Beauty and Adolescent Risky Behaviours*

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Abstract

A growing body of research demonstrates marked labour market benefits from physical attractiveness. Yet, how physical attractiveness influences earlier consequential decisions is not well understood. This paper estimates the effect of attractiveness in adolescence on one set of consequential outcomes, engagement in risky behaviours. We find robust evidence of marked effects of teenage attractiveness across a range of risky behaviours, including underage drinking, smoking, substance abuse and teenage sexual activity. More attractive individuals are more likely to engage in underage drinking, but markedly less likely to smoke or to be sexually active. Mediation analysis reveals that popularity, self-esteem, and personality attractiveness have roles as underlying mechanisms, yet substantial direct effects of physical attractiveness remain. Our findings suggest physical attractiveness in adolescence carries long-lasting consequences over the life course.

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JEL Codes: I12, J10

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1 Introduction

There now exists a growing body of evidence demonstrating marked labour market benefits from physical attractiveness. For instance, Biddle and Hamermesh (1998) find substantial wage premia attached to beauty and show that this is largely invariant to occupational choice. In a similar vein, Fletcher (2009) finds large wage premia to beauty for young adults, and that this remains after attempts to control for ability. Recently, Stinebrickner et al. (2018) demonstrate that these premia are concentrated in jobs with substantial amounts of interpersonal interaction. This literature provides a compelling view that there are sizeable labour market returns to attractiveness.

What is not well understood is how physical attractiveness influences earlier, consequential, decisions. The previous literature seeks to provide, in essence, the effect of attractiveness on labour market 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). At the same time, these risky behaviours are of importance in and of themselves due to their direct link to negative economic outcomes both in adolescence and across 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 set to estimate the influence of beauty on behaviours related to smoking, under-age drinking, illegal substance use and teenage sexual activity. Our main approch is to utilise within interviewer variation in ratings of physical attractiveness. Doing so, we demonstrate marked effects of teenage attractiveness on these behaviours. More attractive individuals are more likely to engage in under-age drinking, but markedly less likely to smoke, to use illegal substance, or to be sexual active. 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 particular channels that seem likely ex ante to be important: popularity, self-esteem, and personality attractiveness. 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 mediating effect with respect to attractiveness and risky behaviours. We demonstrate that attractive adolescents are more popular, which leads them to engage in more risky behaviours that are often associated with social settings. On the other hand, physically attractive adolescents also have higher self-esteem and higher personality attractiveness, which 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. These, in turn, are likely to be consequential for both current and later life outcomes.

2 Literature Review

Initial research on the effects of beauty on adult outcomes considered this as part of a broader focus on non-cognitive traits and skills. The majority of these estimate the effect of these traits and skills on labour market outcomes (Hamermesh and Biddle, 1994; Biddle and Hamermesh, 1998; Mobius and Rosenblat, 2006). This research emphasises the importance of non-cognitive skills such as confidence in determining educational outcomes and labour market success, as well as the role of physical attributes in acquiring the necessary skills for success.

As part of this Hamermesh and Biddle (1994) examine the impact of *looks* on earnings. They use the Quality of Employment Survey (QES) along with the Quality of American Life Survey (QAL) and estimate the effect of interviewers' ratings of interviewees' physical appearance on interviewees' earnings. They demonstrate a sizeable beauty premium. They posit three possible reasons for the beauty premium—employer discrimination, customer discrimination, and occupational crowding.

The authors use three sets of household data to make inferences about the role of beauty in the labour market. They find evidence of a "plainness penalty", such that plain people earn less than average-looking people, who in turn earn less than good-looking people. Hamermesh

and Biddle (1994) also provide evidence that suggests male looks have slightly larger effects on their earnings than those of women. They argue that this may be due to beauty ratings providing a noisier signal of women's physical appearance than for men. Finally, they find, better-looking people sort into occupations where beauty may be more productive due to consumer preferences. Despite this, the positive impact of individuals' looks on wages remains relatively stable across occupations.

In a similar vein, Fletcher (2009) uses data from the restricted version of the National Longitudinal Study of Adolescent Health (Add Health) to estimate the wage returns to attractiveness for young high school graduates (average age 22). He shows that the wage returns to attractiveness are large relative when compared to, for instance, the effect of measured ability. For instance, while a one standard deviation increase in ability is associated with a 3 to 6 percent higher wage, attractive or very attractive individuals earn 5 to 10 percent more than average-looking individuals. Similar to Hamermesh and Biddle (1994) their results imply a 3 to 5 percent plainness penalty insofar as plain people earn less than average-looking people, who earn less than good-looking people. These results remain even after the introduction of controls for ability along with a range of usually unmeasured variables, including a personality rating, self-reports of attractiveness and self-confidence.

Scholz and Sicinski (2015) use data from the Wisconsin Longitudinal Survey (WLS), a one-third sample of all seniors in Wisconsin high schools in 1957, as well as yearbook photos and find a strong positive correlation between facial attractiveness of male high school graduates and

their subsequent labour market earnings in their mid-30s and their early 50s. They conclude that the attractiveness premium does not appear to result from greater cognitive ability, high school class rank, or greater educational attainment of attractive men. This leads them to argue that the beauty premium must either result from employer and customer discrimination or from attractiveness being an intrinsically productive characteristic in the labour market.

Recently Stinebrickner et al. (2018) return to the issue of the wage beauty premia, and in particular, to its source. Rather than focusing on occupational variation in wage premia, they examine its relationship to within occupation variation in job tasks. They use unique data measuring the amount of interpersonal interaction on one's job and demonstrate marked variation in the beauty premium across jobs according to this. Specifically, they find that a large beauty premium exists in jobs that require substantial amounts of interpersonal interaction, and no beauty premium in jobs that require working with information and data. They argue that the variation in the beauty premium across different types of jobs is consistent with the notion that beauty is a productivity-enhancing attribute in interpersonal interactions, and inconsistent with the employer-based discrimination explanation for the beauty premium in Hamermesh and Biddle (1994), as this would predict that all job types will favour attractive workers. They conclude that individuals are more likely to sort into jobs where physical attractiveness is valued.

Mobius and Rosenblat (2006) seek to decompose the beauty premium in an experimental labour market using Argentinean university students and identify three channels through which physical attractiveness raises

an employer's estimate of a worker's ability. The confidence channel operates through workers' beliefs: they argue that physically-attractive workers are substantially more confident and as a result, worker confidence increases wages under oral interaction. Furthermore, the authors argue that, the visual and oral stereotype channels affect employers' beliefs, such that, employers expect good-looking workers to perform better than their less attractive counterparts under both visual and oral interaction even after controlling for individual worker characteristics and worker confidence. They find a sizeable beauty premium that arises during the wage negotiation process between employer and worker. These range from a 12 to 13 percent increase in wages for a one standard deviation increase in beauty in photograph (visual), telephone interview (oral), photograph and telephone (visual and oral) to a 17 percent increase in the face-to-face treatment. Decomposing across the treatment groups, Mobius and Rosenblat (2006) find that 15 to 20 percent of the beauty premium is transmitted through the confidence channel and about 40 percent each through the visual and oral interaction channels.

A related literature uses methods adopted from social network analysis to investigate the effect of popularity. The idea is to derive from observed school friendship networks sociometric measures of individuals' relational attributes and to analyse their determinants and their association with later-life outcomes. Along these lines Conti et al. (2013) use data from the WLS to estimate the relevance of social skills, namely popularity, for achieving economic success in later life. Popularity is measured from responses to the 1975 Telephone Questionnaire 23 years after the original survey, where respondents were asked to report the

names of up to three same-sex best friends from their senior class in high school. They estimate both the predictors of high school friendship nominations as well as the labour market returns to these nominations. Their results suggest that having one additional high school nomination increases labour market earnings by approximately 2 percent around age 35.

In response, Fletcher (2014) replicates the study by Conti et al. (2013) using Add Health. He finds evidence of popularity effects similar to that of Conti et al. (2013). However he finds that the estimated effects of popularity on earnings reported are sensitive to attempts to control for family-level heterogeneity. Once controls for siblings are included, he finds that sibling comparisons eliminate any associations between popularity and earnings. On the basis of this it is suggested that families, rather than friends, may be the cause of the association between popularity and earnings.

These studies motivate us to consider whether physical attractiveness affects choices and behaviours before individuals enter the labour market, and if so, through what transmission mechanisms. Risky health behaviours are a particularly important part of those choices and behaviours, which impose large medical care costs to individuals and society, and carry lifelong consequences on a range of socio-economic outcomes. This paper contributes to filling in this research gap, by focusing on adolescence, a key period for the onset of risky health behaviours. To paint a fuller picture, it also tests whether a number of mechanisms proposed in existing literature underly the relationship between physical attractiveness and risky behaviours.

3 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 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 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.

Initially, Add Health started with an in-school questionnaire which collects data from over 90,000 students in 80 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 subsample of the in-school survey students in subsequent waves. Students in each school were stratified by grade and sex. Roughly 17 students were randomly chosen from each year group so that a total of

approximately 200 adolescents were selected from each of the 80 pairs of schools. The first two waves of the in-home survey took place when the respondents were in secondary education in 1994–95 and 1995–96 respectively.

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. Wave I in-home (conducted between September 1994 and April 1995) is a follow up of the in-school survey and consists of 20,745 detailed interviews from adolescents who were in the initial study. Wave II in-home survey (conducted from April to August 1996) follows up those from Wave I and consists of 14,738 interviews. 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. We pool the data cross-sectionally and as a result our baseline sample is 30,888 after dropping missing values.

We focus on six different types of risky behaviours: smoking, drinking, binge drinking, 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 of 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

[1] Mean age is 16.235 for females and 16.350 for males. The youngest interviewed was 13, the oldest was 21.

[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.

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 questionnaire.

For our analysis, we focus on the engagement in (=1 if answer>0) and frequency of each risky behaviour. These are broken down as follows:

- *Smoking:* During the past 30 days, on how many days did you smoke cigarettes? (Responses range from 0 to 30 days)
- *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)
- *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 as well as variable that captures the frequency of this behaviour. We provide estimates for both of these to gauge at the effects on the extensive and intensive margins.

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. The interviewer is 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 is asked "How physically attractive is the respondent?" This is measured on a 1 to 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. We use the information based on this question to derive a binary indicator, *Attractive*, which takes the value of 1 if the interviewer answered "very attractive" or "attractive", and 0 if "average looking", "unattractive", or "very unattractive".[3] A similar question is asked of the interviewer to rate the personality attractiveness of the respondent, which we will use for additional analysis.

We use popularity, self-esteem and personality attractiveness to investigate its 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 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 evalua-

[3]For robustness checks, we also report results with both the 5-point scale and a 3-point scale in the appendix. The 3-point scale are based on these three regrouped categories: attractive or very attractive; average looking; unattractive or very unattractive.

tion of their own worth, with higher score indicating higher self-esteem.[4] Personality attractiveness is measured by a dummy variable which takes the value of 1 if the interviewer rated the respondent's personality as "very attractive" or "attractive", and 0 if "average looking", "unattractive", or "very unattractive".

Table A1 presents summary statistics for the full sample stratified by gender. The sample consists of 15,798 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, whether mother is absent from home and mother's education levels, whether father is absent from home and father's education levels, and household income.[5]

4 Empirical Strategy

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

$$Y_{ivst} = \alpha_s + \alpha_v + \alpha_t + \beta Attractive_{ivst} + X_{ivst}\gamma + \varepsilon_{ivst}, \tag{1}$$

where Y_{ivst} denotes the risky behaviour outcome of interest for student i at school s interviewed by interviewer v at year t, α_s are school fixed effects, α_v are interviewer fixed effects, α_t year effects, X_{ivst} a vector of in-

[4]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.

[5]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.

dividual characteristics, and ε_{ivst} the error term. $Attractive_{ivst}$ is a binary indicator which takes the value of 1 if individual i is "very attractive" or "attractive" in terms of physical attractiveness, and 0 otherwise.

A challenge for the identification of a beauty effect on risky behaviours is that beauty may proxy for a range of family background characteristics that are also correlated with risky behaviours. To tackle this issue, we start by including a rich set of socio-economic background in X_{ivst}, including the adolescent's race, age and its squared term, whether mother is absent from home and mother's education levels, whether father is absent from home and father's education levels, and household income. Next, our inclusion of school fixed effects[6] α_s in the regression will 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.

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, we introduce fixed effects for the 966 interviewers in the data.[7] The inclusion of interviewer fixed effects α_v helps to deal with

[6] There are 145 schools in the data.

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

the case if interviewer ratings of the respondents' physical attractiveness and the respondents' self-reported risky behaviours are correlated in a systematic way. Hence our main estimates of interest reflect within-interviewer variation in judgements of respondent attractiveness.

We check the robustness of these results to a number of additional concerns. First, out of the concern that a third person present at the interview might bias the adolescent's reporting of risky behaviours, we check if the results are robust when excluding those who had interrupted interviews[8]. We further provide a number of examinations that aim to establish whether any beauty effects reflect confounding influences of factors such as self-esteem and personality attractiveness.

To understand the underlying mechanism through which physical attractiveness might lead to risky behaviours, we examine popularity as a potential mediator. Previous research demonstrate that friendships may be powerful influences for risky behaviours, particularly during adolescence. Attractive adolescents may find it easier to make friends in school. This popularity may influence both the propensity and opportunities to engage in risky behaviours. At the same time, less popular adolescents may be more likely to engage in certain risky behaviours to, for instance, to increase acceptance amongst their peers. Hence, in practice the effect of popularity on risky behaviours is an empirical question. Our approach is to use mediation analysis (Judd and Kenny, 1981; MacKinnon et al., 2007) to understand how much of the beauty effect on risky behaviours is explained by popularity, by running the following

[8]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

regression:

$$Y_{ivst} = \alpha'_s + \alpha'_v + \alpha'_t + \beta' Attractive_{ivst} + \delta Popularity_{ivst} + X_{ivst}\gamma' + \varepsilon'_{ivst}, \tag{2}$$

where $Popularity_{ivst}$ denotes the log number of students in school s who nominate i as a friend. We measure the total effect of beauty on risky behaviour with β_1, the direct effect of beauty on risky behaviour with β', and the indirect (mediated) effect through popularity with $\beta - \beta'$, and compare the sizes of indirect effect to the total effect to gauge the importance of popularity. Standard errors for these measures are obtained by bootstrapping. In a similar way, we further examine how self-esteem and personality attractiveness mediate the relationship between beauty and risky behaviours.

5 Results

5.1 Baseline Results

Table 1 presents estimates of the effect of adolescent attractiveness on risky behaviours. We report all results separately for males and female.[9] The top two panels (A & B) provide estimates of the probability of engaging in one of six different risky behaviours for females and males respectively. The bottom two panels (C & D) provide corresponding estimates for frequency of risky behaviours. Taken together, they provide estimates of the effects of beauty on adolescent risky behaviours at both the intensive and extensive margins. For simplicity the incidence models

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

are estimated as linear probability models, while the frequency models are estimated by least squares.

These estimates show marked variation in both the incidence and frequency of risky behaviours according to interviewer reported beauty. These effects, typically work in the same direction and are quite consistent across genders. More attractive adolescents are less likely to smoke, engage in substance use, and (for girls) become pregnant. The estimates for unprotected sex are consistently negative although not significant. Moreover, these effects are of a substantial magnitude. Comparing the size of the estimated coefficients to the sample mean incidences reported at the bottom of each panel, these reductions are typically in the order of 5–10%. For "ever pregnant" the effect is even larger. Attractive adolescent girls are 15 percent less likely to have ever been pregnant by the time of interview (ages vary between 13 and 19). The one outlying behaviour is drinking alcohol. Attractive adolescents are more likely to have consumed alcohol over the past year, and this effect is much larger for girls. The effect of attractiveness on binge drinking is small and not statistically significant.

One issue might be that these models of incidence may hide important variation in the frequency of these risky behaviours. In turn, at least in some cases, this variation in the intensive margin may be the particular source of policy concern as harms may be concentrated in high frequencies of risky behaviours. To examine this, the bottom two panels report analogous results for the frequency of these risky behaviours. For teenage girls this results largely follow those for incidence. Likewise for boys the estimated effects on frequency largely follow those for in-

cidence, although the positive effects of attractiveness on drinking now becomes statistically insignificant, whereas the negative effects on substance use are now statistically significant. As a general point, these estimates are less precise. This may reflect our decision to estimate these models by OLS when count data models may be more appropriate. In the next section, we return to this point and estimate nonlinear models.

Appendix Tables A2 and A3 report more results based on a 3-point and 5-point scale of attractiveness respectively, with average looking as the reference group. Table A2 shows that being unattractive has only a statistically significant effect in two cases, whereby unattractive males are less likely to engage in drinking or binge drinking. Table A3 demonstrates that while there is an apparent gap between very attractive and attractive females, these differences are much smaller for males. These results highlight more nuanced heterogenous effects by gender. As a general rule, the beauty effects on risky behaviours are stronger for girls than for boys.

5.2 Robustness and Heterogeneity

Table 2 reports alternative results using nonlinear estimation strategies. Panels A & B report odds ratios following a logistic model for binary outcomes, and panels C & D report the coefficients from a Poisson model where frequencies of risky behaviours are the outcomes. 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 and interviewer levels to take into account selection issues at these levels. The results are, in essence, con-

sistent with those in Table 1, but with some expected improvement in precision. The two cases where evidence becomes weaker in terms of statistical significance are the incidence of pregnancy for girls, and the frequency of substance use for boys. Two cases become borderline significant at standard levels: the incidences of binge drinking for girls and for boys. In summary, patterns, signs, and statistical significance largely hold under these estimation approaches, with slight variations. From this point on, for brevity we report models of incidence of behaviour only.

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 Table 3, we rerun the estimation on a subsample 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.

Lastly, we investigate whether there are potential heterogeneities across racial or age groups. There exist large racial disparities in risky behaviours, as well as some small variation in attractiveness ratings across racial groups in our data. Table 4 reports the results for racial heterogeneity by including an interaction term between attractive and non-white. In a number of cases, we recover differences by race. Beauty effects on alcohol consumption is mainly driven by white adolescents, whereas these effects for non-whites are significantly smaller. For female smoking, the results are mainly driven by non-whites. For male

substance use, the results are mainly driven by whites. In the case of female smoking, the effects are stronger for non-whites. In the case of males' unprotected sex, the effects are stronger among whites. In the case of (females') pregnancy, there does not seem to be significant differences between whites and non-whites. Overall racial heterogeneities seem to be behaviour-specific. 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. Results in Table 5 show that there is little to no heterogeneity across age groups, with one exception where the effects on male substance use are mainly driven by lower age groups. In all other cases, the results suggest the beauty effects are similar across high school ages.

6 Mechanisms

Recent research on adolescence (Clark and Lohéac, 2007; Gardner and Steinberg, 2005) has focussed on risk-taking behaviour by an individual caused by emotional and social factors, such as peer effects.[10] 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 their genetics (Anokhin et al., 2009). The health literature seeks to pin down determinants of risky behaviour to genetic, social environmental and personality factors.

[10] In results available on request, we examined the robustness of our results to peer effects by controlling for peer average risky behaviour at the school-grade or school-grade-gender level. The results on beauty are unchanged. We stress that this approach does not identify peer effects on risky behaviours, but it the relationship between beauty and risky behaviours does not reflect peer effects.

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.

First, we look at the role of social environment. Beauty may affect engagement in risky behaviours with popularity as a potential mediator. For instance, a popular student may try to maintain their social status within the network by engaging in certain "cool" behaviours such as attending large social gatherings, or they are more likely to pick up certain behaviours through a larger social network. Here we argue that individuals who are more physically attractive than the base-level case may be more likely to be popular and as a result may be more likely to be invited or be part of more social events in which certain risky behaviours such as the consumption of alcohol or illicit drugs may take place.

In investigating the underlying mechanism through which beauty might affect risk behaviours, our main approach is to utilise mediation analysis using popularity as a potential mediator. The results are presented in Table 6. Column (1) presents the effect of attractiveness on popularity. We find that attractiveness strongly increases popularity for both males and females. Having established this, we next consider whether the effect on risky behaviours is mediated through popularity. Columns (2)–(7) report the results for equation (2), where popularity is included in the model. The results show that popularity is strongly correlated with risky behaviours. Specifically, for females, popularity is positively correlated with smoking, drinking, binge drinking, and substance use, and negatively correlated with pregnancy. Unprotected sex is not sig-

nificantly associated with popularity for females. For males, popularity is strongly associated with drinking, binge drinking, substance use, and unprotected sex, but not correlated with smoking.

To better understand the extent to which popularity explains the effect of attractiveness on risky behaviours, we decompose the total effect into the direct effect (of beauty on risky behaviours) and the indirect effect (mediated through popularity) in Table 7. For females, the indirect effect and direct effect go in the same direction on drinking and pregnancy, explaining about 40% of total effect for drinking, and about 25% of the total effect on pregnancy. The direct and indirect effects take opposite signs for smoking, binge drinking, and substance use, cancelling out some of the negative direct effect. For males, the direct and indirect effects take the same signs for drinking, binge drinking, and unprotected, explaining about or over half of the total effect in each case, and take opposite signs for smoking and substance use.

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 noncognitive traits and skills in the formation and development of human capital (Heckman and Rubinstein, 2001; Cunha and Heckman, 2007; Kautz et al., 2014). These noncognitive 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 (see Table A4 column 1) and to have higher than average levels of self-esteem (see Table A5 column 1).

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.

In addition, we conducted mediation analyses for self-esteem and personality attractiveness, in Tables 8 and 9. The mediated effects through both channels are consistently negative, in the sense that both predict less engagement in the full set of examined risky behaviours. These results make an interesting contrast to those on popularity, which generally predict more risky behaviours. For all examined risky behaviours, higher self-esteem explains lower engagement to varying degrees from about 10% to 55% of the net total effect, depending on the particular behaviour (see Table 8). Personality attractiveness predicts lower engagement in risky behaviours between about 45% and 200% of the net total effect (see Table 9). The mediated effects by self-esteem and personality attractiveness operate in the same direction as the net total effects for all examined risky behaviours, except drinking and binge drinking, in which cases the mediated effects go against the net total effects.

Combined, these suggest that beauty 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.

7 Conclusion

This paper uses Add Health data to investigate how beauty influences a range of adolescent risky behaviours in the United States. We exploit the structure of this data and identify these effects based on within-school and within-interviewer variations in ratings of attractiveness. Our main finding is that attractiveness of adolescents has marked effects on a range of risky behaviours. For instance, more attractive teens are less likely to smoke than teens of average or lower attractive teens. 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, attractive adolescent females are less likely to use illicit substances, engage in unprotected sex and become pregnant. These results are robust a range of alternative estimation approaches and attempts to rule out confounders. In extensions using mediation analysis we 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 noncognitive 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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Table 1: Beauty and risky behaviors

	Risk behaviors					
	(1) Smoke	(2) Drink	(3) Binge drink	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female subsample, dep. var. = engagement in risky behaviour						
Attractive	-0.021^{**}	0.046^{***}	0.011	-0.018^{***}	-0.009	-0.011^{**}
	(0.010)	(0.010)	(0.007)	(0.006)	(0.006)	(0.005)
Obs.	15,795	15,795	15,795	15,795	15,795	15,795
Dep. var. mean	0.279	0.458	0.241	0.151	0.119	0.071
Panel B: male subsample, dep. var. = engagement in risky behaviour						
Attractive	-0.026^{***}	0.024^{**}	0.014	-0.014	-0.006	
	(0.009)	(0.010)	(0.009)	(0.009)	(0.006)	
Obs.	15,093	15,093	15,093	15,093	15,093	
Dep. var. mean	0.288	0.454	0.295	0.183	0.107	
Panel C: female subsample, dep. var. = frequency of risky behaviour						
Attractive	-0.406^{**}	0.080^{**}	-0.007	-0.033^{***}	-0.010	-0.024^{***}
	(0.204)	(0.031)	(0.024)	(0.012)	(0.010)	(0.008)
Obs.	15,795	15,795	15,795	15,742	15,794	15,783
Dep. var. mean	4.527	0.998	0.538	0.263	0.134	0.085
Panel D: male subsample, dep. var. = frequency of risky behaviour						
Attractive	-0.504^{**}	0.054	0.001	-0.034^{*}	-0.014	
	(0.194)	(0.033)	(0.029)	(0.020)	(0.010)	
Obs.	15,093	15,093	15,093	15,018	15,093	
Dep. var. mean	4.622	1.152	0.799	0.369	0.109	

Notes This table reports the effect of beauty on a number of risky behaviours. All models control for observable characteristics, school and interviewer fixed effects. Dependent variable is participation in a certain behavior as indicated in the column heading, with 1 = yes and 0 = no for panels *A* and *B*. Dependent variable is the frequency of the risky behavior for panels *C* and *D*. ***, **, 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 2: Nonlinear model results

	Risk behaviors					
	(1) Smoke	(2) Drink	(3) Binge drink	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female subsample, dep. var. = engagement in risky behaviour, logistic model, odds ratio reported						
Attractive	0.898**	1.176***	1.063*	0.866***	0.961	0.882
	(0.041)	(0.044)	(0.038)	(0.040)	(0.049)	(0.071)
Obs.	15,795	15,795	15,795	15,795	15,795	15,795
Dep. var. mean	0.279	0.458	0.241	0.151	0.119	0.071
Panel B: male subsample, dep. var. = engagement in risky behaviour, logistic model, odds ratio reported						
Attractive	0.894***	1.110***	1.086*	0.938	0.954	
	(0.036)	(0.041)	(0.046)	(0.050)	(0.055)	
Obs.	15,093	15,093	15,093	15,093	15,093	
Dep. var. mean	0.288	0.454	0.295	0.183	0.107	
Panel C: female subsample, dep. var. = frequency of risky behaviour, Poisson model						
Attractive	−0.062*	0.063***	−0.019	−0.121***	−0.014	−0.224***
	(0.035)	(0.024)	(0.035)	(0.043)	(0.059)	(0.076)
Obs.	15,795	15,795	15,795	15,742	15,794	15,783
Dep. var. mean	0.279	0.458	0.241	0.148	0.119	0.070
Panel D: male subsample, dep. var. = frequency of risky behaviour, Poisson model						
Attractive	−0.084**	0.040	0.007	−0.076	−0.068	
	(0.034)	(0.026)	(0.030)	(0.049)	(0.082)	
Obs.	15,093	15,093	15,093	15,018	15,093	
Dep. var. mean	0.288	0.454	0.295	0.179	0.107	

Notes This table reports the effect of beauty on a number of risky behaviours. All models control for observable characteristics, school and interviewer averages of the outcome. Panels *A* and *B* estimate a logistic model, where the dependent variable is engagement in a certain behavior as indicated in the column heading, with 1 = yes and 0 = no. Panels *C* and *D* estimate a Poisson model, where the dependent variable is the frequency of the risky behavior. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Odds ratios are reported in panels *A* and *B*, whereas coefficients are reported in panels *C* and *D*. Standard errors clustered at the school level are in parentheses.

Table 3: Robustness check on interview interruption

	Risk behaviors					
	(1) Smoke	(2) Drink	(3) Binge drink	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female subsample, dep. var. = engagement in risky behaviour						
Attractive	-0.013	0.049^{***}	0.010	-0.019^{**}	-0.010	-0.012^{*}
	(0.012)	(0.010)	(0.008)	(0.008)	(0.007)	(0.006)
Obs.	12,133	12,133	12,133	12,133	12,133	12,133
Panel B: male subsample, dep. var. = engagement in risky behaviour						
Attractive	-0.030^{***}	0.022^{**}	0.014	-0.014	-0.005	
	(0.011)	(0.011)	(0.010)	(0.010)	(0.007)	
Obs.	11,876	11,876	11,876	11,876	11,876	

Notes This table reports the effect of beauty on a number of risky behaviours based on the subsample excluding those who had a third person present during the interview. Beauty is categorised as attractive, unattractive and average looking (base group). All models control for observable characteristics, school and interviewer fixed effects. Dependent variable is engagement in a certain behavior as indicated in the column heading, with 1 = yes and 0 = no for panels *A* and *B*. Dependent variable is the frequency of the risky behavior for panels *C* and *D*. ***, **, 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: Racial heterogeneity in the effect of beauty on risky behaviours

	Risk behaviors					
	(1) Smoke	(2) Drink	(3) Binge drink	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female subsample, dep. var. = participation in risky behaviour						
Attractive	-0.005	0.065^{***}	0.029^{***}	-0.010	-0.008	-0.016^{***}
	(0.012)	(0.011)	(0.010)	(0.010)	(0.008)	(0.006)
Attractive	-0.032^{*}	-0.040^{**}	-0.037^{**}	-0.016	-0.002	0.010
$\times$ non-white	(0.018)	(0.018)	(0.015)	(0.015)	(0.012)	(0.011)
Obs.	15,795	15,795	15,795	15,795	15,795	15,795
Dep. var. mean	0.279	0.458	0.241	0.151	0.119	0.071
Panel B: male subsample, dep. var. = participation in risky behaviour						
Attractive	-0.030^{**}	0.030^{**}	0.031^{***}	-0.029^{***}	-0.014^{*}	
	(0.013)	(0.012)	(0.011)	(0.011)	(0.008)	
Attractive	0.009	-0.013	-0.035^{*}	0.032^{**}	0.017	
$\times$ non-white	(0.016)	(0.021)	(0.018)	(0.014)	(0.010)	
Obs.	15,093	15,093	15,093	15,093	15,093	
Dep. var. mean	0.288	0.454	0.295	0.183	0.107	

Notes This table reports the heterogenous effect of beauty on risky behaviours by race. All models control for observable characteristics, school and interviewer fixed effects. Dependent variable is participation in a certain behavior as indicated in the column heading, with 1 = yes and 0 = no for panels *A* and *B*. Dependent variable is the frequency of the risky behavior for panels *C* and *D*. ***, **, 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: Age heterogeneity in the effect of beauty on risky behaviours

	Risk behaviors					
	(1) Smoke	(2) Drink	(3) Binge drink	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female subsample, dep. var. = participation in risky behaviour						
Attractive	-0.021^{*}	0.054^{***}	0.014	-0.017^{*}	-0.007	-0.010^{**}
	(0.011)	(0.011)	(0.008)	(0.009)	(0.007)	(0.004)
Attractive	0.000	-0.018	-0.007	-0.003	-0.005	-0.003
$\times$ age above median	(0.013)	(0.014)	(0.011)	(0.010)	(0.009)	(0.008)
Obs.	15,795	15,795	15,795	15,795	15,795	15,795
Dep. var. mean	0.279	0.458	0.241	0.151	0.119	0.071
Panel B: male subsample, dep. var. = participation in risky behaviour						
Attractive	-0.021^{*}	0.027^{**}	0.009	-0.026^{***}	-0.004	
	(0.012)	(0.012)	(0.010)	(0.008)	(0.007)	
Attractive	-0.011	-0.006	0.010	0.024^{*}	-0.003	
$\times$ age above median	(0.013)	(0.012)	(0.014)	(0.012)	(0.010)	
Obs.	15,093	15,093	15,093	15,093	15,093	
Dep. var. mean	0.288	0.454	0.295	0.183	0.107	

Notes This table reports the heterogenous effect of beauty on risky behaviours by age. All models control for observable characteristics, school and interviewer fixed effects. Dependent variable is participation in a certain behavior as indicated in the column heading, with 1 = yes and 0 = no for panels *A* and *B*. Dependent variable is the frequency of the risky behavior for panels *C* and *D*. ***, **, 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: Relationships among beauty, popularity, and risky behaviours

	Popularity	Risk behaviors					
	(1) Popularity	(2) Smoke	(3) Drink	(4) Binge drink	(5) Substance use	(6) Unprotected sex	(7) Pregnancy
Panel A: Female subsample							
Attractive	0.230***	−0.014	0.023**	−0.003	−0.021**	−0.004	−0.008
	(0.016)	(0.012)	(0.011)	(0.009)	(0.008)	(0.007)	(0.006)
Popularity		0.019**	0.070***	0.042***	0.020***	0.001	−0.013***
		(0.008)	(0.011)	(0.008)	(0.008)	(0.005)	(0.004)
Obs.	11,182	11,182	11,182	11,182	11,182	11,182	11,182
Panel B: male subsample							
Attractive	0.208***	−0.025**	0.031**	0.016	−0.013	0.003	
	(0.017)	(0.011)	(0.012)	(0.010)	(0.010)	(0.006)	
Popularity		0.009	0.048***	0.046***	0.024***	0.013***	
		(0.009)	(0.009)	(0.008)	(0.009)	(0.004)	
Obs.	10,451	10,451	10,451	10,451	10,451	10,451	

Notes Column (1) reports the results for the effects of physical attractiveness on popularity, and columns (2)–(7) report the effects of physical attractiveness and popularity on risky behaviours. All models control for observable characteristics, school and interviewer fixed effects. ***, **, 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: Mediation analysis results with popularity as the mediatior

	Participation in risk behavior						
	(1) Smoke	(2) Drink	(3) Binge	(4) Substance use	(5) Unprotected sex	(6) Pregnancy	
Panel A: Female							
Direct effect	-0.014	0.023^{**}	-0.003	-0.021^{***}	-0.004	-0.008	
	(0.009)	(0.010)	(0.009)	(0.007)	(0.007)	(0.005)	
Indirect effect (through popularity)	0.004^{***}	0.016^{***}	0.010^{***}	0.005^{***}	0.000	-0.003^{***}	
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	
Total effect	-0.010	0.039^{***}	0.007	-0.017^{**}	-0.004	-0.011^{**}	
	(0.009)	(0.010)	(0.009)	(0.007)	(0.007)	(0.005)	
Obs.	11,182	11,182	11,182	11,182	11,182	11,182	11,182
Panel B: male							
Direct effect	-0.025^{**}	0.031^{***}	0.016	-0.013	0.003		
	(0.010)	(0.011)	(0.010)	(0.008)	(0.007)		
Indirect effect (through popularity)	0.002	0.010^{***}	0.010^{***}	0.005^{***}	0.003^{***}		
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)		
Total effect	-0.023^{**}	0.041^{***}	0.025^{***}	-0.009	0.006		
	(0.010)	(0.011)	(0.010)	(0.008)	(0.007)		
Obs.	10,451	10,451	10,451	10,451	10,451	10,451	

Notes This table reports the results of a mediation analysis, with popularity as the mediator for the effect of beauty on risky behaviors. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors are obtained by bootstrapping.

Table 8: Mediation analysis results with self-esteem as the mediatior

	engagement in risk behavior					
	(1) Smoke	(2) Drink	(3) Binge	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female						
Direct effect	-0.014^{*}	0.053^{***}	0.016^{**}	-0.012^{**}	-0.007	-0.010^{**}
	(0.008)	(0.008)	(0.007)	(0.006)	(0.006)	(0.004)
Indirect effect	-0.007^{***}	-0.007^{***}	-0.006^{***}	-0.005^{***}	-0.002^{***}	-0.001^{***}
(through self-esteem)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Total effect	-0.021^{***}	0.046^{***}	0.011	-0.018^{***}	-0.009	-0.011^{**}
	(0.008)	(0.008)	(0.007)	(0.006)	(0.006)	(0.004)
Obs.	15,760	15,760	15,760	15,760	15,760	15,760
Panel B: male						
Direct effect	-0.021^{**}	0.029^{***}	0.018^{**}	-0.010	-0.004	
	(0.008)	(0.009)	(0.008)	(0.007)	(0.006)	
Indirect effect	-0.006^{***}	-0.006^{***}	-0.005^{***}	-0.005^{***}	-0.002^{***}	
(through self-esteem)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	
Total effect	-0.027^{***}	0.023^{***}	0.014^{*}	-0.014^{**}	-0.006	
	(0.008)	(0.009)	(0.008)	(0.007)	(0.006)	
Obs.	15,061	15,061	15,061	15,061	15,061	

Notes This table reports the results of a mediation analysis, with self-esteem as the mediator for the effect of beauty on risky behaviors. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors are obtained by bootstrapping.

Table 9: Mediation analysis results with personality attractiveness as the mediatior

	engagement in risk behavior					
	(1) Smoke	(2) Drink	(3) Binge	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female						
Direct effect	0.013	0.065***	0.032***	0.006	0.005	−0.006
	(0.008)	(0.009)	(0.008)	(0.007)	(0.006)	(0.005)
Indirect effect	−0.034***	−0.020***	−0.021***	−0.024***	−0.014***	−0.006***
(through personality attractiveness)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)
Total effect	−0.021***	0.045***	0.011	−0.018***	−0.009	−0.011**
	(0.008)	(0.008)	(0.007)	(0.006)	(0.006)	(0.004)
Obs.	15,794	15,794	15,794	15,794	15,794	15,794
Panel B: male						
Direct effect	−0.003	0.037***	0.034***	0.005	0.006	
	(0.009)	(0.010)	(0.009)	(0.008)	(0.006)	
Indirect effect	−0.023***	−0.013***	−0.019***	−0.018***	−0.012***	
(through personality attractiveness)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	
Total effect	−0.026***	0.024***	0.014*	−0.014*	−0.006	
	(0.008)	(0.009)	(0.008)	(0.007)	(0.006)	
Obs.	15,093	15,093	15,093	15,093	15,093	

Notes This table reports the results of a mediation analysis, with personality attractiveness as the mediator for the effect of beauty on risky behaviors. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors are obtained by bootstrapping.

A Appendix

Table A1: Summary statistics by sex

	Female (51.1%)		Male (48.9%)		Total	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
Beauty						
Attractive	0.566	(0.496)	0.429	(0.495)	0.499	(0.500)
Attractive (3-point scale)	0.566	(0.496)	0.429	(0.495)	0.499	(0.500)
Average (3-point scale)	0.383	(0.486)	0.505	(0.500)	0.442	(0.497)
Unattractive (3-point scale)	0.052	(0.221)	0.066	(0.248)	0.059	(0.235)
Very attractive (5-point scale)	0.186	(0.389)	0.101	(0.302)	0.145	(0.352)
Attractive (5-point scale)	0.379	(0.485)	0.328	(0.470)	0.354	(0.478)
About average (5-point scale)	0.383	(0.486)	0.505	(0.500)	0.442	(0.497)
Unattractive (5-point scale)	0.036	(0.185)	0.054	(0.225)	0.044	(0.206)
Very unattractive (5-point scale)	0.016	(0.126)	0.012	(0.110)	0.014	(0.118)
Risky behaviour						
Smoking	0.279	(0.449)	0.288	(0.453)	0.284	(0.451)
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)
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)
Smoking (Days)	4.527	(9.793)	4.622	(9.842)	4.573	(9.817)
Drinking (Days)	0.998	(1.371)	1.152	(1.581)	1.073	(1.479)
Binge drinking (Days)	0.538	(1.159)	0.799	(1.475)	0.665	(1.329)
Illegal drugs (Frequency)	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 (Frequency)	0.085	(0.347)			0.085	(0.347)

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	Female (51.1%)		Male (48.9%)		Total	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
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)
Household 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						
Third person at interview	0.232	(0.422)	0.213	(0.409)	0.223	(0.416)
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)

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	Female (51.1%)		Male (48.9%)		Total	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
Popularity (log in-degree)	1.535	(0.677)	1.393	(0.740)	1.466	(0.712)
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.

Table A2: Results using 3-point scale of beauty

	Risk behaviors					
	(1) Smoke	(2) Drink	(3) Binge drink	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female subsample, dep. var. = participation in risky behaviour						
Attractive (3-point scale)	-0.019^{*}	0.042^{***}	0.010	-0.018^{***}	-0.010	-0.011^{**}
	(0.010)	(0.010)	(0.007)	(0.007)	(0.006)	(0.005)
Unattractive (3-point scale)	0.010	-0.025	-0.006	-0.003	-0.008	0.000
	(0.016)	(0.020)	(0.014)	(0.014)	(0.010)	(0.011)
Obs.	15,795	15,795	15,795	15,795	15,795	15,795
Dep. var. mean	0.279	0.458	0.241	0.151	0.119	0.071
Panel B: male subsample, dep. var. = participation in risky behaviour						
Attractive (3-point scale)	-0.025^{**}	0.018^{*}	0.008	-0.014	-0.004	
	(0.010)	(0.009)	(0.009)	(0.009)	(0.006)	
Unattractive (3-point scale)	0.011	-0.055^{***}	-0.055^{***}	-0.007	0.017	
	(0.018)	(0.020)	(0.018)	(0.013)	(0.011)	
Obs.	15,093	15,093	15,093	15,093	15,093	
Dep. var. mean	0.288	0.454	0.295	0.183	0.107	
Panel C: female subsample, dep. var. = frequency of risky behaviour						
Attractive (3-point scale)	-0.413^{**}	0.074^{**}	-0.013	-0.035^{***}	-0.013	-0.024^{***}
	(0.208)	(0.033)	(0.024)	(0.013)	(0.011)	(0.008)
Unattractive (3-point scale)	-0.054	-0.048	-0.049	-0.011	-0.024	-0.002
	(0.346)	(0.053)	(0.039)	(0.028)	(0.021)	(0.014)
Obs.	15,795	15,795	15,795	15,742	15,794	15,783
Dep. var. mean	4.527	0.998	0.538	0.263	0.134	0.085
Panel D: male subsample, dep. var. = frequency of risky behaviour						
Attractive (3-point scale)	-0.509^{**}	0.040	-0.007	-0.037^{*}	-0.016	
	(0.208)	(0.032)	(0.028)	(0.020)	(0.010)	
Unattractive (3-point scale)	-0.045	-0.120	-0.074	-0.028	-0.016	
	(0.381)	(0.074)	(0.068)	(0.035)	(0.020)	
Obs.	15,093	15,093	15,093	15,018	15,093	
Dep. var. mean	4.622	1.152	0.799	0.369	0.109	

Notes This table reports the effect of beauty on a number of risky behaviours. All models control for observable characteristics, school and interviewer fixed effects. Dependent variable is participation in a certain behavior as indicated in the column heading, with 1 = yes and 0 = no for panels *A* and *B*. Dependent variable is the frequency of the risky behavior for panels *C* and *D*. ***, **, 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 A3: Results using 5-point scale of beauty

	Risk behaviors					
	(1) Smoke	(2) Drink	(3) Binge drink	(4) Substance use	(5) Unprotected sex	(6) Pregnancy
Panel A: Female subsample, dep. var. = participation in risky behaviour						
Very attractive (5-point scale)	−0.025*	0.054***	0.023**	−0.020*	−0.019**	−0.016**
	(0.014)	(0.015)	(0.011)	(0.011)	(0.008)	(0.008)
Attractive (5-point scale)	−0.018*	0.038***	0.006	−0.017**	−0.007	−0.010*
	(0.010)	(0.010)	(0.007)	(0.007)	(0.007)	(0.005)
Unattractive (5-point scale)	0.028	−0.039*	−0.023	0.014	−0.004	0.006
	(0.021)	(0.023)	(0.016)	(0.015)	(0.012)	(0.012)
Very unattractive (5-point scale)	−0.034	0.011	0.038	−0.041*	−0.018	−0.015
	(0.026)	(0.031)	(0.028)	(0.024)	(0.021)	(0.016)
Obs.	15,795	15,795	15,795	15,795	15,795	15,795
Panel B: male subsample, dep. var. = participation in risky behaviour						
Very attractive (5-point scale)	−0.024	0.015	0.009	−0.016	−0.008	
	(0.016)	(0.018)	(0.014)	(0.014)	(0.010)	
Attractive (5-point scale)	−0.025***	0.019*	0.008	−0.014	−0.003	
	(0.010)	(0.010)	(0.010)	(0.010)	(0.006)	
Unattractive (5-point scale)	0.011	−0.071***	−0.070***	−0.012	0.016	
	(0.019)	(0.022)	(0.020)	(0.014)	(0.011)	
Very unattractive (5-point scale)	0.015	0.019	0.019	0.017	0.017	
	(0.039)	(0.041)	(0.036)	(0.029)	(0.021)	
Obs.	15,093	15,093	15,093	15,093	15,093	
Panel C: female subsample, dep. var. = frequency of risky behaviour						
Very attractive (5-point scale)	−0.700***	0.109**	0.027	−0.046**	−0.009	−0.029***
	(0.244)	(0.042)	(0.032)	(0.021)	(0.016)	(0.009)
Attractive (5-point scale)	−0.310	0.061*	−0.027	−0.031**	−0.014	−0.023***
	(0.225)	(0.034)	(0.025)	(0.013)	(0.011)	(0.008)
Unattractive (5-point scale)	0.272	−0.040	−0.065	0.025	−0.004	−0.003
	(0.440)	(0.061)	(0.043)	(0.029)	(0.022)	(0.015)
Very unattractive (5-point scale)	−0.876	−0.061	−0.003	−0.097*	−0.071**	0.000
	(0.580)	(0.094)	(0.080)	(0.049)	(0.035)	(0.034)
Obs.	15,795	15,795	15,795	15,742	15,794	15,783
Panel D: male subsample, dep. var. = frequency of risky behaviour						
Very attractive (5-point scale)	−0.425	0.067	0.001	−0.047	−0.007	
	(0.337)	(0.050)	(0.045)	(0.036)	(0.020)	
Attractive (5-point scale)	−0.529***	0.035	−0.008	−0.035	−0.018*	
	(0.201)	(0.033)	(0.029)	(0.022)	(0.009)	
Unattractive (5-point scale)	0.035	−0.162**	−0.113	−0.034	−0.011	
	(0.398)	(0.075)	(0.074)	(0.037)	(0.023)	
Very unattractive (5-point scale)	−0.414	0.087	0.116	0.001	−0.039	
	(0.801)	(0.133)	(0.108)	(0.069)	(0.028)	
Obs.	15,093	15,093	15,093	15,018	15,093	

Notes This table reports the effect of beauty on a number of risky behaviours. All models control for observable characteristics, school and interviewer fixed effects. Dependent variable is participation in a certain behavior as indicated in the column heading, with 1 = yes and 0 = no for panels *A* and *B*. Dependent variable is the frequency of the risky behavior for panels *C* and *D*. ***, **, 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 A4: Relationships among physical attractiveness, personality attractiveness, and risky behaviours

	Personality	Risk behaviors					
	(1) Personality	(2) Smoke	(3) Drink	(4) Binge drink	(5) Substance use	(6) Unprotected sex	(7) Pregnancy
Panel A: Female subsample							
Attractive	0.444^{***}	0.010	0.060^{***}	0.028^{***}	0.002	0.004	-0.005
	(0.010)	(0.011)	(0.010)	(0.008)	(0.008)	(0.007)	(0.005)
Personality attractive		-0.069^{***}	-0.032^{***}	-0.040^{***}	-0.045^{***}	-0.029^{***}	-0.015^{***}
		(0.008)	(0.009)	(0.009)	(0.007)	(0.007)	(0.006)
Obs.	15,794	15,794	15,794	15,794	15,794	15,794	15,794
Panel B: male subsample							
Attractive	0.454^{***}	-0.005	0.036^{***}	0.034^{***}	0.002	0.004	
	(0.011)	(0.010)	(0.011)	(0.011)	(0.009)	(0.007)	
Personality attractive		-0.046^{***}	-0.027^{**}	-0.043^{***}	-0.034^{***}	-0.021^{***}	
		(0.009)	(0.011)	(0.010)	(0.007)	(0.006)	
Obs.	15,093	15,093	15,093	15,093	15,093	15,093	

Notes Column (1) reports the results for the effects of physical attractiveness on personality attractiveness, and columns (2)–(7) report the effects of physical attractiveness and personality attractiveness on risky behaviours. All models control for observable characteristics, school and interviewer fixed effects. ***, **, 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: Relationships among physical attractiveness, self-esteem, and risky behaviours

	Self-esteem	Risk behaviors					
	(1) Self-esteem	(2) Smoke	(3) Drink	(4) Binge drink	(5) Substance use	(6) Unprotected sex	(7) Pregnancy
Panel A: Female subsample							
Attractive	0.291***	−0.014	0.053***	0.016**	−0.012*	−0.007	−0.010**
	(0.050)	(0.010)	(0.010)	(0.007)	(0.007)	(0.006)	(0.005)
Self-esteem		−0.024***	−0.026***	−0.020***	−0.018***	−0.008***	−0.003***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Obs.	15,760	15,760	15,760	15,760	15,760	15,760	15,760
Panel B: male subsample							
Attractive	0.291***	−0.021**	0.029***	0.018**	−0.010	−0.004	
	(0.050)	(0.009)	(0.010)	(0.009)	(0.009)	(0.006)	
Self-esteem		−0.022***	−0.021***	−0.017***	−0.016***	−0.006***	
		(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	
Obs.	15,061	15,061	15,061	15,061	15,061	15,061	

Notes Column (1) reports the results for the effects of physical attractiveness on self-esteem, and columns (2)–(7) report the effects of physical attractiveness and self-esteem on risky behaviours. All models control for observable characteristics, school and interviewer fixed effects. ***, **, and * denote statistical significance at 0.01, 0.05, and 0.10 levels respectively. Standard errors clustered at the school level are in parentheses.