Supplemental Materials, section 3, for a power analysis. For all study variables, descriptive statistics were examined to determine the normality of distributions and see if any outliers were present. Skewness and kurtosis were examined for all variable distributions and all had acceptable levels <3 and 10, respectively (Kline, 2011). Outliers were identified as values ≥3.29 SD from the mean (Tabach, 2013). In these cases (N = 11), the values were winorized to retain statistical power and attenuate bias that may occur if eliminated (Ghosh & Vogt, 2012). The hypothesized models were tested with path analysis using Mplus statistical software version 8 (Muthén & Muthén, 2012). It has been found that bias-corrected bootstrapping is a suitable method for testing indirect effects (MacKinnon et al., 2004). The significance of indirect effects was tested using bias-corrected bootstrap confidence intervals (CIs) based on 10,000 bootstrapping samples (Preacher & Hayes, 2008) and the indirect effects were considered significant if the 95% CIs did not contain zero.

Overall model fit was evaluated by multiple indices, including overall nonsignificant χ², root-mean-square error of approximation (RMSEA), and confirmatory fit index (CFI). RMSEA values of 0.08 or less and CFI values of 0.90 or greater were considered acceptable fits (Little, 2013). Nested model testing was evaluated using CFI difference, which is not influenced by sample sizes, unlike the chi-square difference test. We tested if a value of ∆CFI is greater than the recommended 0.01 (Cheung & Rensvold, 2002) to reflect a meaningful difference in model fit. Little’s MCAR test indicated that the missing data pattern for all study variables resembled a completely at random pattern (χ² = 14.21, df = 21, p = .860). Full information maximum likelihood (FIML) estimation procedure (Arbuckle, 1996) allowed utilizing the full sample of 167 participants. FIML was used because it has greater statistical efficiency for computing standard error compared to mean-imputation, list-wise, and pair-wise deletion methods (Wothke, 2000). Multivariate GLM was used to test for the effects of demographic covariates (i.e., gender, race categorized into three groups of White, Black, or other person of color, and income-to-needs ratio based on the family income and household size). Additionally, we explored possible gender differences in the associations among attachment, psychopathology, and alcohol use by testing two-group path analyses comparing boys and girls. The data and code are available upon request.

3 RESULTS

All descriptive statistics and correlations for the study variables are presented in Table 1. The results from the multivariate GLM testing demographic covariates showed that gender was significantly associated with internalizing symptoms (F =14.52, p < .001 for Time 3, F = 22.15, p < .001 for Time 4); thus, gender was added as a covariate to the model. Race was significant in the multivariate GLM test (F = 1.69, p = .048), but it was not significantly associated with any study variables at the univariate level (F = 0.17 to F = 2.76, p = .069 to p = .841), and thus was not added as a covariate to the model. Income-to-needs ratio (F = 1.52, p = .155) was not associated with any of the study variables.

The model fit indices indicated acceptable model fit for the hypothesized mediation model (χ² = 4.22, df = 2, p = .120; RMSEA = 0.08; CFI = 0.97). As can be seen in Figure 1, results indicated a significant direct effect from adolescent–father attachment to internalizing symptoms (B = −2.25, SE = 1.10, p = .040) and externalizing symptoms (B = −3.17, SE = 0.91, p < .001), suggesting that less secure attachment was predictive of higher levels of both internalizing and externalizing symptoms. Additionally, a significant direct effect from externalizing symptoms to alcohol use (B = 0.05, SE = 0.02, p = .010) indicated that higher levels of externalizing symptoms predicted higher levels of alcohol use. Further, the indirect effect from adolescent–father attachment to alcohol use via externalizing symptoms was significant (bootstrap 95% CI [−0.18; −0.02]). The result indicated that those with less secure attachment with the father during middle adolescence exhibited higher externalizing symptoms during late adolescence, which further was predictive of higher alcohol use during the transition to young adulthood.

The direct effect from adolescent–mother attachment to internalizing symptoms (B = −1.70, SE = 1.45, p = .241) and externalizing symptoms (B = −0.45, SE = 1.04, p = .665) were not significant. Additionally, the direct effects from adolescent–father attachment (B = 0.32, SE = 0.20, p = .107), adolescent–mother attachment (B = −0.28, SE = 0.18, p = .130), and internalizing symptoms (B = −0.002, SE = 0.01,
TABLE 1  Descriptive statistics and correlations for mother and father attachment, internalizing and externalizing symptoms, and alcohol use.

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Min</th>
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<th>1</th>
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</thead>
<tbody>
<tr>
<td>(1) Adolescent–mother attachment (Times 1 and 2)</td>
<td>4.01</td>
<td>0.58</td>
<td>2.08</td>
<td>4.92</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>(2) Adolescent–father attachment (Times 1 and 2)</td>
<td>3.76</td>
<td>0.66</td>
<td>1.92</td>
<td>4.88</td>
<td>.55*</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>(3) Internalizing symptoms (Times 3 and 4)</td>
<td>11.98</td>
<td>7.52</td>
<td>0.50</td>
<td>41.50</td>
<td>-.20*</td>
<td>-.30*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(4) Externalizing symptoms (Times 3 and 4)</td>
<td>9.80</td>
<td>6.27</td>
<td>0.50</td>
<td>29.50</td>
<td>-.22*</td>
<td>-.35*</td>
<td>.31*</td>
<td>-</td>
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<tr>
<td>(5) Alcohol use (Time 5)</td>
<td>3.02</td>
<td>1.12</td>
<td>1.00</td>
<td>5.00</td>
<td>-.12</td>
<td>.004</td>
<td>.08</td>
<td>.22*</td>
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<td>(6) Gender (boy = 0; girl = 1)</td>
<td>0.47</td>
<td>0.50</td>
<td>0.00</td>
<td>1.00</td>
<td>.11</td>
<td>-.04</td>
<td>.40*</td>
<td>-.14</td>
</tr>
</tbody>
</table>

Note: Values reflect observed data among participants: N = 167 for adolescent–mother attachment and gender; N = 157 for adolescent–father attachment; N = 154 for internalizing and externalizing symptoms; N = 126 for alcohol use. *p < 0.05.

FIGURE 1  Longitudinal associations among adolescent–mother and adolescent–father attachment during middle adolescence, internalizing and externalizing symptoms during late adolescence, and alcohol use during the transition to young adulthood. Standardized estimates are presented. *p < .05.

We conducted a sensitivity analysis controlling for parental alcohol use and parental depression on adolescent alcohol use and adolescent psychopathology (respectively), and the results remained unchanged (see Supplemental Materials, section 6, for further details). We conducted a sensitivity analysis controlling for peer attachment on the outcome of alcohol use and the results remained unchanged (see Supplemental Materials, section 7, for further details). Finally, we conducted a sensitivity analysis examining parent-reported adolescent psychopathology and the results revealed nonsignificant indirect effects of adolescent–father attachment (see Supplemental Materials, section 8, for further details).

4 | DISCUSSION

In this prospective longitudinal study, we examined whether attachment to parents during middle adolescence may serve as a precursor
of substance use during the transition to young adulthood. We further examined if this association is mediated by internalizing and externalizing symptoms during late adolescence. Although the literature is clear about the importance of parents’ influence on adolescent substance use, less is known about the long-lasting effects of parents during the transition to young adulthood. Our findings demonstrate that earlier relationship quality with fathers during middle adolescence is important in predicting alcohol use during the transition to young adulthood when substance use behaviors are facilitated by increased exposure to substances, diminished parental monitoring, and decreased structure (Stone et al., 2012). Further, our data suggested that the link between adolescent–father attachment and substance use was mediated through externalizing symptoms. Finally, our exploratory analysis indicated nonsignificant youth gender differences in the associations among attachment, psychopathology, and alcohol use. This result was consistent with prior meta-analyses reporting nonsignificant gender moderation effects on the attachment-psychopathology link across childhood and through late adolescence for both adolescent–mother and adolescent–father attachment (Deneault et al., 2021; Madigan et al., 2016).

Our data suggest that less secure adolescent–father attachment experienced during middle adolescence was associated with externalizing and internalizing symptoms during late adolescence. Adolescents with less secure attachment to fathers may act out and take negative risks that are harmful to themselves or others (e.g., greater externalizing behaviors) in part due to the lack of secure internal working models that facilitate regulating their risk-seeking and negative emotions (Tops et al., 2014). Additionally, given that the internal working model is a representation formed by experiences with a caregiver over time, repeatedly experiencing unresponsiveness and alienation from the father growing up can give rise to negative affect and feelings of unworthiness, resulting in internalizing symptoms (Dozois & Beck, 2008).

Examining the attachment network (i.e., attachment with both the mother and father; Dagan & Sagi-Schwartz, 2018) may help us to better understand the effects of attachment on developmental outcomes in adolescence. The make-up of an attachment network can be diverse and include caregivers other than parents (e.g., other family members, paid caregivers), but one main focus of nonmaternal attachment research has been to examine the role of child–father attachment. The attachment network research suggests that a child may develop distinct relationships with different caregivers and that each of these relationships can differently impact child development (Deneault et al., 2021). In the current study, there was evidence that adolescent–father attachment was a stronger predictor of later externalizing symptoms than adolescent–mother attachment, indicating the importance of attachment to the father in the development of externalizing symptoms during adolescence. Specifically, even though both adolescent–father attachment and adolescent–mother attachment exhibited significant bivariate correlations with internalizing and externalizing symptoms, when they were simultaneously included in the model to evaluate relative contributions, only the effects of adolescent–father attachment were significant. This finding is consistent with prior research demonstrating that only adolescent–father attachment, not adolescent–mother attachment, was predictive of adolescents’ aggressiveness (Gallarin & Alonso-Arbiol, 2012). Further, these findings support prior literature suggesting that the influence of father love is greater than the influence of mother love for certain developmental outcomes including delinquency and substance use (Rohner & Veneziano, 2001).

Acceptance by fathers (i.e., warmth, affection, care, comfort, nurturance, support, and love) has been found to be a stronger predictor of child adjustment when compared with acceptance by mothers (see Khaleque & Rohner, 2012 for a meta-analysis). Coupled with fathers’ increasing involvement in their children’s lives (Lamb et al., 2014), it is crucial to understand how attachment with mothers and fathers may differently impact child and adolescent development. In the current prospective longitudinal analysis, we found that adolescent–father attachment was a stronger predictor of adolescent externalizing symptoms. This finding is consistent with literature suggesting that insecure attachment with fathers may have a greater influence on externalizing symptoms than insecure attachment with mothers (Bureau et al., 2017; Deneault et al., 2021). Within the psychopathology literature, it has been suggested that fathering behaviors are more potent predictors than mothering behaviors particularly for externalizing symptoms, as fathers are more likely to engage in more rough-and-tumble play, compete with them, and encourage them to take risks (Paquette, 2004; Volling et al., 2019). Through such experiences, adolescents with a secure adolescent–father attachment may solidify internal working models that guide risk taking in socially acceptable ways (e.g., standing up for themselves) while regulating emotions of excitement, frustration, and fear. In the absence of a secure attachment with a father, the adolescent may not have the opportunity to gain and practice these necessary skills and may regulate their emotions in socially maladaptive ways such as acting out or acting in an antagonistic manner (e.g., externalizing symptoms).

Further, our data suggested that only adolescent–father attachment, but not adolescent–mother attachment, had a significant indirect association with alcohol use 2 years later. Specifically, less secure adolescent–father attachment in middle adolescence predicted greater externalizing symptoms in late adolescence, which, in turn, predicted greater alcohol use during the transition to young adulthood. A beneficial role of adolescent–father attachment in deterring substance use and addiction may be due to the increased availability of internal working models for controlling behavior and emotion (Tops et al., 2014), which reduces externalizing behaviors and subsequent substance use behaviors. The transition to young adulthood is a time of many changes, including starting college and moving away from home which are strong predictors of increases in drinking behavior (White et al., 2006). Our finding highlights the importance of adolescent–father attachment history for substance use during this critical transition period during which substance use increases dramatically. The findings have important implications especially for young adults who are beginning college. It has been found that college students drink more than their same-age non-college peers (Schulenberg & Maggs, 2002), and alcohol use during
this transition to young adulthood has been found to be associated with an increased risk of dropping out of school as well as developing substance use disorders later in adulthood (Kessler et al., 2001; Kiciman et al., 2018).

We found that the variances of adolescent–father attachment were greater than adolescent–mother attachment. Our finding indicates that the individual differences in adolescent–father attachment were greater than those of the adolescent–mother attachment. That is, the effects of adolescent–father attachment may be more prominent on their adolescents’ outcomes in part because the level of secure attachment varied more drastically with fathers than mothers. It follows that adolescent–mother attachment security was not a significant predictor due to not having as wide of a range in individual differences concerning the amounts of secure quality. In samples with a wider range of levels of security of adolescent–mother attachment, such as samples involving young people who experienced maltreatment by mothers or maternal psychopathology, adolescent–mother attachment may be a significant predictor. We note that the effects of adolescent–father attachment and adolescent–mother attachment are dynamically determined, such that secure father–adolescent attachment may become more influential in attenuating less secure mother–adolescent attachment. For example, one study found that father engagement was intensified if the child had a less-than-optimal relationship with their mother (Piskernik & Ahnert, 2019). We also note that our findings do not contradict prior research indicating overall importance of insecure attachment with mothers in child and adolescent psychopathology (Groh et al., 2012; Madigan et al., 2016). Rather, when simultaneously examining the relative effects of adolescent–mother and adolescent–father attachment, adolescent–father attachment quality seems to be a more influential factor for the development of externalizing and internalizing symptoms during adolescence.

Notably, internalizing symptoms were not prospectively associated with later alcohol use. This finding contradicts the self-medication hypothesis, which posits that those with internalizing symptoms are more likely to use substances to decrease their symptoms (Bolton et al., 2009) and further adds to the mixed literature regarding the link between internalizing symptoms and substance use (e.g., Colder et al., 2013; Hussong et al., 2011; Isaksson et al., 2020). One primary reason for this nonsignificant link between internalizing symptoms in late adolescence and alcohol use during the transition to young adulthood may be due to the social contexts in which young adults consume alcohol. During this developmental period, drinking is often socially motivated and amplified by affiliation with substance-using peers (Otten et al., 2017; Van Ryzin et al., 2012). It follows that young adults with greater levels of internalizing symptoms are less likely to be exposed to contexts in which they can partake in substance use (Siebenbruner et al., 2006). That is, young adults experiencing depression or anxiety may prefer to stay home and not go to a party, therefore not having that opportunity to drink alcohol.

The current investigation has several methodological contributions to the attachment and psychopathology literature. For one, our sample included a large portion of adolescents living in low-income households and rural settings. Thus, this sample adds unique insights regarding understudied young people to the current literature given that the majority of studies examining adolescent–parent attachment have not focused on already at-risk youth and have been conducted in urban or suburban settings (e.g., Allen et al., 2007; Fairbairn et al., 2018). We used a prospective repeated measures design based on 5 years of longitudinal data that provided tests of statistical causal mediation modeling (Preacher, 2015; Selig & Preacher, 2009) through the sequential process modeling of predictors, mediators, and the outcome measured in the sequential. Additionally, we tested both adolescent–mother and adolescent–father attachment and their contributions to substance use through externalizing and internalizing symptoms.

5 | LIMITATIONS AND FUTURE DIRECTIONS

There are some limitations of this study that offer directions for future research. First, all variables were assessed using self-report and the associations among the study variables may have been enhanced due to potential method variance. However, there is evidence that self-report measures are particularly revealing for behaviors that are related to private or internal experience such as attachment and psychopathology (e.g., Kendall et al., 1989). In addition, alcohol use self-reports among adolescents and adults have demonstrated reliability and validity (Del Boca & Darkes, 2003; Koning et al., 2010). Nevertheless, utilizing multiple informants (e.g., parents, peers, clinicians) and multiple methods (e.g., interview, biospecimen) may be fruitful in future research. Second, studying specific attachment styles (i.e., anxious, avoidant) was outside of the scope of the current study; however, investigating how attachment styles may contribute to psychopathology and substance use would promote a comprehensive understanding of the roles of attachment. Indeed, previous work has indicated that individuals with different patterns of attachment may utilize substances for different reasons, such as to avoid feeling negative emotions or to cope with fear (Schindler, 2019). Further, future work should include an examination of attachment and psychopathology among youth with same-sex parents because the existing literature and current study results that are based on opposite-sex couples may not generalize to all types of co-parenting couples.

6 | CONCLUSION

The transition to young adulthood is an important time to examine the development of substance use behaviors. There are many life changes occurring during this time, including spending less time with parents and leaving home to work or attend college. Although the significant role of attachment in the development of psychopathology has been shown, the differential pathways from adolescent–mother and adolescent–father attachment to substance use during the transition to young adulthood are not well known. Our findings highlight
The significance of the adolescent–father relationship in a developmental cascading pathway, wherein adolescent–father attachment during middle adolescence plays a critical role in the development of externalizing symptoms in late adolescence, and, in turn, predicts subsequent alcohol use during the transition to young adulthood. The findings from the current study support the theoretical perspective that emphasizes the importance of social relationship factors in substance use disorders (Volkow et al., 2011), by illustrating that insecure adolescent–father attachment sets the stage for the developmental cascade into more externalizing symptoms and more alcohol use. The findings have implications for the prevention of problematic substance use, providing evidence that addressing insecure attachment with fathers during adolescence may reduce unhealthy substance use later (Fletcher et al., 2015). Further, the association between late adolescent externalizing symptoms and later alcohol use suggests that behavioral disinhibition during adolescence, likely prevalent among those with poor attachment qualities with their father, may be a target for the prevention of alcohol use during the transition to young adulthood.

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CONFLICT OF INTEREST STATEMENT
The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT
The datasets generated and/or analyzed during the current study are not currently publicly available but are available from the corresponding author on request.

ETHICS APPROVAL STATEMENT
All procedures of this study were approved by the institutional review board of Virginia Tech.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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