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Unpacking the Beauty Premium: What Channels Does It Operate Through, and Has It Changed Over Time?*

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Using data from representative samples of the Australian population in 1984 and 2009, we make two main contributions to analysis of the economic returns of beauty. First, we broaden analysis of the effects of beauty beyond the labour market to examine its relation to household income. We find that beauty significantly affects total household income – via respondents' probability of employment and their hours of work and hourly wage, and whether they have a partner who contributes income to the household. Second, we examine whether the returns to beauty in Australia changed between the 1980s and 2000s. It is found that, for the most part, the effect of beauty was constant across this period. There is, however, some evidence of an increasing effect of beauty on the likelihood that a female respondent is employed, which we suggest may be due to selection effects and the growth in female workforce participation.

I Introduction

Analysis of the effects of beauty is by now a well-established area of research in economics.[1] Beginning with the seminal work of Hamermesh and Biddle (1994) on the Canadian and US labour markets, several studies have shown that more attractive people earn higher hourly wages. This appears to be true in labour markets as diverse as Britain (Harper, 2000) and Shanghai (Hamermesh *et al.*, 2002), and within occupations including attorneys (Biddle & Hamermesh, 1998), sales assistants (Sachsida *et al.*, 2003) and NFL quarterbacks (Berri *et al.*, 2011).

Beauty effects have also been found in other domains. For example, beautiful people tend to be happier (Hamermesh & Abrevaya, 2012), more likely to be successful in soliciting charitable donations (Landry *et al.*, 2006), more likely to raise revenues of their firms (Pfann *et al.*, 2000), have a better chance of being elected into parliament (Klein & Rosar, 2005; King & Leigh, 2009; Berggren *et al.*, 2010), do better on TV game shows (Belot *et al.*, 2012), have higher earnings as prostitutes (Arunachalam & Shah, 2010) and are less likely to become criminals (Mocan & Tekin, 2010).

Our study extends this international literature on the effects of beauty in two important ways, using data from surveys of the Australian population undertaken in 1984 and 2009. First, we

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[1]Hamermesh (2011) provides an excellent overview.

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broaden the analysis of the effects of beauty beyond the labour market. We do this by investigating the association between beauty and total household income, and with individual components of household income such as labour and non-labour income.[2] Second, we examine the stability of the returns to beauty across time; specifically, whether the effects of beauty changed between the survey dates.

Our objective in extending the analysis of the effects of beauty to household income and its components was to provide a broader perspective on where beauty matters and on the welfare implications of attractiveness. For example, if discrimination (what Hamermesh has referred to as 'lookism') causes more attractive people to earn higher wages, it might also cause them to be more likely to be employed, hence magnifying the distributional consequences of beauty.

Establishing whether beauty has a consistent significant impact across time is an important source of information about the robustness of the beauty premium. Putting together the findings from previous studies – using data collected at different times – has been suggestive of stable effects of beauty, but Hamermesh (2011, p. 50) has noted: 'Without any additional evidence… there is no sure way of deciding this issue'. Our study, which uses the same survey instrument on the Australian population with an interval of 25 years, does provide the 'additional evidence' described by Hamermesh. Knowing whether there have been changes in the returns to beauty in recent years may also be informative about factors that mediate the effect of beauty on economic outcomes, such as anti-discrimination legislation or social trends towards a greater emphasis on body image and physical appearance.

Similar to previous studies for other countries, we find that beauty significantly affects hourly wages of workers in Australia. We also find broader effects of beauty on total household income – and that this derives from a relationship between beauty and a respondent's probability of employment, as well as whether they have a partner who contributes income to the household. Returns to beauty via the effect on a worker's hourly wage seem to have been constant in Australia between the 1980s and 2000s, confirming the stability of the beauty effect hypothesised by Hamermesh. We do find some evidence of an increasing effect of beauty on the likelihood that a female respondent is employed, which we suggest may be due to selection effects and the growth in female workforce participation.

The article proceeds as follows. Section II describes the data sources, and presents descriptive information on the distribution of beauty in Australia. Section III describes the theoretical framework and the empirical method. Section IV presents results and gives a summary of the main findings and provides some interpretation. Section V presents results from supplementary robustness analysis. Concluding comments are in section VI.

II Data Sources and Descriptive Information on Beauty

We use data on the Australian population from two sources: (i) The National Social Science Survey 1984 (NSSS84); and (ii) Surveys undertaken by Roy Morgan Research in early 2009 (RM09). NSSS84 is a nationally representative face-to-face survey of the urban population that was undertaken by researchers at Australian National University in 1984 and 1985. Importantly, for our purposes, the survey includes a rating of a respondent's attractiveness by the interviewer, as well as information on income and demographic variables. RM09 is composed of data from the regular weekly face-to-face 'Establishment Survey' undertaken by Roy Morgan Research. Our data are from two surveys we commissioned on 16–17 May 2009 and 23–24 May 2009. Data on beauty and information on income and demographic variables were obtained by adding the same questions available from NSSS84 to the Roy Morgan survey.[3]

The beauty question in NSSS84, which we have replicated in RM09, is:

> In comparison with other people of his/her age would you say the person is [more attractive than average]?

[2] Harper (2000) examines effect of attractiveness on components of household income in the United Kingdom, including respondent's employment status, earnings, marital status and income of partner.

[3] For extra details on the data sources see the Appendix I. An unpublished appendix (available on request from the authors) provides a detailed description of the questions used to construct variables (see Table SA1).

a) Very much more
b) Much more
c) More
d) About average
e) Below average
f) Well below average

Figure 1 presents information on the distribution of responses on beauty from the 1984 and 2009 surveys for respondents aged 18–64 years. In each survey, and for both males and females, the most common ratings are 'about average' and 'more' attractive than average. The main change between the 1984 and 2009 surveys, common to both males and females, is increased dispersion in ratings; for example, the likelihood of a rating at the lower or upper ends of the distribution is higher in 2009 than 1984. The extent of this shift in the distribution of ratings across time is quite large; especially an increase in the proportion rated as 'below average'.

The question on attractiveness in NSSS84 and RM09 is answered by interviewers. Hence, validity of the data depends on consistency of perspective and standards of beauty across interviewers, and on interviewers being able to separate a respondent's physical attractiveness from other characteristics.

Hamermesh and Biddle (1994, p. 1175) argue that: '…within a culture at a point in time there is tremendous agreement on standards of beauty'; and a standard finding in the beauty literature is that inter-rater correlations tend to be high (see for example Langlois *et al.*, 2000). We are not able to address this issue for NSSS84 data. We have, however, formally tested consistency between interviewers in the RM09 survey. We asked all interviewers in the 2009 survey to score the beauty of ten people depicted in colour photographs.[4] The average inter-item covariance was 0.111, and Cronbach's alpha coefficient was 0.576. Put another way, across the ten photos, the cross-interviewer variation ranged from 0.64 to 0.95 of a standard deviation. The largest cross-interviewer standard deviation (i.e. the greatest disagreement between interviewers) was when rating the youngest subject (a 25-year-old female) and the oldest subject (a 90-year-old female).

The literature on effects of beauty has used either internal personnel records and photographs or sample surveys. Both approaches have drawbacks. Personnel records typically only allow a researcher to estimate returns to beauty within a workplace. Face-to-face surveys carry the risk of endogeneity: that the person carrying out the survey may have their evaluation of a respondent's beauty affected by other characteristics such as confidence, intellect or dress (which may be related to earnings). In theory, this problem could be solved by taking a photograph of the respondent, and having that photograph rated by an external assessor. But in practice, it is likely that many respondents would refuse to participate in such a process. Given that our study uses a face-to-face measure, it is important to keep in mind that some part of the returns to beauty may reflect confounding influences. We do seek, however, as a robustness check, to control for potential confounding influences, and find that our results are largely unaffected.

III Empirical Framework and Method

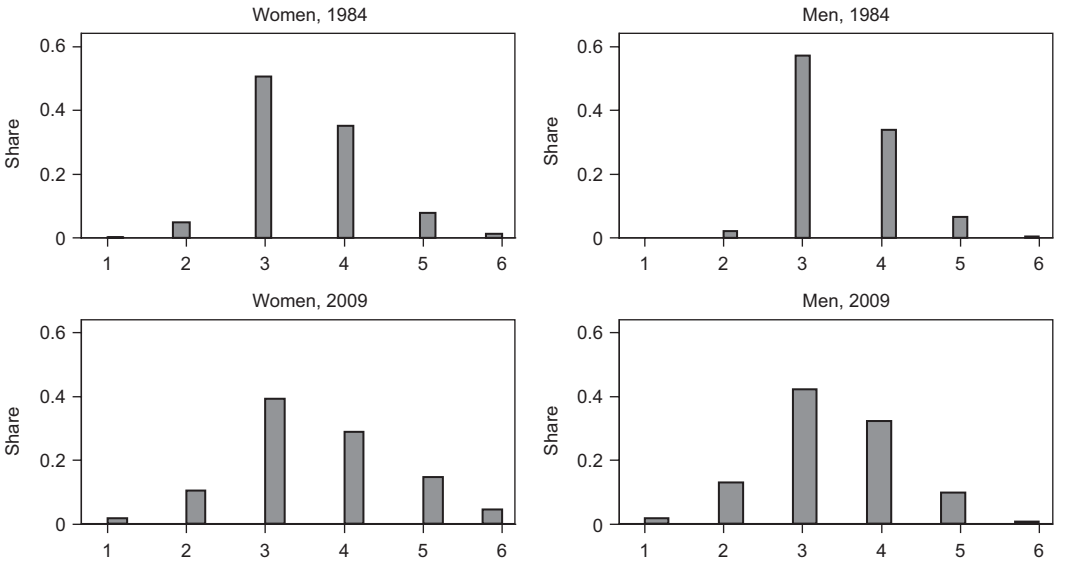
The organising principle for our analysis is to study the effect of beauty on household income. We proceed in two stages. First, we examine whether beauty affects household income. Second, we investigate the channels through which beauty affects household income. To do this, we adopt a simple framework for thinking about the determinants of household income:

$$HY_{it} = E_{it} \cdot (H_{it}|E_{it} = 1) \cdot (w_{it}|E_{it} = 1) + NL_{it} \cdot (NLY_{it}|NL_{it} = 1) + P_{it} \cdot (PY_{it}|P_{it} = 1). \quad (1)$$

Total household income of person i at time t, HY_{it}, is assumed to depend on that person's own income from labour market activity, on their non-labour income, and on the income of their partner. The right-hand side of (1) disaggregates total household income into these components. The first component is income from the person's own labour market activity, where E_{it} is an indicator for whether the person is employed at time t, $(H_{it}|E_{it} = 1)$ is hours of work conditional on being

[4] The photos used are available from the authors on request. Because all our specifications include interviewer fixed effects, we standardized each rater's responses to a mean of zero. This accounts for the possibility that some raters might have been more or less generous to all 10 photos. For ease of interpretation, we also standardized each rater's responses to a standard deviation of one. An unpublished Appendix (available on request from the authors) presents the distribution of interviewer responses to the 10 photos (see Figure SA1).

FIGURE 1
Distribution of beauty ratings across the surveys



Raters were asked: 'In comparison with other people of his/her age would you say the person is more attractive than average?'. Possible answers were 1: Well below average, 2: Below average, 3: About average, 4: More, 5: Much more, 6: Very much more.

employed and $(w_{it}|E_{it} = 1)$ is the hourly wage rate conditional on being employed. The second component is person i's non-labour income at time t, where NL_{it} is an indicator for receiving positive non-labour income, and $(NLY_{it}|NL_{it} = 1)$ is non-labour income for person i conditional on receiving that type of income. The third component is the partner's income at time t, where P_{it} is an indicator for whether person i has a partner, and $(PY_{it}|P_{it} = 1)$ is person i's partner's income at time t conditional on having a partner.

Obviously, this framework is only an approximate representation of the components of household income. We ignore that in many households there will be other members of the household apart from a partner who contribute to income. More significantly, where the survey respondent is not the main earner or partner of the main earner (such as a child of that couple), our constructed measure of household income may be a poor proxy for actual household income. Nevertheless, our approach does allow us to go further than previous studies in understanding how beauty affects components of household income.[5] Also, this approach is the most detailed perspective we can provide from the available data.

To examine the relation between beauty and household income (as well as each of its components), we use the regression specification:

$$Y_{it} = \alpha + \gamma_1 B_{it} + \gamma_2 B_{it} I_t^{1984} + \gamma_3 I_t^{1984} + \sigma' X_{it} + \varepsilon_{it} \quad (2)$$

In this model, Y_{it} is an outcome measure for individual i in year t (1984 or 2009), B_{it} is an assessment of the respondent's beauty, I^{1984} is an indicator for respondents surveyed in 1984, X_{it} is a vector of demographics, interacted with survey

[5] Moreover, we are able to show that our results are not significantly affected by excluding households with three or more adults. An unpublished appendix (available on request from the authors) presents the results for this specification (see Table SA4).

years, γ_1, γ_2, γ_3 and σ are parameters and ε is an IID error term.

Our regression specification includes a measure of beauty and an interaction of beauty with a year dummy for 1984. The coefficient on the beauty measure, γ_1, therefore represents the return to beauty in 2009. The sum of that coefficient and the coefficient on the interaction of the beauty variable and indicator for 1984, γ_2, represents the return to beauty in 1984. Whether the return to beauty has changed between the surveys is determined by the statistical significance of the coefficient γ_2 on the interaction variable.

Beauty is coded in two ways. The first approach is categorical. We collapse the interviewer-assessed beauty variable into a trichotomous scale: classifying 'very much more', 'much more', and 'more' as 'above-average looks'; 'below average' and 'well below average' as 'below-average looks'; and 'about average' as the omitted category. Table 1 presents the distribution of the sample across the three categories for 1984 and 2009. The categorical approach has the advantage that we are able to look for asymmetric effects between respondents being rated above average or below average. However, it has the disadvantage that we lose some of the variation in the interviewer measure. The second way that we represent beauty is therefore to rescale the six-point scale into a single z-score. The z-score approach uses all the variation in the available data, and has the advantage that it is simpler to interpret, especially when looking at whether the beauty effect has changed over time. Results using both methods of coding beauty are reported.

Other explanatory variables included are a quadratic in age, an indicator variable for whether the respondent was born overseas, and years of education. We also include the year dummy, interactions of all control variables with the year dummy and interviewer fixed effects. In fact, due to the set of interviewers being disjoint between the 1984 and 2009 surveys, the year dummy is equal to a linear combination of the interviewer effects and so is omitted from the estimated model. The interviewer effects therefore incorporate regional variation in the outcome variable associated with the location where an interviewer was assigned, and change in the nominal value of the outcome variable between 1984 and 2009. We do not include actual labour market experience as a control variable because it is only available in the 1984 survey.

All models are estimated using OLS. Hence, where the dependent variable is binary, such as employment status, the estimation uses a linear probability model. Because we are running a model with interviewer fixed effects, our choice is between linear probability models and conditional fixed effects logit models. There are two disadvantages of logit models over linear probability models. First, it is not possible to use sample weights. Second, the sample is smaller, because fixed effects logit estimations exclude individuals that do not experience within-interviewer variation in the dependent variable (Greene, 2000). In our case, the reduction in sample size is non-trivial. For example, in the employment status model, the male sample falls from 1566 to 995, while the female sample falls from 1604 to 1234. Wooldridge (2002) suggests that a check on the linear probability model is to see how many of the fitted values do not lie between zero and one. Using the example of the employment status models, 186 of 1566 male observations lie outside the unit interval, while nine of 1604 female observations lie outside the unit interval. This suggests to us that the linear probability models are appropriate to the data.

In all models that are estimated we focus on respondents aged between 18 and 64 years, with non-missing covariates, and where the interviewer is known. In models with log income as the dependent variable, we restrict the sample to

TABLE 1
Distribution of Ratings of Beauty

	Males			Females		
	Above average	Average	Below average	Above average	Average	Below average
Australia – RM09	43.0	42.2	14.8	48.5	39.3	12.3
Australia – NSSS84	40.8	57.1	2.1	44.5	50.6	4.9

observations with positive income. For the hourly wage model, we further restrict the sample to full-time workers with wages that appear credible. To do this, we drop observations with hourly wages that are less than half the federal minimum wage (A$5.59 per hour in 1984, $14.31 per hour in 2009), and those that are above the 99th percentile.[6] The sample of workers we use to study labour market outcomes includes self-employed workers, but our findings are robust to also excluding this group.[7]

IV Findings

Findings from our empirical analysis of the effects of beauty are reported in several steps: (i) Effect on household income; (ii) Effect on income from labour market activity: likelihood of employment, hours of work and hourly wage; (iii) Effect on non-labour income: likelihood of earning non-labour income, non-labour income, and (iv) Effect on income from partner: whether have partner, income from partner. We opt not to test these effects in a single specification because the sample sizes differ across the different models estimated.

In the presentation of our results, the returns to beauty in 2009 are the first coefficients in each panel of the table (either 'above-average' or 'below-average'; or the *z*-score for beauty). The returns to beauty in 1984 can be calculated by adding these first coefficients to the interaction coefficients (for example, in the *z*-score specification, the returns to beauty in 1984 are the 'Beauty (*z*-score)' coefficient plus the 'Beauty (*z*-score)*1984' coefficient).

Results are reported for both specifications of the beauty variable. Our discussion, however, focuses mainly on the categorical specification. It is often the case that one of the categories, 'above-average' or 'below-average' beauty, is significantly related to the outcome variable, whereas the continuous specification of beauty is not significantly related to the same outcome. As these specifications for beauty are not nested, we do not formally test between them. Nevertheless, we interpret the results as suggesting a non-linear relation between our outcome variables and beauty that is best captured by the categorical specification for beauty. Put another way, it suggests that the 'beauty premium' is generally not the same size as the 'plainness penalty' (though this could be driven by the asymmetric distribution of beauty ratings rather than the asymmetrical returns to physical beauty).

A common aspect of the results from the regression models that requires some comment is the high value of the R^2. For example, for the model for males with log total household income as the dependent variable the R^2 is 0.71 (see Table 2). This is obviously exceptionally high by the standards of cross-sectional regressions with an income-type variable as the dependent variable. The explanation is the huge explanatory power of the year dummy and interviewer fixed effects. If we estimate the same model without either the year dummy or interviewer effects, the R^2 falls to 0.16. But if we then include the year dummy (which for

TABLE 2
Determinants of Total Household Income (Dependent Variable: Log Total Household Income)

	Men	Women	Persons
Panel A			
Above-average beauty	0.140*	0.031	0.075
	(0.075)	(0.104)	(0.058)
Below-average beauty	−0.288***	−0.097	−0.251***
	(0.110)	(0.154)	(0.086)
Above-average beauty*1984	−0.001	0.097	0.085
	(0.097)	(0.140)	(0.077)
Below-average beauty*1984	−0.117	0.102	0.132
	(0.225)	(0.250)	(0.153)
Observations	1379	1327	2706
R^2	0.71	0.64	0.61
Panel B			
Beauty (*z*-score)	0.103*	0.021	0.071**
	(0.039)	(0.049)	(0.029)
Beauty (*z*-score)*1984	0.002	0.038	0.023
	(0.052)	(0.039)	(0.039)
Observations	1379	1327	2706
R^2	0.71	0.64	0.61

Notes: Standard errors in brackets. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels respectively. All specifications control for a survey year indicator, a quadratic in age, an indicator variable for whether the respondent was born overseas, and years of education (each of which are interacted with the survey year indicator), and interviewer fixed effects. Persons specifications also include a gender dummy, interacted with the survey year indicator.

[6] The Australian federal minimum wage does not apply to all respondents in our sample. For example, workers aged under 21 and workers in uncovered industries could legally be paid below the federal minimum wage.

[7] An unpublished appendix (available on request from the authors) presents sample descriptive statistics for the regression model for household income (see Table SA2).

TABLE 3
Determinants of Total Labour Income

	Men	Women
1. Employment		
(Dependent variable: Whether respondent is employed)		
Panel A		
Above-average beauty	0.080**	−0.047
	(0.034)	(0.043)
Below-average beauty	−0.122***	−0.179***
	(0.047)	(0.061)
Above-average beauty*1984	−0.038	0.146**
	(0.046)	(0.060)
Below-average beauty*1984	−0.009	0.213*
	(0.110)	(0.110)
Observations	1566	1327
R^2	0.39	0.39
Panel B		
Beauty (*z*-score)	0.070***	0.021
	(0.018)	(0.049)
Beauty (*z*-score)*1984	0.035	0.038
	(0.025)	(0.039)
Observations	1566	1327
R^2	0.39	0.38
2. Hours of work		
(Dependent variable: Hours of work)		
Panel A		
Above-average beauty	3.65***	−3.78*
	(1.30)	(1.72)
Below-average beauty	−2.14	0.868
	(1.98)	(2.61)
Above-average beauty*1984	−3.45**	3.50
	(1.65)	(2.16)
Below-average beauty*1984	−3.62	5.33
	(3.70)	(3.88)
Observations	1329	1280
R^2	0.380	0.359
Panel B		
Beauty (*z*-score)	1.94***	−1.96**
	(0.69)	(0.82)
Beauty (*z*-score)*1984	−1.10	1.31
	(0.89)	(1.03)
Observations	1329	1280
R^2	0.377	0.356
3. Hourly wage		
(Dependent variable: Log Hourly wage – Full-time workers)		
Panel A		
Above-average beauty	0.065	0.000
	(0.050)	(0.067)
Below-average beauty	−0.138*	−0.040
	(0.077)	(0.102)
Above-average beauty*1984	0.044	0.035
	(0.067)	(0.115)
Below-average beauty*1984	0.027	−0.026
	(0.180)	(0.174)
Observations	874	387
R^2	0.82	0.92
Panel B		
Beauty (*z*-score)	0.034	−0.016
	(0.026)	(0.031)
Beauty (*z*-score)*1984	0.027	0.035
	(0.036)	(0.049)
Observations	874	387
R^2	0.82	0.92

Note: See Table 2.

example controls for the increase in nominal income) the R^2 increases to 0.52; and if we also include interviewer effects (which effectively add a control for regional variation in income, because interviewers only work specific neighbourhoods) the R^2 is 0.71.[8] Hence, the value of the R^2 is a reflection of the extent of variation across regions and across time in the value of the dependent variables. This effect differs across the models with different dependent variables (e.g. it is less important for employment outcomes than income outcomes), but is of some importance in all the models estimated.

(i) Household Income

Findings from the regression model for the determinants of total household income are reported in Table 2.[9] For male respondents, there is evidence of an effect of beauty on household income for both specifications of beauty. For example, above-average beauty is associated with a premium of 14 log points (15 per cent) and below-average beauty with a penalty of 29 log

[8] R^2 values for regression models for log total household income for females and persons are reported in an unpublished appendix available on request from the authors (see Table SA4)

[9] We report only coefficients on beauty variables in tables in the main text of the article. Full results from regression model for total household income are in an unpublished appendix (available on request from the authors) (see Table SA3). Full results for other regression models are also available on request from the authors.

points (25 per cent), with the latter effect being more highly significant. For female respondents, no evidence of a significant association with beauty is found. For neither group (or specification of beauty) is there evidence of a significant change in the returns to beauty over time.[10]

(ii) Respondent's Labour Income

Findings on the effect of beauty on labour market income are reported in Table 3. Regression models were estimated for whether a respondent was employed at the survey date, a respondent's hours of work and hourly wages for full-time workers.

Probability of employment

There is quite strong evidence that beauty is significantly related to whether a respondent is employed. Primarily, this derives from a negative effect on the probability of employment of being rated as having below-average beauty. The negative effect of below-average beauty was relatively large (12-18 percentage points) and similar in magnitude for males and females in the base year of 2009. In the earlier sample year, 1984, the same effect existed for males, but for females the effect of beauty was not significant.

One possible explanation for the increasing effect of beauty on the likelihood of employment for females over the past 30 years is the combination of selection effects in the decision to work and the growth in female workforce participation. Hamermesh (2011, pp. 55–57) argues that beauty is likely to increase the returns to work more than the returns to home activity, and therefore females in the workforce are disproportionately likely to have above-average beauty. However, as female labour force participation has increased, this selection effect would be predicted to be weaker. (Between 1984 and 2009 the employment/population rate for women rose in Australia from 41 per cent to 55 per cent; ABS, 2012a.) Hence, as female labour force participation has risen, the dispersion of interviewer-rated attractiveness among female labour force participants will have widened. Incorporating a larger proportion of females rated by interviewers as 'average' or 'below-average' implies that any effect of beauty on employment is more likely to be identified in the most recent sample period.

Hours of work

There appears to be a relationship between weekly hours of work and beauty. For males, being rated as having above-average attractiveness was associated with working longer hours in 2009, but there is mixed evidence on the significance of the association in 1984. For females, we find evidence of a negative relationship between being rated as above-average attractive and hours of work. This effect has extended across both time periods, and also appears in the specification where beauty is coded as a z-score.

Our initial hypothesis for this effect was that it reflected the well-documented tendency of marriage to increase the amount of paid work done by men and decrease the amount of paid work done by women. However, the data do not bear this out, because the gender difference appears both for married and unmarried responses (results not shown). We therefore leave this asymmetry as a puzzle for future researchers: why are attractive men chained to the desk, while attractive women are among the first out the door?

Hourly wages

Workers' beauty is found to be related to their hourly wages. The effect is statistically significant for men, and in the expected direction but not significant for females. For example, for males in 2009 a statistically insignificant 7 log point (7 per cent) premium in hourly wages was associated with having above-average attractiveness, and a penalty of 14 log points (13 per cent) for being rated as having below-average attractiveness.[11] The effect of beauty on hourly wages appears to have been stable across time. Our results on the relationship between hourly wages and beauty can be compared to findings from previous interna-

[10] Using the z-score measure of beauty and making 1984 the base period, we find that the coefficient (standard error) on beauty are 0.066 (0.029) for males and 0.060 (0.034) for females. The coefficient (standard error) on the interaction between 2009 and beauty are 0.009 (0.034) for males and -0.039 (0.039) for females.

[11] Including all workers in the sample, we observe no statistically significant hourly wage beauty premium in either data set. This may reflect measurement problems in wage earnings or hours. Expanding the sample of full-time workers to include workers who were excluded in the process of trimming observations judged to be outliers on the basis of the calculated hourly wage however does not significantly affect the findings. Results from these regression models are in an unpublished appendix (available on request from the authors) (see Table SA5).

TABLE 4
Comparing the Australian Beauty Premium with Other Studies

	% rated above average	% rated below average	Wage effect of above-average looks (per cent)	Wage effect of below-average looks (per cent)
Australia in 1984 (this study)				
Men	41	2	11.6 (10.9 log points)**	−10.4 (−11.0 log points)
Women	45	5	3.6 (3.5 log points)	−6.4 (−6.6 log points)
Australia in 2009 (this study)				
Men	43	15	6.7 (6.5 log points)	−12.9 (−13.8 log points)*
Women	49	12	0	−3.9 (−4.0 log points)
Canada and United States (Hamermesh & Biddle, 1994)				
Men	30	11	5.4**	−8.9**
Women	32	14	3.9*	−5.5*
Shanghai, China (Hamermesh *et al.*, 2002)				
Men	32	2	2.9	−24.6**
Women	34	2	9.7*	−31.1**
United Kingdom (Harper, 2000)				
Men	28	1	0.6	−17.6**
Women	37	1	0.6	−10.8*
United States, young people (Hamermesh & Biddle, 1994)				
Men	8	6	10.1**	−4.1**
Women	14	7	6.5**	−4.3**

Notes: Australia figures match Tables 1 and 3 (Panel 3A) of this article (except for 1984 survey, which are separately calculated). Data for all studies except Australia were compiled by Dan Hamermesh and reported on his website. Australian figures are based on those for full-time workers, and are converted from log points to percentage effects using the standard formula [exp(β)−1]*100. The citations provide information on the dataset and sample selection, but in most cases, the estimates appear to have been separately calculated for Hamermesh, solely for the purposes of this table. ** and * denote statistical significance at the 5% and 10% levels respectively (Hamermesh does not separately denote significance at the 1% level).

tional studies. This is done in Table 4. On the whole, the beauty effects observed in Australia are most similar to those observed in North America and the United Kingdom.

Summary

The effect of beauty on labour income in Australia appears to derive from each of its components. Persons rated as having below-average beauty are penalised in seeking employment. This effect has been stable across time for males, but for females has increased between the 1980s and 2000s. Once a person has a job, it also seems that beauty is associated with hours worked and the hourly wage – although differently for males and females. For males, there is evidence that beauty is positively related to both outcomes – mainly through a penalty to being rated as having below-average attractiveness. For females, beauty is found to reduce hours worked and the effect on wages, while in the expected direction, is relatively small. The effect of beauty on income earned from employment has been stable across time.

(iii) Total Individual Income

Results from analysis of the relationship between beauty and total individual income are reported in Table 5. Males with above-average attractiveness have total income 20 log points (22 per cent) higher than their peers who are rated as being of average attractiveness; being rated as having below-average beauty is associated with a penalty on total income of 31 log points (26 per cent). For females, however, there is no significant association between individual income and beauty. The findings imply that the relationship between beauty and a individual income is an important element in explaining the relationship between beauty and household income.

Total individual income consists of the sum of income from labour market activity and non-labour income. Having seen in the previous subsection that there is a beauty effect on income from labour market activity, it is also possible to evaluate whether a relation with non-labour income might contribute to the overall effect on total individual income. Table 6 reports results on the association between beauty and non-

TABLE 5
Determinants of Total Individual Income
(Dependent Variable: Log Total Individual Income)

	Men	Women
Panel A		
Above-average beauty	0.203***	−0.171
	(0.071)	(0.106)
Below-average beauty	−0.305***	−0.166
	(0.099)	(0.149)
Above-average beauty*1984	−0.106	0.130
	(0.098)	(0.157)
Below-average beauty*1984	−0.030	0.361
	(0.242)	(0.292)
Observations	1512	1355
R^2	0.59	0.55
Panel B		
Beauty (*z*-score)	0.159*	−0.039
	(0.037)	(0.049)
Beauty (*z*-score)*1984	−0.076	−0.009
	(0.052)	(0.074)
Observations	1512	1355
R^2	0.59	0.55

Note: See Table 2.

labour income. This is done distinguishing between the likelihood of receiving non-labour income, and the amount of non-labour income received. No significant association is found, or evidence of any change across time, although it must be noted that a relatively small proportion of our total sample has positive non-labour income.

(iv) Partner's Income

The final component of household income we examine is income from the respondent's partner. Results on the relationship between beauty and components of a respondent's partner's income are shown in Table 7. We distinguish between the effect of beauty on marital status, and the effect on partner's income.

For both males and females, we find relatively strong evidence of an association between marital status and beauty. More attractive respondents are more likely to be married. Significant effects are associated mainly with above-average beauty for males, and with below-average beauty for females. For example, in 2009 females with below-average beauty are 14 percentage points less likely to be married. The effect of beauty on marital status has been stable across time for males, but the effect seems only to be significant for females in the 2009 survey.

Changes across time in the effects of beauty on the likelihood of being married or divorced may be explained by changes in the incidence of these events. Between 1984 and 2009, the marriage rate in Australia fell from seven per 1000 people to

TABLE 6
Determinants of Individual Non-Wage Income

	Men	Women
1. Receipt of non-labour income		
(Dependent variable: Whether receive non-labour income)		
Panel A		
Above-average beauty	−0.007	0.012
	(0.045)	(0.052)
Below-average beauty	−0.020	−0.050
	(0.067)	(0.078)
Above-average beauty*1984	0.066	0.025
	(0.061)	(0.081)
Below-average beauty*1984	0.128	−0.254
	(0.146)	(0.159)
Observations	1217	946
R^2	0.480	0.484
Panel B		
Beauty (*z*-score)	0.002	0.019
	(0.023)	(0.025)
Beauty (*z*-score)*1984	0.020	0.003
	(0.032)	(0.038)
Observations	1217	946
R^2	0.479	0.479
2. Non-labour income		
(Dependent variable: Log non-wage individual income)		
Panel A		
Above-average beauty	−0.105	0.310
	(0.706)	(0.767)
Below-average beauty	−1.103	0.542
	(1.101)	(1.922)
Above-average beauty*1984	0.085	−0.078
	(0.838)	(0.842)
Below-average beauty*1984	1.597	0.107
	(1.264)	(2.268)
Observations	377	301
R^2	0.70	0.77
Panel B		
Beauty (*z*-score)	0.233	0.073
	(0.312)	(0.369)
Beauty (*z*-score)*1984	−0.379	0.059
	(0.350)	(0.410)
Observations	377	301
R^2	0.70	0.77

Note: See Table 2.

TABLE 7
Determinants of Household Income from Respondent's Partner

	Men	Women
1. Marital status		
(Dependent variable: Whether respondent is married)		
Panel A		
Above-average beauty	0.106***	0.072*
	(0.039)	(0.041)
Below-average beauty	−0.079	−0.137**
	(0.055)	(0.058
Above-average beauty*1984	−0.033	−0.065
	(0.054)	(0.057)
Below-average beauty*1984	−0.077	0.082
	(0.128)	(0.105)
Observations	1566	1604
R^2	0.48	0.44
Panel B		
Beauty (*z*-score)	0.063***	0.065***
	(0.020)	(0.019)
Beauty (*z*-score)*1984	−0.007	−0.069**
	(0.029)	(0.027)
Observations	1566	1604
R^2	0.48	0.44
2. Partner's income		
(Dependent variable: Log spousal income)		
Panel A		
Above-average beauty	0.231	0.244**
	(0.166)	(0.105)
Below-average beauty	−0.393*	−0.030
	(0.228)	(0.179)
Above-average beauty*1984	−0.137	−0.257
	(0.251)	(0.167)
Below-average beauty*1984	−0.192	−0.448
	(0.664)	(0.361)
Observations	634	724
R^2	0.69	0.66
Panel B		
Beauty (*z*-score)	0.150*	0.090*
	(0.085)	(0.054)
Beauty (*z*-score)*1984	−0.115	−0.052
	(0.132)	(0.087)
Observations	634	724
R^2	0.69	0.66

Note: See Table 2.

5.5 per 1000 people, with age-specific marriage rates showing a similar decrease (ABS, 2012b). It may be that the falling marriage rate has introduced extra sorting by beauty into determining who gets married.

A respondent's beauty also appears to be associated with their partner's income. More attractive respondents have partners with higher levels of income. The strongest evidence is for males, where there is a negative effect on spousal income associated with being rated as 'below-average' beauty; for females where there is a premium in spousal income from being rated as 'above-average'. The effect of beauty on partner's income has not changed significantly across time.

Income of respondents' partners therefore appears to make a contribution to the overall association between beauty and total household income. This effect derives both from the association between beauty and whether the respondent has a partner (who will then contribute to household income), and also from the association between beauty and the partner's income.[12] While not conclusive, on balance the findings appear to support the idea that the strength of association between marital status and beauty has increased between 1984 and 2009, especially for females.

V Robustness Analysis

(i) Changes in Ratings of Beauty Over Time

In introducing the data on ratings of the respondents' beauty, we noted that the dispersion in ratings had increased between the 1984 and 2009 surveys. To the extent that this represents a change in the actual distribution of beauty, our empirical approach to measuring and estimating changes across time in the effects of beauty, is valid. However, should the change in ratings simply represent a change in interviewer behaviour, then there is a problem. For example, suppose that more respondents being rated as having below-average beauty in 2009 than 1984 is due to a change in interviewer behaviour. This would imply that the true average beauty of the respondents rated as having below-average had increased between the surveys. Our results would therefore be biased towards finding a less negative (or more positive) effect of being rated as having below-average beauty.[13] Hence, where a

[12] Harper (2000) finds that unattractive males are less likely to be married and attractive females are more likely to be married; however, he does not find a relationship between respondent's beauty and spousal income. Important to take into account, though, is that this study controls for respondent's height and obesity, which are found to be significantly related to spousal income.

[13] We are especially grateful to Dan Hamermesh for pointing out this issue to us.

TABLE 8
Determinants of total household income – Alternative coding of beauty variable (Dependent variable: Log Total Household Income)

	Men	Women
Beauty (*z*-score)	0.116***	0.026
	(0.042)	(0.053)
Beauty	0.063	0.056
(*z*-score)*1984	(0.071)	(0.091)
Observations	1379	1327
R^2	0.70	0.63

Notes: Standard errors in brackets. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. All specifications control for a survey year indicator, a quadratic in age, an indicator variable for whether the respondent was born overseas, and years of education (each of which are interacted with the survey year indicator), and interviewer fixed effects.

change in ratings reflects a change in interviewer behaviour, the estimated change in the effect of beauty across time will confound any true change with the effect of changes in the average quality of beauty of respondents in each category.

To address this issue, we recode the beauty variable for each respondent as the value of the cumulative normal at the mid-point of the category in which they were rated. For example, if 5 per cent of respondents were rated in the lowest category, they would be assigned the value of −1.96, being the value of the cumulative normal at 2.5 per cent. This exercise is done separately for each survey. Results of re-estimating the model for household income using the alternative coding of the beauty variable are presented in Table 8. Our results are very similar to those found with the *z*-score coding of beauty (reported in Table 2).[14] Hence, we conclude our estimates of changes in the effects of beauty over time are not likely to be significantly biased by composition effects.

(ii) Is Beauty Proxying for Productivity?

The main reasons that beauty might affect labour market outcomes are productivity and discrimination. Being more attractive may, in some circumstances, make a worker more productive; or it may be that employers or customers are prepared to pay a premium to interact with a more attractive worker even where that worker is no more productive than other workers. One line of research has questioned whether what might be regarded as higher productivity due to beauty is in fact reflecting other factors that are correlated with beauty, such as self-confidence or general intelligence (for a review see Hamermesh, 2011, pages 51–54).

Several studies address how beauty might be correlated with self-confidence, and the implications for estimating the returns to beauty. For example, using laboratory evidence from an artificial labour market (in which Argentinean students solve computer mazes), Mobius and Rosenblat (2006) concluded that one fifth of the beauty effect was due to the fact that attractive people are more confident, with the remaining four-fifths coming from physical features. An effect of beauty on self-confidence is consistent with studies that have shown that the wage premium for taller people and the wage penalty for overweight people can be largely explained by individuals' characteristics when they were teenagers (Sargent & Blanchflower, 1994; Persico *et al.*, 2004). These studies imply that it is not height or weight per se, but some other factor (such as confidence, perhaps mediated through participation in school sports and clubs) that explains the wage differentials. Other studies have asked respondents to assess their own beauty, and found that those who rate themselves as better-looking also earn higher wages (French, 2002; Tao, 2008).

Another literature has suggested that the returns to beauty are partly due to intelligence. As Buss (1985, p. 49) succinctly puts it, 'If females generally prefer intelligent males because they typically have higher incomes and status, and if most males prefer physically attractive females, then over time these two characteristics will tend to covary' (see also Kanazawaa & Kovar, 2004). However, Fletcher (2009) has examined this question for young adults in the United States, and finds that controlling for intelligence does not affect the estimated wage effect of beauty.

Using the NSSS84 survey, we are able to evaluate the robustness of our findings including controls for self-confidence and intelligence. To do this, we exploit the fact that the NSSS84 survey contains measures of respondent self-assessed beauty and literacy aptitude test scores.

[14] We have also re-estimated all other models using the same re-coded beauty variable, and in all cases found that the results were similar to with the original *z*-score variable. Results from these regressions are available on request from the authors.

TABLE 9
Determinants of Hourly Wages and Employment Status – Extra Controls

	Men	Women
1. Hourly wages		
(Dependent Variable: Log (Hourly Wage) – Full-time workers – 1984)		
1.1 No extra controls		
Panel A		
Above-average beauty	0.110***	0.029
	(0.032)	(0.068)
Below-average beauty	−0.050	−0.068
	(0.129)	(0.101)
Observations	428	144
R^2	0.668	0.837
Panel B		
Beauty (*z*-score)	0.059***	−0.017
	(0.018)	(0.027)
Observations	428	144
R^2	0.666	0.836
1.2 Extra explanatory variable – Self-assessed beauty		
Panel A		
Above-average beauty	0.088**	0.004
	(0.034)	(0.076)
Below-average beauty	−0.045	−0.070
	(0.130)	(0.104)
Self-assessed above-average beauty	0.100**	0.021
	(0.049)	(0.099)
Self-assessed below-average beauty	−0.049	−0.164
	(0.163)	(0.214)
Observations	428	144
R^2	0.673	0.839
Panel B		
Beauty (*z*-score)	0.053***	0.005
	(0.019)	(0.131)
Self-assessed beauty (*z*-score)	0.020	0.028
	(0.017)	(0.037)
Observations	428	144
R^2	0.668	0.838
1.3 Extra explanatory variable – Literacy test score		
Panel A		
Above-average beauty	0.105***	0.037
	(0.032)	(0.070)
Below-average beauty	−0.022	−0.060
	(0.129)	(0.103)
Literacy	0.040**	0.023
	(0.016)	(0.039)
Observations	428	144
R^2	0.675	0.838
Panel B		
Beauty (*z*-score)	0.055***	0.018
	(0.018)	(0.027)
Literacy	0.040**	0.023
	(0.167)	(0.038)
Observations	428	144
R^2	0.673	0.534
2. Employment		
(Dependent variable: Whether employed – Full-time workers – 1984)		
2.1 No extra controls		
Panel A		
Above-average beauty	0.047	0.085**
	(0.029)	(0.042)
Below-average beauty	−0.233**	0.036
	(0.099)	(0.093)
Observations	727	820
R^2	0.463	0.373
Panel B		
Beauty (*z*-score)	0.037**	0.038*
	(0.016)	(0.020)
Observations	727	820
R^2	0.460	0.373
2.2 Extra explanatory variable – Self-assessed beauty		
Panel A		
Above-average beauty	0.047	0.076*
	(0.030)	(0.043)
Below-average beauty	−0.188*	0.045
	(0.098)	(0.093)
Self-assessed above-average beauty	−0.046	0.080
	(0.040)	(0.056)
Self-assessed below-average beauty	−0.309***	0.037
	(0.090)	(0.121)
Observations	727	820
R^2	0.476	0.376
Panel B		
Beauty (*z*-score)	0.036**	0.034
	(0.016)	(0.021)
Self-assessed beauty (*z*-score)	0.003	0.018
	(0.015)	(0.020)
Observations	727	820
R^2	0.460	0.374
2.3 Extra explanatory variable – Literacy test score		
Panel A		
Above-average beauty	0.048**	0.850**
	(0.029)	(0.042)

TABLE 9
(continued)

	Men	Women
Below-average beauty	−0.233**	0.037
	(0.099)	(0.093)
Literacy	−0.019	0.003
	(0.014)	(0.019)
Observations	727	820
R^2	0.465	0.373
Panel B		
Beauty (*z*-score)	0.038**	0.386*
	(0.016)	(0.020)
Literacy	−0.019	0.002
	(0.014)	(0.019)
Observations	727	820
R^2	0.461	0.373

We interpret the respondent-assessed measure of beauty as a proxy for self-confidence. The respondent-assessed beauty question that we use asked respondents, 'In comparison with other people of your age are you considered [more attractive than average]?' with five alternatives to replace the text in brackets: ranging from 'below average' to 'very much more attractive than average'. The literacy aptitude test score measure is based on 13 multiple-choice questions in which the respondents are asked to complete such sentences as: 'Lemons are sour but sugar is…….?' with the possible answers being bitter, white, fattening and sweet. We convert the 0–13 test score measure into a *z*-score.

Results from regression models for hourly wages and employment that include the respondent-assessed beauty measure and test score measure as extra explanatory variables are reported in Table 9. For these regression models, we restrict attention to a common sample for whom information on the self-assessed beauty and literacy variables are available. The findings indicate that the beauty effect is primarily due to physical appearance, rather than self-confidence or intelligence. Although the self-rated beauty measure is significant in some models, its inclusion causes only minimal attenuation in the effect of interviewer-rated beauty on hourly wages and employment. Hence, our results are consistent with the laboratory results of Mobius and Rosenblat (2006), who find that most of the beauty effect is due to appearance, with only a small portion due to self-confidence; and with recent studies using data from Germany and Luxembourg by Pfeffer (2011) and Doorley and Sierminska (2012). Including the control for literacy aptitude has hardly any effect on the estimated effect of interviewer-rated beauty on the likelihood of employment. This finding is consistent with the previous research by Fletcher (2009).

It is important to note that an alternative interpretation of the self-assessed measure of beauty is that it is an extra signal of true beauty. Taking this view, when both measures of beauty are included as explanatory variables, the coefficient on the interviewer measure can be regarded as a lower bound on the return to beauty. Accordingly, we can interpret the results in Table 9 as showing that the lower bound on the return to beauty is not a large distance from the effect estimated with the model that includes only the interviewer measure.

VI Conclusion

Our results suggest that Australia has in common with the rest of the world that beauty does matter. Similar to previous research, we have found that beauty affects the 'price' a worker receives for their labour. These effects are of a similar magnitude to other countries. Like previous studies, we also find stronger evidence of effects for males than for females. Hamermesh (2011) discusses whether this gender difference might be explained by selection effects, whereby a higher proportion of males than females in the workforce causes larger dispersion in beauty ratings for males than females.

Importantly, we find no evidence of a change across time in the effect of beauty on the hourly wage. In Australia, at least, it seems the existence of a beauty premium has been a constant feature of the labour market over the past 30 years. Hence, any effects over this time of factors such as anti-discrimination legislation or greater attention to physical appearance must have largely cancelled each other.

More generally, we find evidence of effects of beauty on household income. There is a significant effect of beauty on household income for male respondents, although for females no significant effect is found. As well as deriving from a relationship between beauty and hourly wages, the association with household income also depends substantially on the effect of beauty on a respondent's employment status and hours of work as well as their partner's income. There is no evidence of a change across time in the

relationship between beauty and household income.

The likelihood of a respondent being in employment is found to be positively related to their beauty. This seems to be mainly due to a negative effect on the likelihood of employment from being rated as having below-average beauty. For males the effect has been constant, but for females, it has increased between our sample periods. This result seems consistent with Hamermesh (2011) selection-based explanation for gender differences in the effect of beauty. The growth in female labour market participation in the past 30 years may have created a female workforce with greater dispersion in physical attractiveness, and hence allowed the effect of beauty to be more precisely identified.

Differences in the incomes of partners of survey respondents are also found to be significantly related to the respondents' beauty. Partly, this effect derives from the likelihood of a respondent having a partner. Males who are rated as being of above-average beauty are found to be more likely to be married, whereas females who are rated as being of below-average attractiveness are significantly less likely to be married. For males, these effects are constant between the surveys, but for females seem to be significant only in the 2009 survey. For respondents who have a partner, there is an extra positive effect of beauty on household income via a relationship between their beauty and their partner's income. This effect, however, appears weaker than the effect on marital status, and has not changed across time.

Supporting Information

Additional supporting information may be found in the online version of this article:

Table SA1. Key questions from NSSS84 and RM09

Table SA2. Summary Statistics

Table SA3. Determinants of total household income (Dependent variable: Log total household income)

Table SA4. Explanatory power of models for log total household income with alternative sets of controls

Table SA5. Determinants of total household income – Omitting households with more than 2 adults (Dependent variable: Log total household income)

Table SA6. Determinants of total labour income – Extra analysis

Figure SA1. Inter-rater comparability (2009 Survey)

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Appendix I
Details on data sources

NSSS84 – Face-to-face survey; Interviews done from June 1984 to July 1985; Sample from a random sample of households in Census Collector Districts chosen from urban localities with 10,000 or more persons as of the 1981 Australian Census; Respondent a randomly chosen member of household over 18 years; Number of responses = 2,208; Also a rural mail-based survey (does not include information on interviewer rating of respondent's beauty); Kelley *et al.*, 1987.

RM09 – Face-to-face survey; RMR undertake regular weekly 'Establishment Survey'; Our data from two weekly surveys done on 16–17 May 2009; and 23–24 May 2009. Each survey selects a stratified random national sample of approximately 1,100 respondents aged 14 years and above. Households chosen in randomly selected clusters of eight households based on Census Collector Districts, with one interview per household, and a new sample of households each week. The sampling frame does not include remote areas, but covers all major population centres and all federal electorates. In total, there were 2,196 respondents aged 14 and above. We use a subsample of this group, being the 1598 respondents who were aged 18–64.