DISCUSSION PAPER SERIES

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ABSTRACT

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Physically attractive individuals experience a range of advantages in adulthood including higher earnings; yet, how attractiveness influences earlier consequential decisions is not well understood. This paper estimates the effect of attractiveness on engagement in risky behaviours in adolescence. We find marked effects across a range of risky behaviours with notable contrasts. More attractive adolescents are more likely to engage in underage drinking; while they are less likely to smoke, use drugs, or practice unprotected sex. Investigation into the underlying channels reveals that popularity, self-esteem, and personality attractiveness have roles as mechanisms. Our findings suggest physical attractiveness in adolescence carries long-lasting consequences over the life course.

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1 Introduction

Physically attractive adults have better labour market outcomes, earn more, and have a range of improved life outcomes (Hamermesh and Biddle, 1994; Biddle and Hamermesh, 1998; Hamermesh, 2011; Mobius and Rosenblat, 2006; Ling et al., 2019; Scholz and Sicinski, 2015; Hale et al., 2021). For example, both Biddle and Hamermesh (1998) and Fletcher (2009) demonstrate substantial wage premia attached to beauty. These premia remain after attempts to control for ability, though Stinebrickner et al. (2018) demonstrate that these premia are concentrated in jobs with substantial amounts of interpersonal interaction. In academia, attractive researchers receive more citations for their research (Hale et al., 2021), and attractive female professors receive more favourable teaching evaluations (Babin et al., 2020). In other aspects of life, more attractive adults are happier (Hamermesh and Abrevaya, 2013), and more attractive political candidates experience greater electoral success (King and Leigh, 2009; Berggren et al., 2010; Jones and Price, 2017),

Together, this literature provides a compelling view that more attractive adults experience better life outcomes. What is less well understood is how attractiveness influences earlier, consequential, decisions. The literature described above seeks to provide, in essence, the effect of attractiveness on labour market and other outcomes conditional on individual characteristics, both demographic and "pre-market". However, attractiveness is also likely to change both the opportunities and costs of a variety of behaviours during adolescence. This includes a range of risky behaviours such as under-age drinking, smoking, illicit substance use

and under-age sexual activity that, in and of themselves, have implications for both labour market performance and important pre-market investments, most notably education (Carneiro et al., 2007; Heckman and Rubinstein, 2001; Heckman et al., 2006). Along these lines, Mocan and Tekin (2010) demonstrate how unattractiveness during adolescence influences later criminal behaviour, and argue that this reflects the impact of beauty on human capital formation, while recently Hamermesh et al. (2019) show that beauty leads to higher educational attainment amongst students. At the same time, adolescent risky behaviours are of importance insofar as they predict later behaviours that generate negative outcomes over the life course (Cawley and Ruhm, 2011).

We contribute to this literature by using rich survey data containing information on beauty to investigate how this influences adolescent risky behaviours. We use the Add Health data and initially focus on the effect of beauty on one particular risky behaviour, underage alcohol consumption. We demonstrate that more attractive adolescents are more likely to engage in under-age drinking. We then contrast this to a range of other risky behaviours (smoking, illegal substance use, and teenage sexual activity) where we demonstrate different effects insofar as being unattractive often increases these behaviours. We do this using a range of approaches that aim to reduce obvious sources of bias, and in a series of robustness checks we demonstrate that these effects do not reflect a range of likely confounders.

This raises the question of what mechanisms generate these effects? While, we are unable to be exhaustive in this regard we examine a number of channels that seem likely ex-ante to be important: popularity, self-

2

esteem, and the "attractiveness" of an individual's personality. For instance, previous research has demonstrated that retrospective measures of school friendship network size are related to both social skills and later life outcomes (Conti et al., 2013). We use similar, but contemporaneous, information on popularity to investigate its potential mediating effect with respect to attractiveness and risky behaviours. We demonstrate that attractive adolescents are more popular, and this is associated with a greater likelihood of underage drinking. Yet, we continue to demonstrate direct effects of attractiveness on drinking. On the other hand, physically attractive adolescents also have higher self-esteem and higher personality attractiveness, both predict less engagement in risky behaviours. Thus a number of channels operate simultaneously in nuanced ways in mediating the relationship between attractiveness and risky behaviours. Shedding light on these channels helps to further understand various factors tied with health behaviours and risk taking.

Finally, we seek to explore whether these teenage behaviours predict later life behaviors. We provide suggestive evidence that adolescent attractiveness is predictive of alcohol consumption behaviour in early adulthood. This suggests that these earlier behavioural effects are consequential for both current and later life outcomes.

2 Data

We use data from the restricted-use version of the National Longitudinal Study of Adolescent Health (Add Health). Add Health is a school-based longitudinal study of a nationally representative sample of ado-

lescents in grades 7–12 in the United States during the 1994–95 school year. Add Health combines longitudinal survey data on respondents' social, economic, psychological and physical well-being with contextual data on the family, neighbourhood, community, school, friendships, peer groups, and romantic relationships. This provides unique opportunities to study how social environments and behaviours in adolescence are linked to health and achievement outcomes in young adulthood. The novel design of Add Health allows us to estimate the influence of beauty on risky behaviours such as smoking, under-age drinking, illegal substance use, and teenage sexual activity.

Add Health started with an in-school questionnaire which collected data from over 90,000 students in 144 schools (including high schools and their feeder schools) in 1994–95. The selection of schools followed a primary sampling frame based on a database collected by Quality Education Data, to ensure that the selected high schools were representative of schools in the United States with respect to region of country, urbanicity, size, type, and ethnicity. After the in-school survey, the study then followed up with a series of more detailed in-home interviews of a stratified random sub-sample of the in-school survey students in subsequent waves. Students in each school were stratified by grade and sex. This resulted in a representative sample of 20,745 adolescents in grades 7–12 in the Wave I in-home survey in 1994/95, of which 14,738 were followed up in the Wave II in-home survey in 1996. Add Health further conducted Wave III interviews in 2001/02 when respondents were young adults (aged 18–26), and Wave IV in 2007/08 when most respondents finished their education (aged 24–32).

Our data on beauty and risky behaviours are drawn from the in-home section of the survey. For the purpose of our study we focus on adolescence[1] and pool together Waves I & II of the in-home surveys, with an initial sample size of 35,483. Although the in-home surveys have a panel structure, we do not follow an individual fixed effects approach, as beauty is primarily a fixed physical characteristic and there is little variation across the two waves. After dropping missing values, our baseline sample includes 30,888 observations.

While our primary focus is on underage drinking, we examine six different types of risky behaviours in total: drinking, binge drinking, smoking, substance use, unprotected sex, and pregnancy.[2] Waves I and II of the in-home survey asked adolescents about both their engagement in and frequency of consumption for these activities where relevant. For topics on sexual behaviour, substance use, and illegal activities the respondents listened to recorded questions through headphones and entered their responses independently on the computer. The interviewer did not see or hear the questions, nor the responses of the interviewee. This computer-assisted personal interviewing (CAPI) method helps reduce concerns of under-reporting that is often present in studies that examines risky and illicit behaviour, as the respondent has full anonymity during the interview.

For our analysis, we focus on the engagement in and frequency of each risky behaviour. Our primarily focus is on drinking behaviours:

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[1]Mean age is 16.24 for females and 16.36 for males. The youngest interviewed was 13, and the oldest was 19.

[2]To alleviate reverse causality issues, we dropped 75 observations who were in late pregnancy (7 to 9 months) at the time of the interview.

- *Drinking:* During the past 12 months, on how many days did you drink alcohol? (Responses range from 0 = never, 1 = one or two days, 2 = once a month or less, to 6 = everyday or almost everyday)

- *Binge drinking:* Over the past 12 months, on how many days did you drink five or more drinks in a row? (Responses range from 0 = never, 1 = one or two days, 2 = once a month or less, to 6 = everyday or almost everyday)

Other risky behaviours we examine include:

- *Smoking:* During the past 30 days, on how many days did you smoke cigarettes? (Responses range from 0 to 30 days)

- *Substance Use:* During the past 30 days, how many times did you use marijuana/cocaine /inhalants/other drugs? (Responses range from 0 to 900)

- *Unprotected Sex:* Did you or your partner use any method of birth control when you had sexual intercourse most recently? What proportion of the time have you used birth control? (Responses range from 0 = none of the time, 1 = some of the time, to 5 = all of the time)

- *Pregnancy:* Have you ever been pregnant? How many times have you been pregnant? (Responses range from 0 to 9 times)

As a result, for all six behaviours, we have both a dummy variable that represents engagement in the activity (=1 if answer> 0) as well as a variable that captures the frequency of this behaviour. We provide estimates for both of these to gauge the effects for the onset as well as intensity of

risky behaviours.

The key independent variable throughout our analysis is the physical attractiveness of the respondent. This information is recorded by the interviewer immediately after the interview. While we do not have a detailed information on each interviewer, we know that interviewers were predominantly female as well as which interviewer conducted which interview. The interviewer was asked to describe the respondent, the neighbourhood, the circumstances, and the surroundings of the interview. With respect to the question on physical attractiveness, the interviewer was asked "How physically attractive is the respondent?" This is measured on a 1–5 scale, with 1 being "very unattractive" and 5 being "very attractive". The mean score on the 1–5 scale is 3.57, with a standard deviation of 0.84, where within-interviewer variation is 0.76 and between-interviewer variation is 0.47.

Figure 1 depicts the distributions of beauty by sex. On average, girls score a rating of 3.69 and boys 3.45. While magnitudes vary, the distribution of beauty ratings are similar for boys and girls. First, for both sexes, the most likely rating is "about average", followed by "attractive", "very attractive", and "unattractive" in order, and least likely rating is "very unattractive". Second, "very unattractive" and "unattractive" make up a much smaller proportion (combined, this is 5.16% for girls and 6.59% for boys) than "very attractive" and "attractive" (combined, 56.58% for girls and 42.94% for boys). In particular, "very unattrative" contribute to a very small proportion of the observations (1.23% for girls and 1.60% for boys). Considering the small sample size, it is difficult to make meaningful inference for this group and as a result we are cautious in inter-

preting estimates for these individuals. While we do not know whether the "true" underlying distribution of beauty is symmetric or normally distributed, this could indicate a reluctance of interviewers to give low ratings about the respondent, prompting a concern for measurement error. That said, the top three categories are much larger in size and present more variation, which may alleviate this concern. It is also worth noting that the distribution of beauty we observe is similar to the patterns reported by Hamermesh and Abrevaya (2013) for a range of different data sources. For later analysis, we create five dummies variables indicating each category of physical attractiveness.

We further plot the propensity of risky behaviours by beauty ratings in Figure 2. These provide some initial indication that there are variations in behaviour across individual beauty. For instance, there appears to be an increasing gradient in drinking (both propensity to drink, and to binge drink) across attractiveness. It is noticeable that those rated as "very unattractive" often present different patterns than, for instance, "unattractive" adolescents. We issue a caveat that in the following results we cannot provide definitive evidence on this group due to their small sample size but present these estimates for completeness.

We use popularity, self-esteem and personality attractiveness to investigate their mediating effect with respect to attractiveness and risky behaviours. In order to measure popularity, we use information from self-defined friendship nominations. Each respondent was asked to nominate their top 5 male and top 5 female friends. From this we proxy popularity with the logarithm of in-degree, i.e. the number of times the respondent has been nominated as a friend by their peers. Self-esteem

8

is measured with an index on a scale of 4 to 20 by summing up the responses to four questions relating to the respondent's subjective evaluation of their own worth, with higher score indicating higher self-esteem.[3] Personality attractiveness is rated by interviewers on a similar five-point scale as physical attractiveness.

Table 1 presents summary statistics for the full sample stratified by gender. The sample consists of 15,795 female respondents and 15,093 male respondents. Add Health allows us to create a rich set of family background information which we later use as covariates. These include: the adolescent's race, age and its squared term, whether mother is absent from home, mother's education levels, whether father is absent from home, father's education levels, and household income.[4]

3 Empirical Strategy

Our baseline model takes the form of the following fixed effects model

$$Y_{ist} = \alpha_s + \alpha_t + \Sigma_{j=1,2,4,5}\beta_j Attractiveness_{ist}^{j} + X_{ist}\gamma + \varepsilon_{ist}, \qquad (1)$$

where Y_{ist} denotes the risky behaviour outcome of interest for student i at school s at year t, α_s are school fixed effects, α_t year effects, X_{ist} a vector of individual characteristics, and ε_{ist} the error term. $Attractiveness_{ist}^{j}$ is a

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[3]Respondents are asked how strongly the agree or disagree with the following statements, on a scale of 1 to 5, with 1 = strongly disagree and 5 = strongly agree: (1) You have a lot to be proud of; (2) You like yourself just the way you are; (3) You feel like you are doing everything just about right; (4) You have a lot of good qualities.

[4]To avoid dropping those who have missing values for household income, a binary indicator of missing household income is included in the regression, and missing values are recoded to zero.

series of binary indicators of attractiveness (e.g. $j = 5$ for "very attractive") where we omit category three, "average looking", as the reference group.

A challenge for a causal interpretation of beauty effects on risky behaviours is that attractiveness may proxy for a range of family background characteristics that are also correlated with risky behaviours. Our initial approach is to include a rich set of socio-economic background in X_{ist}, as mentioned in the previous section. Next, we include school fixed effects[5] α_s in the regression should reduce the influence of unobservable family socio-economic status if there is selection into school based on family background. Unless indicated otherwise, standard errors are clustered at the school level to allow for intra-school correlation of the error term.

We further check for robustness to other factors. Our key variable of interest, physical attractiveness, reflects judgements of the survey interviewers. This, naturally, leads to a range of concerns regarding the extent to which this measure may reflect other factors that are correlated with the propensity to undertake risky behaviours. For instance, interviewers may either vary in their judgement of attractiveness and/or they may receive a non-random selection of respondents in terms of attractiveness and propensity to engage in risky behaviour. Out of this concern, in extensions we introduce fixed effects for the 966 interviewers in the data.[6] The inclusion of interviewer fixed effects helps to deal with the case if interviewer ratings of the respondents' physical attractiveness and the

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[5]There are 144 schools in the data.

[6]There are 563 interviewers in Wave I, and 401 interviewers in Wave 2. An average interviewer interviews 32 students.

respondents' self-reported risky behaviours are correlated in a systematic way. This robustness check provides estimates that reflect within-interviewer variation in judgements of respondent attractiveness.

Another concern relates to within-school cohort trends that could incorrectly attribute variations in risky behaviours to differences in attractiveness across school cohorts. For this we check if the results are robust to the inclusion of school-cohort fixed effects in addition to interviewer fixed effects. Yet another concern relates to measurement error, that a third person present at the interview might bias the adolescent's reporting of risky behaviours. On this point we check if the results are robust when excluding those who had interrupted interviews.[7] Lastly, we check for robustness to nonlinear estimation strategies using logistic and Poisson models instead of least squares.

We then seek to explore the mechanisms underlying the relationships between attractiveness and risky behaviours. We consider social networks and personality traits as potential mechanisms. Previous research demonstrate that friendships may strongly influence risky behaviours, particularly during adolescence (Lundborg, 2006; Clark and Lohéac, 2007), while Conti et al. (2013) and Fletcher (2014) examine the role of high school popularity on later earnings. Attractive adolescents may find it easier to make friends in school. This popularity then could influence both the propensity and opportunities to engage in risky behaviours. Meanwhile, less popular adolescents may be more likely to engage in certain risky behaviours to, for instance, to increase acceptance amongst

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[7]An interrupted interview is where the interview was paused due to respondent taking telephone call, visitors to the house, household member passed through, respondent attended to child or household responsibilities or environmental distractions

11

their peers. Hence, in practice the effect of popularity on risky behaviours is an empirical question. Beyond social circles, physical attractiveness can also play a role in the development of personality traits, which in turn are manifested in behavioural patterns. For instance, physical attractiveness can lend an adolescent higher self-esteem, who would feel less need to engage in risky behaviours to appear "cool".

Empirically, we use information on popularity, personality attractiveness, and self-esteem in the data, as three measures of different mechanisms. To understand the direct effects of attractiveness on these variables, we replace the dependent variable in the baseline model with each mechanism variable. Next, we rerun the baseline model, with risky behaviours as dependent variables, while controlling for the three mechanisms, to examine the extent to which these mechanisms explain away the effects of physical appearance on risky behaviours.

4 Results

4.1 Beauty and drinking

Table 2 presents estimates of the effect of adolescent attractiveness on the likelihood of underage drinking, where for comparison we report estimates without and with school fixed effects. Initially we report pooled models across genders in columns (1) and (2). Subsequently, and for the rest of the paper we provide estimates separately for males and females.[8] In our main estimates we report the coefficients for four attractiveness

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[8]Reported numbers of observations may be smaller due to missing values or no variation in the outcomes within the school or interviewer.

dummy variables, such that all estimates are relative to average attractiveness.

The results reveal little evidence that selection into schools plays a role in the relationship between attractiveness and drinking. Results in columns (2), (4), and (6) which include schools fixed effects, are essentially unchanged from those in columns (1), (3), and (5), respectively, that do not include school fixed effects.

Irrespective of the inclusion of school fixed effects, we find evidence of clear differences in the likelihood of underage alcohol consumption by attractiveness across all specifications. More attractive adolescents drink more relative to those of average attractiveness, while unattractive adolescents drink less. For comparison, and for all estimates, we report sample means of the dependent variable. Underage drinking propensity in the last year is approximately 0.46. Using this we can provide some idea of the magnitude of the estimated effects. Overall, attractive and very attractive adolescents are approximately 15 percent more likely (column 2) to have engaged in underage drinking than unattractive adolescents. For completeness, in all estimates we report estimates for the very unattractive category but remind the reader that there are very few individuals in this group and our estimates are materially unaffected if we instead group this category together with the unattractive category.

Estimates split by gender reveal additional differences. Column (4) shows that both attractive and very attractive females are more likely to drink, while unattractive females are equivalently less likely to drink although these effects are no longer statistically significant at standard levels. Re-

sults for males in column (6) shows that there is no effect for very attractive males, but large differences are apparent across attractive and unattractive males. Coefficients in columns (4) and (6) are plotted in Figure 3 for visual presentation.

Alcohol harms are concentrated in heavy drinking. Table 3 reports equivalent estimates to Table 2, but where the dependent variable is whether the individual has drunk five or more drinks in a single sitting in the past twelve months. Generally, the earlier patterns hold. Heavier drinking is higher amongst very attractive females (column 4), and there is clear difference across the range of attractive to unattractive for males (column 6). While sometimes imprecise, these estimates are again sizeable when compared to the sample means, with a large gap between attractive and unattractive male adolescents equivalent to over 20 percent of the mean (column 6). Along similar lines, Table 4 reports OLS estimates of frequency of drinking. While the male estimates are imprecise, these generally follow the patterns of earlier results. In Appendix Table A1, we conduct the regressions on drinkers only, and find no effects on the intensive margin. Combined, these results suggest that physical attractiveness is mainly associated with engagement in alcohol consumption on the extensive margin. Herein, we return to focusing on binary indicators of risky behaviours, but stress that the tenor of our results are largely unchanged if we instead focus on extensive margin type outcomes.

4.2 Drinking vs other risky behaviours

Naturally, underage drinking represents just one of many potential risky behaviours that adolescents might engage in. Table 6 presents estimates

for a range of additional behaviours: smoking (column 3); substance use (column 4); unprotected sex (column 5); and pregnancy (column 6). What is clear is that these demonstrate quite different patterns to those for drinking or binge drinking (also presented for comparison in columns 1 and 2). As an example, attractive females are less likely to smoke, use illicit substance, engage in unprotected sex or to have been pregnant. Males show no differences in unprotected sex by attractiveness, but there is indication that attractive males are less likely to smoke and use illicit substances. Moreover, there is no evidence that unattractive males engage in other risky behaviours more or less often than other males. In summary, the role of attractiveness appears quite different between alcohol related behaviour and other risky behaviours.

4.3   Robustness and Heterogeneity

Table 5 further explores this by providing estimates that, in addition to school fixed effects, introduce additional fixed effects that aim to examine the robustness of drinking results to a range of issues. We recognise that attractiveness ratings are inherently subjective, and in part, reflect preferences and judgements of particular interviewers. Columns (1) and (3) introduce interviewer fixed effects. Hence, all estimates come from within interviewer (and school) variation in attractiveness ratings. Doing so actually leads to more marked attractiveness patterns, compared to Table 2. Specifically, there is now a clear drinking-attractiveness gradient for females running from unattractive through to very attractive. While, for males the effect of being unattractive on reducing drinking becomes larger. Importantly, this suggests that our earlier estimates do

15

not reflect across-interviewer subjectivity in attractiveness judgements.

Next we introduce school-cohort fixed effects (columns 2 and 4) reflecting a concern that there may be across-cohort, within-school, variations in drinking behaviour, for instance due to peer group behaviour. These estimates report similar patterns to those in Table 2, although the point estimate of being "attractive" for males becomes less precise.

Another concern relates to the self-reported nature of the risky behaviours. Although the CAPI procedure helps with keeping the responses unobserved from the interviewer, interruption during the interview such as parents entering the room might still lead to some biased reporting. In Appendix Table A2, we rerun the estimation on a sub-sample which was interruption free during the interview process. We lose some precision, partly due to the smaller sample, but the results are similar to those obtained from the full sample.

Appendix Table A3 reports alternative results using non-linear estimation strategies. Odds ratios are reported for logistic models where drinking or binge drinking is the outcome, and incidence rate ratios are reported for Poisson models where the frequency of drinking or binge drinking is the outcome.[9] The results are in essence consistent with those in Table 2.

Lastly, we investigate whether there are potential heterogeneity across racial or age groups. There exist large racial disparities in risky behaviours, as well as some small variation in attractiveness ratings across

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[9]Considering the difficulty of finding consistent estimators for dealing with fixed effects in non-linear models, we adopt the simplifying approach of including the average outcome at the school level.

racial groups in our data. On the age dimension, the variation in risky behaviours is naturally much lower in younger age groups, which prompts us to investigate whether the beauty effects may vary across age. Appendix Table A4 reports the results for heterogeneous effects by race and age. We find some evidence that beauty effects on drinking and binge drinking is mainly driven by white females (columns 1 and 2), while in other regards we find no evidence of heterogeneity.

5 Mechanisms

Recent research on adolescence (Clark and Lohéac, 2007; Gardner and Steinberg, 2005) has focused on risk-taking behaviour by an individual caused by emotional and social factors, such as peer effects.While adolescents spend a substantial proportion of their time with their peers at school, thus are likely to be influenced by them, there is more to the decision-making process including factors such as genetics (Anokhin et al., 2009). The health literature seeks to pin down determinants of risky behaviour to genetic, social environmental and personality factors. While we cannot provide a detailed explanation of the role genetics play, we provide evidence on two potential mechanisms through which attractiveness might effect risky behaviours, namely the social environmental and personality factors. Specifically, we examine three variables as mechanisms: popularity (measured with log in-degree of the adolescent's friendship network), personality attractiveness (reported by the interviewer), and self-esteem (reported by the adolescent).

In investigating the underlying mechanism through which beauty might

affect risk behaviours, our main approach involves two parts. First, we regress the mechanism variables onto attractiveness and covariates, to gauge the direction and magnitude beauty affects these variables; next, we regress drinking onto attractiveness and covariates, with the mechanism variables as additional control variables, to understand how coefficients on attractiveness changes with such additions.

Results are presented in Table 7, where columns (1)–(4) report the results for females, and columns (5)–(8) for males. First, we look at the role of popularity in the relationship between physical attractiveness and drinking. Results in columns (1) and (5) suggest that attractiveness is positively correlated with popularity, consistent with the notion that attractive adolescents are more likely to be invited to social events. Further, results in column (4) and (8) show that popularity predicts more drinking, although it does not fully explain the effects of attractiveness on drinking.

Next, we consider how socio-emotional and personality traits and skills may be an underlying mechanism to mediate the effects of beauty on risky behaviours. A growing body of research highlights the importance of non-cognitive traits and skills in the formation and development of human capital (Heckman and Rubinstein, 2001; Cunha and Heckman, 2007; Kautz et al., 2014). These non-cognitive traits and skills can be linked to physical attractiveness in various ways. Individuals who are physically more attractive may have different risk attitudes in general due to their personality. Physically attractive individuals tend to be more likely perceived as having an attractive personality and to have higher than average levels of self-esteem. For instance, existing evidence shows

that physically attractive workers tend to be more confident and higher confidence increases wages (Mobius and Rosenblat, 2006). Similarly in our setting, these personality traits can be linked directly to risky health behaviours, for instance, adolescents with high self-esteem are less likely to try illegal substance or have unprotected sex (Mendolia and Walker, 2014). Another example is self-efficacy, which leads to more exercising and less drinking (Chiteji, 2010). These traits are not necessarily related to popularity but may lead individuals to form different time preferences and risk attitudes, thus making different health behavioural choices.

Consistent with existing evidence, the results suggest that attractiveness is positively correlated with perceived personality attractiveness (see Table 7 columns 2 and 6) and self-reported self-esteem (see Table 7 columns 3 and 7). Further, we find that these personality traits predict less drinking (columns 4 and 7), suggesting they offer a protective role in preventing underage drinking behaviours, to the opposite direction of the role of popularity.

Combined, these suggest that attractiveness affects risky behaviours in a number of nuanced ways, some of which may cancel the others out as they operate in opposite directions. Of the three channels we examine, in general, popularity makes adolescents more likely to engage in risky behaviours, whereas self-esteem and attractive personality make them less likely to participate in risky behaviours.

We add a caveat that these analyses are imperfect tests of underlying mechanisms. An alternative interpretation could be that these characteristics represent confounding factors such as family background and

socio-economic status not captured by the observables, which lead to endogeneity concerns on omitted variables or reverse causation. In this case, controlling for these variables as in columns (4) and (8) would reduce the endogeneity bias. From this perspective, the remaining effects of attractiveness point to a separate effect of physical attractiveness on drinking that are not explained by popularity, personality attractiveness, and self-esteem. While these variables provide insights into how attractiveness affects or is associated with underage drinking, they do not provide a full picture of all causal paths. Understanding the complex underlying mechanisms would be a potential direction for future research.

For comparison, we present in Table A5 analogous estimates for other risky behaviours. The key point is that the patterns of mediation are heterogeneous across risky behaviours. In general personality attractiveness and self-esteem reduce these risky behaviours. Yet, popularity increases the likelihood of some risky behaviours (smoking and drug use for females; drug use and unprotected sex for males), but has no effect on others (unprotected sex for females), and is negatively related to pregnancy.

In summary, attractiveness affects adolescent risky behaviours in nuanced ways, with differences across different types of behaviours and across genders. That said, a common mechanism is that non-cognitive abilities such personality attractiveness and self-esteem offer a protective role against the onset of adolescent risky behaviours. From a policy perspective, interventions that help build self-esteem, can help adolescents stay away from engaging with risky health behaviours, particularly those that have life-long consequences such as unprotected sex and

teenage pregnancy.

6 Long-Run Effects

Finally, while adolescent drinking and risky behaviours are in and of themselves important for a range of reasons, one clear concern is life cycle effects on risky behaviours. We face restrictions due to data on the extent to which we can explore this. However, in later waves of Add Health when the respondents reached adulthood,[10] we do observe relevant outcomes, where respondents were asked if they had any of a series of nine drinking problems in the last twelve months (Wave III) or ever (Wave IV). Based on this, we construct two measures of long-run drinking problems, one defined as whether or not the respondent had any drinking problem, and the other defined as number of incidence (see Appendix Table A6).

This leads us to estimate analogous version of Equation (1) but where focus on the relationship between adolescent attractiveness and these two measures of long-term alcohol-related problems.

The results are reported in Table 8 and reveal a number of points. There appears to be links between adolescent attractiveness and later drinking problems. For males, these broadly follow the patterns observed for underage drinking. For instance, unattractive men, are relatively less likely to have developed/had drinking problems. In some cases this is relative to all other men, while in others there is evidence of a gradient between

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[10]Wave III took place in 2001–2002, when respondents were aged 18–26; Wave IV took place in 2007–08, when respondents were aged 24–32.

unattractiveness and attractiveness.

For females the story is less clear. In column (1), unattractiveness in adolescence is associated with a lower likelihood of alcohol problems in early adulthood, and being very attractive is associated with an additional higher risk of drinking problems. There are also effects on increased drinking problems from being very unattractive. Yet, these patterns become unclear by Wave IV (column 3).

In general, our reading of these results is that they provide suggestive evidence that the effects of adolescent attractiveness on adolescent risky behaviours are likely to continue at least into early adulthood. Insofar as this is a critical period for a range of skill formation and early labour market attachment, this in turn seems likely to influence labour market returns.

7 Conclusion

This paper examines how beauty influences a range of adolescent risky behaviours in the United States. We exploit unique and rich information from Add Health to understand these relationships between beauty and risky behaviours, and investigate underlying mechanisms and long-run effects. Our main finding is that attractiveness of adolescents has marked effects on a range of risky behaviours. Attractiveness is associated with higher teen alcohol consumption. Attractive females, in particular, are substantially more likely to have consumed alcohol in the past twelve months, than those of or below average attractiveness. At the same time, more attractive teens are less likely to engage in other

types of risky behaviours such as smoking, drug use, unprotected sex, and pregnancy. These results are robust to a range of alternative estimation approaches and attempts to rule out confounders. We further demonstrate a number of likely underlying mechanisms. Popularity, self-esteem, and personality attractiveness are important mediators of the effect of attractiveness, none of which alone can explain the full effects. These mechanisms operate in different directions and may offset each other, producing varying net effects on different risky behaviours.

These results are important for a number of inter-related reasons. Previous labour market research demonstrates marked effects of attractiveness. Our results suggest important pre-market effects of attractiveness on individual behaviour likely to be consequential for both labour market performance and important pre-market investments. Further, our findings suggest that physical attractiveness, and its associated characteristics, provide another avenue for understanding non-cognitive traits that are important in child and adolescent development and carry lifetime consequences. For instance, nourishing adolescent self-esteem could prove useful for preventing the onset of risky behaviour. Finally, these risky behaviours are themselves of importance due to their link to negative outcomes both in adolescence and across the life course. Our results suggest that pre-determined (at least prior to adolescence) traits have marked effects on these behaviours and related outcomes.

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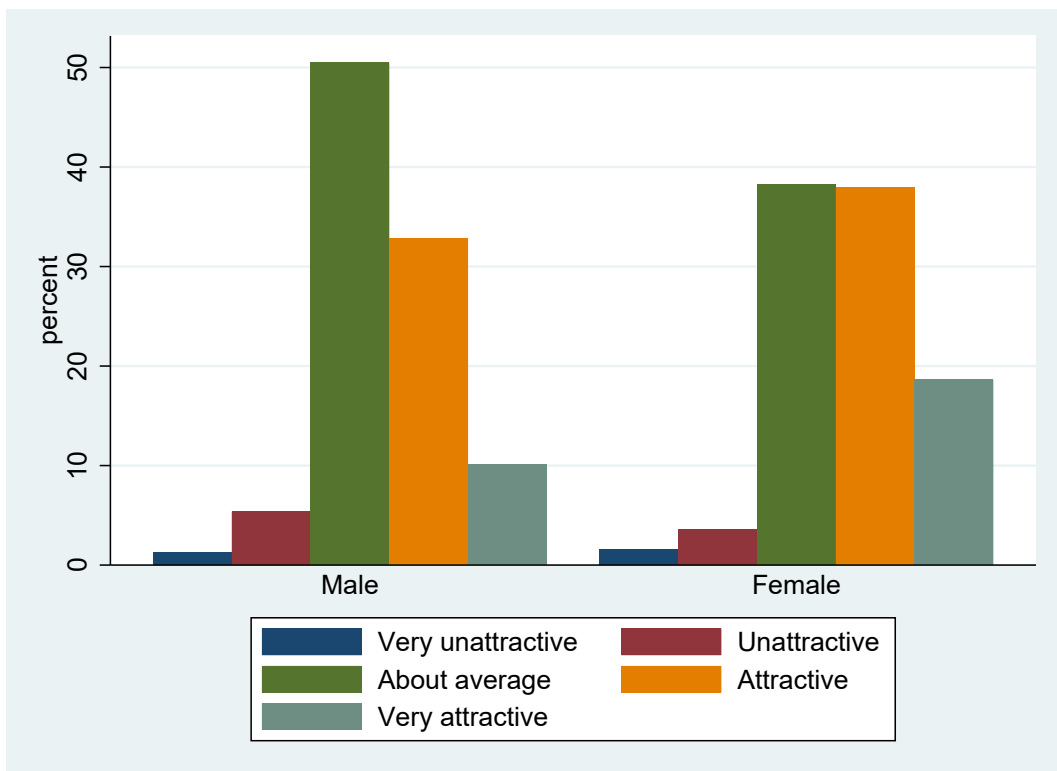
Figure 1: Distributions of beauty by sex

(a) Drinking   (b) Binge drinking   (c) Smoking

(d) Drug use   (e) Unprotected sex   (f) Pregnancy
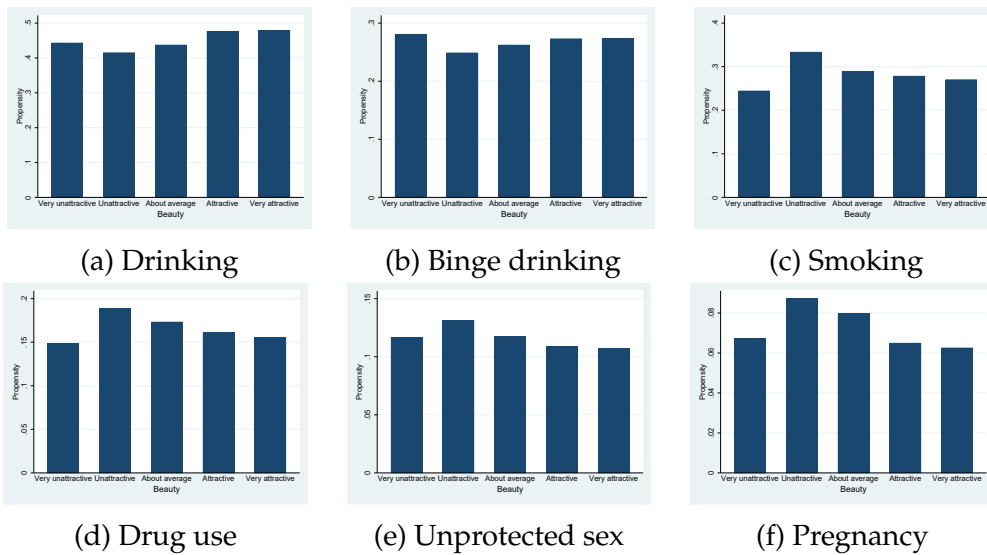
Figure 2: Propensity of risky behaviours by beauty ratings: a drinking; b binge drinking; c smoking; d drug use; c unprotected sex; and f pregnancy;
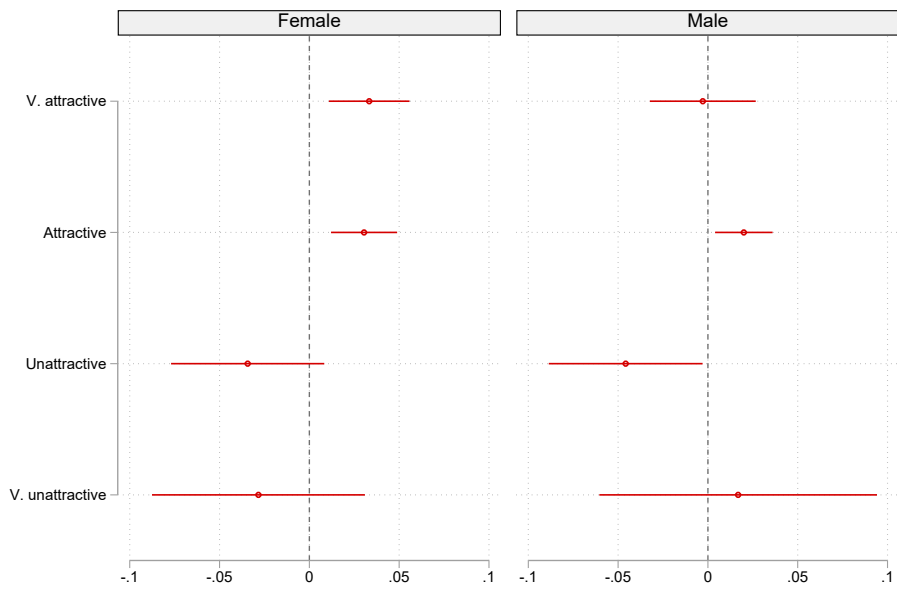
Figure 3: Coefficient plot for the effects of beauty on drinking

Table 1: Summary statistics by sex

	Female (51.1%)		Male (48.9%)		Total	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
Beauty						
Physical attractiveness (scale 1–5)	3.685	(0.869)	3.453	(0.794)	3.571	(0.842)
Very attractive	0.186	(0.389)	0.101	(0.302)	0.145	(0.352)
Attractive	0.379	(0.485)	0.328	(0.470)	0.354	(0.478)
About average	0.383	(0.486)	0.505	(0.500)	0.442	(0.497)
Unattractive	0.036	(0.185)	0.054	(0.225)	0.044	(0.206)
Very unattractive	0.016	(0.126)	0.012	(0.110)	0.014	(0.118)
Risky behaviour						
Drinking	0.458	(0.498)	0.454	(0.498)	0.456	(0.498)
Binge drinking	0.241	(0.428)	0.295	(0.456)	0.267	(0.443)
Smoking	0.279	(0.449)	0.288	(0.453)	0.284	(0.451)
Illegal drugs	0.151	(0.358)	0.183	(0.386)	0.167	(0.373)
Unprotected sex	0.119	(0.324)	0.107	(0.309)	0.113	(0.317)
Ever pregnant	0.071	(0.257)		(.)	0.071	(0.257)
Drinking (Frequency)	0.998	(1.371)	1.152	(1.581)	1.073	(1.479)
Binge drinking (Frequency)	0.538	(1.159)	0.799	(1.475)	0.665	(1.329)
Smoking (Days)	4.527	(9.793)	4.622	(9.842)	4.573	(9.817)
Drugs (log number of times)	0.263	(0.750)	0.369	(0.950)	0.315	(0.855)
Unprotected sex (frequency)	0.134	(0.590)	0.109	(0.526)	0.122	(0.560)
Pregnancies (number of times)	0.085	(0.347)		(.)	0.085	(0.347)
Covariates						
White	0.518	(0.500)	0.521	(0.500)	0.519	(0.500)
Black	0.210	(0.407)	0.193	(0.395)	0.202	(0.401)
Hispanic	0.161	(0.368)	0.168	(0.374)	0.164	(0.371)

	Female (51.1%)		Male (48.9%)		Total	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
Other ethnicity	0.111	(0.314)	0.118	(0.322)	0.114	(0.318)
Age	16.243	(1.534)	16.355	(1.520)	16.298	(1.528)
Age-sq./10	26.619	(4.939)	26.981	(4.911)	26.796	(4.929)
Mother not present	0.058	(0.235)	0.065	(0.246)	0.062	(0.240)
Mother no high school	0.150	(0.357)	0.131	(0.337)	0.141	(0.348)
Mother high school or some college	0.502	(0.500)	0.488	(0.500)	0.495	(0.500)
Mother degree and above	0.250	(0.433)	0.264	(0.441)	0.257	(0.437)
Mother education missing	0.040	(0.195)	0.052	(0.223)	0.046	(0.209)
Father not present	0.315	(0.464)	0.272	(0.445)	0.294	(0.456)
Father no high school	0.101	(0.302)	0.100	(0.300)	0.101	(0.301)
Father high school or some college	0.330	(0.470)	0.352	(0.478)	0.341	(0.474)
Father degree and above	0.210	(0.407)	0.230	(0.421)	0.220	(0.414)
Father education missing	0.044	(0.206)	0.045	(0.207)	0.045	(0.207)
Log household income	7.783	(4.595)	8.002	(4.482)	7.890	(4.541)
Income missing	0.254	(0.435)	0.234	(0.423)	0.244	(0.430)
Wave I	0.580	(0.494)	0.589	(0.492)	0.585	(0.493)
Wave II	0.420	(0.494)	0.411	(0.492)	0.415	(0.493)

Additional variables (numbers of observations are smaller)

	Female (51.1%)		Male (48.9%)		Total	
Third person at interview	0.232	(0.422)	0.213	(0.409)	0.223	(0.416)
Log in-degree	1.535	(0.677)	1.393	(0.740)	1.466	(0.712)
Personality attractive	0.558	(0.497)	0.446	(0.497)	0.504	(0.500)
Self-esteem	16.053	(2.654)	16.785	(2.369)	16.411	(2.545)
Drinking problem incidents at Wave 3	1.243	(1.686)	1.805	(2.092)	1.505	(1.907)
Any drinking problems at Wave 3	0.472	(0.499)	0.574	(0.495)	0.519	(0.500)
Drinking problem incidents at Wave 4	1.104	(2.027)	1.798	(2.555)	1.426	(2.313)
Any drinking problems at Wave 4	0.312	(0.463)	0.435	(0.496)	0.369	(0.483)

	Female (51.1%)		Male (48.9%)		Total	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
N	15,795		15,093		30,888	

Notes: This table reports the means and standard deviations of variables in the analysis by sex. Standard deviations are in parentheses.

Source: Authors' calculation based on Add Health data.

Table 2: Beauty and prevalence of drinking by gender

	Dep. var. = drinking					
	Both genders		Female		Male	
	(1)	(2)	(3)	(4)	(5)	(6)
Very attractive	0.018*	0.018*	0.032***	0.033***	−0.004	−0.003
	(0.010)	(0.010)	(0.012)	(0.011)	(0.015)	(0.015)
Attractive	0.029***	0.025***	0.033***	0.030***	0.024***	0.020**
	(0.006)	(0.006)	(0.010)	(0.009)	(0.008)	(0.008)
Unattractive	−0.038**	−0.040**	−0.033	−0.034	−0.044**	−0.046**
	(0.015)	(0.016)	(0.021)	(0.022)	(0.021)	(0.022)
Very unattractive	−0.004	−0.012	−0.021	−0.028	0.025	0.017
	(0.027)	(0.026)	(0.030)	(0.030)	(0.042)	(0.039)
Obs.	30,888	30,888	15,795	15,795	15,093	15,093
Dep. var. mean	0.456	0.456	0.458	0.458	0.454	0.454
Dep. var. SD	0.498	0.498	0.498	0.498	0.498	0.498
Controls	Yes	Yes	Yes	Yes	Yes	Yes
School FE	No	Yes	No	Yes	No	Yes

Notes This table reports the regression results for the effects of physical attractiveness on a dummy variable indicating drinking or not in the past 12 months, based on combined Waves I and II data from Add Health. Physical attractiveness is measured with dummy variable indicating each of five levels, with about average" as the reference group. Control variables include race dummies, age and its squared term, mother's absence and education levels, father's absence and education levels, log household income and a dummy indicator missing income, and a school-year dummy. Columns (1) and (2) further control for a gender dummy. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.
"

Table 3: Beauty and prevalence of binge drinking by gender

	Both genders		Female		male	
	Dep. var. = binge drinking					
	(1)	(2)	(3)	(4)	(5)	(6)
Very attractive	0.005	0.006	0.016*	0.018**	−0.004	−0.003
	(0.008)	(0.008)	(0.009)	(0.009)	(0.015)	(0.015)
Attractive	0.008	0.007	0.007	0.005	0.024***	0.020**
	(0.006)	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)
Unattractive	−0.032***	−0.036***	−0.021	−0.020	−0.044**	−0.046**
	(0.012)	(0.012)	(0.015)	(0.016)	(0.021)	(0.022)
Very unattractive	0.025	0.018	0.023	0.024	0.025	0.017
	(0.025)	(0.023)	(0.028)	(0.027)	(0.042)	(0.039)
Obs.	30,888	30,888	15,795	15,795	15,093	15,093
Dep. var. mean	0.267	0.267	0.241	0.241	0.295	0.295
Dep. var. SD	0.443	0.443	0.428	0.428	0.456	0.456
Controls	Yes	Yes	Yes	Yes	Yes	Yes
School FE	No	Yes	No	Yes	No	Yes

Notes This table reports the regression results for the effects of physical attractiveness on a dummy variable indicating binge drinking (5 or more drinks in a row) or not in the past 12 months, based on combined Waves I and II data from Add Health. Physical attractiveness is measured with dummy variable indicating each of five levels, with about average" as the reference group. Control variables include race dummies, age and its squared term, mother's absence and education levels, father's absence and education levels, log household income and a dummy indicator missing income, and a school-year dummy. Columns (1) and (2) further control for a gender dummy. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.
"

Table 4: Beauty and frequency of drinking by gender

| | Dep. var. = frequency of drinking | | | | | |
| | Both genders | | Female | | Male | |
	(1)	(2)	(3)	(4)	(5)	(6)
Very attractive	0.035	0.037	0.053	0.065*	0.011	0.009
	(0.032)	(0.032)	(0.033)	(0.034)	(0.048)	(0.050)
Attractive	0.048**	0.043**	0.057*	0.054*	0.037	0.031
	(0.020)	(0.021)	(0.029)	(0.029)	(0.027)	(0.027)
Unattractive	−0.059	−0.063	−0.043	−0.042	−0.086	−0.089
	(0.052)	(0.055)	(0.057)	(0.058)	(0.074)	(0.078)
Very unattractive	−0.033	−0.061	−0.109	−0.117	0.092	0.050
	(0.077)	(0.072)	(0.085)	(0.087)	(0.128)	(0.120)
Obs.	30,888	30,888	15,795	15,795	15,093	15,093
Dep. var. mean	1.073	1.073	0.998	0.998	1.152	1.152
Dep. var. SD	1.479	1.479	1.371	1.371	1.581	1.581
Controls	Yes	Yes	Yes	Yes	Yes	Yes
School FE	No	Yes	No	Yes	No	Yes

Notes This table reports the regression results for the effects of physical attractiveness on the frequency of drinking (from 0 = never to 6 = everyday or almost everyday) in the past 12 months, based on combined Waves I and II data from Add Health. Physical attractiveness is measured with dummy variable indicating each of five levels, with about average" as the reference group. Control variables include race dummies, age and its squared term, mother's absence and education levels, father's absence and education levels, log household income and a dummy indicator missing income, and a school-year dummy. Columns (1) and (2) further control for a gender dummy. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.
"

Table 5: Robustness checks on the relationship between beauty and drinking

| | Dep. var. = drinking | | | |
| | Female | | Male | |
	(1)	(2)	(3)	(4)
Very attractive	0.054***	0.046***	0.015	0.005
	(0.014)	(0.015)	(0.018)	(0.019)
Attractive	0.037***	0.033***	0.019*	0.016
	(0.010)	(0.010)	(0.010)	(0.011)
Unattractive	−0.042*	−0.040	−0.071***	−0.056**
	(0.023)	(0.027)	(0.022)	(0.022)
Very unattractive	0.010	0.012	0.019	−0.004
	(0.031)	(0.031)	(0.041)	(0.041)
Obs.	15,795	15,116	15,093	14,492
Dep. var. mean	0.458	0.455	0.454	0.450
Dep. var. SD	0.498	0.498	0.498	0.498
Controls	Yes	Yes	Yes	Yes
School FE	Yes	No	Yes	No
Interviewer FE	Yes	Yes	Yes	Yes
School-cohort FE	No	Yes	No	Yes

Notes This table reports the regression results of drinking on physical attractiveness, based on combined Waves I and II data from Add Health. Physical attractiveness is measured on a five-point scale, with s absence and education levels, log household income and a dummy indicator missing income, and a school year dummy. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.

Table 6: Comparison of beauty effects on drinking and other risky behaviors

	Risk behaviors					
	(1) Drink	(2) Binge drink	(3) Smoke	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female subsample, dep. var. = engagement in risky behaviour						
Very attractive	0.033***	0.018**	−0.023**	−0.015	−0.011*	−0.011
	(0.011)	(0.009)	(0.010)	(0.010)	(0.007)	(0.008)
Attractive	0.030***	0.005	−0.013	−0.014**	−0.006	−0.010**
	(0.009)	(0.007)	(0.008)	(0.006)	(0.006)	(0.005)
Unattractive	−0.034	−0.020	0.033	0.011	−0.006	0.003
	(0.022)	(0.016)	(0.020)	(0.014)	(0.011)	(0.011)
Very unattractive	−0.028	0.024	−0.030	−0.036	−0.020	−0.018
	(0.030)	(0.027)	(0.025)	(0.023)	(0.018)	(0.014)
Obs.	15,795	15,795	15,795	15,795	15,795	15,795
Dep. var. mean	0.458	0.241	0.279	0.151	0.119	0.071
Dep. var. SD	0.498	0.428	0.449	0.358	0.324	0.257
Panel B: male subsample, dep. var. = engagement in risky behaviour						
Very attractive	−0.003	−0.011	−0.019	−0.021*	−0.012	
	(0.015)	(0.012)	(0.014)	(0.012)	(0.009)	
Attractive	0.020**	0.008	−0.019**	−0.009	−0.005	
	(0.008)	(0.008)	(0.009)	(0.010)	(0.006)	
Unattractive	−0.046**	−0.051***	0.024	0.003	0.015	
	(0.022)	(0.018)	(0.018)	(0.015)	(0.011)	
Very unattractive	0.017	0.019	−0.010	0.001	0.007	
	(0.039)	(0.034)	(0.033)	(0.029)	(0.020)	
Obs.	15,093	15,093	15,093	15,093	15,093	
Dep. var. mean	0.454	0.295	0.288	0.183	0.107	
Dep. var. SD	0.498	0.456	0.453	0.386	0.309	

Notes This table reports the regression results for the effects of physical attractiveness on a range of risky behaviours, as indicated in the column heading. All models control for observable characteristics and school fixed effects. Dependent variables are engagement in a certain behavior, coded as dummy variables. with 1 = yes and 0 = no. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.

Table 7: Beauty effects on popularity, personality attractiveness, and self-esteem

	Dep. var. =							
	Female				Male			
	(1) Log in-degree	(2) Personality attractiveness	(3) Self-esteem	(4) Drink	(5) Log in-degree	(6) Personality attractiveness	(7) Self-esteem	(8) Drink
Very attractive	0.232*** (0.022)	0.599*** (0.013)	0.420*** (0.064)	0.039*** (0.013)	0.222*** (0.026)	0.678*** (0.013)	0.476*** (0.071)	0.014 (0.021)
Attractive	0.164*** (0.017)	0.445*** (0.012)	0.195*** (0.045)	0.032*** (0.012)	0.147*** (0.015)	0.463*** (0.011)	0.193*** (0.048)	0.041*** (0.013)
Unattractive	−0.228*** (0.033)	−0.018 (0.019)	−0.419*** (0.121)	−0.018 (0.027)	−0.176*** (0.037)	−0.054*** (0.017)	−0.360*** (0.084)	−0.059** (0.025)
Very unattractive	0.038 (0.050)	0.002 (0.029)	0.274* (0.161)	−0.031 (0.038)	−0.079 (0.072)	0.009 (0.036)	0.306 (0.190)	0.016 (0.041)
Log in-degree				0.074*** (0.010)				0.049*** (0.008)
Personality attractive				−0.036*** (0.009)				−0.022* (0.012)
Self-esteem				−0.024*** (0.002)				−0.019*** (0.003)
Obs.	11,182	15,794	15,760	11,161	10,451	15,093	15,061	10,433
Dep. var. mean	1.535	0.558	16.053	0.456	0.446	0.454	0.455	0.446
Dep. var. SD	0.677	0.497	2.654	0.498	0.497	0.498	0.498	0.497
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes This table reports the regression results of mechanism variables on physical attractiveness, based on combined Waves I and II data from Add Health. Physical attractiveness is measured on a five-point scale, with about average" as the reference group. Control variables include race dummies, age and its squared term, mother's absence and education levels, father's absence and education levels, log household income and a dummy indicator missing income, and a school year dummy. Columns (1) and (2) further control for a gender dummy. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses. "

Table 8: The long-run effects of adolescent beauty on drinking problems

	Dep. var. = long-run outcomes			
	at Wave III (aged 18–26)		at Wave IV (aged 24–32)	
	(1) Any drink problem	(2) Drinking problem incidents	(3) Any drink problem	(4) Drinking problem incidents
Panel A: Female				
Very attractive	0.029**	0.068	0.006	−0.011
	(0.013)	(0.048)	(0.014)	(0.065)
Attractive	0.001	0.019	0.007	0.042
	(0.012)	(0.041)	(0.010)	(0.041)
Unattractive	−0.042*	−0.115	−0.023	−0.081
	(0.024)	(0.084)	(0.023)	(0.089)
Very unattractive	0.055*	0.098	−0.031	−0.175
	(0.032)	(0.111)	(0.029)	(0.108)
Obs.	12,331	12,331	12,939	12,939
Dep. var. mean	0.472	1.243	0.312	1.104
Dep. var. SD	0.499	1.686	0.463	2.027
Controls	Yes	Yes	Yes	Yes
School FE	Yes	Yes	Yes	Yes
Panel B: Male				
Very attractive	−0.011	0.051	0.004	−0.076
	(0.020)	(0.091)	(0.016)	(0.084)
Attractive	0.016	0.077*	0.005	−0.044
	(0.012)	(0.045)	(0.011)	(0.060)
Unattractive	−0.087***	−0.460***	−0.070***	−0.348***
	(0.023)	(0.079)	(0.022)	(0.105)
Very unattractive	0.034	0.039	−0.080*	−0.483**
	(0.046)	(0.193)	(0.043)	(0.204)
Obs.	10,767	10,767	11,156	11,156
Dep. var. mean	0.574	1.805	0.435	1.798
Dep. var. SD	0.495	2.092	0.496	2.555
Controls	Yes	Yes	Yes	Yes
School FE	Yes	Yes	Yes	Yes

Notes This table reports the regression results of the effects of adolescent physical attractiveness at Wave I (aged 13–18) on long-run outcomes at Waves III (aged 18–26) and IV (aged 24–32) from Add Health. Control variables include race dummies, age and its squared term, mother's absence and education levels, father's absence and education levels, log household income and a dummy indicator missing income, and a school year dummy. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.

A Appendix

Table A1: Beauty and frequency of drinking by gender, drinkers only

| | Dep. var. = frequency of drinking (excluding non-drinkers) | | | | | |
| | Both genders | | Female | | male | |
	(1)	(2)	(3)	(4)	(5)	(6)
Very attractive	0.000	0.013	−0.034	−0.009	0.051	0.053
	(0.042)	(0.043)	(0.040)	(0.041)	(0.075)	(0.077)
Attractive	−0.034	−0.023	−0.030	−0.017	−0.048	−0.036
	(0.026)	(0.027)	(0.034)	(0.036)	(0.035)	(0.036)
Unattractive	0.080	0.089	0.090	0.109	0.051	0.052
	(0.060)	(0.060)	(0.094)	(0.099)	(0.075)	(0.076)
Very unattractive	−0.067	−0.077	−0.157	−0.127	0.053	0.006
	(0.083)	(0.085)	(0.124)	(0.126)	(0.121)	(0.139)
Obs.	14,090	14,090	7,233	7,233	6,857	6,857
Dep. var. mean	2.353	2.353	2.179	2.179	2.536	2.536
Dep. var. SD	1.337	1.337	1.237	1.237	1.411	1.411
Controls	Yes	Yes	Yes	Yes	Yes	Yes
School FE	No	Yes	No	Yes	No	Yes

Notes This table reports the regression results for the effects of physical attractiveness on the frequency of drinking in the past 12 months, for drinkers only, based on combined Waves I and II data from Add Health. Physical attractiveness is measured with dummy variable indicating each of five levels, with about average" as the reference group. Control variables include race dummies, age and its squared term, mother's absence and education levels, father's absence and education levels, log household income and a dummy indicator missing income, and a school-year dummy. Columns (1) and (2) further control for a gender dummy. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.
"

Table A2: Robustness check on interview interruption

	Risk behaviors					
	(1) Drink	(2) Binge drink	(3) Smoke	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female subsample, dep. var. = engagement in risky behaviour						
Very attractive	0.035***	0.019*	−0.020*	−0.017	−0.017**	−0.010
	(0.013)	(0.011)	(0.012)	(0.011)	(0.007)	(0.008)
Attractive	0.039***	0.008	−0.008	−0.015*	−0.006	−0.012**
	(0.011)	(0.008)	(0.010)	(0.008)	(0.007)	(0.005)
Unattractive	−0.030	−0.013	0.022	0.022	0.001	0.007
	(0.025)	(0.020)	(0.025)	(0.017)	(0.014)	(0.015)
Very unattractive	−0.017	0.044	−0.018	−0.011	−0.008	−0.030**
	(0.032)	(0.032)	(0.031)	(0.029)	(0.021)	(0.015)
Obs.	12,133	12,133	12,133	12,133	12,133	12,133
Panel B: male subsample, dep. var. = engagement in risky behaviour						
Very attractive	−0.012	−0.015	−0.030*	−0.021	−0.009	
	(0.017)	(0.015)	(0.015)	(0.014)	(0.010)	
Attractive	0.022**	0.006	−0.019**	−0.011	−0.004	
	(0.010)	(0.009)	(0.009)	(0.012)	(0.006)	
Unattractive	−0.040*	−0.048**	0.027	0.011	0.010	
	(0.023)	(0.020)	(0.021)	(0.019)	(0.013)	
Very unattractive	0.014	0.008	−0.018	0.012	0.003	
	(0.049)	(0.038)	(0.037)	(0.035)	(0.024)	
Obs.	11,876	11,876	11,876	11,876	11,876	

Notes This table reports the effects of beauty on a number of risky behaviours based on the subsample excluding those who had a third person present during the interview. All models control for observable characteristics and school fixed effects. Dependent variable is engagement in a certain behavior as indicated in the column heading, with 1 = yes and 0 = no. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.

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Table A3: Beauty and drinking behaviours: Logistic and Poisson results

	Dep. var. =							
	Female				Male			
	(1) Drink dummy, logistic OR	(2) Binge dummy, logistic OR	(3) Drink frequency, Poisson IRR	(4) Binge frequency, Poisson IRR	(5) Drink dummy, logistic OR	(6) Binge dummy, logistic OR	(7) Drink frequency, Poisson IRR	(8) Binge frequency, Poisson IRR
Very attractive	1.149***	1.098*	1.071***	1.009	0.984	0.947	1.008	0.954
	(0.058)	(0.054)	(0.026)	(0.046)	(0.064)	(0.063)	(0.040)	(0.044)
Attractive	1.144***	1.030	1.071***	0.953	1.097**	1.051	1.029	0.996
	(0.047)	(0.043)	(0.022)	(0.037)	(0.041)	(0.045)	(0.024)	(0.029)
Unattractive	0.855	0.872	0.923	0.893	0.811**	0.763***	0.921	0.926
	(0.084)	(0.088)	(0.048)	(0.073)	(0.080)	(0.079)	(0.064)	(0.079)
Very unattractive	0.908	1.162	0.952	0.970	1.100	1.125	1.045	1.126
	(0.120)	(0.181)	(0.065)	(0.140)	(0.198)	(0.200)	(0.100)	(0.114)
Obs.	15,795	15,795	15,795	15,795	15,093	15,093	15,093	15,093

Notes This table reports the effects of beauty on drinking and binge drinking based on nonlinear models. Columns (1), (2), (5), and (6) report odds ratios from logistic models, whereas columns (3), (4), (7), and (8) report incidence rate ratios from Poisson models. All models control for observable characteristics, and school averages of the outcome. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively.

Table A4: Heterogeneity in the effects of beauty on risky behaviours by race and age

| | Dep. var. = | | | | | | | |
| | Female | | | | Male | | | |
	(1) Drink	(2) Binge drink	(3) Drink	(4) Binge drink	(5) Drink	(6) Binge drink	(7) Drink	(8) Binge drink
Attractive or very attractive	0.057*** (0.011)	0.030*** (0.010)	0.043*** (0.010)	0.013 (0.008)	0.019* (0.011)	0.018* (0.010)	0.024** (0.011)	0.007 (0.009)
Interaction term with non-white	−0.045*** (0.015)	−0.041*** (0.013)			0.000 (0.018)	−0.022 (0.016)		
Non-white	−0.089*** (0.021)	−0.068*** (0.017)			−0.091*** (0.021)	−0.089*** (0.016)		
Interaction term with age above median			−0.016 (0.015)	−0.005 (0.012)			−0.010 (0.013)	0.001 (0.014)
Age above median			−0.007 (0.017)	−0.003 (0.015)			0.003 (0.013)	0.027** (0.012)
Obs.	15,795	15,795	15,795	15,795	15,093	15,093	15,093	15,093
Dep. var. mean	0.458	0.241	0.458	0.241	0.454	0.295	0.454	0.295
Dep. var. SD	0.498	0.428	0.498	0.428	0.498	0.456	0.498	0.456

Notes This table reports the heterogenous effect of beauty on risky behaviours by race and age. All models control for observable characteristics and school fixed effects. Dependent variable is engagement in drinking or binge drinking behavior as indicated in the column heading, with 1 = yes and 0 = no. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.

Table A5: Mechanism analysis for attractiveness and other risky behaviours

	Dep. var. =						
	Female				Male		
	(1) Smoke	(2) Drugs	(3) Unprotected sex	(4) Pregnancy	(5) Smoke	(6) Drugs	(7) Unprotected sex
Very attractive	0.022	0.002	0.008	−0.003	0.007	0.005	0.005
	(0.016)	(0.012)	(0.009)	(0.008)	(0.018)	(0.014)	(0.012)
Attractive	0.017	−0.001	0.011	−0.004	−0.008	0.002	0.011
	(0.012)	(0.009)	(0.008)	(0.005)	(0.011)	(0.010)	(0.007)
Unattractive	0.024	−0.008	−0.010	0.001	0.016	−0.020	−0.008
	(0.023)	(0.016)	(0.015)	(0.015)	(0.023)	(0.018)	(0.014)
Very unattractive	−0.012	−0.024	−0.008	−0.012	−0.009	−0.004	0.015
	(0.034)	(0.025)	(0.022)	(0.014)	(0.037)	(0.032)	(0.024)
Log in-degree	0.022***	0.024***	0.002	−0.014***	0.014	0.026***	0.015***
	(0.007)	(0.007)	(0.004)	(0.004)	(0.009)	(0.008)	(0.004)
Personality attractive	−0.052***	−0.030***	−0.024***	−0.008	−0.025**	−0.025***	−0.019***
	(0.009)	(0.008)	(0.007)	(0.005)	(0.011)	(0.008)	(0.007)
Self-esteem	−0.023***	−0.018***	−0.006***	−0.003***	−0.022***	−0.016***	−0.006***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)
Obs.	11,161	11,161	11,161	11,161	10,433	10,433	10,433
Dep. var. mean	0.456	0.456	0.456	0.456	0.446	0.446	0.446
Dep. var. SD	0.498	0.498	0.498	0.498	0.497	0.497	0.497
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes This table reports the regression results of the effects of physical attractiveness, conditional on log in-degree, personality attractiveness, and self-esteem, for females and males separately, based on combined Waves I and II data from Add Health. Physical attractiveness is measured on a five-point scale, with about average" as the reference group. Control variables include race dummies, age and its squared term, mother's absence and education levels, father's absence and education levels, log household income and a dummy indicator missing income, and a school year dummy. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.
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Table A6: Definitions of long-run drinking problems

Variable	Definition
Any drinking problem at Wave 3	Dummy variable, $= 1$ if respondent answers once or more for any of the following problems in the past twelve months (except for the last item, which refers to "since 1995"):

- You had problems at school or work because you had been drinking.
- You had problems with your friends because you had been drinking.
- You had problems with someone you were dating because you had been drinking.
- How many times were you hung over?
- how many times were you sick to your stomach or threw up after drinking?
- How many times did you get into a sexual situation that you later regretted because you had been drinking?
- How many times did you get into a physical fight because you had been drinking?
- How many times were you drunk at school or work?
- Since June 1995, have you driven while drunk?

Variable	Definition
Drinking problem incidents at Wave 3	Number of items the respondent answers once or more to the nine drinking problems above in the past twelve months, scale 0–9

Variable	Definition
Any drinking problem at Wave 4	Dummy variable, $= 1$ if respondent answers once or more for any of the following problems:

- How often has your drinking interfered with your responsibilities at work or school?

- How often have you been under the influence of alcohol when you could have gotten yourself or others hurt, or put yourself or others at risk, including unprotected sex?

- How often have you had legal problems because of your drinking, like being arrested for disturbing the peace or driving under the influence of alcohol, or anything else?

- How often have you had problems with your family, friends, or people at work or school because of your drinking?

- Did you continue to drink after you realized drinking was causing you problems with family, friends, or people at work or school?

- Have you ever found that you had to drink more than you used to in order to get the effect you wanted?

- Has there ever been a period when you spent a lot of time drinking, planning how you would get alcohol, or recovering from a hangover?

- Have you often had more to drink or kept drinking for a longer period of time than you intended?

- Have you ever continued to drink after you realized drinking was causing you any emotional problems (such as feeling irritable, depressed, or uninterested in things or having strange ideas) or causing you any health problems (such as ulcers, numbness in your hands/feet or memory problems)?

Variable	Definition
Drinking problem incidents at Wave 4	Number of items the respondent answers once or more to the nine drinking problems above, scale 0–9

Notes: Wave 3 takes place in 2001–2002, when respondents are aged 18–27; Wave 4 takes places in 2007–08, when respondents are aged 24–33.