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A Longitudinal Evaluation of Risk and Resiliency on Alcohol Use from Adolescence through Adulthood

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A longitudinal evaluation of risk and resiliency on alcohol use from adolescence through adulthood

by

Sarah Elizabeth Bickelhaupt

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Human Development and Family Studies

Program of Study Committee:
Brenda J. Lohman, Co-Major Professor
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Iowa State University
Ames, Iowa
2016

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DEDICATION

This dissertation is dedicated to the many individuals who have invested in me and helped to make the completion of this journey possible. First to my two major professors, Dr. Brenda Lohman and Dr. Tricia Neppl. I am so grateful for your persistent and patient efforts in assisting me both professionally and personally through this long but invaluable experience. Your poise and work ethic has been influential in modeling success for me in the field of Human Development and Family Studies. Secondly to my committee members, Dr. Kere Hughes-Belding, Dr. Cassandra Dorius, and Dr. Matthew DeLisi. I have so much appreciated all of you for embracing and supporting me as a graduate student in addition to your enthusiasm and continued encouragement through this research process. Thirdly, I especially want to recognize my family. Your dedication and unwavering support over these past few years have meant a great deal to me. I could not have been able to accomplish this challenging but remarkable milestone in my life without you. With sincere gratitude, I thank you.
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Paper 2 Table 1. Sample Descriptives ...............................................................96
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Adolescents are particularly more vulnerable than adults when consuming the same amount of alcohol; thus creating greater health problems for adolescents who continue to drink on a regular basis as they transition into adulthood. Adolescent alcohol use can be further exacerbated when coupled with familial risk factors such as harsh parenting and parent alcohol use. However, individual personal characteristics such as self-esteem can diminish possible negative consequences associated with early-onset drinking. Utilizing the four-chapter, two-paper format, this dissertation centered on two research areas regarding these concepts: Paper (1) The contributing factors of alcohol use over time guided by Family Systems Theory; and Paper (2) The impact of positive personal characteristics as a form of resiliency on the continuity of alcohol use over time employed by a Resiliency framework. Data was drawn from the Family Transitions Project (FTP). This dissertation provided evidence as to the magnitude of influence of predictors of risk and resilience from adolescence to adulthood. In paper 1 (N = 390), adolescent and father alcohol use as well as externalizing behaviors were driving determinants of persistent alcohol use. Harsh parent-adolescent interactions demonstrated a significant, indirect effect between emerging adult and adult alcohol use. In paper 2 (N = 492), positive personal characteristics were not tenacious in minimizing the exhibition of externalizing behaviors or persistent alcohol use into adulthood. This dissertation advances the literature by evaluating adolescent alcohol use in regards to the stability of individual alcohol use, externalizing behaviors, and positive personal characteristics over a 20-year time frame. Implications are additionally included which outline potential avenues of preventing or diminishing the impact of risk-patterned alcohol use over time.
CHAPTER 1: INTRODUCTION

Inspired by the qualitative findings that emerged from my thesis (Bickelhaupt, 2012), my dissertation research centered on two primary interests regarding adolescent through adult development: 1) The contributing factors of alcohol use over time; and 2) The impact of positivity as a form of resiliency on the continuity of alcohol use over time. Both frameworks encompassed the developmental periods of adolescence (13 – 16 years old), emerging adulthood (19 – 23 years old), and adulthood (27 – 31 years old). This dissertation research was an effort to “promote competence and resilience” in adolescents who are predisposed to poor developmental outcomes (i.e., alcohol use over time; Hill, Nord, & Blow, 1992) and “focus on strategies that protect or restore the efficacy of these basic systems” (Masten, 2001, p. 235).

Pertaining to the first focus of this dissertation, alcohol use during adolescence and into emerging adulthood has been characterized as a normative occurrence that begins to dissipate as individuals age (Schulenberg & Maggs, 2002). However, the younger an adolescent is when they begin drinking the more at risk they are of not only continuing to drink as they age but also developing alcohol-related problems such as dependence (Ellickson, Tucker, & Klein, 2003; Grant & Dawson, 1997; Grant, Stinson, & Harford, 2001; Jackson, Sher, Gotham, & Wood, 2001; Maggs & Schulenberg, 2004; Moss, Chen, & Yi, 2014; Muthén & Muthén, 2000). These findings hold significant relevance to adolescent developmental outcomes. One reason for this is because adolescents are more susceptible to biological harm (i.e., brain development impairment) when compared to adults who consume the same amount of alcohol over time (McGue, 1994). This combination creates a greater health threat for adolescents who continue to drink on a
regular basis as they transition into young adulthood (Russell, 1990). Furthermore, other individual risk factors that are related to alcohol use include internalizing behaviors (Abrantes, Brown, & Tomlinson, 2004; Brown, McGue, Maggs, Schulenberg, Hingson, Swartzwelder et al., 2009; King, Iacono, & McGue, 2004) and externalizing behaviors (Farrington, 2009; Steinberg, Bornstein, Vandell, & Rook, 2011). In addition, family risk factors have been identified to contribute to alcohol use. These family risk factors include harsh parent relationships (e.g., Abrantes et al., 2004; Brown et al., 2009; Colder, Chassin, Lee, & Villalta, 2010; Colder, Scalco, Trucco, Read, Lengua, Wieczorek, et al., 2013; King et al., 2004; Iacono, Malone, & McGue, 2008); parent alcohol use (Conger, Patterson, & Ge, 1995; Kramer & Bank, 2005; Ellickson et al., 2003; Windle, Spear, Fuligni, Angold, Brown, & Pine et al., 2008), and sibling alcohol use (e.g., Brody, 1996; Conger & Little, 2010; Stocker, Lanthier, & Furman, 1997; Windle et al., 2008).

Pertaining to the second focus of this dissertation, research has shown that having a positive attitude is a strong indicator of being able to effectively cope with stressful environments (i.e., alcohol use; Redonnet, Chollet, Fombonne, Bowes, & Melchior, 2012; Ellickson et al., 2003; Zimmer-Gembeck & Skinner, 2011). Therefore, personal traits associated with positivity such as mastery (e.g., Lipschitz-Elhawi & Itzhaky, 2014; Pearlin, Menaghan, Lieberman, & Mullan, 1981); self-esteem (e.g., Backer-Fulghum, Patock-Peckham, King, Roufa, & Hagen, 2011; Laible, Carlo, & Roesch, 2004; Rangarajan, 2008); and positive affect (e.g., being interested in doing things and generally having a positive attitude about life; Moskowitz, Shmueli-Blumberg, Acree, & Folkman, 2012) were assessed as developmental attributes to healthy development for adolescents who have experienced early and persistent alcohol use. Typically tested as
separate constructs, these facets of positivity have been shown to be instrumental in contributing to this developmental process. To date, there is limited research specifically targeting these personal characteristics in relation to alcohol use. Thus, the specific aims of this dissertation were to examine the continuity of alcohol use from adolescence through adulthood and to evaluate how positivity, as well as individual and family risk factors, may help to explain alcohol use over time. “The task now for scientists is to understand more fully how risk and protective factors are linking with substance use within individuals over time and across contexts” (Schulenberg & Maggs, 2002, p. 57).

Collectively, the risk and resiliency framework soundly integrates into the Family Systems Theory as a dynamic, multidimensional tenet of examination. Walsh (2006) explains that exploring these concepts within a Family System’s prospective “expands our view of individual adaptation as embedded in broader transactional process in family…over time” (p. 12). Thus, to gain a fuller understanding of knowledge and to advance the literature, it was a logical next research step to assess these complex areas of human development by providing novel contributions of assessing adolescents longitudinally over an almost 20-year period of time. This is important as many studies conducted in this area have largely been cross-sectional, retrospective accounts, and/or limited in their time points of assessment (Amodeo & Griffen, 2009; Barnow, Schuckit, Lucht, John, & Freyberger, 2002; Latendresse, Rose, Viken, Pulkkinen, Kaprio, & Dick, 2008). Further, other studies have struggled with prolonged longitudinal assessment due to sample attrition issues (Alati, Baker, Betts, Connor, Little, Sanson, & Olsson, 2014). To overcome these limitations, data are drawn from *Family Transitions Project (FTP)*,
the study has an overall retention rate of 90% from their continued participant involvement.

**Dissertation Organization**

This dissertation follows the alternative dissertation format and encompasses two comprehensive manuscripts detailing the predictors of risk for drinking over time and resiliency in terms of individual personal characteristics from the developmental stages of adolescence and emerging adulthood into adulthood. The following two chapters of this dissertation reflect this effort and are organized in the following way: Chapter 2 encompasses the introduction, theoretical framework, and a comprehensive review of literature including the following main areas of interest for this study: stability of alcohol use from adolescence into adulthood, individual risk factors, and family risk factors. These sections are followed by the methods, results, and discussion sections detailing how each of the hypotheses for chapter 2 were assessed and conclusions were derived. Furthermore, Chapter 3 includes the introduction, theoretical framework, and comprehensive review of literature which includes: stability of alcohol use, the impact and stability of externalizing risk behavior, and the impact and stability of positivity over time. These sections are also followed by the methods, results, and discussion sections specifying how each of the hypotheses for chapter 3 were tested and inferred.

**Paper one.** The first paper, Chapter 2, assessed alcohol use from adolescence through adulthood and is entitled “*Understanding Adolescent and Family Risk Factors on Alcohol Use from Adolescence to Adulthood.*” Paper One specifically examined how individual risk factors (e.g., depression, externalizing behaviors, and adolescent alcohol use) and family risk factors (e.g., harsh parent relationships, parent alcohol use, and sibling
alcohol use) may help to predict alcohol use in emerging and adulthood. Research encompassing parents and/or siblings have demonstrated that these contextual influences contribute a vital role in terms of developmental risk of the adolescent (Conger, Patterson, & Ge, 1995; Kramer & Bank, 2005).

**Paper two.** The second paper, Chapter 3, entitled, “Continuity of Alcohol Use and Externalizing Risk: The Impact of Positivity on Alcohol Use in Adulthood”, explored if the presence of externalizing behavior and positivity play a role in the stability of alcohol use from adolescence through adulthood. Specifically, paper 2 evaluated three individual personal characteristics, (e.g., mastery, self-esteem, positive affect) and how they are related to adolescent alcohol use across the developmental periods of adolescence through adulthood.

**Conclusion**

Persistent alcohol use can have many complicated aspects to consider before moving forward in this area of research when we think about preventative and intervening determinants for adolescents. Early alcohol use can set an individual up for serious socioemotional implications (Abrantes et al., 2004; Brown et al., 2009; King et al., 2004) and life-long dependence on alcohol (Geisner, Varvil-Weld, Mittmann, Mallett, & Turrisi, 2015; White & Labouvie, 1989). Additional research is warranted to pursue specific ways that can have a broader impact on preventing risk-pattern drinking (Ellickson et al., 2003; Ewing, Osilla, Pedersen, Hunger, Miles, & D’Amico, 2014; Moss et al., 2014; Nelson, Van Ryzin, & Dishion, 2015) in order to assist this vulnerable population of youth to become healthy and self-reliant individuals. Collectively, these aforementioned integrated constructs and developmental frameworks offer a unique
research perspective into the stability and intervening mechanisms of alcohol use over an extended period of time. These two studies propel the literature forward by evaluating adolescent alcohol use in a familial context and how those family interpersonal relationships effect individual alcohol use over time in addition to examining the stability of individual externalizing behaviors and positive personal characteristics over time.
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CHAPTER 2. UNDERSTANDING ADOLESCENT AND FAMILY RISK FACTORS ON ALCOHOL USE FROM ADOLESCENCE TO ADULTHOOD

Paper to be submitted to *Journal of Research on Adolescence*

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**Introduction**

Substance use can set an individual up for serious health implications later in life such as obesity, hypertension, diabetes, and life-long drinking patterns (Black, 1981; Oesterle, Hill, Hawkins, Guo, Catalano, & Abbott, 2004; Schulenberg & Maggs, 2002; Smith Ireland, & Thornberry, 2005). Individual and family risk factors such as alcohol use by parents and/or siblings contribute a vital role in potential negative developmental outcomes for adolescents (Conger, Patterson, & Ge, 1995; Kramer & Bank, 2005). Moreover, drinking during adolescence can have many negative health outcomes into adulthood such as poor cognitive functioning and heart rhythm abnormalities (see Berg, Kiviruusu, Karvonen, Kestilä, Lintonen, Rahkonen et al., 2013; NIAA, 2015). That is, adolescents are more susceptible to this kind of harm when compared to adults who consume the same amount of alcohol over time (McGue, 1994); thus creating a greater health threat for adolescents who continue to drink on a regular basis as they transition into young adulthood (Russell, 1990). According to the National Institute on Alcohol and Alcoholism, early alcohol use can inhibit normal brain development by disrupting

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developing communication pathways, cause irreversible damage to the liver, and increase the risk of cancer later in life (NIAAA; Underage Drinking, 2015).

Findings from the 2013 National Survey on Drug Use and Health indicate that an estimated 35% of 15-year-olds have drank alcohol at least once, while 22% of 15-year-olds have reported drinking within the last month (NIAAA, 2015). According to results from the 2013 Youth Risk Behavior Survey, by 12\textsuperscript{th} grade the percentage of adolescents who have tried alcohol almost doubles (70%) and adolescents who drink heavily nearly quadruples (22%; CDC, 2013). Moreover, adolescents who begin drinking before the age of 15 are six times more likely to develop alcohol dependence in adulthood than those who begin drinking at or after 21 years old (CDC, 2013). As a whole, underage drinking costs the U.S. economy 24 billion dollars and is responsible for approximately 4,300 adolescent alcohol related deaths annually (CDC, 2010; NIAAA, 2013, Sacks, Gonzales, Bouchery, Tomedi, & Brewer, 2015). This is a significant portion of young people who are at risk of developing these aforementioned life-long negative consequences from heavy drinking (Substance Abuse and Mental Health Services Administration, 2014). Further, McCabe, Boyd, Young, Crawford, and Pope (2005) found that without intervention, these estimates of alcohol use rise to approximately 37% by young adulthood with the vast majority continuing this pattern into later adulthood.

It is widely understood that adolescent alcohol use continues into young adulthood. That is, studies suggest that moderate drinking (1 drink per day for a woman or 2 drinks per day for a man) to episodes of heavy drinking episodes (4 drinks for women or 5 drinks for men within a two hour period; NIAAA, 2015) can be classified as normative or typical behavior for older adolescents and young adults (Schulenberg & Maggs, 2002).
Young adults entering college may find that drinking with peers can be a gateway to social acceptance (Maggs, 1997; Maggs & Schulenberg, 2005). However, less is known about the mechanisms that effect alcohol use across time (Brown, McGue, Maggs, Schulenberg, Hingson, Swartzwelder et al., 2009). Thus, the purpose of the current investigation is to understand the influence of both individual and family risk factors during adolescence on alcohol use across emerging adulthood (mid-20s) and adulthood (early 30s). Specifically, individual risk factors include adolescent internalizing as well as externalizing behaviors (Birndorf, Ryan, Auinger, & Aten, 2005; Harter, 1998), while familial level risk factors include harsh parenting (Conger et al., 1995), parental alcohol use (Ellickson, Tucker, & Klein, 2003; Gruber, DiClemente, Anderson, & Lodico, 1996; Gutman, Eccles, Peck, & Malanchuk, 2011), and sibling alcohol use (Conger, Stocker, & McGuire, 2009; Craine, Tanaka, Nishina, & Conger, 2009). To be sure of such an association, this study also takes into account youth alcohol use during adolescence.

Indeed, adolescent alcohol use is important to study because early established drinking behaviors can negatively influence an individual’s development across their lifetime. Previous research has evaluated efforts to disband the individual and familial mechanisms that predict negative risky behaviors such as heavy adolescent drinking in order to better inform those who work directly with adolescents (i.e., practitioners) to promote healthy developmental outcomes. For example, early alcohol use has been identified as a high-risk contributor to an adolescent’s inability to achieve strong self-concepts in order to meet life’s milestones (i.e., living on your own; Ellickson et al., 2003). Adolescents who began drinking at an early age experience a higher risk of developing antisocial behaviors and internalizing symptoms such as depression (Flory,
Lynam, Milich, Leukefeld, & Clayton, 2004). More recent work evaluating adolescents 13 to 19 years old, also illustrated risk-behavior (e.g., lifetime pattern of alcohol use) among adolescents associated with alcohol use when compared to adolescents that report not drinking at all. Many adolescents (62%) also reported binge drinking at least once within the last year (Calvert, Bucholz, & Steger-May, 2010).

Furthermore, regular alcohol use (e.g., being drunk at approximately once per month at age 16) is one of the most significant indicators for economic and physical disadvantage in middle adulthood (Berg et al., 2013). However, there are a limited studies that address these issues from adolescence into adulthood (Schulenberg & Maggs, 2008). Likewise, many studies have assessed indicators of drinking behaviors either as cross-sectional studies or with a limited time frame (Loeber, Stouthammer-Loeber, & White, 1999; Low, Shortt, & Snyder, 2012; Schulenberg & Maggs, 2002; Danielsson, Wennberg, Tengstrom, & Romelsjö, 2010). The current study aims to evaluate alcohol use from a family systems developmental perspective over three key developmental life stages spanning a 20-year period; adolescence (13 -16 years of age), emerging adulthood (19 – 23), and adulthood (27 – 31) in addition to investigating determinants of drinking behaviors from emerging adulthood to adulthood.

**Theoretical Framework**

Individual and familial risk factors for alcohol use from emerging adulthood to adulthood can be framed by the Family Systems Theory. At its core, Family Systems Theory suggests there is interdependence between two primary facets that outline the contextual basis of this theory: the interaction between family and individual behavior (Vakalahi, 2001). Family systems are simply defined by each subsystem within the
immediate family such as the adolescent-parent or sibling relationships. Family behavior encompasses the role family members personify in order to maintain a healthy family system (Rabstejnek, 2012; Vakalahi, 2001). These dynamic interactions have been described as having a “spillover” (Pike, Coldwell, & Dunn, 2005, p. 528) or “ripple” effect (Trim, Leuthe, & Chassin, 2005, p. 397) between family members. Within this study, we address the adolescent-parent relationship as a potential indicator or “spillover” effect of alcohol use over time.

There is a reciprocal ebb and flow to the interactions within a family; hence, what one subsystem member experiences, other immediate family members are either directly or indirectly impacted (Steinberg, Bornstein, Vandell, & Rook, 2011). This system provides a meaningful framework in conceptualizing how these physical boundaries between family members can be either permeable “open” or restricted “closed”. An open system lends itself to increased flexibility for the family leaving opportunities to grow and develop together. In the case of a closed system, family members are more ridged and may struggle when the system experiences difficulty such as when family members use alcohol (Steinglass, 1985). As a result, maintaining equilibrium within that system can be challenging which can strain the system resulting in additional family conflict (Kristjansson, Sigfusdottir, Allegrante, & Helgason, 2009). For example, if an adolescent begins drinking at an early age, internalizing behaviors such as depression may co-occur which consequently affects the interrelationships of other family members (Bowen, 1974; White & Klein, 2008). When these behavior patterns such as alcohol use persist over time, the system becomes ridged but stable which is representative of a closed system that is resistant to change (Gravitz & Bowden, 1985; Palmer, 1997; Steinglass, 1985).
The current research reflects these ideas of stability from a risk perspective and serves as an opportunity to discern the underpinnings of perpetuated alcohol use by adolescents over time. This study unique in that it encompasses the proposed antecedents of alcohol use assessed in one conceptual model of risk extended from adolescence into adulthood. Specifically, the individual risk indicators tested in this model include adolescent alcohol use, depression, and externalizing behavior; and the family risk indicators include harsh parenting, parent alcohol use, and sibling alcohol use (see Figure 1).

**Stability of Alcohol Use**

Well studied normative drinking patterns have been described as an increase use of alcohol during adolescence, peaking in young adulthood, and declining thereafter (Schulenberg & Maggs, 2002). However, there are several identified risk factors associated with persistent use of alcohol over time. One of these indicators is when drinking behaviors are first initiated (Grant, Stinson, & Harford, 2001; Jackson, Sher, Gotham, & Wood, 2001; Maggs & Schulenger, 2004; Moss, Chen, & Yi, 2014; B. Muthén & L. Muthén, 2000). In particular, adolescents who are younger than 15 years of age at onset are especially vulnerable (Moss et al., 2014). Others suggest that vulnerability to persistent drinking begins at 13 or 14 years old or younger (Ellickson, et al., 2003), between 7 to 12 years old (Grant et al., 2001), or even 16 and younger (Grant & Dawson, 1997). Regardless of how early the onset, it is apparent that early alcohol use puts an adolescent at risk of developing lifelong patterns of drinking (Brown et al., 2009; Grant et al., 2001; Maggs & Schulengerg, 2005; Moss et al., 2014; Muthén & Muthén, 2000). Indeed, this risk may proportionally increase by each growth year (Grant & Dawson, 1997).
Capaldi, Feingold, Kim, Yoerger, and Washburn (2013) further support these observations from a longitudinal study of males. Although age at first drunken episode was a clear indicator of drinking later in life, they concluded that heavy alcohol use (5 or more drinks in one sitting over the last two weeks) during adolescence was predictive of persistent alcohol use through an individual’s late twenties. Conversely, Brown et al. (2009) concluded that alcohol use from ages 16 to 20 years old can predispose individuals to later issues with drinking. While many studies have focused on the frequency and perpetuation of alcohol use from adolescence into emerging adulthood, few have been able to determine specific influences on drinking from adolescence into adulthood (Ellickson et al., 2003; Ewing, Osilla, Pedersen, Hunger, Miles, & D’Amico, 2014; Moss et al., 2014; Nelson, Van Ryzin, & Dishion, 2014). Moreover, Ellickson et al. (2003) provided evidence that alcohol use poses its own differential risk apart from other forms of substance use and multiple indicators need to be explored from a longitudinal perspective. Thus, the current study investigates the impact of alcohol use from early adolescence into emerging adulthood and on into adulthood.

**Individual Risk Factors**

Apart from the onset of alcohol use during adolescence, internalizing behaviors (Abrantes, Brown, & Tomlinson, 2004; King, Iacono, & McGue, 2004) and externalizing behaviors (Farrington, 2009; Steinberg et al., 2011) are both associated with persistent alcohol use over time. Previous research has determined that internalizing behaviors do not often occur in isolation and often co-exist with externalizing behaviors (Colder, Scalco, Truc, Read, Lengua, Wieczorek et al., 2013; Hussong, Jones, Stein, Baucom, & Boeding, 2011). That is, these negative behaviors tend to occur at the same time
particularly in the presence of alcohol use. Thus, it is suggested that when examining these constructs, they should be assessed at the same time point (Colder et al., 2013). The internalized behavior of depression increases risk of adolescents initiating and using alcohol (Abrantes et al., 2004; Colder, Chassin, Lee, & Villalta, 2010; King et al., 2004). In a study of seventh graders, boys who displayed internalizing behaviors and were using alcohol, were more likely to be using alcohol six months later (Loeber et al., 1999). In a more recent study, Saraceno and colleagues (2011) found that early adolescents who experienced depression were 27% more likely to also develop problems with using alcohol when compared to those who did not express depressive symptoms. In contrast, a twin study using a sample of young girls found only a weak association between these two variables over a four year period; however, it was concluded that this may be the result of a limited observation time frame (King et al., 2004; Chassin, Pitts, DeLucia, & Todd, 1999; Zucker, 1994).

In terms of externalizing behaviors, such behaviors are predictive of adolescent alcohol use (Colder et al., 2013; Iacono, Malone, & McGue, 2008; King et al., 2004) and are especially apparent for predicting heavy drinking (approximately 5 or more drinks at one time point during the last 12 months; King et al., 2004). Similar research has supported this finding with heavy drinking defined as four or more drinks at one time point within the past 30 days (Farrington, 2009; Hill, White, Chung, Hawkins, & Catalano, 2000; Muthén & Muthén, 2000; Tucker, Orlando, & Ellickson, 2003). More specifically, externalizing behaviors associated with alcohol use are more destructive such as aggression and rule-breaking (Vanheusden, Van Lenthe, Mulder, Van Der Ende, Van De Mheen, MacKenbach, & Verhulst, 2008). Moreover, the younger the adolescent
who displays these externalizing tendencies, the more likely they are to drink heavily in adulthood. This trend is apparent in both males and females (Zucker, 2008).

In sum, the aforementioned individual risk factors provide a catalyst for deeper investigation. The current study assesses the stability of alcohol use and the association of these individual risk factors over a 20-year period encompassing three developmental life stages; adolescence, emerging adulthood, and adulthood. Furthermore, these constructs are evaluated through the lens of the Family Systems theoretical perspective by collectively testing these individual risk factors within the context of family risk factors.

**Family Risk Factors**

**Harsh Parenting**

It is well understood that parents play a vital role in the development of a child through adulthood (Abar & Turrisi, 2008; Crawford & Novak, 2002; van den Bree & Pickworth, 2005; Wood, Repetti, & Roesch, 2004). Adolescent acting-out behaviors such as alcohol use may hinge on the parenting environment they experience in the family of origin (Gilliom & Shaw, 2004; Lewis, Collishaw, Thapar, & Harold, 2013). In accordance with the Family Systems Theory, the immediate interactional environment of the adolescent is the instrumental force of influence on an adolescent’s behavior with their parents at the helm of these interactions (White & Kline, 2008). Specifically, harsh parenting behaviors such as low warmth, high rejection, and in some instances more abusive behaviors increase an adolescent’s anxiety and decrease their ability to cope with stressful situations in a competent manner (Jaeger, Hahn, & Weinraub, 2000). That is, those adolescents experiencing harsh parental behaviors in conjunction with internalizing behaviors use alcohol as a means of coping due to an inability to utilize other more
healthy ways of dealing with stress (Chaplin, Sinha, Simmons, Healy, Mayes, Hommer, et al., 2012).

Furthermore, high-conflict parenting practices contribute to externalizing behaviors (Donovan, Jessor, & Jessor, 1983; Loukas, Piejak, Bingham, Fitzgerald, & Zucker, 2001) and alcohol use in adolescents (Alati, Baker, Betts, Connor, Little, Sanson, & Olsson, 2014; Conger, Ge, Elder, Lorenz, & Simons, 1994; Conger & Conger, 2002; Thompson & Wilsnack, 1987). Adalbjarnardottir and Hafsteinsoon (2001) compared harsh parents and warmly responsive parents and found those adolescents exposed to harsh parenting pose a greater risk to becoming involved in drinking than those adolescents with more supportive parents. The risk of adolescent alcohol use is especially exacerbated when there is an alcohol-dependent parent present. In these instances, adolescents are also more likely to develop alcohol-related problems (Hill, Nord, & Blow, 1992). Additionally, Zucker, Donovan, Masten, Mattson and Moss (2008) suggest that parents who behave aggressively is a strong indicator of mid and later adolescent alcohol use. This has been supported by Shin, Miller, and Teicher (2013) who found that heavy drinking can persist into young adulthood when adolescents consistently experienced negative interactions with their parents.

**Parent Alcohol Use**

Within the framework of Family Systems Theory, it is also important to consider the contextual influences of the parent’s use of alcohol when examining adolescent alcohol use over time (Redonnet, Chollet, Fombonne, Bowes, & Melchior, 2012; Steinglass, 1985). Parent alcohol use has a direct association with drinking behaviors in early adolescence (Ellickson et al., 2003). According to Windle, Spear, Fuligni, Angold,
Brown, & Pine et al. (2008), parent alcohol use when coupled with negative parent-adolescent discourse can be an especially strong predictor of alcohol use during adolescence. Conversely, while parent alcohol use elicits adolescent alcohol use, it may not be related to prolonged alcohol use into adulthood (van der Vorst, Engels, Meeus, & Dekovic, 2006). Despite evidence that parent-drinking influences adolescent-drinking (Hayes, Smart, Toumbourou, & Sanson, 2004), more research is warranted to determine how parent-drinking behavior may influence adolescent-drinking behavior into emerging adulthood and adulthood (Alati, et al., 2014; Cranford, Jester, Puttler, Fitzgerald, & Zucker, 2005; Hill et al., 1992; Mares, van der Vorst, Engels, & Lichtwarck-Aschoff, 2010).

**Sibling Alcohol Use**

In addition to parents, siblings have an impact on later drinking behaviors (Brody, 1996; Conger & Little, 2010; Stocker, Lanthier, & Furman, 1997). Several studies have shown that sibling drinking effects the drinking behaviors of the adolescent. For example, adolescents have been found to be three times more likely to begin drinking regularly if their sibling is also drinking (Fagan, & Najman, 2005). According to Windle and colleagues (2008), upwards of 25% of adolescents used alcohol if their sibling used alcohol in the past year. This may be due to adolescents having an affinity to imitate their sibling behaviors (Conger et al., 2009). Moreover, if there is parental conflict and/or drinking problems in the home, adolescents may be using alcohol as a way to cope with the stress and if their sibling is also drinking, it only exacerbates use (Hall, Henggeler, Ferreira, & East, 1992; Windle, 2000).
Taken together, family risk factors are an essential component in the effort to better understand and explain adolescent alcohol use over time. According to Scholte, Poelen, Willemsen, Boomsma, and Engels (2008) the next step for research is to test both parent and sibling drinking behaviors together to better identify the causal associations of alcohol use into adulthood. In addition, more studies are needed to explore sibling drinking over longer developmental trajectories into adulthood (Bedford, 1998; Connidis, 2001; Jackson et al., 2001). Siblings typically represent the longest relationships an individual will have in their lifetime, and as such it is important to examine the influence of sibling alcohol use (Tucker, McHale, & Crouter, 2001) as it can have strong and long-term effects on the adolescent well into adulthood (Black 2001; Bowen, 1974; Braithwaite & Devine, 1993; Voorpostel & Blieszner, 2008). All told, the current study is in a unique position to extend this body of literature by evaluating both individual and family risk factors on alcohol use over time.

**The Present Investigation**

The current study prospectively examines how individual and family level risks during adolescence influence alcohol use in emerging adulthood and adulthood. Specifically, individual factors including internalizing and externalizing behaviors, as well as the family risk factors of harsh parenting, parent alcohol use, and sibling use were assessed during early to middle adolescence (13-16 years old). Alcohol use in emerging adulthood was assessed at ages 19 to 23 years old and alcohol use in adulthood at 27 to 31 years old. The current study uniquely contributes to the body of literature by examining alcohol use over a 20-year period. As illustrated in Figure 1, it was hypothesized that individual and family risk factors as experienced in adolescence would
be associated positively with alcohol use in both emerging adulthood and adulthood. In addition, alcohol use in emerging adulthood would be associated positively with alcohol use in adulthood. Moreover, because we controlled for alcohol use in adolescence, the model predicts relative change in alcohol use over time.

In the present investigation we also controlled for gender as it has been found to be a contributing factor to the pervasiveness of alcohol abuse into adulthood. For example, some studies indicate that being male is an enhanced risk factor due to their history of being more aggressive and exhibiting more impulsive behaviors when compared to girls the same age (Berg et al., 2013; Muthén & Muthén, 2000; Melby, R. Conger, K. Conger, & Lorenz, 1993). Yet, Simons-Morton, Haynie, Crump, Eitel, and Saylor, (2001) found that girls may be more susceptible to peer pressure which may lead to more alcohol use than boys. In contrast, there have also been studies which demonstrated that as people age, gender discrepancies in terms of alcohol use diminish (Fillmore, 1987). Moreover, Ellickson et al. (2003) conducted a similar study controlling for gender and also found evidence of same-gender drinking behaviors into emerging adulthood.

**Method**

**Participants**

Data come from the Iowa Youth and Families Project (IYFP) which were collected annually from 1989 through 1994 (n = 451). Participants included the target adolescent (52% female), his/her parents, and a sibling within four years of age of the target adolescent. When interviewed for the first time in 1989, the target adolescent was in seventh grade (M age = 13.2 years; 236 girls, 215 boys). Participants were recruited from public and private schools in eight rural Iowa counties. Due to the rural nature of the
sample, there were few racially ethnic minority families; therefore, all of the participants were Caucasian. Seventy-eight percent of the eligible families agreed to participate. The families were primarily lower middle- or middle-class. In 1989, parents averaged 13 years of schooling and had a median family income of $33,700. In 1994, the families from the IYFP continued in another project, the Family Transitions Project (FTP). The same target adolescents participated in the FTP in order to follow their transition into adulthood. The FTP has followed the target youth from as early as 1989 through 2007 (M target age = 31 years), with a 90% retention rate.

The present study includes individuals who participated from early adolescence through adulthood (n = 390). The data encompassed three developmental time points. The first was when the adolescent was between 13 and 16 years old (1989-1992). The second period was during early adulthood when the now young adult was between 19 and 23 years old (1995-1999). Finally, the last time point was when they were in adulthood at ages 27 to 31 years (2003-2007).

**Procedure**

Throughout adolescence, families were visited in their homes twice each year by a trained interviewer. Each visit lasted approximately two hours, with the second visit occurring within two weeks of the first visit. Incentives were provided for participation. During the first visit, each family member completed a set of questionnaires pertaining to subjects such as individual characteristics and family relationships. During the second visit, family members participated in structured interaction tasks that were videotaped. In the present analyses, observer ratings from the parent-adolescent discussion task was used. During the discussion task, mothers and fathers, along with their adolescent
discussed questions from a series of cards which lasted 25 minutes. Parents and the youth took turns reading questions related to subjects such as school activities, family rules, and parental discipline. The person reading the card was instructed to read each question out loud and give his or her answers first. The rest of the family members were instructed to give their individual answers next and then everyone discussed together about the answers that were given. They were to go on to the next card once they felt they had said everything they wanted to about each question. Trained observers coded the quality of these parent-adolescent interactions using the Iowa Interaction Rating Scales (Melby & Conger, 2001) which have been shown to demonstrate rigorous validity and reliability (Melby & Conger, 2001).

Measures

The means, standard deviations, and minimum and maximum scores for all study variables are provided in Table 1. The covariate included in this study was adolescent gender (0 = male; 1 = female).

Individual risk factors (ages 13 – 16).

**Depression.** Adolescent depression was assessed by using a well-established self-report measure including 12 items (α = .97; SCL-90-R: Derogatis, 1983). Responding adolescents used a 5-point Likert scale ranging from (1) *Not at All* to (5) *Extremely*. Questions asked study participants if they had been distressed or bothered by the following feelings within the past week: Feeling lonely?; Feeling hopeless about the future?; and Thoughts of ending your life?”. Responses were averaged across each of the three waves and then combined to form one manifest variable. Due to a low percentage of the sample being depressed the data was skewed [low to moderate
depression (38%) and intermediate to high depression, (6%)]]. For the purposes of meeting the assumption of normality, depression was recoded to a 1 to 11 scale (Cohen, Cohen, West, & Aiken, 2003).

**Externalizing.** Using 10 self-report items, adolescents were asked whether or not they had engaged in a variety of delinquent activities during the past 12 months (adapted from Elliott, Huizinga, & Agetone, 1985; Elliott Huizinga, & Menard, 1989). These items involved reports of delinquency in regards to crimes against people and property (i.e., beating someone up, cutting class, damaging property, taking something of value, or drinking and driving). The response 4-point Likert scale included: (0) *Never*, (1) *Once*, (2) *2 – 3 times*, (3) *4 – 5 times*, and (4) *6 or more times* ($\alpha = .97$; adapted from Elliott et al., 1985; Elliott et al., 1989). Responses were averaged across each of the three waves and then combined to form one manifest variable.

**Family risk factors (ages 13 – 16).**

**Harsh parenting.** Observer ratings were used to assess both mothers’ and fathers’ hostility, antisocial behavior, and angry coerciveness toward the adolescent from the parent-adolescent discussion task. Each rating was scored on a 9–point scale, ranging from *low* (no evidence of the behavior) to *high* (the behavior is highly characteristic of the parent). Hostility was defined as hostile, annoyed, critical, and disapproving behavior toward the adolescent. Angry coercion involves an attempt to control or change the other person’s behavior in a hostile manner. Antisocial behavior was characterized by egotistic, immature, rebellious, and indifferent behavior towards the adolescent (Neppl, et al., 2009). Responses were averaged across each of the three waves to create one manifest
variable. These scores demonstrated robust internal consistency ($\alpha = .88$) and strong inter-rater reliability ($\alpha = .94$; Neppl, et al., 2009).

**Parent alcohol use.** Parent alcohol use was assessed using 4 self-report items from both the mother and the father indicating whether they had any alcohol in the past month with (1) *Yes* and (2) *No*. For those parents that responded (1) *Yes*, they were asked three more follow-up questions regarding their alcohol consumption including *How many days this past month did you have...* (1) *4 or more alcoholic drinks*, (2) *Only 2 or 3 alcoholic drinks*, and (3) *Only 1 alcoholic drink*. The response options for these three questions included: (1) *Entering the number of days* for each of the three questions (Mother, $\alpha = .82$; Father, $\alpha = .80$). Mother and father responses were summed at each time point and averaged across the three waves to create one manifest variable for mother alcohol use and one for father alcohol use.

**Sibling alcohol use.** Sibling alcohol use was assessed using comparable items as adolescent alcohol use through self-report of 4 items. These included (1) *Drunk beer*, (2) *Drunk wine or wine coolers (not at church)*, and (3) *Drunk hard liquor, such as bourbon, whiskey, vodka, or gin*. The 4-point response Likert scale was used was (0) *Never*, (1) *1 – 11 times in the last year*, (2) *1 – 3 times per month in the last year*, (3) *1 – 2 times per week in the last year*, and (4) *3 or more times per week in the last year* ($\alpha = .84$; Conger, Rueter, & Conger, 1994). These items were averaged across three waves to establish one manifest variable.

**Stability of Alcohol Use.**

**Adolescent alcohol use (ages 13 – 16).** Adolescent alcohol use was assessed through self-report of 4 items. These included (1) *Drunk beer*, (2) *Drunk wine or wine coolers*
(not at church), and (3) Drunk hard liquor, such as bourbon, whiskey, vodka, or gin. The 4-point response Likert scale was used was (0) Never, (1) 1–11 times in the last year, (2) 1–3 times per month in the last year, (3) 1–2 times per week in the last year, and (4) 3 or more times per week in the last year (α = .88; Conger et al., 1994). These items were averaged across three waves to establish one manifest variable.

**Emerging adulthood alcohol use (ages 19–23).** Emerging adulthood alcohol was assessed through self-report of 4 similar items asking, “During the past 30 days, how often did you...” (1) Drink beer, wine or wine coolers, (2) Drink hard liquor such as bourbon, vodka, whisky or gin, and (3) Have 3 or 4 drinks in a row. (A drink is a glass of wine, a wine cooler, a bottle of beer, a shot glass of liquor or mixed drink). The response 5-point Likert response scale included: (0) Never, (1) 1 to 2 times a week or less, (2) 3 to 4 times a week, (3) 5 to 6 times a week, and (4) Every day (α = .96; adapted from Elliott et al., 1985; Elliott et al., 1989). Responses were averaged across each of the three waves to form a manifest variable.

**Adult alcohol use (ages 27–31).** Adult alcohol use was assessed through self-report of 5 similar items asking, “During the past 30 days, how often did you...” (1) Drink beer, (2) Drink wine, wine coolers, or other wine drinks, (3) Drink hard liquor such as bourbon, vodka, whisky, gin, tequila, etc., (4) Have 3 or 4 drinks in a row, and (5) Have 5 or more drinks in a row. (A drink is a glass of wine, a wine cooler, a bottle of beer, a shot glass of liquor or mixed drink). The 5-point Likert scale included: (0) Never, (1) 1 to 2 times a week or less, (2) 3 to 4 times a week, (3) 5 to 6 times a week, and (4) Every day (α = .97; adapted from Elliott et al., 1985; Elliott et al., 1989). Responses were averaged across the three waves to form a manifest variable.
Results

Correlations among Constructs

Table 2 shows the zero-order correlations between all constructs used in the analyses. Consistent with our theoretical predictions, adolescent alcohol use was significantly and positively correlated with both emerging adult ($r = .30, p < .001$) and adult alcohol use ($r = .21, p < .001$). Moreover, alcohol use in emerging adulthood was associated with use in adulthood ($r = .61, p < .05$). In terms of individual risk factors, adolescent externalizing behavior was associated with alcohol use in emerging adulthood ($r = .26, p < .001$) and adulthood ($r = .23, p < .001$). Depression, although significant, was negatively associated with both emerging adult ($r = -.10, p < .05$) and adult alcohol use ($r = -.11, p < .05$). For family risk, father use was significantly correlated with both emerging adulthood ($r = .17, p < .001$), and adulthood ($r = .12, p < .05$). The remaining family risk factors of mother alcohol use, sibling use, and harsh parenting were not significantly associated with alcohol use in either emerging adulthood or adulthood.

Structural Equation Analyses

Structural Equation Modeling (SEM) was employed using the STATA 14 statistical software package (StataCorp, 2015). Full Information Maximum Likelihood (FIML) estimation was used to handle missing data and establish the best model fit for longitudinal data (Allison, 2003). Using this method for model estimation, we were able to produce the most accurate fit because FIML limits bias by using estimations based on all of the available data (Newsom, 2015) instead of deleting cases that contain missing data (Duncan, Duncan, & Strycker, 2013). The SEM was examined with gender which was included in the final model.
Model fit was explored using several fit indices. The standard \( \chi^2 \) model fit value was evaluated along with the root-mean-square error approximation (RMSEA; Brown & Cudeck, 1993). Additionally, the structural comparative fit index (CFI) and the standardized root-mean-squared residual (SRMR; Hu & Bentler, 1999) coefficients were examined. The acceptable thresholds for these fit indices are a \( \chi^2 \) that is not significant so that the null hypothesis can be rejected. It is common practice to accept an RMSEA range of .05 to .08, a CFI > .95, and an SRMR < .04. The model was tested and was determined to be an adequate fit, \( \chi^2 (20) = 61.961, p < .05 \), RMSEA = 0.073, CFI = 0.969, and \( \text{SRMR} = 0.035 \). See Figure 2 for the complete model.

We determined there were four main determinates in regard to the stability of alcohol use over time. Adolescent alcohol use (\( \beta = .26, p < 0.001, SE = .06 \)), externalizing behaviors (\( \beta = .14, p < 0.05, SE = .06 \)), and father use (\( \beta = .14, p < 0.01, SE = .05 \)) were associated with alcohol use in emerging adulthood. In contrast, depression was statistically significantly related but in an inverse association with drinking in emerging adulthood (\( \beta = -.18, p < 0.001, SE = .05 \)). There were no statistically significant direct associations to alcohol use in adulthood. Thus, indirect effects through emerging adulthood to adulthood were examined.

**Indirect Effects**

Following the analysis of direct effects, mediating pathways were tested to evaluate any underlying associations within the model that would help explain alcohol use into adulthood. All indirect analyses were employed using STATA 14 software (StataCorp, 2015). It was found that alcohol use in emerging adulthood mediated the associations between adolescent alcohol use (\( \beta = .15, p < 0.001, SE = .04 \)), father alcohol use (\( \beta = .
.005, \( p < 0.05, SE = .002 \), externalizing behaviors (\( \beta = .16, p < 0.05, SE = .07 \)), and depression (\( \beta = -.02, p < 0.001, SE = .005 \)) and alcohol use in adulthood.

It was also found that alcohol use in emerging adulthood mediated the association between harsh parenting in adolescence (\( \beta = .39, p < 0.001, SE = .03 \)) and alcohol use in adulthood. In previous research, this circumstance has been identified as a “suppressor effect” where the decomposition of the direct paths originating from adolescence to emerging adulthood are more clearly defined where in the suppressor variable, harsh parenting, in fact acts as an enhancing agent in regards to the overall effect of alcohol use over time (MacKinnon, Krull, & Lockwood, 2010). To explain further, the magnitude of alcohol use extending to adulthood occurs because harsh parenting in adolescence is a determining factor through drinking in emerging adulthood. Similarly recognized as a “sleeper effect”, this concept has recently been disputed as needing additional evidence to support the claim (Flückiger, Del Re, & Wampold, 2015), but to note, other studies have acknowledged the legitimacy of this phenomenon (Holmes, 2013).

**Discussion**

The present investigation assessed alcohol use over the course of almost 20 years. It also assessed both individual and family risk factors of alcohol use into emerging adulthood and adulthood. Extending previous research, the current study sought to evaluate alcohol use along with other known risk factors for alcohol use over time in one model (Loeber et al., 1999; Low et al., 2012; Schulenberg & Maggs, 2002; Danielsson et al., 2010). It was deemed that when multiple risk factors were evaluated together, we found salient determinants which drive perpetuated use of alcohol from the developmental period of adolescence into adulthood; thus, filling a gap in longitudinal
alcohol-related risk research. Key findings include that alcohol use, externalizing behavior, depression, and father alcohol use in adolescence were directly associated with emerging adulthood alcohol, and indirectly associated with alcohol use in adulthood.

The interdependency of dynamics within the family system can be multidimensional (Pike et al., 2005; Steinberg et al., 2011; Steinglass, 1985; Trim et al., 2005; Vakalahi, 2001). Thus, this conceptualization of family research lends itself to a better understanding of developmental outcomes which stem from these interworking family system relationships. In the current study, the intervening construct of harsh parenting was a demonstration of these complex relationships. In our longitudinal model, harsh parenting accounted for a greater magnitude in alcohol use from emerging adulthood extending into adulthood. In addition, this significant indirect effect, not manifesting itself until adulthood, is a further indication of the complexities that arise from being raised in a non-supportive or harsh environment. In other words, the negative effects that have been associated with harsh parenting during adolescence may not surface until later in adulthood (Neppl et al., 2009).

One deduction from these results includes the idea that as individuals age, life responsibilities increase which may result in a threshold or breaking point. In such cases, an individual’s coping strategies are no longer sufficient perhaps due to the direct effects from father alcohol use into emerging adulthood and the intervening effects of harsh parenting in adulthood. In turn, the family dynamics as experienced in adolescence, emerge in adulthood as a latent response to the harsh environment where they had been raised. Consistent with previous findings, negative parenting patterns can increase the risk of alcohol use in adolescence and emerging adulthood (Zucker et al., 2008).
Further, this study provides evidence of homeostatic alcohol use over time as demonstrated by the significant results across two developmental time frames (adolescence and emerging adulthood). Other significant risks factors for alcohol use revealed that not all increases in alcohol use in emerging adulthood can be deemed as “normative” developmental behavior as many studies suggest (Goldman, 2002). In sharp contrast, the current research supports the notion that developmental deviations from normative trajectories (i.e., alcohol experimentation in college-age emerging adults; Schulenberg, Maggs, Long, Sher, Gotham, Baer, et al., 2001) can be an expected outcome especially from individuals who share the characteristics of a father who used alcohol and harsh parental practices. The need to extend research beyond the normal societal pressures for alcohol use in emerging adulthood (Schulenberg & Maggs, 2002) should not be ignored. The current study demonstrates, for example, that externalizing behaviors and depression, can act as both direct and as intervening effects in regards to the sustainability of alcohol use through emerging adulthood and adulthood. That said, contrary to our hypotheses, depression was found to be significantly and negatively associated with alcohol use in emerging adulthood.

To explain further, depression in terms of alcohol use over time was found to be what some researchers have referred to as an “avoidance coping” mechanism (Chan, Kelly, & Toumbourou, 2013; Cooper, Russell, & George, 1988; Kort-Butler, 2009). In fact, few researchers have investigated this somewhat non-intuitive phenomenon. The occurrence of this negative effect of depression on alcohol use over time may be driven by an individual’s motivation to drink. If the desire to drink is motivated by the need to regulate or even inhibit negative emotions (i.e., depressive feelings), individuals may be using
alcohol to conceal depression, and thus display a significant inverse association between depression and alcohol use (Holahan, Moos, Holahan, Cronkite, & Ranall, 2000). The negative effect of depression found was illustrated in both direct and indirect associations. Similar to previous reasoning, the desire to suppress negative feelings may be another unforeseen consequence of having a father who used alcohol coupled with harsh parenting practices. Other studies have referred to this effect as a form of emotional compensation which has been shown to increase the risk of alcohol dependency later in life (Russell & Mehrabian, 1975). Strictly speaking, if an adolescent, who originates under the aforementioned circumstances, has learned to cope with depression by trying to neutralize negative feelings through the use of alcohol, it is reasonable to determine that similar coping strategies would be utilized as they age. In sum, it is well recognized that alcohol use over prolonged periods of time has been shown to hinder executive functioning (e.g., higher-order thinking) to the point that an individual may no longer be able to identify depressive symptoms later in adulthood (Hanson, Lisdauhl Medina, Padula, Tapert, & Brown, 2011).

**Limitations**

The current study has many strengths, but it is not without limiting aspects. The proposed sample originates from a rural, primarily Caucasian population that is not in itself characterized as a risk-population. Second, clinical levels of depression, excessive alcohol use or abuse, or the aspects of adjudication that legally defines a juvenile as committing delinquency (United States Department of Justice, 2016) were not fully explored. In addition, the literature has demonstrated there may be genetic factors associated with alcohol use which were not addressed in the present research (Rende,
Slomkowski, Lloyd-Richardson, & Niaura, 2005). Regardless of these limitations, the current study elicits strong merit in moving the literature forward to gain a deeper conceptual framework from which to build future research.

**Future Directions and Implications**

One area to extend this research that may prove useful would be to sample only those individuals who identified their parent as abusing alcohol (Black, 1981; Miller & Jang, 1977). More recently, much research has been identified as acknowledging differences among parents who use alcohol versus those who have been recognized as abusing alcohol (e.g., Handley & Chassin, 2013; Huang, Serrano, Curran, & Chassin, 2012). Finally, a longitudinal study which differentiates pathways of individual alcohol use against patterns of heavy drinking, binging, or alcohol abuse could possibly be explored in future assessments.

Learning that externalizing behaviors in adolescence have both a significant and positive association with alcohol use prolonged into adulthood, it is reasonable to infer that service professionals including secondary teachers who witness such negative behaviors have an opportunity for an entry point of intervention. The integration of Family Systems Theory has provided the current study a deeper understanding of the driving determinants of alcohol use from adolescence into adulthood wherein these providers have the potential to create a shift in the developmental trajectory of an adolescent who has been directly affected by harmful environmental factors within the family system (i.e., harsh parenting). Finally, future research may wish to address protective moderating factors, such as how close an individual feels towards their sibling (Conger, Bryant, & Brennom, 2004). The current investigation extenuates the importance
of earlier intervention strategies in the effort to prevent or diminish the consequences of these negative family system effects; to instead, work towards the effort of fostering more positively related outcomes.
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doi:org/10.1093/alcalc/agt026


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Figure 1. Conceptual Model

Adolescence
Ages 13 – 16
Years

Emerging Adulthood
Ages 19 – 23
Years

Adulthood
Ages 27 – 31
Years

- Adolescent Alcohol Use
- Adolescent Depression
- Adolescent Externalizing Behaviors
- Harsh Parenting
- Emerging Adult Alcohol Use
- Adult Alcohol Use
- Mother Alcohol Use
- Father Alcohol Use
- Sibling Alcohol Use
Figure 2. Measurement Model

Significance Level: *p < .05, **p < .01, ***p < .001; Model Fit: $\chi^2(20)=61.961$, $p<.05$, RMSEA=0.073, CFI=0.969, SRMR=0.035
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Mean and standard deviation coefficients are presented as meanscore values
\(^a\) Ages 13-16, \(^b\) Ages 19-23, \(^c\) Ages 27-31
Table 2. Correlations among variables used in analyses

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***. Correlation is significant at the 0.001 level (2–tailed).
**. Correlation is significant at the 0.01 level (2–tailed).
*. Correlation is significant at the 0.05 level (2–tailed).

<sup>a</sup> Ages 13–16, <sup>b</sup> Ages 19–23, <sup>c</sup> Ages 27–31
CHAPTER 3. CONTINUITY OF ALCOHOL USE AND EXTERNALIZING RISK: THE IMPACT OF POSITIVITY ON ALCOHOL USE IN ADULTHOOD

Paper to be submitted to Alcohol and Alcoholism

Sarah E. Bickelhaupt\textsuperscript{5,6}, Tricia K. Neppl\textsuperscript{7}, and Brenda J. Lohman\textsuperscript{8}

Impact Factor: 2.724

Introduction

Despite the decline of alcohol use in recent years among adolescents, it still poses a growing concern of potential health risks as it has shown to be a significant indicator of behavioral problems in adulthood (Black, 1981; Waddell, 2012). Studies have consistently shown that when adolescents begin drinking at an early age, it predisposes them to later behavioral developmental consequences primarily due to ill modeled ways of coping with stressful life events (Ellickson, Tucker, & Kline, 2003; Windle, Spear, Fuligni, Angold, Brown, & Pine et al., 2009). Moreover, it has been found that youth who began using alcohol at 13 years of age have greater difficulty coping with life stressors when they have experienced adversity in their lives (Flory, Lynam, Milich, Leukefeld, & Clayton, 2004). However, with adversity comes opportunity for individuals to use available resources and work towards improving their lives. In order to accomplish this goal, an adolescent needs to desire the acquisition of strength drawn from difficult situations and look towards the future with optimism (Bonanno, 2004; Walsh, 2006).

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Furthermore, being positive can enhance their ability to cope and reduce their risk of abusing alcohol (Ellickson et al., 2003; Windle et al., 2008).

Thus, the current study contributes to a growing body of literature aimed at positive youth development. In addition, it adds to the positive development movement (Seligman & Csikszentmihalyi, 2000) by focusing on and providing further exploration regarding the impact individual personal characteristics, such as positivity, have on adolescent outcomes and risk of alcohol use over time. These differences are what create psychological adaptation to stressful life events (Donnellan, Conger, McAdams, & Neppl, 2009) and what may mean the difference in specifically shaping the lives of individuals who begin drinking in adolescence (Flory et al., 2004) and strive for healthy developmental outcomes as an adult (Masten, 2001). Specifically, the current study brings unique contributions to the literature by exploring positivity (Windle et al., 2008) as well as externalizing behaviors and how they are linked to alcohol use (Abela, Zinck, Kryger, Zilber, & Hankin, 2009) over a 20-year period from early adolescence to adulthood.

**Theoretical Framework**

Researchers, especially over the past 15 years, have been exploring and trying to understand the concept of resiliency and why some individuals, in similar situations, fare better than others (Friborg, Barlaug, Martinussen, Rosenvinge, & Hjemdal, 2005). According to Walsh (2006), being resilient is defined as being able to view individual and family development through the lens of a strengths perspective versus a model of deficit. By doing so, it leaves room for growth and hope that their negative life experiences are not an end all. Masten (2001) adds to this by describing that resiliency is
not an uncommon occurrence; however, Walsh (2006) further argues that it depends on the type of fortitude that really matters because being resilient in the face of adversity does not simply mean the pure survival of getting through negative life experiences but instead to really work through them and thrive. Those individuals that have the internal desire to move forward and gain strength from negative life experiences can still go on to achieve great things in their lives (Walsh, 2006). Wolin and Wolin (1993) support these notions along with acknowledging that resiliency is complex and is more than getting over being hurt but “being hurt and responding with strength” (Wolin & Wolin, 1993, p. 426).

Resiliency is often presented as positive individual characteristics which will be referred to as positivity throughout the remaining portions of this paper (see Caprara, Alessandri, Eisenberg, Kupfer, Steca, Caprara et al., 2012). Resiliency has been shown to be positively linked to certain individual positive characteristics. These positive traits can be viewed as being a resource for an individual as a means of accomplishing individual growth (Tugade & Fredrickson, 2004) For example, individuals who demonstrate positive characteristics have higher levels of problem-solving abilities and possess higher levels of self-control (Conger & Conger, 2002; Penley, Tomaka, & Wiebe, 2002; Rutter, 1985). Further, personal characteristics, such as having a positive attitude, elicit resilient behavior (i.e., being able to effectively adapt when life becomes challenging; Masten, Cutuli, Herbers, & Reed, 2009). However, there is limited research examining individual positivity as a way of minimizing alcohol use over an extended period of time. For example, using a cross-sectional design, Backer-Fulghum, Patock-Peckham, King, Roufa, and Hagen (2011) found that having positive self-perception is indirectly but positively
linked to less alcohol-related problems. Thus, the primary aim of the current study was to assess the impact of positivity on alcohol use from adolescence through adulthood. From the literature, it is conceivable that alcohol use in adolescence may be positively related to exhibiting poor behaviors such as externalizing behaviors, but negatively related to positivity into adulthood.

**Stability of Alcohol Use**

Adolescent drinking behaviors typically follow a normative pattern of development indicated by an increase in drinking throughout adolescence and young adulthood with a tapering off as individuals get older (Schulenberg & Maggs, 2002). However, adolescents who use alcohol on a regular basis are more likely to follow a maladaptive developmental trajectory. That is, they have an increased risk to heavy drinking and exhibiting other externalizing behaviors (Windle et al., 2008). More specifically, when drinking patterns are established at young ages, it increases the likelihood that they will use alcohol throughout later adulthood (e.g., a 10 year period of time from 13 to 23 years old; Shin, Miller, & Teicher, 2013). Adolescents are especially vulnerable for life-long drinking patterns if they begin drinking between 13 and 14 years of age (Ellickson et al., 2003) increasing the likelihood they will still be drinking in adulthood (Grant, Stinson, & Harford, 2001; Maggs & Schulengerg, 2005; Moss, Chen, & Yi, 2014; B. Muthén & L. Muthén, 2000). Few studies have examined the stability of alcohol use over an extended period of time (i.e., early adolescence through adulthood). To the best of our knowledge, few to no studies have addressed the potential significance of individual externalizing risk factors (Abela et al., 2009) and positivity characteristics (Walsh, 2006) on long-term alcohol use from early adolescence to adulthood.
**Impact and Stability of Externalizing Behavior**

Externalizing behaviors for adolescents are most often defined as delinquent acts such as stealing (Farrington, 2009; Steinberg, Bornstein, Vandell, & Rook, 2011) and using substances such as alcohol (Neppl, Conger, Scaramella, & Ontai, 2009). Periodic experimentation with alcohol is, by in large, a normative externalizing behavior for many adolescents (Steinberg et al., 2011). In the current study, since alcohol is the main construct of interest, alcohol use was differentiated from other externalizing behaviors. Alcohol use alone has been found to be strongly associated with externalizing behaviors but is also unique in that together these constructs result in even more destructive forms of externalizing behaviors (Vanheusden, Van Lenthe, Mulder, Van Der Ende, Van De Mheen, MacKenbach, & Verhulst, 2007). For example, individuals who become dependent on alcohol as they age are also more likely to exhibit other externalizing behaviors such as stealing and acting out violently (Hill, White, Chung, Hawkins, & Catalano, 2000; Tucker, Orlando, & Ellickson, 2003). Furthermore, young adolescents who exhibit externalizing behaviors are more likely to be heavy drinkers later in adulthood (i.e., 27 to 42 years old), regardless of gender (Zucker, 2008).

It is also important to note that previous research has demonstrated that externalizing behaviors generally remain stable over time. For example, in a longitudinal study of boys assessed periodically from the age of 8 until they were 32 revealed that the aggressive externalizing behaviors displayed in childhood are highly predictive of more destructive behavior in adulthood (i.e., fighting and police involvement; Farrington, 1991). In more recent work, Loeber, Capaldi, and Costello (2013) found that both boys and girls who exhibit externalizing behaviors in adolescence are at greater risk of these negative
behaviors persisting minimally into emerging adulthood (e.g., aggression and shoplifting). Thus, we examined the role of adolescent and emerging adult externalizing behaviors over time in association with alcohol use in adolescence into adulthood.

**Impact and Stability of Positivity**

According to Masten (2001), positivity is a dynamic yet stable construct that can be considered an individual resource for the purpose of being resilient when encountering life’s adversities (Masten, 2001; Masten et al., 2009). For example, an adolescent exposed to negative parenting behaviors (Hill, Nord, & Blow, 1992) yet more confident in their ability to later move beyond that environment, has a greater likelihood of positive developmental outcomes (Finkenauer, Engels, & Baumeister, 2005; Furnham, Crump, & Whelan, 1997; Walsh, 2006). Despite this evidence, little research has examined the influence of individual positive personal characteristics on alcohol use over time (Windle et al., 2008). According to Ferguson (2010) and Neppl, Jeon, Scholfield, and Donnellan (2015) positivity is highly sustainable from adolescence to emerging adulthood. It is for these reasons, this study poses a unique contribution to the literature by exploring positivity in the context of becoming resilient to the stability of drinking patterns from adolescence to adulthood (Windle et al., 2008).

To explain further, those adolescents who begin drinking at an early age tend to be more externally controlled and exhibit lower internal feelings of self-control (Berkowitz & Perkins, 1988; Brennan, Walfish, & AuBuchon, 1986; Peeters, Monshouwer, van de Schoot, Janssen, Vollebergh, & Wiers, 2014; Sorocco, Carnes, Cohoon, Vincent & Lovallo, 2015; Werner, 1986). In another study, adolescents aged 14 to 18 who display higher levels of mastery are better able to cope with emotional stress and therefore pose a
lower risk of using alcohol when compared to adolescents who exhibit lower levels of mastery (Lipschitz-Elhawi & Itzhaky, 2014). It is probable that adolescents who demonstrate higher levels of self-control are better able to minimize the possible negative consequences of early drinking patterns that persist into later adolescence (Finkenauer et al., 2005; Furnham et al., 1997; Walsh, 2006). Furthermore, individuals who struggle with developing a strong sense of mastery or do not feel they have control over future outcomes, are at a higher risk of alcohol use over time. In addition, Palfai & Weafer (2006) demonstrated that adults who were are satisfied with their ability to reach their goals use alcohol less frequently. Moreover, a poor sense of internal control can effect alcohol use apart from establishing dependence which predicts alcohol use into young adulthood (Ernst, Luckenbaugh, Moolchan et al., 2006; López-Caneda, Rodríguez Holguín, Cadaveira, Corral & Doallo, 2013).

In regard to self-esteem and alcohol use, Backer-Fulghum and colleagues (2011) provided evidence that high self-esteem in adolescence is indirectly associated with a decreased risk of using alcohol and developing alcohol-related problems in young adulthood. Their research also found the reverse to be true. That is, those adolescents that report low self-esteem are at higher risk of using alcohol and developing issues related to alcohol use (Tomaka, Morales-Monks, & Gigi Shamaley, 2012; Walitzer & Sher, 1996). Related to this, adolescents with low levels of self-esteem and who have negative internal self-beliefs are at an increased risk of later alcohol abuse by age 20 (Malone, Taylor, Marmorstein, McGue, & Iacono, 2004). These possible negative consequences can impact an adolescent’s development into adulthood (Black, 1981; Jessor & Jessor, 1977; Smith, Ireland, & Thornberry, 2005).
The Present Investigation

The current research prospectively examined how externalizing behavior and positivity impact alcohol use from adolescence into adulthood. Data were drawn from a two-decade longitudinal study of a cohort of youth and their families followed from adolescence to adulthood. Specifically, adolescent alcohol use, externalizing behavior, and positivity were assessed during adolescence (ages 13 – 16). Externalizing behaviors and positivity were assessed again during emerging adulthood (ages 19 – 23). Finally, alcohol use in adulthood was measured between the ages of 27 to 31 years old. This allows us to prospectively assess longitudinal relations between externalizing behaviors, positivity, and alcohol use over nearly a 20-year period. This is an important feature of the current study as relatively few studies have examined how the continuity of alcohol use, risky behaviors, and positivity impacts alcohol use into adulthood.

The current study contributes to the body of literature by addressing limitations of previous research such as a lack of longitudinal analyses (Alati et al., 2014) and by providing a deeper understanding of the impact of positivity on development from adolescence through adulthood (Windle et al., 2008). As illustrated in Figure 1, it was hypothesized that alcohol use in adolescence would be associated with alcohol use in adulthood. Likewise, externalizing behavior and positivity would also be stable from adolescence to emerging adulthood. It was expected that externalizing behavior and positivity would be associated and remain stable from adolescence through adulthood. Finally, positivity would negatively influence externalizing behavior and alcohol use over time.
In the present investigation we also controlled for gender as it has been found to influence alcohol use over time (Berg, Kiviruusu, Karvonen, Kestilä, Lintonen, Rahkonen et al., 2013; Muthén & Muthén, 2000; Melby, Conger, Conger, & Lorenz, 1993). For example, females are more vulnerable to internalizing behaviors (Berkowitz & Perkins, 1988; Rangarajan, 2008; Wade & Dixon, 2006) whereas males are associated with more pronounced externalizing behaviors (Berg et al., 2013; B. Muthén & L. Muthén, 2000; Melby et al., 1993). However in contrast, Ellickson et al. (2003) did not find gender differences in drinking behaviors from adolescence into emerging adulthood. Furthermore, being male is indicative of lower levels of self-control when compared to females of the same age (Berg et al., 2013; Muthén & Muthén, 2000; Melby et al., 1993). On the other hand, females can be more vulnerable to external pressures which may lead to alcohol use (Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001).

**Method**

**Participants**

Data originate from the Family Transitions Project (FTP) which began in 1989 as a longitudinal study of 559 target rural youth and their families during the economic crisis of the 1980’s. The FTP is a combination of two earlier studies: The Iowa Youth and Families Project (IYFP) and the Iowa Single Parent Project (ISPP). Participants from IYFP included the target adolescents, his/her parents, as well as a sibling that was within four years of the target adolescent from 1989 to 1992 (N = 451 families). When interviewed for the first time in 1989, the target adolescent was in seventh grade (M age = 12.7; 236 girls, 215 boys). Participant recruitment was established through the access of both private and public schools in towns that did not exceed 6,500 residents in the state of
Iowa. The mothers’ mean age in 1989 was 38 years old, and the father’s mean age at that time was 40 years old with a reported median family income of $33,700. The nature of this project lent itself to be almost entirely Caucasian families who had between 4 and 13 members ($M = 4.94$; Neppl et al., 2009).

The ISPP study began in 1991 when the target adolescents were in ninth grade ($M$ age $= 14.8; N = 108$). These families were of lower to middle-class and from a similar geographical region as the participants in the IYFP study. All of the measures and procedures were executed in the exact same way as the previous study except for the exclusion of any data collection from the fathers in the ISPP study. In 1994, when the target adolescents were in 12th grade, the families in both the IYFP and the ISPP studies were combined to establish the FTP. The FTP now encompasses the target participants from the time they were about 13 years old through their early thirties with a retention rate of approximately 90 percent (Neppl et al., 2009; Neppl, Dhalewadikar, & Lohman, 2015).

The present study includes those who participated from adolescence to adulthood (age 31; $n = 492$). In order to capture the three developmental periods for this study, nine waves of data were evaluated. The first developmental period includes data from when adolescents were 13, 15, and 16 years old respectively (1989-1992). The second period was during emerging adulthood when the targets were ages 19, 21, and 23 respectively (1995-1999). Finally, adulthood covers the ages of 27, 29, and 31 years (2003-2007).

**Procedure**

Throughout the target’s adolescence, families were visited in their homes each year by a trained interviewer. Structured face-to-face interviews were conducted and incentives were provided for participation. During the visit, family members were asked
about their alcohol consumption, externalizing behaviors, and positive personal characteristics (i.e., self-esteem). During adulthood targets were visited in their homes by a trained interviewer and completed similar two-hour questionnaires that included questions about risk factors, personal characteristics, and alcohol use.

**Measures**

The means, standard deviations, and minimum and maximum scores for all study variables are provided in Table 1. The covariate included in this study was gender (0 = male; 1 = female).

**Adolescent alcohol use (ages 13 – 16).** Adolescent alcohol use was assessed through self-report of 3 items. These included (1) *Drunk beer*, (2) *Drunk wine or wine coolers (not at church)*, and (3) *Drunk hard liquor, such as bourbon, whiskey, vodka, or gin*. The 4-point response Likert scale was used was (0) *Never*, (1) *1 – 11 times in the last year*, (2) *1 – 3 times per month in the last year*, (3) *1 – 2 times per week in the last year*, and (4) *3 or more times per week in the last year* ($\alpha = .87$; Conger et al., 1994). These items were averaged across three waves to establish one manifest variable.

**Adolescent externalizing behavior (ages 13 – 16).** Five, self-reported items of externalizing behavior included that of crimes against people and property: damaging property, stealing, getting picked up by police because of something they had done, and drinking and driving. The response 4-point Likert scale included: (0) *Never*, (1) *Once*, (2) *2 – 3 times*, (3) *4 – 5 times*, and (4) *6 or more times* ($\alpha = .94$; adapted from Elliott, Huizinga, & Agetone, 1985; Elliott, Huizinga, & Menard, 1989). Responses were averaged across each of the three waves and then combined to form one manifest variable.
**Emerging adult externalizing behavior (ages 19 – 23).** Emerging adulthood externalizing behavior included the same 5 items as used in adolescent externalizing behavior. For the composite construct of externalizing behavior in emerging adulthood, responding young adults were asked to report how many times in the last 12 months they had engaged in activities such as damaging property, stealing, getting picked up by police because of something they had done, and drinking and driving (α = .99). Responses were first summed at the wave level and then averaged across each of the three waves and finally combined to form one manifest variable.

**Adolescent positivity (ages 13 – 16).** Positivity was measured as a mean composite variable with three indicators: mastery, self-esteem, and positive affect. Mastery (Pearlin, et al., 1981) was assessed with seven items measured on a 5-point Likert scale ranging from (1) *Strongly Agree* to (5) *Strongly Disagree*. Items include questions such as, “I can do anything I really set my mind to” and “What happens to me in the future mostly depends on me.” Item responses were averaged (α = .86). Adolescents also completed Rosenberg’s (1965) self-esteem scale. Responses ranged from (1) *Strongly Agree* to (5) *Strongly Disagree* Ten items were averaged together (α = .78). Sample items include, “I feel that I am a person of worth, at least on an equal level with others” and “I take a positive attitude towards myself”. Positive affect included six items regarding how the youth viewed their life in general over the past month such as, have you generally enjoyed the things you do?, felt that the future looked hopeful and promising?, and have you been a happy person?. Each item ranged from (1) *Most to All of the Time* to (5) *None of the Time* and was averaged together (α = .82; adapted from Veit & Ware, 1983). The composites were then averaged across the three waves to construct one manifest variable.
Emerging adulthood positivity (ages 19 – 23). Positivity was measured as a mean composite variable using the exact same three indicators employed for adolescent positivity: mastery (α = .97), self-esteem (α = .94), and positive affect (α = .92). Responses ranged from (1) Most to All of the Time to (5) None of the Time. The composites were averaged across the three waves to construct one manifest variable (α = .85).

Adult alcohol use (ages 27- 31). Adult alcohol use was assessed through self-report of 5 similar items asking, “During the past 30 days, how often did you…” (1) Drink beer, (2) Drink wine, wine coolers, or other wine drinks, (3) Drink hard liquor such as bourbon, vodka, whisky, gin, tequila, etc., (4) Have 3 or 4 drinks in a row, and (5) Have 5 or more drinks in a row (A drink is a glass of wine, a wine cooler, a bottle of beer, a shot glass of liquor or mixed drink). The 6-point Likert scale was recoded to reflect (0) Never to (5) Every day. Then the scores were averaged for each of the three ages (27, 29, and 31) and combined together resulting in one manifest indicator of adult alcohol use in the model (α = .96; adapted from Elliott et al., 1985; Elliott et al., 1989).

Results

Correlations among Constructs

Table 2 shows the zero-order correlations between constructs used in the analyses. Consistent with our hypotheses, adolescent alcohol use was significantly and positively correlated with externalizing behaviors ($r = .64$, $p < .001$) and alcohol use in adulthood ($r = .22$, $p < .001$) and negatively correlated with positivity ($r = -.18$, $p < .001$) during adolescence. Furthermore, adolescent externalizing behaviors was significantly and positively correlated with externalizing behaviors in emerging adulthood ($r = .30$, $p <$
.001) and alcohol use in adulthood \((r = .23, p < .001)\). Along similar lines, externalizing in emerging adulthood was significantly and positively correlated with alcohol use in adulthood \((r = .28, p < .001)\). Adolescent positivity was significantly and positively correlated with positivity in emerging adulthood \((r = .58, p < .001)\). Moreover, adolescent positivity \((r = -.23, p < .001)\) was significantly and negatively correlated with adolescent externalizing behaviors. However, positivity in emerging adulthood was not significantly related to emerging adult externalizing behaviors or alcohol use in adulthood.

**Structural Equation Analyses**

Structural Equation Modeling (SEM) was employed using the STATA 14 statistical software package (StataCorp, 2015). The model was estimated using Full Information Maximum Likelihood (FIML) to handle missing data and identify the best model fit for longitudinal data structures (Allison, 2003). Using this method for model estimation, the most accurate fit was established due to FIML limiting bias by utilizing estimations based on all data available (Newsom, 2015) as opposed to deleting entire cases that contain any missing data (Duncan, Duncan, & Strycker, 2013). The SEM was assessed with gender as a control variable which was included in the final model.

The SEM fit indices used included the standard \(\chi^2\) value along with the root-mean-square error approximation (RMSEA; Brown & Cudeck, 1993). In addition, the structural comparative fit index (CFI) and the standardized root-mean-squared residual (SRMR; Hu & Bentler, 1999) coefficients were examined. The acceptable thresholds for these fit indices are a \(\chi^2\) value that is not significant in that the null hypothesis can be rejected. Further, it is acknowledged as acceptable values of an RMSEA range of .05 to .08, a CFI > .95, and an SRMR < .04. The full model with the gender as a control variable revealed
a reasonable fit given the number of variables in the full model, $\chi^2 (8) = 32.50$, $p > .001$, RMSEA = .08, CFI = .96, and SRMR = .04. The SEM standardized beta coefficients illustrating this fit are displayed Figure 2.

Our results provide evidence to support our hypotheses in terms of the stability of alcohol use from adolescence through adulthood ($\beta = .12$, $p < 0.05$, $SE = .05$). Adolescent alcohol use was also associated with adolescent externalizing ($\beta = .59$, $p < 0.001$, $SE = .03$) and adolescent positivity ($\beta = -.19$, $p < 0.001$, $SE = .04$). Moreover, externalizing and positivity were both stable from adolescence to emerging adulthood ($\beta = .31$, $p < 0.001$, $SE = .04$ and ($\beta = .58$, $p < 0.001$, $SE = .03$, respectively). Further, externalizing behaviors in emerging adulthood was related to alcohol use in adulthood ($\beta = .21$, $p < 0.001$, $SE = .04$). Finally, positivity in emerging adulthood was not significantly associated with alcohol use in adulthood.

**Discussion**

The present investigation examined the role of externalizing behavior and positivity on the stability of alcohol use from adolescence to adulthood. This research adds to the current literature by examining risk as well as resiliency in both adolescence and emerging adulthood on alcohol use from adolescence through adulthood. Much of the previous work in this area has been cross-sectional in nature (Backer-Fulghum, et al., 2011; Barnow, Schuckit, Lucht, John, & Freyberger, 2002). Therefore, this study uniquely contributes to literature by examining the aforementioned constructs in one model over an extended period of time.

Consistent with our first hypothesis, we found that alcohol use in adolescence was associated with alcohol use in adulthood. In addition, our findings aligned with our
second hypothesis, externalizing and positivity were both stable from adolescence to emerging adulthood. However, it was the stability of externalizing, rather than positivity, through emerging adulthood that was associated with alcohol use in adulthood. This gives adherence to negative outcomes which advances our knowledge, at least in part, as to why it can be difficult to interrupt these pathways once they are established (Epstein, Hill, Bailey, & Hawkins, 2013). In contrast, our third hypothesis encompassing positivity was ultimately not founded. Positivity did not prove to be tenacious enough to curtail the influence of exhibiting negative behaviors leading to alcohol use in adulthood. In other words, positivity onto itself may not be able to change an individual’s trajectory of risk leading to drinking patterns which persist into adulthood when other risk is present, such as externalizing behaviors during one’s youth or illegal activities during one’s early adult years.

Indeed, the results indicated that externalizing behavior may play a role in alcohol use from adolescence to adulthood. This is consistent with other cross-sectional research which found that adolescents’ perceptions are salient to exhibiting both externalizing behaviors and alcohol use (Barnow, Schuckit, Lucht, John, & Freyberger, 2002). The fact that positivity was not a resilient predicting factor in the role of alcohol use in adulthood was unexpected. It may be that positivity is disassociated from other protective factors such as having a caring adult in an adolescent’s life (Werner & Johnson, 2004). Thus, positivity may simply not be able to be a mutually exclusive construct to effectively guard against prolonged alcohol use in the presence of externalizing behaviors from adolescence through emerging adulthood.
Limitations

The current investigation is not without limitations. These include the sample originating from a rural, primarily Caucasian population; thus, results are not necessarily able to be generalized to a minority group in an urban area. This study also did not focus on the clinical levels of exhibiting law-breaking activities or the limits of alcohol use to constitute abuse in any way whereas some studies have indicated that this information is necessary in evaluating developmental outcomes (Bulloch, Lavorato, Williams, & Patten, 2012). In addition, the literature has demonstrated that there may be genetic factors associated with alcohol use which were not addressed here (Rende, Slomkowski, & Lloyd-Richardson, Niaura, 2005).

Future Directions and Implications

Despite the limitations, the current study demonstrates strong merit due to the robust, longitudinal data set and the strong argument posed regarding the aforementioned targeted constructs in this analyses. All of these strengths elicit ideas for next steps in research. One next step would be to design a similar but moderating model of positivity. Since positivity did not govern whether or not an individual used alcohol into adulthood, it lends itself to the notion that perhaps the association is that of an interaction. In this study, since positivity was not associated with alcohol use in adulthood, perhaps positivity would instead buffer the overall negative trajectory. Previous cross-sectional work suggests that this idea of moderation may be noteworthy. For example, Campbell-Sills, Cohan, and Stein (2006) concluded that individual resilient characteristics have been shown to “moderate the impact of adversity on emotional health” (p. 597). Furthermore, few studies have addressed the potential significance of individual
socioemotional and behavioral buffering characteristics (i.e., personality traits) (Campbell-Sills et al., 2006; Walsh, 2006).

Other future research may include assessing whether the stability of alcohol use is different for home environments embedded in less-advantaged or more affluent neighborhoods. This has been shown to impact both externalizing and drinking behaviors especially for adolescents (Trim & Chassin, 2008). Additionally, moving beyond alcohol use and specifically exploring heavy drinking and alcohol abuse would be of importance. According to Whiteside and Lynam, (2003), it is more than plausible to suggest differences between regular and prolonged use of alcohol and abusing alcohol which has been identified as profoundly inhibiting one’s daily functioning whether it be in a work and/or family environment.

Practical implications of the study findings speak to how paramount early intervention is especially when adolescents are clearly exhibiting externalizing risk behaviors such as stealing or deliberately hurting someone to get something they want. This study has brought to our attention that even if an individual possesses resiliency characteristics such as having higher self-esteem, by in large it is not enough to alter a negative developmental path for adolescents who are using alcohol and displaying poor social behaviors. More is necessary to either formally (i.e., therapists, coaches, teachers) or informally (i.e., extended family members) support and encourage the promotion of these positivity characteristics among adolescents and emerging adults.
References


StataCorp. 2015. *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP.


http://dx.doi.org/10.15288/jsa.1986.47.34


Figure 1. Conceptual Model

- Adolescent Externalizing
- Emerging Adult Externalizing
- Adolescent Alcohol Use
- Adult Alcohol Use
- Adolescent Positivity
- Emerging Adult Positivity
Figure 2. Measurement Model

Significance Level: *p < .05, **p < .01, ***p < .001; Model Fit: $\chi^2(8)=32.50$, p<.001, RMSEA=0.08, CFI=0.96, SRMR=0.04
Table 1. Descriptive statistics for study variables (N = 492)

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<th>Max</th>
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<sup>a</sup> Ages 13-16, <sup>b</sup> Ages 19-23, <sup>c</sup> Ages 27-31
Table 2. Correlations among variables used in analyses

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<td>-.06</td>
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<td>6. Alcohol use (^c)</td>
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<td>.28(^***)</td>
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*** Correlation is significant at the 0.001 level (2–tailed).
** Correlation is significant at the 0.01 level (2–tailed).

\(^a\) Ages 13–16, \(^b\) Ages 19–23, \(^c\) Ages 27–31
CHAPTER 4: DISCUSSION

Summary of Chapters

This dissertation is in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Human Development and Family Studies; however, more specifically, this work is an effort to bridge the passion I have for adolescents and families who are considered at risk and the policy and research that has the potential to support and/or guide them to discover both physical and emotional well-being as well as success within in the many systems they are embodied. On the whole, Chapter 2 focused on a risk perspective of alcohol use, and the aim of Chapter 3 was to investigate how the risk pathway of alcohol use may be perpetuated by consecutive externalizing behaviors but more importantly, if those negative developmental behaviors could be altered when positivity was present as a resiliency factor in both adolescence and emerging adulthood. The following is a synopsis of the chapters outlined in this dissertation followed by a section designed to synchronize chapter meanings, and finally, an overarching future directions and implication section.

Chapter 2. Guided by Family Systems Theory (Steinglass, 1985; Vakalahi, 2001), the research conducted in Chapter 2 encompassed many risk factors such as alcohol use during adolescence (Ellickson, Tucker, & Klein, 2003; Grant, Stinson, & Harford, 2001), exhibiting externalizing behaviors (Birndorf, Ryan, Auinger, & Aten, 2005; Harter, 1998), harsh parenting practices (Conger, Patterson, & Ge, 1995; Neppl, Conger, Scaramella, & Ontai, 2009), and parent alcohol use (Ellickson et al., 2003; Windle, Spear, Fuligni, Angold, Brown, & Pine et al.; 2008) which have previously been associated with regular and prolonged alcohol use over time but had not before been
evaluated as a whole. What is more is that alcohol use was evaluated over an almost 20-year time frame. By doing this, we were able to determine some of the driving forces behind pervasive alcohol use from adolescence through emerging adulthood and into adulthood. For example, externalizing behaviors and father alcohol use were salient factors in perpetuated alcohol use into emerging adulthood. In addition, the construct of harsh parenting demonstrated a significant indirect effect between emerging adult and adult alcohol use. This study provided evidence of regular and prolonged use of alcohol as demonstrated in the significant results across two developmental time frames (adolescence and emerging adulthood). Further, both externalizing behaviors and depression also showed intervening effects on alcohol use over time which suggests that not all alcohol use should be considered a normal part of going through early adulthood (Schulenberg, Maggs, Long, Sher, Gotham, Baer, et al., 2001) and should be more seriously considered.

Chapter 3. Chapter 3 was supported in the context of a resiliency framework (Walsh, 2006) and extended the findings from Chapter 2 a step further. In chapter 3 we worked to establish if positive personal characteristics would decrease or even extinguish those at risk of experiencing regular and prolonged alcohol use in the presence of poor social behaviors from the developmental periods of adolescence through adulthood. That is, this research brings unique contributions to this area of study by exploring positivity as mechanism to potentially decreasing alcohol use over time (Windle et al., 2008) as well as understanding the role of externalizing behaviors which has been linked to alcohol use (Abela, Zinck, Kryger, Zilber, & Hankin, 2009) over a 20-year period from early adolescent to adulthood. Ultimately positivity was not tenacious enough to curtail the
influence of exhibiting negative behaviors on alcohol use in adulthood. Thus, positivity onto itself was not be able to change an individual’s trajectory of risk leading to drinking patterns which persist into adulthood when in the presence of externalizing risk behaviors, such as delinquent acts during one’s youth or illegal activities during one’s early adult years. Further, the results from this research indicated that externalizing behavior plays a role in the stability of alcohol use from adolescence to adulthood.

**Linking Chapters**

Taken together, this body of work provides evidence and reinforces both the conceptual and practical significance that pervasive alcohol use should be evaluated in a longitudinal and comprehensive manner. Utilizing the risk and resiliency frameworks has enabled an opportunity to more closely explore externalizing risk behaviors (Abela et al., 2009) and early alcohol use (Abrantes, Brown, & Tomlinson, 2004; Brown, McGue, Maggs, Schulenberg, Hingson, Swartzwelder, et al., 2009; King, Iacono, & McGue, 2004) in conjunction with protective or resilient personal characteristics, such as exhibiting higher levels of positivity (Masten, 2001), which have been determined to be closely linked (Jenson & Fraser, 2005).

Further, there is much research that has identified reasons adolescents develop less desirable outcomes which have primarily been derived from deficit models of development (Walsh, 2006). However, less has been known regarding the underpinnings of how individuals perpetuate personal resilient characteristics despite challenging life experiences (Backer-Fulghum, Patock-Peckham, King, Roufa, & Hagen, 2011). Specifically, an overarching goal of this dissertation was to identify and more deeply understand why adolescents adjust and maintain positive attributes such as displaying
higher levels of self-esteem (Laible, Carlo, & Roesch, 2004) while withstanding poor environmental influences. Luthar & Cicchetti (2000) support these inferences by finding that a strength-based perspective has been an effective way of cultivating higher levels of resilient characteristics. These risk and resiliency factors have seemingly been represented by a ratio between the number of risk factors an adolescent is simultaneously experiencing such as harsh parenting (Conger et al., 1995; Neppl et al., 2009) or parent use of alcohol (Ellickson et al., 2003; Windle, et al.; 2008) and the number to resiliency factors present in their lives (Garbarino, 1999). That is, resiliency in terms of having either formal (i.e., counselors or coaches) or informal (i.e., extended family members) supports in their lives have been shown to enhance one’s ability to not circum to the risks of developing poor developmental outcomes (i.e., heavy alcohol use; Substance Abuse and Mental Health Services Administration, 2014).

**Future Directions and Implications**

We have accomplished much of our underlying aims of this dissertation research. Diligently, we have done this by merging these aforementioned contributing risk and resiliency factors in adolescence and carefully evaluating previously known determinants of negative development outcomes over an extended period of time; specifically from adolescence through emerging adulthood and into adulthood. These two studies discussed in detail in Chapters 2 and 3, provided satisfying evidence as to the magnitude of influence of the aforementioned possible determinates of risk and resilience in terms of cumulative equity in lifespan developmental outcomes. Since this research was not compendiously representative, we ultimately offer suggestions for future research.
To build off of the current conglomerate of research presented in this dissertation, one area warranting further investigation is sampling only those individuals who described either one or both of their parents as abusing alcohol (Black, 1981; Miller & Jang, 1977). Previous research has identified differences among parents who use alcohol versus those who abuse alcohol (e.g., Handley & Chassin, 2013; Huang, Serrano, Curran, & Chassin, 2012). It would also be valuable to assess these constructs longitudinally in an effort to distinguish pathways of individual alcohol use against patterns of heavy drinking, binging, or alcohol abuse. Another future research idea includes assessing whether stability of alcohol use are different for home environments that are embedded in less-advantaged or more affluent neighborhoods. This has been shown to impact both externalizing and drinking behaviors especially for adolescents (Trim & Chassin, 2008).

Beyond the extent of this research, although interesting, would be to explore gender-related effects of alcohol use over extended periods of time. For example, women have been shown to be more susceptible of internalizing behaviors (i.e., depression) in conjunction with an increased desire to seek avenues diminishing feelings of distress such as drinking alcohol; whereas men have been more likely to be drawn to externalizing behaviors such as using alcohol in excess (Nolen-Hoeksema, 2004). Additional research supported that girls were found to be more vulnerable to family stress and posit an increased likelihood of displaying “avoidant coping” behaviors when compared to boys (Chan, Kelly, & Toumbourou, 2013; Cooper, Russell, & George, 1988; Kort-Butler, 2009). Thus, gender may have an impact on developmental processes when assessed as a predicting determinant of alcohol use over time.
The dissemination of this dissertation research may potentially function as an important next step in the continued effort to offer additional information and resources to service providers and other professionals who work directly with youth and families experiencing the previously mentioned life challenges. Because of the integration of the Family Systems Theory, results from this research also have the potential to offer real world application to better identify a possible entry point for intervention services. For example, providing awareness that earlier intervention may be necessary for adolescents experiencing adverse environmental conditions (Luthar, Cicchetti, & Becker, 2000; Rutter, 2000; Werner, 2000) may offer, for example, secondary teachers an opportunity to be agent of change in altering an adolescent’s life that would otherwise be set to experience negative outcomes. As a result, these efforts may contribute to more positively related developmental outcomes for youth who are at risk.

Collectively these integrated and complex constructs conjoined with the aforementioned developmental frameworks, offer a unique research perspective into the stability and intervening mechanisms of regular and persistent alcohol use over an extended period of time. The consummation of these studies was an effort to contribute and propel the literature forward by evaluating driving determinants of adolescent alcohol use in both an individual and familial context in addition to how the risk of persistent alcohol use is influenced by the presence of individual personal positivity characteristics over a 20-year period of time.
References


ACKNOWLEDGEMENTS

This study would not have been possible without the funding that currently supports the Family Transitions Project (FTP) which includes agencies with the National Institute of Health, but over the life of the project funding has been provided by the following agencies: the Bureau of Maternal and Child Health, the Iowa Agriculture & Home Economics Experiment Station, the MacArthur Foundation Research Network on Successful Adolescent Development among Youth in High-Risk Settings, the National Institute for Child Health and Human Development, the National Institute on Drug Abuse, and the National Institute of Mental Health.
APPENDIX A: HUMAN SUBJECTS APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Date: 9/7/2012
To: Dr. Tricia Nappl
2358 Palmer
From: Office for Responsible Research
Title: Family Transitions Project, FTP
IRB ID: 12-060
Approval Date: 9/7/2012 Date for Continuing Review: 2/6/2013
Submission Type: Modification Review Type: Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 50), please be sure to:

- Use only the approved study materials in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- Retain signed informed consent documents for 3 years after the close of the study, when documented consent is required.
- Obtain IRB approval prior to implementing any changes to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences involving risks to subjects or others; and (2) any other unanticipated problems involving risks to subjects or others.
- Stop all research activity if IRB approval lapses, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- Complete a new continuing review form at least three to four weeks prior to the date for continuing review as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. Approval from other entities may also be needed. For example, access to data from private records (e.g., student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. IRB approval in no way implies or guarantees that permission from these other entities will be granted.

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1138 Pearson Hall, to officially close the project.

Please don’t hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.
INSTITUTIONAL REVIEW BOARD (IRB)
Amendment for Personnel Changes

Title of Project: Family Transitions Project, FTP

Principal Investigator (PI): Tricia Neppl
University ID: 29167966345
Email Address: tnepppl@iastate.edu

Degrees: Ph.D.
Phone: 4-8502

FOR STUDENT PROJECTS (Required when the principal investigator is a student.)
Name of Major Professor/Supervising Faculty:
Phone: 4-8502
Email Address: @iastate.edu

changes in Key Personnel:
Key personnel includes any individuals who will have contact with the participants or the participants’ data (e.g., interviewers, transcribers, coders, etc.). This information is intended to inform the committee of the training and background related to the specific procedures that each person will perform on the project. For more information, please see Human Subjects - Persons Required to Obtain IRB Training. Personnel who will have contact with human blood, specimens, or other biohazardous materials must also complete Bloodborne Pathogens Training if the principal investigator has or will change, a complete new IRB application is required.

List any individuals to be removed from the study staff: Megan Grummer; Renae Schurbon; Brenda Smith; Alexandria Ulrich

Complete the following table to list any new key personnel:

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<th>Involved in the consent process?</th>
<th>Contact with human blood, specimens, or other biohazardous materials?</th>
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Office for Responsible Research: 08/26/11
FOR IRB USE ONLY

☐ All human subjects training requirements have been met.

IRB Reviewer Signature

Date 9/7/2012

Office for Responsible Research: 08/26/11