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Beauty, underage drinking, and adolescent risky behaviours ☆

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ABSTRACT

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. Attractive adolescents are *more* likely to engage in drinking; the gap between attractive and unattractive adolescents in terms of propensity to drink constitutes about 15% of the baseline mean. In contrast, more attractive adolescents are *less* likely to smoke, use drugs, or practice unprotected sex. Investigation into the underlying channels reveals that physically attractive adolescents are more popular, and have higher self-esteem and personality attractiveness. Popularity leads to a higher likelihood of engagement in "cool" risky behaviours and a lower likelihood for "uncool" behaviours, while self-esteem and personality generally predict a lower likelihood of engaging in all risky behaviours. Our findings suggest physical attractiveness in adolescence carries long-lasting consequences over the life course.

1. Introduction

Physically attractive[1] adults have better labour market outcomes, earn more, and experience 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., 2024, which is forthcoming in this Special Issue). 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. (2019) demonstrate that they are concentrated in jobs with substantial amounts of interper-

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[1] We use the terms "beauty" and "physical attractiveness" interchangeably.

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sonal interaction. In academia, attractive researchers receive more citations for their research (Hale et al., 2024), 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 various behaviours during adolescence. These include a range of risky behaviours such as underage drinking, smoking, illicit substance use, and underage sexual activity that, in and of themselves, have implications for both labour market performance and crucial 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. (2023) and Adamopoulou and Kaya (2023) show that beauty leads to higher educational attainment amongst students. At the same time, adolescent risky behaviours are important 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 interviewer-rated information on beauty to investigate how beauty 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 underage 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 attractive often reduces engagement in these behaviours. We employ 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 probable confounding factors.

This raises the question: what mechanisms generate these effects? While we are unable to be exhaustive in this regard, we examine several channels that seem important ex-ante: popularity, self-esteem, and the "attractiveness" of an individual's personality. For example, 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 concerning attractiveness and risky behaviours. We show that attractive adolescents are more popular, and that popularity is associated with a greater likelihood of underage drinking, in addition to the direct effects of attractiveness on drinking. On the other hand, physically attractive adolescents also have higher self-esteem and greater personality attractiveness, both of which predict less engagement in risky behaviours. These findings suggest that a number of channels operate simultaneously in nuanced ways to mediate the relationship between physical attractiveness and risky behaviours. Shedding light on these channels helps to further understand various factors tied to health behaviours and risk-taking.

Finally, we seek to explore whether these teenage behaviours predict later-life behaviours. 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

2.1. Add health

We use data from the restricted-use version of the National Longitudinal Study of Adolescent to Adult Health (Add Health). Add Health is a school-based longitudinal study of a nationally representative sample of adolescents 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 family, friendships, and school. This provides unique opportunities to study how social environments and behaviours in adolescence are linked to health and achievement outcomes in young adulthood. The design of Add Health allows us to estimate the influence of beauty on risky behaviours such as smoking, underage 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. Subsequently, after the in-school survey, the study conducted a series of more detailed in-home interviews with a stratified random sub-sample of the in-school survey students. 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[2] and pool together Waves I & II of the in-home surveys, with an initial sample size of 35,483. Although the

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

in-home surveys have a panel structure, we do not employ an individual fixed effects approach, as beauty is primarily a fixed physical characteristic and there is little variation across the two waves.[3] After dropping missing values, our baseline sample comprises 30,888 observations.

2.2. Risky health behaviours

While our primary focus is on underage drinking, we examine a total of six different types of risky behaviours: drinking, binge drinking, smoking, substance use, unprotected sex, and pregnancy.[4] Waves I and II of the in-home survey asked adolescents about whether and how often they engage in these activities. For all of these topics in the interview, respondents listened to recorded questions through headphones and entered their responses independently on a computer. The interviewer did not see or hear the questions, nor the interviewee's responses. As the respondent had full anonymity during the interview, this Audio Computer-Assisted Self-Interview (Audio CASI) data collection method helped reduce concerns of under-reporting, a common issue in studies exploring risky and illicit behaviours.

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

- *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) on the extensive margin, as well as a variable that captures the frequency of this behaviour on the intensive margin. We provide estimates for both of these to gauge the effects on the onset as well as intensity of risky behaviours.

Beyond adolescence, we also observe whether respondents experience drinking problems when they reach adulthood in Waves III (age 18–26) & IV (age 24–32). Similarly to the approach above, we construct two measures of long-run drinking problems, one on the extensive margin, and the other on the intensive margin. Detailed definitions of these variables are available in Online Appendix Table A1.

2.3. Physical attractiveness

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 detailed information about each interviewer, we know that interviewers were predominantly female, and which interviewer conducted each interview. The interviewer was asked to describe the respondent, neighbourhood, circumstances, and 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 an overall standard deviation (SD) of 0.84. The within-interviewer SD is 0.76, and the between-interviewer SD is 0.47. As we only have one interviewer rating for each respondent, it may be argued that "beauty is in the eye of the beholder", and the single rating is entirely subjective. However, in their meta-analysis Langlois et al. (2000) find a high reliability of beauty ratings among multiple raters, both within and across cultures. This suggests that a single rating can provide useful and reliable information about the respondent's physical attractiveness, even though it might be less precise than approaches involving multiple raters assessing an individual's beauty based on photographs.

Distributional information of beauty by sex is available in Table 1. On average, girls receive a rating of 3.69 and boys 3.45. While magnitudes vary, the distributional patterns of beauty ratings are similar for girls and boys. First, for both sexes, the most common rating is "about average" (38.3% for girls and 50.5% for boys), followed by "attractive", "very attractive", and "unattractive" in order, and the least likely rating is "very unattractive". Second, "very unattractive" and "unattractive" make up a much smaller proportion

[3] Of 11,810 adolescents who were observed in both Waves I & II, 47.6% had the same beauty rating in Wave II, and another 41.9% had a one-point change on a five-point scale from Wave I to Wave II.

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

(combined, this is 5.2% for girls and 6.6% for boys) than "very attractive" and "attractive" (combined, 56.6% for girls and 42.9% for boys). In particular, "very unattractive" accounts for a tiny proportion of the observations (1.6% for girls and 1.2% for boys). Considering the small group size, it is difficult to draw meaningful inferences for this subgroup.[5] While we do not know whether the "true" underlying distribution of beauty is symmetric, or whether it is normal, this could indicate a reluctance of interviewers to assign low ratings to respondents, prompting a concern about measurement error. That said, the top three categories ("about average", "attractive", and "very attractive") 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.

Considering the small group size of "very unattractive" adolescents, and our interest in the differential effects by broad categories, we collapse the five-point raw physical attractiveness rating into *three* levels of beauty for the analysis: attractive or very attractive, average looking (omitted category in the regressions), and unattractive or very unattractive.

2.4. Other variables

We investigate popularity, self-esteem, and personality attractiveness as potential underlying mechanisms, to explore their mediating effects in the nexus between physical 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 five male and top five female friends in the in-school survey. From this, we proxy popularity with the logarithm of the number of friends, or to be more precise, the logarithm of the number of times the respondent has been nominated as a friend by their peers. Self-esteem is measured using an index on a scale that ranges from 4 to 20. This index is derived from summing up the responses to four questions relating to the respondent's subjective evaluation of their own worth, with higher scores indicating higher self-esteem.[6] Personality attractiveness is rated by interviewers on a similar five-point scale as physical attractiveness, based on their responses to the question: "*How attractive is the respondent's personality?*"

Table 1 presents summary statistics for the selected sample stratified by gender. The sample consists of 15,795 female and 15,093 male respondents. Add Health enables us to create a comprehensive set of covariates based on rich information on family background in the data. 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.[7]

2.5. Profiles by beauty

Table 2 presents demographic and socio-economic profiles by physical attractiveness. In general, attractive girls are more likely to be white, tend to come from better-educated and higher-income family backgrounds, and perform better academically. While there are less clear racial background patterns for attractive boys, they also tend to come from better-educated and higher-income family backgrounds, and perform better academically. Overall, these profiles show a positive correlation between beauty and socio-economic background.

3. Empirical strategy

Our baseline regression model takes the form of the following equation

$$Y_i = \alpha_{svt} + \beta_1 Attr_i + \beta_2 Unattr_i + X_i\gamma + \varepsilon_i, \tag{1}$$

where Y_i denotes the risky behaviour outcome of interest for student i, α_{svt} are fixed effects at the school-by-interviewer level (absorbing year fixed effects as interviewers are different across years),[8] X_i is a vector of individual characteristics, and ε_i represents the error term. $Attr_i$ is a binary indicator of being attractive or very attractive, $Unattr_i$ that of being unattractive or very unattractive, whereas "average looking" is the omitted reference group. Unless indicated otherwise, standard errors are clustered at the school-by-interviewer level to allow for within-cluster correlation of the error term.

A challenge in making a causal interpretation of the beauty effects on risky behaviours is that attractiveness may proxy for a range of family background characteristics that are also correlated with risky behaviours, resulting in an omitted variable bias. The inclusion of a rich set of socio-economic background covariates in X_i, helps deal with selection on observables. The inclusion of school-by-interviewer fixed effects α_{svt}, helps further with mitigating selection issues based on unobservables. For instance, there

[5] This observation aligns with prior literature that uses beauty data from Add Health. For instance, Wong and Penner (2016) combine "very unattractive" and "unattractive" categories in their analysis based on Add Health. Another two studies using Add Health also combine categories albeit at different margins, as seen in French et al. (2009) and Mocan and Tekin (2010).

[6] Respondents were asked how strongly they 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.

[7] To avoid dropping those with missing values in household income, a binary indicator of missing household income is included in the regression, and any missing values are recoded as zero.

[8] There are 144 schools in the sample. There are 563 interviewers in Wave I, and 401 interviewers in Wave 2. An average interviewer interviews 32 students. Overall these lead to 2,094 school-by-interviewer groups, with an average group size of 15 students.

Table 1
Summary statistics by sex.

Source: Authors' calculation based on Add Health data.

	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)
Beauty (collapsed categories for analysis)						
Attractive or very attractive	0.566	(0.496)	0.429	(0.495)	0.499	(0.500)
Unattractive or very unattractive	0.052	(0.221)	0.066	(0.248)	0.059	(0.235)
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)
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)						
Third person at interview	0.232	(0.422)	0.213	(0.409)	0.223	(0.416)
Ever had sex	0.390	(0.488)	0.415	(0.493)	0.402	(0.490)
Most recent GPA	2.885	(0.747)	2.663	(0.772)	2.777	(0.768)
Log # of friends	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)
N	15,795		15,093		30,888	

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

Table 2
Demographic and socio-economic profiles by physical attractiveness.

	Unattractive or very unattractive	About average	Attractive or very attractive
Female			
White	0.461	0.484	0.546
	(0.499)	(0.500)	(0.498)
Mother degree and above	0.209	0.223	0.272
	(0.407)	(0.417)	(0.445)
Father degree and above	0.178	0.180	0.233
	(0.383)	(0.384)	(0.423)
Log household income	10.243	10.331	10.513
	(0.837)	(0.841)	(0.804)
Most recent GPA	2.734	2.806	2.952
	(0.793)	(0.753)	(0.732)
Obs.	815	6,043	8,937
Male			
White	0.553	0.512	0.527
	(0.497)	(0.500)	(0.499)
Mother degree and above	0.219	0.239	0.301
	(0.414)	(0.427)	(0.459)
Father degree and above	0.175	0.205	0.268
	(0.380)	(0.404)	(0.443)
Log household income	10.339	10.388	10.532
	(0.788)	(0.820)	(0.816)
Most recent GPA	2.517	2.600	2.757
	(0.801)	(0.770)	(0.759)
Obs.	994	7,618	6,481

Notes Cells present means, and standard deviations are reported in parentheses.

may be self-selection into schools based on family background, interviewers may judge physical attractiveness in an idiosyncratic way, or respondents may misreport risky behaviours to different degrees depending on the interviewer.

In particular, our key variable of interest, physical attractiveness, reflects judgements of the survey interviewers. This naturally raises concerns about the extent to which this measure may reflect other factors that are correlated with the propensity to undertake risky behaviours. For instance, interviewers may vary in their judgement of attractiveness due to different tastes, or they may receive a non-random selection of respondents in terms of attractiveness and propensity to engage in risky behaviour. Furthermore, there is evidence that certain beauty standards, such as anthropometric characteristics, may differ by the sex of the interviewer (Oreffice and Quintana-Domeque, 2016). By controlling for school-by-interviewer fixed effects, we can account for these unobservable differences, and isolate the variation in risky behaviours within the school and interviewer that can be attributed to physical attractiveness. On this point, we make a minor contribution to the existing literature using Add Health data which mostly controls for either observable school characteristics, school fixed effects, or interview fixed effects, but not all (Fletcher, 2009; French et al., 2009; Mocan and Tekin, 2010; Wong and Penner, 2016).

We run a number of further robustness checks. First, there could be a concern related to measurement error, that a third person present at the interview might bias the adolescent's reporting of risky behaviours or the interviewer's rating of the respondent's physical attractiveness. On this point we check if the results are robust after excluding those who had interrupted interviews.[9] Second, we investigate the possibility of reverse causality, where risky behaviours, such as smoking, might influence an adolescent's physical attractiveness. To address this, we assess the robustness of our results when using lagged beauty. Finally, we conduct additional robustness checks using logistic and Poisson models instead of least squares.

Next, we seek to explore the mechanisms underlying the relationships between physical attractiveness and risky behaviours. We consider social networks and personality traits as likely potential mechanisms. Previous research demonstrates that friendships may strongly influence risky behaviours, particularly during adolescence (Lundborg, 2006; Clark and Lohéac, 2007). Popularity in high school may also impact later earnings (Conti et al., 2013; Fletcher, 2014). We posit that attractive adolescents may find it easier

[9] An interrupted interview is one where the interview was paused due to the respondent taking telephone calls, visitors to the house, household member passing through, the respondent attending to child or household responsibilities, or environmental distractions.

to make friends in school, making them more popular. This popularity then could influence both the propensity and opportunities to engage in risky behaviours. Meanwhile, it is also possible that less popular adolescents engage in certain risky behaviours to increase acceptance amongst 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 process 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 these 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, in the following form:

$$M_i = \alpha_{svt} + \beta_1 Attr_i + \beta_2 Unattr_i + X_i\gamma + \varepsilon_i, \tag{2}$$

where M_i denotes the mechanism variable. Next, we rerun the baseline model, with risky behaviours as dependent variables, while controlling for the three mechanism variables, to examine the extent to which these mechanisms explain away the effects of physical attractiveness on risky behaviours:

$$Y_i = \alpha_{svt} + \beta_1 Attr_i + \beta_2 Unattr_i + M_i\delta + X_i\gamma + \varepsilon_i. \tag{3}$$

In the last step of our analysis, we examine whether adolescent beauty leads to long-run consequences on health outcomes. We estimate analogous versions of Equation (1), but here the outcomes are two measures of long-term drinking problems, at two time points of early adulthood (age 18–26 and 24–32).

4. Results

4.1. Beauty and drinking

We begin by reporting the results of a number of specification checks in Table 3. Column (1) only controls for socio-economic observables, columns (2) and (3) further control for school and interviewer fixed effects respectively, column (4) includes all previous controls, and column (5) further includes school-by-interviewer fixed effects. The dependent variable is a dummy variable of engagement in drinking in all specifications.

The patterns in terms of magnitude and statistical significance of the estimated coefficients are very similar across specifications. All specifications show that attractive or very attractive adolescents are statistically significantly more likely to engage in drinking than average-looking school peers by 2.3–3.0 percentage points, against a baseline mean of 45.6%. Unattractive or very unattractive adolescents are significantly less likely to drink than average-looking peers by between 3.0–3.6 percentage points.

In terms of precision of estimates, the inclusion of school fixed effects or interviewer fixed effects does not noticeably change the standard errors across different specifications. In terms of magnitude, the coefficients change slightly between columns (1) and (2), and stabilise from column (3) onwards. Overall, the results are stable on both magnitude and precision once interviewer fixed effects are included (from column 3 onwards), and are essentially unchanged whether school or school-by-interviewer fixed are further added in (columns 4 and 5). We choose column (5) as our preferred specification, which includes school-by-interviewer fixed effects as illustrated in Equation (1).

There is evidence of clear differences in the likelihood of underage alcohol consumption by attractiveness across all specifications. Based on the results of our preferred specification, attractive or very attractive adolescents are 6.6 percentage points in absolute terms, or 14.5% in relative terms, more likely to engage in drinking than their unattractive or very unattractive peers.

In results reported in Online Appendix Table A2, we check for robustness on nonlinear modelling, self-reporting concerns, and lagged beauty. The findings are qualitatively similar.

4.2. Gender heterogeneity

Pooling girls and boys together masks potential gender heterogeneity. Summary statistics in Table 1 suggest clear differences in both physical attractiveness and risky behaviours by gender. Table 4 presents estimates of the effect of adolescent attractiveness on the likelihood of underage drinking for girls and boys separately. For the rest of the paper we provide estimates separately by gender.

Estimates split by gender reveal some heterogeneity in the relationship between beauty and drinking. Column (2) shows that attractive or very attractive girls are more likely to drink by 4.0 percentage points than average-looking peers, while unattractive or very unattractive females are less likely to drink by 3.2 percentage points, although the latter result is not statistically significant at the 10% level. The gaps in the propensity between attractive and unattractive girls are 7.2 percentage points in absolute terms or 15.8% in relative terms. Results for boys in column (3) show that attractive or very attractive boys are also more likely to drink than average-looking boys, by 2.1 percentage points. This difference is smaller than that for girls. Unattractive or very unattractive boys are also less likely to drink than average-looking boys, by 5.3 percentage points. This difference is larger than that for girls. The gaps in the propensity between attractive and unattractive boys are 7.4 percentage points in absolute terms or 16.2% in relative terms.

How do these effects compare to existing results? A number of studies have utilised Add Health data to examine beauty effects on a range of outcomes. Fletcher (2009) reports a 5–10% beauty premium in wage returns for very attractive individuals, and a suggestive 3–5% "plainness penalty" for unattractive individuals. French et al. (2009) find a 6% plainness penalty for below average-looking male students, and a 3% boost for very attractive female students, in terms of high school GPA. Mocan and Tekin (2010)

Table 3
Specification checks.

	Dep. var. = drinking				
	(1)	(2)	(3)	(4)	(5)
Attractive or very attractive	0.027***	0.023***	0.030***	0.029***	0.030***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Unattractive or very unattractive	-0.030**	-0.034**	-0.035***	-0.035***	-0.036***
	(0.012)	(0.014)	(0.012)	(0.012)	(0.013)
Obs.	30,888	30,888	30,888	30,888	30,888
Dep. var. mean	0.456	0.456	0.456	0.456	0.456
Dep. var. SD	0.498	0.498	0.498	0.498	0.498
Controls	Yes	Yes	Yes	Yes	Yes
School FE	No	Yes	No	Yes	Absorbed
Interviewer FE	No	No	Yes	Yes	Absorbed
SchXIntvw FE	No	No	No	No	Yes
SE cluster	Individual	School	Interviewer	Interviewer	SchXIntvw

Notes This table reports the regression results of the relationship between drinking and physical attractiveness, using a range of specifications based on combined data from Waves I and II of Add Health. Control variables include gender, 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 where appropriate, a school-year dummy (absorbed when interviewer fixed effects are included as interviewers are different across school-years). ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Clustered standard errors (SE) are in parentheses, with the level indicated in the "SE cluster" row.

Table 4
Beauty and prevalence of drinking by sex.

	Dep. var. = drinking		
	(1) All	(2) Female	(3) Male
Attractive or very attractive	0.030***	0.040***	0.021**
	(0.006)	(0.009)	(0.009)
Unattractive or very unattractive	-0.036***	-0.032	-0.053***
	(0.013)	(0.020)	(0.017)
Obs.	30,888	15,795	15,093
Dep. var. mean	0.456	0.458	0.454
Dep. var. SD	0.498	0.498	0.498
Controls	Yes	Yes	Yes
SchXIntvw FE	Yes	Yes	Yes

Notes This table reports the regression results of the relationship between drinking and physical attractiveness, for females and males combined (column 1) and separately (columns 2 and 3). Control variables are listed in the notes to Table 3. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Clustered standard errors at the school-by-interviewer levels are in parentheses.

document a reduction of criminality by 2.5 percentage points (against a baseline mean of 9.8%) for very attractive females, in terms of propensity to commit non-drug crimes. The magnitude of our estimated beauty effect on underage drinking, roughly a 15% gap in the propensity to drink between attractive and unattractive adolescents, seems to be larger than equivalent differences in high school academic performance, similar with those for wage returns, and smaller than those for criminality.

Overall, we find a clear and sizeable effect of physical attractiveness on the propensity of adolescent drinking for both girls and boys. The gap in the propensity to drink between attractive and unattractive girls or boys constitutes about 15% of the baseline mean. We also notice that the drinking effect of beauty works at different margins for boys and girls. For girls, beauty has a larger positive effect on the attractive versus average margin, while for boys it has a larger negative effect on the unattractive versus average margin.

In exploring further potential heterogeneity by racial and age groups in Online Appendix Table A3, we find some evidence that beauty effects on drinking are more pronounced for white attractive girls, white unattractive boys, and older unattractive girls.

Alcohol harms are concentrated in heavy drinking. Online Appendix Table A4 reports equivalent estimates to Table 4, but where the dependent variable is binge drinking, i.e. whether the individual has drunk five or more drinks in a single sitting in the past twelve months. The results show that while the earlier patterns hold qualitatively, they are in general weaker and less precise. Ignoring gender differences, attractive adolescents are 1 percentage point more likely than average looking peers to engage in binge drinking, and unattractive adolescents are 2.8 percentage points less likely to do so (column 1). This leaves a gap of 3.8 percentage points (or 14.2% of the baseline mean) between attractive and unattractive adolescents in their propensity to binge drink. When split by gender, the results are not significant for girls (column 2), while unattractive boys are 5.6 percentage points less likely to binge drink than average looking boys (column 3). Overall the evidence is weaker for binge drinking than for any drinking.

Table 5
Comparison of beauty effects on drinking and other risky behaviours.

	Risky behaviours					
	(1) Drink	(2) Smoke	(3) Substance use	(4) Unprotected sex	(5) Unprotected sex if ever had sex	(6) Pregnancy
Panel A: Female subsample, dep. var. = engagement in risky behaviour						
Attractive or very attractive	0.040***	-0.021**	-0.017**	-0.011*	-0.053***	-0.012**
	(0.009)	(0.008)	(0.007)	(0.006)	(0.015)	(0.005)
Unattractive or very unattractive	-0.032	0.008	-0.002	-0.008	0.011	-0.002
	(0.020)	(0.018)	(0.014)	(0.013)	(0.032)	(0.010)
Obs.	15,795	15,795	15,795	15,795	6,132	15,795
Dep. var. mean	0.458	0.279	0.151	0.119	0.306	0.071
Dep. var. SD	0.498	0.449	0.358	0.324	0.461	0.257
Controls	Yes	Yes	Yes	Yes	Yes	Yes
SchXIntvw FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: male subsample, dep. var. = engagement in risky behaviour						
Attractive or very attractive	0.021**	-0.025***	-0.013	-0.002	-0.013	
	(0.009)	(0.009)	(0.008)	(0.006)	(0.015)	
Unattractive or very unattractive	-0.053***	0.009	-0.004	0.021*	0.067**	
	(0.017)	(0.017)	(0.015)	(0.011)	(0.026)	
Obs.	15,093	15,093	15,093	15,093	6,219	
Dep. var. mean	0.454	0.288	0.183	0.107	0.260	
Dep. var. SD	0.498	0.453	0.386	0.309	0.439	
Controls	Yes	Yes	Yes	Yes	Yes	
SchXIntvw FE	Yes	Yes	Yes	Yes	Yes	

Notes This table reports the regression results of the relationship between a range of risky behaviours (as indicated in column heading) and physical attractiveness. Control variables are listed in the notes to Table 3. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Clustered standard errors at the school-by-interviewer levels are in parentheses.

To further investigate the effects on the intensive margin, Appendix Table A5 reports the estimates for frequency of drinking. When non-drinkers are included in the analysis (columns 1 and 2), the patterns are similar to earlier results but less precise. When they are excluded (columns 3 and 4), the patterns do not hold.

With all results combined, there is clear and strong evidence that physical attractiveness is mainly associated with more engagement in alcohol consumption on the extensive margin, and less clear or weaker evidence on the intensive margin in terms of drinking more heavily or frequently.

4.3. Drinking vs other risky behaviours

Naturally, underage drinking represents just one of many potential risky behaviours that adolescents might engage in. Table 5 presents estimates for a range of additional behaviours: smoking (column 2); substance use (column 3); unprotected sex (column 4); unprotected sex conditional on ever having had sex (column 5); and pregnancy (column 6, for girls only).

What is clear is that these demonstrate strikingly contrasting patterns to those for drinking (also presented for comparison in column 1). For girls, those who are attractive or very attractive are across the board less likely to smoke, use illicit substance, engage in unprotected sex or to have been pregnant. For boys, the evidence is less strong in terms of statistical significance, but general patterns follow that attractive or very attractive boys engage less in these other risky behaviours as well.

While all examined behaviours are risky health behaviours, the contrasts between drinking and others, and gender differences between boys and girls, are noteworthy. These heterogeneous patterns across behaviours and by gender suggest that beauty affects these behaviours through varying channels. For instance, risky behaviours can carry different social implications. Having unprotected sex can be a social stigma for girls, but among boys it may be viewed favourably by peers. We next turn to understanding the potential mechanisms through which beauty affects different risky behaviours.

5. Mechanisms

Previous economics studies on adolescence have primarily examined risk-taking behaviour influenced by social factors, such as peer effects (Clark and Lohéac, 2007; Gardner and Steinberg, 2005). Although adolescents spend a substantial proportion of their time with their peers at school and are likely to be influenced by them, the decision-making process is complex and involves additional factors, such as genetics and emotions (Anokhin et al., 2009; Loewenstein, 2000). The health literature seeks to pin down determinants of risky behaviour to genetic, social environmental, and personality factors. While we cannot provide a detailed

Table 6
Mechanism analysis for drinking.

	Dep. var. =							
	Female				Male			
	(1) Log # of friends	(2) Personality attractiveness	(3) Self-esteem	(4) Drink	(5) Log # of friends	(6) Personality attractiveness	(7) Self-esteem	(8) Drink
Attractive or very attractive	0.208***	0.441***	0.264***	0.044***	0.196***	0.445***	0.261***	0.042***
	(0.015)	(0.011)	(0.050)	(0.012)	(0.017)	(0.011)	(0.047)	(0.012)
Unattractive or very unattractive	-0.147***	-0.037**	-0.227*	-0.019	-0.167***	-0.070***	-0.256***	-0.077***
	(0.032)	(0.018)	(0.117)	(0.025)	(0.033)	(0.016)	(0.093)	(0.023)
Log # of friends				0.073***				0.047***
				(0.008)				(0.007)
Personality attractive				-0.046***				-0.026**
				(0.013)				(0.012)
Self-esteem				-0.025***				-0.019***
				(0.002)				(0.002)
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	1.393	0.446	16.785	0.446
Dep. var. SD	0.677	0.497	2.654	0.498	0.740	0.497	2.369	0.497
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SchXIntvw FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes This table reports the regression results of the relationship between mechanism variables and physical attractiveness. Control variables are listed in the notes to Table 3. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Clustered standard errors at the school-by-interviewer levels are in parentheses.

explanation of the role genetics play, we provide evidence on two potential channels through which attractiveness might effect risky behaviours: social environmental and personality factors. Specifically, we examine three variables as mechanisms: popularity (measured by log number of friends), personality attractiveness (reported by the interviewer), and self-esteem (reported by the adolescent).

In investigating the underlying mechanisms through which beauty might affect risk behaviours, our approach involves two steps. First, we regress the mechanism variables onto attractiveness and covariates, to gauge the direction and magnitude of the beauty effect on these variables; next, we regress risky behaviours onto attractiveness and covariates, with the mechanism variables as additional control variables, to understand how coefficients on attractiveness change with such additions. Results are presented in Table 6, 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. Attractive adolescents tend to be popular among peers, and there could be several reasons why popularity plays a role in their risky behaviours: they could be more likely to be invited to social gatherings, they may try to maintain their social status within the network by engaging in certain "cool" risky behaviours, or they are more likely to pick up certain behaviours through a larger social network.

Results in columns (1) and (5) confirm that attractiveness is positively correlated with the number of friends, consistent with the notion that attractive adolescents are more popular. Furthermore, results in columns (4) and (8) show that popularity predicts more drinking, although it does not fully explain the effects of attractiveness on drinking.

We have measured popularity by the number of friends. Besides the number, it could be argued that the type of friends also matters. For instance, more attractive adolescents might be friends with those who drink, and thus are influenced to drink. To fully understand this process would require the identification of peer effects which is beyond the scope of this paper.[10] However, examining association between the adolescents' beauty and their friends' risky behaviour could potentially shed some light. In Online Appendix Table A6, we report these results. Note that the sample sizes are much reduced because of missing data on friends.[11] Overall, in a correlational sense, we find little evidence that beauty is associated with friends' risky behaviours. As there are a large amount of missing data, we are unable to reach a clear conclusion on this point.

Next, we consider how socio-emotional skills and personality traits could 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, revised 2015). 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

[10] See, for example, recent work by Adamopoulou and Kaya (2023) which exploits random variation within schools across cohorts to identify the effects of own and peer attractiveness on academic performance, based on Add Health data.

[11] The information on the number of friends comes from the in-school survey, which does not suffer from this issue. However, only a proportion of students (and consequently, friends) are tracked in the in-home surveys, which leads to a large amount of missing data for friends.

Table 7
Mechanism analysis for other risky behaviours.

	Dep. var. =						
	Female				Male		
	(1) Smoke	(2) Drugs	(3) Unprotected sex	(4) Pregnancy	(5) Smoke	(6) Drugs	(7) Unprotected sex
Attractive or very attractive	0.019*	-0.001	0.010	-0.003	-0.004	-0.002	0.013
	(0.011)	(0.009)	(0.008)	(0.006)	(0.012)	(0.010)	(0.008)
Unattractive or very unattractive	-0.001	-0.013	-0.006	-0.003	-0.004	-0.025	0.007
	(0.022)	(0.017)	(0.016)	(0.012)	(0.022)	(0.019)	(0.014)
Log # of friends	0.021***	0.023***	0.001	-0.015***	0.015**	0.026***	0.015***
	(0.007)	(0.006)	(0.005)	(0.004)	(0.006)	(0.006)	(0.004)
Personality attractive	-0.063***	-0.037***	-0.032***	-0.012**	-0.035***	-0.023**	-0.013
	(0.011)	(0.009)	(0.008)	(0.006)	(0.012)	(0.009)	(0.008)
Self-esteem	-0.023***	-0.017***	-0.006***	-0.003***	-0.022***	-0.017***	-0.006***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Obs.	11,161	11,161	11,161	11,161	10,433	10,433	10,433
Dep. var. mean	0.270	0.142	0.114	0.061	0.270	0.168	0.099
Dep. var. SD	0.444	0.349	0.317	0.240	0.444	0.374	0.299
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SchXIntvw FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes This table reports the regression results of the effects of physical attractiveness, conditional on number of friends, personality attractiveness, and self-esteem, for females and males separately. Control variables are listed in the notes to Table 3. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Clustered standard errors at the school-by-interviewer levels are in parentheses.

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 substances 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 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 6 columns 2 and 6) and self-reported self-esteem (see Table 6 columns 3 and 7). Furthermore, we find that these personality traits predict less drinking (columns 4 and 8), suggesting they offer a protective role in preventing underage drinking behaviours, in the opposite direction of the role of popularity.

Overall these results suggest that attractiveness affects underage drinking in a number of nuanced ways, some of which may cancel the others out as they operate in opposite directions. Among the three channels we examine, popularity makes adolescents more likely to engage in drinking, whereas self-esteem and attractive personality are associated with less engagement in drinking.

We add a caveat that these analyses, particularly on personality attractiveness and self-esteem, 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. 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 is not explained by popularity, personality attractiveness, and self-esteem. Moreover, one weakness of interviewer-based in-person beauty rating approaches as opposed to photo-based approaches, is a greater potential for reverse causation between factors such as personality and self-esteem, and recorded beauty. For example, someone who has higher self-esteem and is more upbeat during the interview may be rated higher in physical attractiveness. In this regard, the evidence we present on personality and self-esteem is suggestive rather than conclusive. To summarise, while these variables provide insights into how attractiveness is associated with underage drinking, they do not provide a full picture of all causal paths. Understanding the complex underlying mechanisms, particularly with interviewer- or self-reported measures, would be a potential direction for future research.

We further investigate whether these three channels operate similarly across all risky behaviours. For comparison, we present in Table 7 analogous estimates for other risky behaviours beyond drinking. We find that personality and self-esteem are associated with these risky behaviours in a similar way as for drinking, while the popularity channel exhibits heterogeneous patterns across behaviours. In general, personality attractiveness and self-esteem are associated with a reduction in these other risky behaviours. Except for unprotected sex for boys, in six out of all seven models (all columns except 7), we find a significant and negative correlation between personality attractiveness and risky behaviour, with personality attractiveness associated with a 1.2–6.3 percentage point drop in risky behaviours. For self-esteem, we find a consistently significant and negative correlation across all seven models, with a one-point increase in self-esteem associated with a 0.3–2.3 percentage point drop in risky behaviours.

Yet, popularity increases the likelihood of some risky behaviours, but has no or negative effects on others. For girls, a one-unit increase in popularity leads to more smoking by 2.1 percentage points, more drug use by 2.3 percentage points, has no effect on

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
Female				
Attractive or very attractive	0.016	0.062*	0.018*	0.100**
	(0.010)	(0.036)	(0.009)	(0.042)
Unattractive or very unattractive	-0.010	-0.061	-0.017	-0.071
	(0.023)	(0.072)	(0.019)	(0.079)
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
SchXIntvw FE	Yes	Yes	Yes	Yes
Male				
Attractive or very attractive	0.015	0.067	0.004	-0.039
	(0.011)	(0.047)	(0.011)	(0.060)
Unattractive or very unattractive	-0.075***	-0.399***	-0.087***	-0.404***
	(0.021)	(0.077)	(0.020)	(0.108)
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
SchXIntvw FE	Yes	Yes	Yes	Yes

Notes This table reports the regression results of the effects of adolescent physical attractiveness in adolescence on long-run drinking problems at Waves III and IV from Add Health. Control variables are listed in the notes to Table 3. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Clustered standard errors at the school-by-interviewer levels are in parentheses.

unprotected sex, and a negative effect on getting pregnant by 1.5 percentage points. For boys, it leads to more smoking by 1.5 percentage points, more drug use by 2.6 percentage points, and more unprotected sex by 1.5 percentage points. We explain these heterogeneous patterns with the perceived "coolness" of different risky behaviours among adolescents. There is existing evidence in the adolescent development literature which points to a popularity motivation for adolescents to do "bad", that is, engaging in certain risky, aggressive, and anti-authority behaviours in order to look "cool" to peers, and to boost or maintain popularity within the peer social hierarchy (see, e.g. Owens and Duncan, 2009; Dumas et al., 2017). Drinking, smoking, and taking drugs, can be seen as "cool" for both genders. Having unprotected sex can be seen as "cool" among boys only, and "not cool" among girls. Getting pregnant for girls is also "not cool". Here our results are consistent with such notions, that attractive adolescents are seen as more popular, and they engage in "cool" risky behaviours and avoid "not cool" behaviours to maintain or boost their popularity. These findings suggest that there is a social status element in adolescent risky behaviours.

In summary, physical attractiveness is linked to adolescent risky behaviours in nuanced ways, with differences across different types of behaviours and genders. In particular, physical attractiveness increases popularity in the social network, which is manifested in varying ways depending on the perceived "coolness" of the risky behaviour. That said, a common suggestive mechanism is that non-cognitive abilities such as 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 in 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 are 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, 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 the number of incidences.

The results are reported in Table 8 and reveal several points. There appear to be links between adolescent attractiveness and later drinking problems. These broadly follow the patterns observed for underage drinking, although the effects may be at different

margins for females and males. Very attractive or attractive girls are more likely than average-looking peers to develop drinking problems in adulthood, and unattractive boys are less likely than average-looking peers to develop these issues.

In general, these results 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 the 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. These mechanisms operate in different directions and may offset each other, producing varying net effects on different risky behaviours. Popularity is linked to a higher likelihood of engagement if the risky behaviour is perceived “cool”, and a lower likelihood if it is considered “not cool”; personality attractiveness and self-esteem generally offer a protective role against engagement in risky behaviours across the board.

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, which is consequential for both labour market performance and important pre-market investments. Furthermore, 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.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The authors do not have permission to share data.

Appendix A. Supplementary material

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.jebo.2023.09.011.

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