Early Sexual Debut: The multidimensional predictors of adolescent sexual risk-taking

Renee McNeil

"*This report is submitted in partial fulfilment of the Honours degree of Bachelor of Psychological Science (Honours)"*

Word Count: 4965

Declaration

"This report contains no material which has been accepted for the award of any other degree of diploma in any University, and, to the best of my knowledge, this thesis contains no material previously published except where due reference is made. I give permission for the digital version of this report to be made available on the web, via the University of Adelaide's digital thesis repository, the Library Search and through web search engines, unless permission has been granted by the School to restrict access for a period of time."

Adolescence is understood as a time of sexual maturation for many (Savioja et al., 2015; Smout et al., 2020; Manlove et al., 2012). Despite sexual exploration being a normative part of adolescence, the line between healthy sexual engagement and risky sexual behaviour is at times blurred (Savioja et al., 2015). Early sexual debut is commonly defined as the initiation of sexual intercourse prior to the age of 16 and has been widely associated with a variety of negative consequences (Epstein et al., 2018; Vasilenko, et al. 2016; Zimmer-Gembeck & Helfand, 2008; Boislard & Poulin, 2010). Research indicates that early sexual debut can be related to increased rates of sexually transmitted infections, substance use, juvenile pregnancy, poor academic performance, and anti-social behaviours (Smout et al., 2020; Zimmer-Gembeck & Helfand, 2008). Zimmer-Gembeck and Helfand (2008) conducted a review of 35 longitudinal studies relating to early sexual debut, which established correlations between the age of sexual debut and alcohol use, delinquency, and school performance. Further, individuals who participated in early sexual debut have been shown to experience elevated rates of adverse mental health outcomes (Smout et al., 2020, Tubman et al., 1996; Savioja et al., 2015; Boislard & Poulin, 2010). Pathways that lead to early involvement in sexual intercourse are complicated and may include psychosocial, biological, cognitive, personality, emotional, and environmental factors (Zimmer-Gembeck & Helfand, 2008; Aaron & Jenkins, 2002). The specific domains of personality, mental health, problem behaviours, family structure, socioeconomic status, and alcohol consumption are indicated as being particularly influential predictors (Raynor & Levine, 2009; Smout et al., 2020; Zimmer-Gembeck & Helfand, 2008; Boislard & Poulin, 2010; Aaron & Jenkins, 2002).

There has been an increase in adolescent mental health issues in recent times. Specifically, depression in adolescents has reached rates of up to 12% worldwide and is estimated to account for approximately 45% of overall diseases in adolescents (Osborne et

al., 2020; Savioja et al., 2015). Early sexual debut has been linked to depression in numerous studies (Osborne et al., 2020; Savioja et al., 2015; Smout et al., 2020). Savioja et al. (2015) propose that one possible theory for the connection between depression and early sexual debut is that depressed adolescents may seek out intimate relationships and engage in intercourse at an earlier age in an attempt to establish close connections with others. In their study on self-reported depression and sexual experiences, Savioja et al. found that adolescents experiencing depression had higher rates of early sexual debut. Further evidence supporting the link between depression and early sexual debut was established by Smout et al. (2020). Smout et al. examined a subsample of adolescents who participated in the Longitudinal Study of Australian Children (LSAC) and identified a strong association between depression and early risk-taking behaviours. Contrary to the findings established by Savioja et al. and Smout at al., Di Rago et al. (2012) found that risk-taking behaviours were related to anxiety but not depression. Noting the contradictory outcomes in previous research, a more thorough understanding of the relationship between depression and early sexual debut is warranted.

Literature indicates that individual differences in personality contribute to engagement in risk-taking behaviours (Joseph & Zhang, 2021). Raynor and Levine (2009) report that the Big Five Model of personality has a robust capacity to predict health behaviours. The Big Five Model categorises the dimensions of personality into the domains of openness, conscientiousness, extraversion, agreeableness, and neuroticism. In their research based on associations between the Big Five Model and health behaviours, Raynor and Levine established a significant relationship between extraversion and risk taking. The domain of extraversion indicates how outgoing and sociable a person is. Individuals who score high in extraversion tend to actively seek the company of others (Raynor & Levine,

2009; Srivastava, 1999). This association provides a good insight into the social aspects of personality and risk-taking behaviours; however, Joseph and Zhang (2021) challenge the suggestion that risk-taking propensity fits into a single personality category. In their study, Joseph and Zhang discovered that none of the domains captured in the Big Five Model explained greater than 20% of the variation. This particular study advanced research in the domains of general, social, ethical, and financial risk-taking, but research would benefit from taking a closer look at possible associations between individual personality traits and early sexual debut as there is a lack of literature relating to this specific relationship.

Another area identified as a risk for increased probability of early sexual debut is family structure (Boislard & Poulin, 2010; Savioja et al., 2015). Particularly, disruptions to parental living arrangements are said to have a series of negative consequences for adolescents (Apel & Kaukinen, 2008; Boislard & Poulin, 2010; Miller et al., 2001). Research conducted by Boislard and Poulin (2010) established that adolescents who were part of a non-intact (single parent) family had a significantly higher chance of engaging in early sexual debut. Evidence from research undertaken by Childs et al. (2020) indicated that the direct effect between family structure and adolescent risk-taking behaviours is only weak and suggest that the quality of parenting in non-intact families is far more influential. It has been suggested that adolescents who are members of non-intact families may not receive the same level of supervision as those in intact families. Gottfredson and Hirschi (1990) state that supervision is critical to the development of self-control; a characteristic that is closely tied to risk-taking behaviours. Parental scaffolding and opportunities for limit setting are suggested to be highly influential in the development of self-control; however, tend to be limited within the setting of non-intact environments (Holmes et al., 2018; Gottfredson and Hirschi 1990). As family structures continue to diversify, there is an increased need for

research to focus on understanding of the long-term effects of family disruptions on adolescent development and behaviours.

Holmes et al. (2018) state that the relationship between self-control and risk-taking behaviours can be linked through socioeconomic status. Socioeconomic status incorporates the general social standing of a family and is comprised of income, occupation, education level, access to social resources, and capacity to engage in society (Australian Bureau of Statistics, 2016, Brieant et al., 2021). Adolescents who experience socioeconomic disadvantage are at greater risk of being exposed to poverty, violence, minimal social support, parental conflict, fewer learning opportunities, and deficits in nutrition and health (Brieant et al., 2021; Delker et al., 2018). Brieant et al. (2021) argue that the detrimental environment produced by socioeconomic disadvantage impacts adolescent cognitive development across multiple facets and that this explains the propensity for members of this group to participate in elevated risk-taking behaviours. This concept was supported in their research which established that adolescents belonging to lower socioeconomic groups had reduced cognitive control which was found to be associated with greater levels of risk-taking behaviours. Noting the evidence supporting the influence of socioeconomic status on risk-taking behaviours, the effects of socioeconomic disadvantage are of specific interest to this research.

Furthermore, instability associated with a disadvantaged upbringing impacts behaviour regulation, which may result in impulsivity. Impulsivity, lack of ability to plan, and minimal future orientation are said to increase susceptibility to risk-taking behaviours (Holmes et al., 2018; Zimmer-Gembeck & Helfand, 2008; Michels et al., 2005). An individual's ability to assess consequences is essential to making reasonable decisions

related to health-related behaviours and risk-taking. There are consistent findings that endorse this theory; however, the majority of research on decision making and sexual activity is typically associated with safe sex methods and sexual perceptions (Michels et al., 2005; Butler, 2003). As adolescents do not always make choices that support their best interest, understanding the process involved with decision making is vital to efforts aimed at reducing risky behaviours (Michels et al., 2005).

Conduct disorders are also said to be associated with disadvantaged socioeconomic environments (Sully et al., 2016; Cavazos-Rehg et al., 2010). The minimal supervision, inconsistent relationships, lack of connectedness, and reduced support that are associated with disadvantaged socioeconomic environments are said to influence behavioural problems in adolescents (Cavazos-Rehg et al., 2010; Roche et al., 2005). Cavazos-Rehg et al. (2010) state that behavioural factors play a significant role in whether adolescents participate in risk-taking behaviours. In research investigating the association between conduct disorder and early sexual debut, Cavazos-Rehg et al. found that conduct disorder symptoms in adolescents, was related to a higher probability of early sexual debut. Further, the research indicated that conduct disorder symptoms along with alcohol related issues held the strongest connections to early sexual debut.

Finally, Problem Behaviour Theory proposes that there is a strong co-occurrence between many risk-taking behaviours (Jessor & Jessor, 1977). Particularly, there is robust empirical evidence relating early sexual debut and alcohol use (Boislard & Poulin, 2010; Smout et al., 2020). Zimmer-Gembeck and Helfand (2008) performed a meta-analysis on 35 longitudinal studies relating to the onset of sexual intercourse and found that alcohol use had one of the strongest associations with early sexual debut. Fergusson and Lynskey (1996)

also had significant findings relating to the association between early sexual debut and alcohol consumption. In a longitudinal study, which included 1265 New Zealand children, it was shown that adolescents who misused alcohol experienced significantly higher rates of early sexual debut. Fergusson and Lynskey suggest two probable explanations for the results. The first explanation is related to the possibility that reduced inhibitions resulting from alcohol consumption may promote experimentation and an increased likelihood of risk-taking behaviours. The alternate explanation is that both alcohol use and risky sexual behaviour result from a life pathway that encourages such risk-taking behaviours. Bellis et al. (2007) state that there has been an increase in adolescent binge drinking in recent times and that excessive consumption contributes greatly to harm-related behaviours such as risk-taking. Seeing as prevalence of alcohol misuse is an increasing concern, greater knowledge of harmful alcohol use and the relationship to risk-taking behaviours will generate better insight into why adolescents participate in early sexual debut.

Overall, empirical evidence suggests that a wide range of psychological, biological, social, behavioural, and economic factors influence the timing of sexual debut; indicating that a multifaceted approach to minimising adolescent sexual risk-taking behaviour is required. Guided by this perspective, the present study seeks to extend prior research by providing a more complete understanding of the multiple predictors of early sexual debut. Specifically, this research will compare adolescents who have engaged in early sexual debut and adolescents who have not, with an aim of identify key differences that should be considered when designing interventions targeted at reducing sexual risk-taking behaviours in adolescents.

It is hypothesised that adolescents who were categorised as early sexual debut will demonstrate significantly higher levels of depressive symptoms, extraversion, conduct problems and alcohol misuse than adolescents in the non-early sexual debut category. It is also expected that, adolescents who identified as early sexual debut will demonstrate lower levels of future outlook than non-early debut participants. Further, it is anticipated that a greater proportion of adolescents who report early sexual debut will report living in a single parent household compared to adolescents who did not report early sexual debut. Finally, it is hypothesised that adolescents who engaged in early sexual debut will have greater levels of socioeconomic disadvantage than adolescents who did not.

Method

Participants and procedure

This research analysed a subsample of the Department of Social Services et al. (2019) Longitudinal Study of Australian Children (LSAC). The LSAC is a nationwide study that follows the development of children and their families. This study utilises data from what is classified as the Kindergarten cohort (K cohort). The K cohort consists of a sample of 4983 participants who were aged between 4 and 5 years old in 2004 when the first data was collected. Since commencement, information has been obtained twice a year and there are a total of seven waves of data accessible. This particular study will utilise data that was collected in Wave 7. The participants in Wave 7 were aged between 16-17 years at the time of collection (Department of Social Services et al., 2019). The research protocol for the LSAC was approved by the Australian Institute of Family Studies Ethics Committee and a detailed description on the LSAC can be obtained from “Australian Institute of Family Studies.

Growing Up in Australia: The Longitudinal Study of Australian Children" (Department of Social Services, 2014). All statistical analyses were conducted using the statistical software RStudio.

Measures

Early Sexual Debut Status

Initiation of early sexual debut was operationalised by evaluating the response to the question 'How old were you the first time you had sex?'. Based on the definition of early sexual debut (15 and below) from Epstein et al. (2018) and Vasilenko, et al. (2016) participants were categorised into the dichotomous categories of early sexual debut and non-early sexual debut. For the purposes of this study any participants classified as no sexual initiation and sexual initiation at 16 and beyond were categorised as non-early sexual debut.

Depressive Symptoms

The adolescent's depression levels were measured using the Short Mood and Feelings Questionnaire (SMFQ). The SMFQ consists of 13 self-report items such as 'I didn't enjoy anything at all' which measure the level of depressive symptoms in the past month on a 3-point scale (0 = Not true; 1 = Sometimes; 2 = True). The SMFQ demonstrates good validity with all questions having a minimum item total correlation of ($r = .50$) and reliability ($\alpha = .88$ to $.89$). (Thabrew et al., 2017).

Personality Inventory

The Big 5 Personality Inventory (BFI-10) was used to measure the personality traits of the K cohort at Wave 7. This research specifically analysed the mean results of the domain of extraversion. Participants were asked to indicate, on a five-point Likert scale ('1 =

disagree strongly' to '5 = agree strongly') how well the following statements describe their personality:

1. I see myself as someone who is reserved; keeps thoughts and feelings to self (reversed)
2. I see myself as someone who is outgoing, sociable

Morizot (2014) states that the BFI-10 has adequate validity and endorses the measure for adolescent use.

Family Structure

Family structure was determined through a dichotomous (yes/no) answer to the question 'Child has 2 parents in the home'.

Socioeconomic Status

Socioeconomic status was evaluated using the Socio-Economic Indexes for Areas (SEIFA) (Australian Bureau of Statistics, 2016). The SEIFA is a single socioeconomic measure that positions areas in Australia according to relative socio-economic advantage and disadvantage. The SEIFA was generated by the Australian Bureau of Statistics 2016 Census data and comprises the categories of: The Index of Relative Socio-economic Disadvantage (IRSD); The Index of Relative Socio-economic Advantage and Disadvantage (IRSAD); The Index of Education and Occupation (IEO); The Index of Economic Resources (IER). All four indices were totalled to obtain an overall socioeconomic score.

Future Outlook

The influence of future outlook was defined by reviewing the mean scores of the Future Outlook Inventory which was developed by Cauffman and Woolard (1999) and demonstrates acceptable reliability ($\alpha = .69$) and validity ($r = .71$). This information is

obtained from the adolescents' self-report scaled response (1 = Never; 2 = Rarely; 3 = Often; 4 = Always) to questions such as 'I think about how things might be in the future'.

Conduct Problems

Conduct problems were assessed using the conduct specific responses on the Strengths and Difficulties Questionnaire (SDQ). This section consisted of five questions with participants indicating the most accurate answer (1 = Not true; 2 = Somewhat true; 3 = Certainly true) to statements such as 'Obeys orders'. The SDQ has established validity (r = .33 to .51) and reliability (α = .59 to .80). nationally and internationally (Hawes and Dadds, 2004).

Alcohol Misuse

Assessment of alcohol misuse was performed through analysis of the mean scores to the five-item alcohol-related harms questionnaire (Vassallo & Sanson, 2013). Rehm et al. (1999) report acceptable validity correlations (r = .49 to .58) and moderate reliability (Kappa = 0.48). Participants responded to questions like 'Has your alcohol use caused you to become violent and get into a fight' using a 3-point scale (0 = Never; 1 = Sometimes; 2 = Often).

Results

Of the 3089 participants examined in the study, 9.4% (N=290) were classified in the category of early sexual debut. Around 75% (N=2314) indicated no sexual initiation, while 16% (N=485) experienced sexual debut at 16 years of age or after. Full distribution of age of sexual debut is illustrated in Figure 1.

Figure 1

Age of Sexual Debut

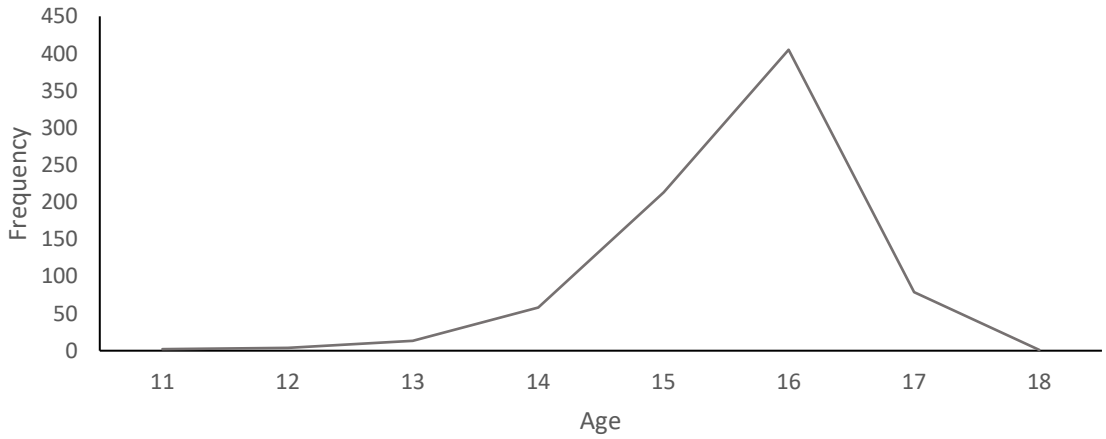

Table 1 indicates the differences between early sexual debut and non-early sexual debut for each variable. Descriptive statistics for each of the predictor variables are presented in Table 1, separated by early sexual debut and non-early sexual debut. As group sizes differed greatly in size the Mann-Whitney U test was employed to evaluate the variations between the categories of early sexual debut and non-early sexual debut for ordinal and continuous variables. To add to the information obtained by the *p* values and to give a more complete picture of the results, Vargha and Delaney's A statistic was used to test effect sizes for variables analysed using the Mann-Whitney U test (Vargha and Delaney, 2000). Pearson's chi-square was used to assess the differences between early sexual debut

and non-early sexual debut for dichotomous variables and again to supplement the *p* value, effect sizes were established using Cramer's V (Cohen, 1988).

Table 1

Sample characteristics and differences between early sexual debut and non-early sexual debut

Variables	Early Sexual Debut	Non-Early Sexual Debut	Significance of Difference	Effect Size
Depressive Symptoms				
M (SD)	9.25 (7.86)	7.33 (7.59)	U = 322248 *** a	*A* = .88
Extraversion				
M (SD)	3.35 (.86)	3.20 (.93)	U = 348061 ** a	*A* = .99
Family Structure				
% single parent households	3.45	1.61	X^2= 4.09 * b	*V* = .04
Socioeconomic Status				
M (SD)	4014.97 (260.48)	4057.24 (273.32)	U = 444074** a	*A* = 1
Future Outlook				
M (SD)	20.43 (5.17)	21.89 (4.24)	U = 432783 *** a	*A* = .99
Conduct Problems				
M (SD)	2.51 (1.84)	1.59 (1.56)	U = 264496 *** a	*A* = .84
Alcohol Misuse				
M (SD)	5.78 (1.33)	5.31 (.89)	U = 143077 *** a	*A* = 1
N = 3089				

*p<.05. **p<.01. ***p<.001.

a Mann Whitney U-tests

b χ_2-tests

A Vargha and Delanay's A

V Cramer's V

It was hypothesised that adolescents who were categorised as early sexual debut would demonstrate significantly higher levels of depressive symptoms, extraversion, conduct problems and alcohol misuse. As can be seen in Table 1, the mean for depressive symptoms, extraversion, conduct related issues and alcohol misuse was higher for adolescents in the category of early sexual debut, with the Mann-Whitney U test indicating that the differences were significant, and the effect sizes were strong.

It was also expected that adolescents who identified as early sexual debut would demonstrate lower levels of future outlook. Table 1 illustrates that adolescents who

identified as early sexual debut produced lower mean scores on the Future Outlook Inventory. Analysis using the Mann-Whitney U test determined that the variance between early sexual debut and non-early sexual debut was significant and a strong effect size was also produced (Table 1).

Further, it was anticipated that a greater proportion of adolescents who reported early sexual debut would report living in single parent households compared to adolescents who did not report early sexual debut. As presented in Table 1, 3.45% of adolescents who reported early sexual debut lived in single parent households compared to 1.61% of adolescents who did not report early sexual debut. A chi-square test found that the differences were significant; however, despite reaching statistical significance, the effect size was negligible (Table 1).

Finally, it was predicted that adolescents who identified as early sexual debut would experience greater levels of socioeconomic disadvantage that adolescents who did not. Mean socioeconomic scores for adolescents who had engaged in early sexual debut were lower than that of adolescents who did not (Table 1). Table 1 illustrates a strong effect size and reveal significant differences as per the results of the Mann-Whitney U test.

Discussion

Understanding the breadth of circumstances that contribute to sexual risk-taking in adolescents is a crucial step in designing successful interventions aimed at reducing early sexual debut. This study examined a comprehensive set of predictors (depressive symptoms, extraversion, future orientation, family structure, socioeconomic status, conduct issues, and alcohol misuse) of adolescent sexual risk-taking behaviours, to assess the differences between adolescents who had participated in early sexual debut and adolescents who had not. In this section, results for each of the variables will be discussed individually but taken together, the results revealed that early sexual debut is associated with a variety of psychological, biological, social, behavioural, and economic factors.

Depressive Symptoms

As hypothesised, significant differences were found between depressive symptoms and the categories of early sexual debut and non-early sexual debut. The results indicated that depressive symptoms were higher for adolescents who had engaged in early sexual debut. These results support the theory proposed by Savioja et al. (2015) that adolescents who experience higher levels of depressive symptoms may seek out the comfort of others to manage the negative symptoms that they experience. This study did not test for the onset of depressive symptoms and so it is unknown whether depressive symptoms followed sexual debut; however, the results are consistent with previous literature which has linked depressive symptoms and early sexual debut (Kim, 2016; Vafai et al., 2020; Goncalves et al., 2017; Smout et al, 2020). These results demonstrate the association between depressive symptoms and early sexual debut and highlight the importance of mental health when addressing sexual risk-taking behaviours.

Extraversion

This research revealed that as predicted, adolescents in the category of early sexual debut scored significantly higher in the domain of extraversion as assessed by the Big Five Model of personality. These findings are in line with the results from previous research that suggests personality profiles can influence risk-taking behaviours and reveal the domain of extraversion as a likely predictor of sexual risk-taking behaviours (Raynor & Levine, 2010; Nicholson et al., 2005). It could be speculated that adolescents high in extraversion require consistent excitement and arousal and that this drive motivates adolescents to engage in risky sexual behaviours. This suggestion is supported by Raynor and Levine (2010) who link the risk-taking behaviours of extraverted individuals to biological drives. Further, individuals high in extraversion tend to actively seek social engagement which in turn could increase opportunities for sexual risk-taking behaviours. As existing literature has yet to directly assess the relationship between personality and early sexual debut, the results from the present study are especially salient.

Family Structure

Consistent with prior research (Boislard & Poulin, 2010; Savioja et al., 2015) and in line with the hypothesis, the results indicated that a significantly greater proportion of adolescents who had engaged in early sexual debut reported living in single parent households. Even though the differences were statistically significant, the associated effect size was negligible. Further, the proportion of adolescents living in single parent households was low for both groups. Adolescents in the early sexual debut cohort experienced levels of 3.45% and the non-early sexual debut cohort had levels of only 1.61%. Based on this outcome, it is worth considering whether there are other contributing factors that influence

the relationship between family structure and risky sexual behaviours in adolescents. As suggested by Miller et al. (2001), the sexual values held by parents contribute towards adolescent attitudes. Further, communication has been cited as an influence on adolescent sexual behaviours and frequency and quality of parent and adolescent communication has been indicated as an influential factor of risky sexual behaviours. Adolescents who communicate with their parents regularly and disclose at high levels are said to experience delays in sexual debut (Boislard & Poulin, 2010). Overall, the findings do indicate a relationship between household composition and early sexual debut and as studies on household composition and adolescent risk-taking behaviours are limited, these results provide valuable insight. Nevertheless, future research may benefit from a better understanding of how family structure relates to other characteristics of the family structure.

Socioeconomic Status

The results showed that socioeconomic status was one of the more influential predictors of early sexual debut and as expected, the study established significant differences between early sexual debut and non-early sexual debut. Further, the analysis produced a large effect size, demonstrating the meaningfulness of the differences between groups. There is a substantial amount of literature documenting the relationship between socioeconomic disadvantage and risk-taking behaviours (Holmes et al. 2018; Brieant et al., 2021; Delker et al., 2018). This research adds further evidence to the existing findings and contributes specifically to the domain of sexual risk-taking. Perhaps as suggested by Brieant et al. (2020), socioeconomic disadvantage negatively impacts cognitive development, leading to poor decision-making abilities by adolescents. Alternatively, as indicated by

Holmes et al. (2018) the link between self-control and socioeconomic could be related to household chaos. Research would benefit from a deeper knowledge of which aspects of socioeconomic status specifically contribute to sexual risk-taking behaviours. Irrespective, these findings indicate that greater levels of socioeconomic disadvantage are likely to place adolescents at greater risk of early sexual debut. Interventions aimed at addressing sexual risk-taking behaviours, should specifically target areas of disadvantage to increase the likelihood of success.

Future Outlook

The hypothesis related to future outlook was supported with adolescents who had experienced early sexual debut scoring significantly lower on the Future Outlook Inventory. A large effect size was also found for future outlook, indicating the importance of this factor on risky sexual behaviours. These results substantiate research conducted by Zimmer-Gembeck and Helfand (2008) which articulated that reduced future orientation may be an important predictor of risky sexual behaviour. Decision-making requires the ability to assess potential outcomes and as stated by Michels et al. (2005), sexual activity is related to risk-benefit assessment. The outcomes of this research, indicate that adolescents who are not future oriented may have a reduced ability to make such assessments and therefore could be at a greater risk of engaging in risky sexual behaviours. Understanding how adolescents make decisions about their own behaviours is especially useful in identifying willingness to engage in risky sexual behaviours. To date, the underlying processes of decision-making has received less attention than some of the more apparent predictors, making these findings particularly valuable to future research and possible interventions.

Conduct Problems

Adolescents who were categorised as early sexual debutants had significantly higher levels of conduct related problems which was consistent with the hypothesis. The outcome from this study support the research of Cavazos-Rehg et al. (2010) who also established a link between conduct related issues and early sexual debut. Sully et al. (2016) report that risk-taking is specifically related to having a diagnosis of Conduct Disorder. The results derived from this analysis were related to conduct related problems and not a diagnosis. The significant results and associated large effect size suggest that interventions related to risky sexual behaviours should pay close attention to conduct related issues in general. Cavazos-Rehg et al. propose that genetic factors may increase adolescent vulnerabilities to conduct related issues and so future studies might consider investigating this pathway and how it influences adolescent sexual risk-taking.

Alcohol Misuse

The results demonstrated that adolescents who had engaged in early sexual debut had significantly higher levels of alcohol misuse. This outcome confirms the hypothesis and supports the results found in the meta-analysis performed by Zimmer-Gembeck and Helfand (2008) which indicate alcohol as a strong predictor of early sexual debut. As literature consistently implicates alcohol as a predictor of sexual debut (Zimmer-Gembeck and Helfand, 2008; Boislard & Poulin, 2010; Smout et al., 2020; Fergusson and Lynskey, 1996), the results and strong effect size was not surprising. However, the findings from this study expand on existing research by considering alcohol misuse as part of a broader set of predictors which should all be assessed in order to create successful interventions for risky sexual behaviours. What has not been addressed in this research are the driving factors

behind alcohol misuse and as stated by Fergusson and Lynskey (1996), there is potential for a genetic predisposition towards alcohol misuse. As alcohol seems to be such a strong predictor of risky sexual behaviour a deeper knowledge of the causal associations of alcohol misuse would benefit research in this field.

Limitations

There are several limitations to this research which merit comment. First, this research does not assess the correlations between predictors and so cannot demonstrate directionality or causality. For example, as mentioned, this research did not assess the levels of depressive symptoms prior to sexual debut and so it cannot be clear if there were changes to depressive symptoms as a result of early sexual debut. Further research is required to fully understand the correlations and associated pathways of early sexual debut. Second, there may be confounding variables that influence predictors that have not been accounted for in this study. This study did not capture the cumulative effects of the family environment or genetic influences and future studies should seek to obtain more information on these factors. Finally, many of the measures were self-report and hence there may be levels of information bias associated such as an underestimation of age of sexual debut or level of conduct problems. Notwithstanding these limitations, the comprehensive nature of this research had advantages over previous research. Many existing studies only review a limited number of predictors and hence have restricted capacity to understand the true scope of factors that influence early sexual debut.

Conclusion

In summary, the outcomes of this study demonstrate that a wide range of psychological, biological, social, behavioural, and economic factors influence the timing of

sexual debut. Because early sexual debut has extensive and ongoing consequences, tailored interventions are required to address sexual risk-taking behaviours and mitigate a range of negative outcomes. The implications of this study are relatively simple: to increase success rates, prevention efforts must be multidimensional and account for a comprehensive array of predictors.

References

Aarons, S. J., & Jenkins, R. R. (2002). Sex, pregnancy, and contraception-related motivators and barriers among Latino and African-American youth in Washington, DC. *Sex Education*, *2*(1), 5–30. doi: https://doi.org/10.1080/14681810220133596

Apel, R., & Kaukinen, C. (2008). On the relationship between family structure and antisocial behaviour: Parental cohabitation and blended households. *Criminology*, *46*(1), 35–70. doi: https://doi.org/10.1111/j.1745-9125.2008.00107.x

Australian Bureau of Statistics (2016). *Census of population and housing: Socio-Economic Indexes for Areas (SEIFA).* Retrieved from: https://www.abs.gov.au/ausstats/abs@.nsf/mf/2033.0.55.001.

Bellis, M. A., Hughes, K., Morleo, M., Tocque, K., Hughes, S., Allen, T., Harrison, D., & Fe-Rodriguez, E. (2007). Predictors of risky alcohol consumption in schoolchildren and their implications for preventing alcohol-related harm. *Substance Abuse Treatment, Prevention and Policy*, *2*(1), 15–15. doi: https://doi.org/10.1186/1747-597X-2-15

Boislard M-A., & Poulin, F. (2010). Individual, familial, friends-related and contextual predictors of early sexual intercourse. *Journal of Adolescence, 34*(2), 289–300. doi: https://doi.org/10.1016/j.adolescence.2010.05.002

Brieant, A., Peviani, K. M., Lee, J. E., King-Casas, B., & Kim-Spoon, J. (2021). Socioeconomic risk for adolescent cognitive control and emerging risk-taking behaviors. *Journal of Research on Adolescence*, *31*(1), 71–84. doi: https://doi.org/10.1111/jora.12583

Butler, C. A. (2003). A qualitative study of HIV sexual risk behavior among white female street youth. *Dissertation Abstracts International, 63*, 57-87.

Cauffman, E. & Woolard, J. (1999). *Future outlook inventory*. Unpublished test.

Cavazos-Rehg, P. A., Spitznagel, E. L., Bucholz, K. K., Nurnberger Jr, J., Edenberg, H. J., Kramer, J. R., Kuperman, S., Hesselbrock, V., & Bierut, L. J. (2010). Predictors of sexual debut at age 16 or younger. *Archives of Sexual Behavior*, *39*(3), 664–673. doi: https://doi.org/10.1007/s10508-008-9397-y

Childs, K. K., Brady, C. M., Cameron, A. L. J., & Kaukinen, C. (2020). The role of family structure and family processes on adolescent problem behavior. *Deviant Behavior*, 1–16. doi: https://doi.org/10.1080/01639625.2020.1771128

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Delker, B. C., Bernstein, R. E., & Laurent, H. K. (2018). Out of harm's way: Secure versus insecure-disorganized attachment predicts less adolescent risk taking related to childhood poverty. *Development and Psychopathology*, *30*(1), 283–296. doi: https://doi.org/10.1017/S0954579417000621

Department of Social Services, Australian Institute of Family Studies, Australian Bureau of Statistics. (2019). *Growing Up in Australia: longitudinal Study of Australian Children*. (LSAC) Release 7.2 (Waves 1-7). 10.26193/F2YRL5.

Di Rago, V., Panno, A., Lauriola, M., & Figner, B. (2012). All negative affects are not equal: Anxiety but not depression predicts risk-taking. *Psychology & Health*, *27*, 195–195.

Epstein, M., Furlong, M., Kosterman, R., Bailey, J. A., King, K. M., Vasilenko, S. A., Steeger, C. M., & Hill, K. G. (2018). Adolescent age of sexual initiation and subsequent adult health outcomes. *American Journal of Public Health, 108*(6), 822–828. doi: https://doi.org/10.2105/AJPH.2018.304372

Fergusson, D. M., & Lynsky, M. T. (1996). Alcohol misuse and adolescent sexual behaviors and risk taking. *Pediatrics, 98*(1), 91–96.

Gonçalves, H., Gonçalves Soares, A. L., Bierhals, I. O., Machado, A. K. ., Fernandes, M. P., Hirschmann, R., da Silva, T. M., Wehrmeister, F. C., & Menezes, A. M. (2017). Age of sexual initiation and depression in adolescents: Data from the 1993 Pelotas (Brazil) birth cohort. *Journal of Affective Disorders*, *221*, 259–266. doi: https://doi.org/10.1016/j.jad.2017.06.033

Gottfredson, M. R. & Hirschi, T. (1990). *A general theory of crime.* CA: Stanford University Press.

Hawes, D.J., Dadds, M.R., 2004. Australian data and psychometric properties of the strengths and difficulties questionnaire. *Australian and New Zealand Journal of Psychiatry, 38*, 644–651. doi: https://doi.org/10.1080/j.1440-1614.2004.01427.x.

Holmes, C., Brieant, A., Kahn, R., Deater-Deckard, K., & Kim-Spoon, J. (2019). Structural home environment effects on developmental trajectories of self-control and adolescent risk taking. *Journal of Youth and Adolescence, 48*(1), 43–55. doi: https://doi.org/10.1007/s10964-018-0921-7

Jessor, R., & Jessor, S. L. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth*. Academic Press.

Joseph, E. D., & Zhang, D. C. (2021). Personality profile of risk-takers: An examination of the big five facets. *Journal of Individual Differences. Advance online publication.* doi: http://dx.doi.org/10.1027/1614-0001/a000346

Kim, H. S. (2016). Sexual debut and mental health among South Korean adolescents. *The Journal of Sex Research*, *53*(3), 313–320. doi: https://doi.org/10.1080/00224499.2015.1055855

Manlove, J., Wildsmith, E., Ikramullah, E., Terry-Humen, E., & Schelar, E. (2012). Family environments and the relationship context of first adolescent sex: Correlates of first

sex in a casual versus steady relationship. *Social Science Research*, *41*(4), 861–875. doi: https://doi.org/10.1016/j.ssresearch.2012.02.003

Michels, T. M., Kropp, R. Y., Eyre, S. L., & Halpern-Felsher, B. L. (2005). Initiating sexual experiences: How do young adolescents make decisions regarding early sexual activity? *Journal of Research on Adolescence*, *15*(4), 583–607. https://doi.org/10.1111/j.1532-7795.2005.00112.x

Miller, B. C., Norton, M. C., Curtis, T., Hill, E. J., Schvaneveldt, P., & Young, M. H. (1997). The timing of sexual intercourse among adolescents: Family, peer, and other antecedents. *Youth & Society*, *29*(1), 54–83. doi: https://doi.org/10.1177/0044118X97029001003

Miller, B. C., Benson, B., & Galbraith, K. A. (2001). Family relationships and adolescent pregnancy risk: A research synthesis. *Developmental Review*, *21*(1), 1–38. doi: https://doi.org/10.1006/drev.2000.0513

Morizot, J. (2014). Construct validity of adolescents' self-reported big five personality traits: Importance of conceptual breadth and initial validation of a short measure. *Assessment, 21*(5), 580-606. doi: https://doi.org/10.1177/1073191114524015

Nicholson, N., Soane, E., Fenton-O'Creevy, M., & Willman, P. (2005). Personality and domain-specific risk taking. *Journal of Risk Research*, *8*(2), 157–176. doi: https://doi.org/10.1080/1366987032000123856

Osborn, T. L., Rodriguez, M., Wasil, A. R., Venturo-Conerly, K. E., Gan, J., Alemu, R. G., Roe, E., Arango G, S., Otieno, B. H., Wasanga, C. M., Shingleton, R., & Weisz, J. R. (2020). Single-session digital intervention for adolescent depression, anxiety, and well-being: Outcomes of a randomized controlled trial with Kenyan adolescents. *Journal of*

Consulting and Clinical Psychology, *88*(7), 657–668. doi: https://doi.org/10.1037/ccp0000505

Raynor, D. A., & Levine, H. (2009). Associations between the Five-Factor Model of personality and health behaviors among college students. *Journal of American College Health*, *58*(1), 73–82. doi: https://doi.org/10.3200/JACH.58.1.73-82

Rehm, J., Frick, U., & Bondy, S. (1999). A reliability and validity analysis of an alcohol-related harm scale for surveys. *Journal of Studies on Alcohol*, *60*(2), 203–208. doi: https://doi.org/10.15288/jsa.1999.60.203

Roche, K. M., Mekos, D., Alexander, C. S., Astone, N. M., Bandeen-Roche, K., & Ensminger, M. E. (2005). Parenting influences on early sex initiation among adolescents: How neighborhood matters. *Journal of Family Issues, 26,* 32–54.

Savioja, H., Helminen, M., Fröjd, S., Marttunen, M., & Kaltiala-Heino, R. (2015). Sexual experience and self-reported depression across the adolescent years. *Health Psychology & Behavioral Medicine*, *3*(1), 337–347. doi: https://doi.org/10.1080/21642850.2015.1101696

Smout, A., Newton, N. C., Slade, T., O'Donoghue, B., & Chapman, C. (2020). The relationship between early risk-taking behavior and mental health problems among a nationally representative sample of Australian youth. *Journal of Affective Disorders*, *272*(Jul 2020), 239–248. doi: https://doi.org/10.1016/j.jad.2020.04.040

Srivastava, J. S. (1999). *Handbook of personality: Theory and research*. New York, NY: Guilford Press.

Sully, K., Sonuga-Barke, E. J. S., Savage, J., & Fairchild, G. (2016). Investigating the familial basis of heightened risk-taking in adolescents with conduct disorder and their

unaffected relatives. *Developmental Neuropsychology*, *41*(1-2), 93–106. doi: https://doi.org/10.1080/87565641.2016.1145223

Thabrew, H., Stasiak, K., Bavin, L., Frampton, C., & Merry, S. (2018). Validation of the Mood and Feelings Questionnaire (MFQ) and Short Mood and Feelings Questionnaire (SMFQ) in New Zealand help-seeking adolescents. *International Journal of Methods in Psychiatric Research*, *27*(3), 1610–n/a. doi: https://doi.org/10.1002/mpr.1610

Tubman, J. G., Windle, M., & Windle, R. C. (1996). The onset and cross-temporal patterning of sexual intercourse in middle adolescence: Prospective relations with behavioral and emotional problems. *Child Development*, *67*(2), 327–343. doi: https://doi.org/10.1111/j.1467-8624.1996.tb01737.x

Vafai, Y., Thoma, M. E., & Steinberg, J. R. (2020). Association between first depressive episode in the same year as sexual debut and teenage pregnancy. *Journal of Adolescent Health*, *67*(2), 239–244. doi: https://doi.org/10.1016/j.jadohealth.2020.02.001

Vargha, A., & Delaney, H. D. (2000). A critique and improvement of the CL common language effect size statistics of McGraw and Wong. *Journal of Educational and Behavioral Statistics, 25*(2), 101–132. https://doi.org/10.2307/1165329

Vasilenko, S. A., Kugler, K. C., & Rice, C. E. (2016). Timing of first sexual intercourse and young adult health outcomes. *Journal of Adolescent Health*, *59*(3), 291–297. doi: https://doi.org/10.1016/j.jadohealth.2016.04.019

Vassallo, S., & Sanson, A. (Eds.). (2013). *The Australian Temperament Project: The first 30 years*. Melbourne: Australian Institute of Family Studies.

Zimmer-Gembeck, M. J., & Helfand, M. (2008). Ten years of longitudinal research on U.S. adolescent sexual behavior: Developmental correlates of sexual intercourse, and the

importance of age, gender and ethnic background. *Developmental Review*, *28*(2), 153–224. doi: https://doi.org/10.1016/j.dr.2007.06.001