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Is gender in the eye of the beholder? Identifying cultural attitudes with art auction prices[1]

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Abstract

In the secondary art market, artists play no active role. This allows us to isolate cultural influences on the demand for female artists' work from supply-side factors. Using 1.5 million auction transactions in 45 countries, we document a 47.6% gender discount in auction prices for paintings. The discount is higher in countries with greater gender inequality. In experiments, participants are unable to guess the gender of an artist simply by looking at a painting and they vary in their preferences for paintings associated with female artists. Women's art appears to sell for less because it is made by women.

Keywords: Art; Auction; Gender; Culture; Bias
JEL codes: Z11; J16; D44

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Abstract

In the secondary art market, artists play no active role. This allows us to isolate cultural influences on the demand for female artists' work from supply-side factors. Using 1.5 million auction transactions in 45 countries, we document a 47.6% gender discount in auction prices for paintings. The discount is higher in countries with greater gender inequality. In experiments, participants are unable to guess the gender of an artist simply by looking at a painting and they vary in their preferences for paintings associated with female artists. Women's art appears to sell for less because it is made by women.

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The challenge in improving economic outcomes for women is to disentangle culture from biology. Culturally determined gender roles may explain why women have different labor market outcomes than men; biological gender differences (e.g., in strength) and differences in preferences can also explain why women have different labor market outcomes than men.[3] Presumably policy can only affect culture, not biology. To guide policy-making, it is thus important to identify settings in which culture, not biology, leads to worse outcomes for women. We argue that the market for art is such a setting.

Using a sample of 1.5 million auction transactions between 1970 to 2013 in 45 countries for 62,442 individual artists, we document that auction prices for paintings by female artists are significantly lower than prices for male artists even after including country-fixed effects. Although some have advanced the hypothesis that biological factors would lead women to produce systematically worse art (see the discussion in Cohen, 1996), there is no credible scientific evidence for this hypothesis. There is also no evidence that women produce art that is systematically less pleasing to art auction participants. In fact, we hypothesize that one cannot infer the gender of an artist by looking at a painting. We provide evidence consistent with this hypothesis. This makes it difficult to attribute the price difference in paintings to biology. Since auction price differences are higher in countries with more gender inequality, we argue that the price difference identifies a pure effect of culture on economic outcomes for female artists.

We use several empirical strategies and two experiments to identify potential explanations why culture matters. One possible explanation for our

[3] A large literature has documented gender differences in psychological traits and measures of preferences (e.g., Bertrand, 2010; Niederle, 2014). While some of these differences may have biological origins (e.g., risk-taking preferences appear to be correlated with testosterone levels, which are on average higher in men), the role of biology in shaping preferences is not yet clear, see, e.g., Cobb-Clark (2017).

results is that the price difference reflects a quality difference that can be attributed to women's historical lack of access to art education and resources (e.g., Nochlin, 1971; Davis, 2015). While selection might lead the average quality of women's art entering the secondary market to be better, not worse, than the average quality of the men's art (see also Cameron et al., 2017), the importance of selection depends on the process through which art reaches the secondary market. Not all auctions emphasize "high art", so art by artists with differing degrees of training can enter the secondary market—in the extreme case through auctions of work by "naïve" painters.[4] Moreover, "usually art is sold [at auction] because of "the three D's": death, divorce or debt, or because collectors' tastes have changed." (Thompson, 2017, p. 24).

To formally address the idea that art produced by women may be systematically different, we exploit the fact that an artist' work is typically sold in several countries and include artist-fixed effects in our regressions of the auction price on country-level measures of gender inequality. While we are unable to estimate the average gender price discount in these regressions, we can still identify the coefficients on the interaction between a gender indicator and our proxies for country-level gender inequality. Consistent with our earlier results, the coefficients on these interaction terms are positive for most measures of gender inequality. Under the assumption that talent or training are fixed personal characteristics, historic lack of access to training does not appear to be the primary explanation for the price difference.

Since art can reflect personal experience, one might argue that the themes and styles in women's art are simply less appealing to "big-spending" collectors—the bulk of whom are male, according to Thornton (2008). In a

[4] For instance, following Edward Albee's death, Sotheby's auctioned "The Collection of Edward Albee" on September 26, 2017. While Edward Albee's collection contained "a handful of stars", it also contained "unsung contemporary painters and sculptors" (Sotheby's, 2017, p.8).

landmark 1971 article, Nochlin dismisses this argument. She argues that there are no common qualities of "femininity" linking the styles of women artists and that the work of women artists is more closely related to the work of their contemporaries than they are to each other. The art critic Jerry Saltz (2015) puts it more bluntly: "No intelligent person thinks that art should be seen exclusively through a binary gender lens or bracketed in a category of "women's art."" However, we are unaware of formal refutations of this theory.

While our artist-fixed effect specifications help rule out the idea that our findings are driven by differences in "themes" or training, we also conduct an experiment (experiment #1) to provide more systematic evidence on the question whether one can identify the gender of the artist simply by looking at a painting. For a sample of paintings, half of which were by women, participants in the experiment guessed the artist was male 62.7% of the time. Overall, participants guessed the gender of the artist correctly 50.5% of the time, i.e., their guesses were statistically indistinguishable from random. Of necessity, the sample of artists in our experiment is small. Nevertheless, our experimental evidence is consistent with Nochlin's (1971) and Saltz's (2015) arguments that there is no such thing as "women's art".

A final cultural explanation is that the price difference simply reflects societal biases towards women. As Allen (2005) writes:

> *Asking why women's art sells for less than men's elicits a long and complex answer, with endless caveats, entirely germane qualifiers and diverse, sometimes contradictory reasons. But there is also a short and simple, if unpopular, answer that none of those explanations can trump. Women's art sells for less because it is made by women.*

Art is notoriously difficult to value (e.g., Ashenfelter and Graddy, 2003) and it is widely recognized that factors such as taste play an important role in setting prices. Most directly, local attitudes towards women can affect the amount

that is bid in the auction. But local attitudes can also inform pre-sale estimates of art, and hence the auction outcome, because auction houses use information they solicit about clients' preferences through pre-show cocktail parties and social events in setting their estimates (as discussed in, e.g., Bruno et al., 2016).[6]

Local attitudes may also influence how the auction itself is conducted. Lacatera et al. (2015) document that the auctioneers themselves can affect the bidding outcome. While there is little data on auctioneers, some observers characterize the auctioneer profession as male-dominated (e.g., Bellamy, 2005). To be able to solicit information about client's preferences, it is also plausible that auction houses employ auctioneers from similar cultural backgrounds as the local clientele. Of course, online bidding may work against the influence of local preferences on the auction outcome.

Our evidence that country-level measures of gender inequality are related to the gender discount in art prices after controlling for artist- or auction-fixed effects is consistent with the idea that art by women sells for a lower price simply because it is made by women. Time trends in the price difference and variation in the fraction of transactions by female artists across countries provides additional support for this argument. We use our experiments to examine the validity of a bias hypothesis in more depth.

In experiment #1, we asked participants how much they liked the painting on a scale of 1-10 after they guessed the gender of the artist. This allows us to measure whether perceived gender might affect a person's appreciation of the work. In a second experiment (experiment #2), we randomly associated fake male and female artists' names with images of paintings and asked participants how much they liked the painting. To avoid associating fake artist names with real

[6] We do not examine auction house price estimates because the coverage is poor for the earlier years. For the sample of paintings for which we have estimates, the correlation between the midpoint of the estimate and the hammer price is 0.93.

paintings, we "created" our own paintings following the neural network algorithm in Gatys et al. (2015).

In the first experiment, we find that participants who are male, affluent and who visit art galleries have a lower appreciation of works they associate with female artists. In the second experiment, we find that affluent participants have a lower appreciation of works we associated with a female artist name, particularly when they visit art galleries. Since affluent males who visit art galleries are most likely to represent the typical bidder in an art auction, we believe the evidence is consistent with the idea that "Women's art sells for less because it is made by women" (Allen, 2005).

Since the 1985 founding of the Guerrilla Girls, the discussion about women's status in the art world is gaining increased momentum—in part because of the Guerrilla Girls' data gathering efforts ("weenie counts") that highlight women's low representation in the art world.[7] Our work provides direct evidence that supports the claims of many, including Nochlin (1971) and the Guerrilla Girls, that there is a link between women's low representation in the art world and cultural institutions.

In the economics literature, relatively little has been written on the role of women in the arts. Cohen (1996) examines the argument that women are unable to produce great art for genetic reasons. He argues that the fact that women's performance in the arts varies with circumstances and incentives is evidence against the genetics hypothesis. Using Finnish data from 1992, Heikkinen and Karhunen (1996) document that the income of female artists is lower than that of male artists. Throsby and Zednik (2010) document similar results in a 2009 survey of artists in Australia. They also find that time constraints are more

[7] In 1985, seven female artists founded the Guerrilla Girls in response to the Museum of Modern Art's 1984 exhibition "An International Survey of Recent Painting and Sculpture" that included only 13 women out of 165 artists. Over 55 female artists have been members of the Guerrilla Girls.

binding for female artists than male artists. More recently, Cameron et al. (2017) examine the career histories of over 4,000 graduates of the Yale School of Art. They document that art by female graduates was less likely to sell at auction, but when it did so it sold at a higher price. It is possible that their results are different from ours because of their focus on artists from an elite art school.

At a more general level, our paper contributes to the literature that relates country-level cultural characteristics to economic outcomes for women (see Fernandez, 2007 and 2008; Giuliano, 2017 for reviews of this literature). Our paper differs from most of the papers in this literature in one key aspect: the outcomes we examine are not directly linked to decision-making by women. Once artists sell their work, what happens to their work is no longer under their control. Thus, "supply side" factors commonly advanced to explain economic outcomes for women, such as preferences (e.g., Shurchkov and Eckel, 2017) and family considerations (e.g., Bailey and Lindo, 2017; Rossin-Slater, 2017) do not play a role in our setting. The effects we document should be purely driven by demand-side considerations (for art). Thus, our setting allows us to isolate how cultural factors related to gender inequality affect the demand for an output produced by women.

Our results highlight the importance of culture in shaping economic outcomes for women. Even though the artist does not directly participate in the secondary market, outcomes in the secondary market can have a profound influence on artists' careers. Most directly, prices in the secondary market can affect prices in the primary market and alter incentives for creating art (e.g., Galenson and Weintraub, 2000). But, as Thornton (2008, p. 8) describes, auction prices can also affect "the perceptions of an artist's oeuvre". Similarly, Ashenfelter and Graddy (2003, p. 783) write: "the [auction] market…is certainly one of the key components of our understanding of what is good and bad." A good example of how market prices are used to judge quality is the recent

statement by the German artist Georg Baselitz that: "[women] simply don't pass the market test, the value test… As always, the market is right." (Clark, 2013).

But, we know from Becker (1957) that just because a market is in equilibrium does not mean there is no discrimination. Our evidence suggests that policies to reduce gender inequality may improve outcomes for female artists and women who wish to be artists even if they do not directly target the art market. Until the time that gender inequality is eliminated, like auditions for orchestras (Goldin and Rouse, 2000), outcomes might be different if some art auctions were "blind".

I. Data

Our auction data comes from the Blouin Art Sales Index (BASI), an independent database on artworks sold at over 1,380 auction houses worldwide, including the two major players Christie's and Sotheby's. BASI sources its data from Hislop's Art Sales Index, the primary source of price information in the world of fine art, supplemented with catalogue data from auction houses (both electronic and hard copy). BASI is presently the largest known database of artworks, containing roughly 6.1 million art transactions (almost half of which are for paintings) by more than 500,000 individual artists since 1922.

In this paper, we restrict our analysis to transactions from 1970 to 2013 involving paintings created by artists born after 1850 for whom we can identify gender.[8] Transactions before 1970 are relatively sparse and impede a precise estimation of country- and year-level effects. Moreover, there are very few female artists born before 1850. Including these painters would skew our estimation of the effect of gender on prices.

[8] The birthyear is missing for 8.16% of observations in the original sample. We exclude those observations.

This selection leaves us with a sample of roughly 1.5 million transactions from 62,665 individual artists. Our sample is similar to but slightly larger than the sample in Korteweg et al. (2016), which consists of a subset of this data, and the sample in Renneboog and Spaenjers (2013), which consists of data on 1,088,709 art sales for 10,442 artists from 1957 to 2007. Because of their focus on graduates from the Yale School of Art, the sample employed in Cameron et al. (2017) is substantially smaller. Of the 4,434 graduates from the Yale School of Art, 525 artists appear in the BASI data with a total of 10,906 sales.

For each sold painting in our data set, we have detailed information about the painting, the artist, and the auction it got sold. We know the painting's title, artist, year of creation, size, whether it was signed or stamped by the artist, and its medium (e.g., "oil on canvas", or "oil on board"). The BASI database also categorizes each painting into one of six main styles as defined by Christie's and Sotheby's: Asian, Post-war and Contemporary, Impressionist and Modern, Old Masters, American, 19th Century European, and a residual "Other" style category. For each artist, we observe their name, nationality, year of birth, and year of death (where applicable). We also know the date of the auction, and the auction house and its location at which the painting was brought up for sale.

BASI does not include artist (or painting) identifiers or information on the artist's gender. To enable us to include artist-fixed effects, we first correct for variations in the spelling of artists' names using information on styles, nationality and birth year to ensure variations in names are due to spelling mistakes.[9] To determine the artist's gender, we used a variety of sources. We first compile three lists of names. We obtain baby names from the 1882 and 2011 US Social Security Administration (SSA, available at

[9] Unfortunately, it is not possible to reliably standardize painting titles in order to use painting-fixed effects. Many artists use similar names for their paintings, e.g., "Untitled" which makes it impossible to assign unique identifiers to paintings based on titles alone.

https://www.ssa.gov/oact/babynames/limits.html), and we obtain names of directors of companies between 2000 and 2010 from Boardex. We chose the 1882/2011 SSA data at random from an older/recent period to obtain older/recent names. We use data from Boardex because it contains data on individuals in over 90 countries. We classify names in each name data set using 6 rules. For each name, we require at least 9 (18) individuals to have the same name. If 95% (99% and 100%) of individuals with that name are female, we define the name as female for that rule. If the names are consistently classified as female across rules, we classify the artists as female for that data set. If the classification is inconsistent across rules for a data set or is inconsistent across data sets (e.g., female in 1882 but male in 2011) or we cannot classify gender using the three names data sets, we search for the artist's gender in "The Getty Research Institute - Union List of Artist Names Online" and "Oxford Art Online - Grove Art Online" or on Google. We also use the latter three data sets to conduct a random check of artists' gender for artists whose gender we identified by name only. Overall, we are able to classify gender for just over 87% of the BASI painting data set.

Art auctions are conducted as ascending bid (i.e., English-style) auctions, where the auctioneer calls out increasingly higher prices. When a bid is solicited that no other bidder is prepared to exceed, the auctioneer strikes his hammer, and - provided it exceeds the seller's reserve price - the painting is sold at this highest bid price (called the "hammer price"). In our data, we convert all hammer prices to U.S. dollars using the spot rate at the time of sale. For sake of comparability we further convert prices in 2013 dollars using CPI inflation.

We define the variables we use in our analysis in Table 1. Panel A describes the auction and artist variables we use in our regressions. Panel B describes our measures of gender culture. Panel C of Table 1 describes the variables we use in our experiments.

-Insert Table 1 about here-

For the countries in our sample, we obtain five different proxies for gender culture that are also measure of inequality. The first two, the *United Nation Gender Inequality Index* and the *World Economic Forum Gender Gap Index*, are composite indicators designed to provide a comprehensive view of the disparity between men and women within a country in terms of educational attainment, political empowerment, labor force participation, health, etc. Both variables have comprehensive geographic coverage but are available only from 2000 onwards. Thus, we use extrapolated versions of these measures that backfill the missing observations from the first available data points for each country.[10]

The remaining three measures are the percentage of women in parliament, the tertiary education enrolment ratio, and the female labor force participation. These variables capture individual dimension of gender equality (political empowerment, educational attainment, and economic participation) and have the advantage of being available in longer time series. All these variables are taken from the World Bank and described in more detail in Table 1.

All culture variables are increasing in gender equality (higher values represent less gender inequality) except for the Gender Inequality Index which is defined on a scale of 0 to 1 with zero representing equality. To make the interpretation consistent, we redefine this variable as one minus the original value of the index.

[10] We acknowledge that this process will introduce some noise, but this may be mitigated by the low over-time variation (compared to cross-country variation) of these indicators. Results are similar if we do not extrapolate.

Table 2 shows descriptive statistics for our auction data sample. Female artists account for 16.9% of the population of artists, but only for 6.9% of transactions. The mean transaction price is around US $48,212 for male artists and US $25,262 for female artists. Relative to the average price of male art, the discount for women's art is 47.6%. Not surprisingly, mean auction prices are heavily affected by a handful of transactions of "superstar artists" that are not representative of the general market. When we exclude transactions above 1 million dollars (which we label as mega-transactions), the discount drops to 28.8%. If we look at median prices, we obtain a similar discount (25.28%).

-Insert Table 2 about here-

In Panel A of Table 3, we show the evolution of the discount over time. While the gender discount for the entire sample is relatively stable over time, when we exclude mega-transactions the discount drops from 43.6% in the 1970s to an average of 25% after 2000. Later we will show that this time trend persists in a multivariate setting and will use this evidence to support our hypothesis that the gender discount is influenced by cultural factors related to the role of women in society.

-Insert Table 3 about here-

Panel B provides statistics on the geographic distribution of auction transactions in our sample. The UK and North America are the two largest art markets and together account for 41% of our sample. The gender price discount is large in both markets with and without mega-transactions. The fact that the price discount and the percentage of transactions by female artists varies across countries suggests country-level factors related to the role of women in society

may be important for explaining auction outcomes.

II. Gender and auction prices

In Table 4, we show regressions of auction prices on a dummy that is equal to one if the artist is female and various controls. Because auction prices are truncated and extremely skewed, our dependent variable is the natural logarithm of inflation-adjusted auction prices. Column 1 shows the regressions without controls. In columns 2 and 3, we include year- and country-fixed effects. In columns 4 and 5 we include standard artist and painting characteristics (see, e.g., the overview in Ashenfelter and Graddy, 2003). The artist characteristics we control for are the (natural logarithm of) age (at the time of the auction) and a dummy variable that is equal to one if the artist is dead. The painting characteristics we control for are the (natural logarithm of) the surface area measured in squared millimeters, a dummy variable that is equal to one of the painting is signed or otherwise marked, and style-fixed effects (according to the six broad categorizations by Christie's and Sotheby's).

-Insert Table 4 about here-

In column 5, we include a proxy for auction-fixed effects. In our data we do not have an identifier for individual auctions. We define an "auction" as the set of transactions executed by the same auction house (for example Sotheby's in London) on the same day.[11] It is possible that auction houses hold more than one auction each day. Assuming multiple-auction days are rare, the auction fixed

[11] The median number of sales per auction in our sample is 14. In 11.98% of auctions, only one transaction is recorded. This does not mean that only one item was auctioned; other paintings may have gone unsold or the painting may have been part of a collection together with other types of art (for example, sculptures).

effects account for characteristics specific to the auction the painting is sold at, such as characteristics of the auctioneer and the clientele and the auction itself and characteristics of the collection that is being sold, e.g., its size and theme.

In columns 6-7, we replicate the specifications in columns 4-5 after excluding mega transactions. As a first step towards addressing the fact that female artists historically had less access to training, we also restrict our sample to a subsample of data in which artists only appear if they have at least 20 transactions in our sample, which is roughly 20% of artists (who collectively account for 85% of transactions). We rerun all regressions in Table 4 in this subsample and report the coefficients on "Female Painter" at the bottom of the table. In all specifications, we cluster the standard errors at the artist and auction level.

As the results in Table 4 show, the gender price discount persists after addressing potential omitted variable biases, even in the restricted sample. The magnitude of the effect varies between 24.7% (with country-fixed effects in column 4) and 12.2% (with auction-fixed effects in column 5).

To examine whether the univariate time trends and geographical patterns in gender discounts persist in a multivariate context, we first add interaction terms between the gender variable and time period indicators (as in Panel A of Table 3) to the regression in column 4 of Table 4. Figure 1 plots the point estimates for the interaction terms of gender with the period dummies for the full sample and the sample of artists with at least 20 transactions. Consistent with the univariate results, the discount is decreasing over time — especially for the sample of artists with at least 20 transactions. Since gender inequality has also gone down over time, the trend is consistent with the idea that gender inequality influences the discount.

-Insert Figure 1 about here-

Next, we add interaction terms between the gender variable and geographic indicators (as in Panel B of Table 3) to the regressions underlying Figure 1. Figure 2 shows the point estimates for the interaction terms of gender with geographic dummies. Since art markets developed at different points in time in different countries, we retain the interactions between gender and the different time periods when estimating the coefficients on the interactions between gender and geography.

-Insert Figure 2 about here-

As Figure 2 suggests, there is significant heterogeneity in the discount across countries. While art by female artists sell at a discount in most countries, it sells at a premium in Sweden, Finland and South Africa.

III. Culture and the Gender Price Discount

The significant variation of the gender price discount over time and across countries is consistent with the idea that the discount reflects attitudes towards women at the time and in the place of the auction. In this section, we test this idea more formally by augmenting our regressions with country-level variables that proxy for cultural attitude towards women and their interactions with the artist's gender. We also include the interactions between Log (GDP) and the artists' gender to ensure the interactions with culture do not simply reflect non-linear effects of economic development. Results are similar without the GDP interactions and are available on request.

We start by estimating the following regression:

$$Log(Price) = \alpha + \beta Female + \gamma Culture + \lambda Female \times Culture + Controls\ (including\ Log\ (GDP)\ interactions) + Year + Style + \varepsilon$$

In this regression, we are primarily interested in the coefficient on the interaction coefficient λ. Because our culture variables are measured at the country/year level, they exhibit little variation over time. Thus, we do not include country- or auction-fixed effects in the regression. However, we cluster standard errors at the artist and auction level.

Table 5 shows the results for this estimation. Three of the coefficients on the interaction terms are significant at conventional levels and all the interaction coefficients are positive, which suggests that an increase in gender equality is associated with a lower auction price discount for paintings by female artists.

-Insert Table 5 about here-

To gauge the economic importance of these coefficients we provide the estimate of the gender price gap for values of the culture variables in a ± 1 standard deviation range around the mean at the bottom of Table 5. If we consider, for example, the percentage of women in parliament, we see that paintings of female artists sell at a 34.7% discount in countries/years where this percentage is "low" (12.2%, one standard deviation below the mean) but sell at a 4.5% discount when the percentage is "high" (31.21%, one standard deviation above the mean). In the same way we estimate a gender price gap of 25% when the tertiary education enrolment ratio of women relative to men is "low" but the gap is reduced to 19% when the ratio is "high".

Artistic talent/style

To formally address the idea that art produced by women may be systematically different, in Table 6 we add artist-fixed effects to the specifications in Table 5. To be able to identify the coefficients on $Female \times Culture$, the work of an artist must be sold in different years and different countries that vary in their gender culture. Cameron, Goetzman and Nozari (2017) provide evidence that the art market is truly international. They document that the work of 525 graduates from the Yale School of Art is auctioned in 36 different countries. In our sample, 82.98% of transactions belong to artists whose paintings are sold in more than one country. This percentage increases to 89.5% in the subsample of artists for whom we have at least 20 transactions on record.

While including the artist-fixed effects cannot help us rule out the possibility that the skill or style of an artist may evolve over time, it allows us to rule out the idea that there are systematic skill or style differences between male and female artists. With the inclusion of artist fixed effects, we are no longer able to estimate the average gender price discount but we can still estimate the coefficient on the interaction between *Female* and our gender culture proxy variables.

-Insert Table 6 about here-

After adding artist fixed effects to our regressions, the coefficients on the interactions with culture are positive and significant for all but the backfilled culture indices in columns 1 and 2 of Table 6. From the marginal effects calculated at the bottom of the table we can see that the results are all economically significant except in column 2.

The $R^2$of the regressions increases significantly between Tables 5 and

Table 6 from 18% – 22% to 73% – 77%. This is consistent with the idea that individual artist effects are extremely important for understanding auction outcomes. It is outside the scope of this paper to discuss whether the individual effects reflect objective differences in talent or style. Our goal is simply to show that even after accounting for fixed individual effects, the difference between the average auction price of paintings of female vs. male artists is related to variables that measure the inequality between women and men in society.

Supply of art by women

Before we turn to a more detailed examination of potential explanations for the findings in Tables 5 and 6, we provide one additional piece of evidence that is consistent with the idea that culture affects the demand for artworks by women. If there is little demand for women's art in some countries, presumably auction houses and potential sellers would avoid selling collections with a large percentage of female artworks in those countries. It is difficult to examine this hypothesis in detail because, to the best of our knowledge, there is no data on how items are bundled for auction and sellers' choice of auction house location. Nevertheless, we provide some suggestive evidence consistent with this hypothesis in Table 7. We regress the percentage of auction transactions involving paintings by women in a country and year on our culture variables and Log (GDP) and year dummies and correct our standard errors for heteroskedasticity.

-Insert Table 7 about here-

Panel A of Table 7 reports the results for the full sample; Panel B reports the results for country/year observations with at least 100 transactions in the sample. The evidence from Panel B in particular suggests that the supply of art by women might be relatively higher in countries with higher gender equality since

the coefficients on the culture variables are positive and statistically significant for three out of five measures.

IV. Is gender in the eye of the beholder? Experimental evidence

Our artist-fixed effect specifications help rule out the idea that our findings are driven by differences in "themes", intrinsic artistic ability or training. To conduct a more in-depth examination of our hypothesis that cultural attitudes towards women affect auction prices, we conduct two experiments using surveys.[12] Since in principle anyone can bid in an auction,[13] we use SurveyMonkey® Audience services to identify samples of participants that are representative of the US population in terms of gender, age, income and geographical distribution (according to SurveyMonkey). The responders are drawn from a large pool of participants in the SurveyMonkey Contribute program. Enrolees in this program agree to participate in periodical surveys in exchange for donations made to their charity of choice.

For each participant, SurveyMonkey provides data on gender, age and income range. In the surveys, we ask for additional information related to educational attainment, frequency of visits to art galleries or exhibitions, state or US territory of residence and family background (country of birth of both parents).

We conducted experiment #1 two weeks apart from experiment #2. The numbers of participants were dictated by funding constraints. Since experiment #1 involved more questions, it was more expensive to conduct than experiment #2. We surveyed 1,000 participants in experiment #1 and 2,000 in experiment #2.

[12] Both experiments received Human Ethics approval.
[13] For instance, to bid in a Christie's auction, bidders create an account by supplying their contact details, along with a government issued photo ID and proof of address. For certain transactions, bidders may be asked for a financial reference and/or a deposit as a condition of allowing them to bid.

Because of missing data on income in SurveyMonkey, we end up with responses for 880 (1,823) participants in experiment #1 (#2). While SurveyMonkey assured us that the likelihood the same individual would take part in both experiments was "extremely low", to increase confidence that our participant pools are distinct we merged the two samples on all common characteristics (age, gender, income, reported family background, state) to determine potential overlap between them. We calculate that the samples overlap by at most 90 individuals. The results of dropping these individuals from our analysis are similar to the results using the full sample and are available on request.

Table A1 in Appendix A provides summary statistics for the two experimental populations as well as Chi-squared tests for the null hypothesis that the two populations are equal. Online Appendix 1 provides the surveys we used in the experiments. Table A1 in Online Appendix 2 provides summary statistics for all survey responses.

Experiment #1: Can you guess?

In our first experiment we ask our test subjects to look at a sample of paintings and a) guess the gender of the artist and b) rate how much they liked the artwork on a scale from 1 to 10. This experiment allows us to address two separate, but related issues. First, we are interested in examining whether it is possible to guess the gender of the artist by looking at a painting. If paintings by female artists have visually distinctive characteristics, there could be a taste-based explanation for the gender price discount we document that has nothing to do with the gender of the artist per se. This experiment also allows us to measure the effect of perceived (as opposed to actual) gender of the artist on the artistic appreciation of the artwork. The presence of such an effect would reinforce our main argument that the gender price gap is at least partially culturally motivated.

To conduct the experiment, we use a sample of ten paintings. To keep our

selection as neutral as possible, we choose the ten paintings from the first paintings in our sample auctioned at the beginning of 2013. We impose the following restrictions on the selection: a) Five paintings from male and five from female painters; b) Only one painting per artist; c) Auction price below US $100,000 (to ensure the paintings are relatively unknown); d) Availability of an electronic image with sufficient resolution. Table A2 in Appendix A describes our sample of the 10 paintings.

Each subject in our experiment is shown a random selection of five out of these ten paintings. After looking at each painting the subject is asked to guess: a) The gender of the artist; b) The place of birth of the artist (among a selection of six broad geographical areas); c) The approximate period in which the painting was created (among a selection of three possibilities). Each participant was also asked to rate the painting on scale 1 - 10 based on subjective artistic appreciation ("How much do you like this painting?"). While we do not have any prior about participants' ability to guess place of birth of the artist and period of creation of the painting, we use these two additional questions to avoid making it too obvious that our primary interest is in the perceived gender of the artist.

Table 8 summarizes participants' ability to correctly guess the gender of the artist by looking at a painting. The participants guessed the artist is "Male" 62.7% of the time in the entire sample. The fact that the frequency of "Male" guesses is significantly above 50% indicates that the respondents expect a higher incidence of male vs. female painters. In part, this may reflect respondents' exposure to women as artists. Historically, women have been underrepresented in art history books (Galenson, 2009). For instance, not a single female artist appeared in H.W. Janson's *History of Art*, a definitive art history book, until the year 1987. The percentage of art by women in museums, art fairs and galleries is also much lower than 50% (Reilly, 2015). As a result, female artists also receive less press coverage than men.

-Insert Table 8 about here-

Consistent with the idea that respondents who are likely to have more knowledge of art are more likely to guess "Male", we document in Table 9 that the probability of answering "Male" is higher for older, more affluent and better educated respondents. However, the proportion of "Male" guesses does not differ significantly by the gender of the respondent or the frequency of visits to art galleries.

-Insert Table 9 about here-

The proportion of "Male" guesses was roughly the same for the five paintings of male artists and the five paintings of female artists. Globally the frequency of correct guesses was 50.5%, which is statistically indistinguishable from a random guess. The only painting for which a significant majority of respondents guessed a female artist is a painting of a vase of flowers, *Vase de fleurs au pichet vert*, painted by Marie Lucie Nessi-Valtat. This hints at the idea that some topics might be perceived as being predominantly feminine.

The fact that a representative sample of individuals is unable to correctly guess the gender of an artist by looking at a painting is not per se proof that there are no structural differences between the artistic production of male and female artists. However, it is suggestive that any structural differences that might exist are not readily observable. In addition, the experiment provides us with a measure of "perceived gender" that is orthogonal to the actual gender of the painter. Using "perceived gender" allows us to measure the effect of gender perceptions on the artistic appreciation of a painting.

In Table 10 we report the results of OLS regressions of the appreciation

score of each painting on the perceived gender of the artist, *Female Guess,* which is equal to one if the respondent guessed the artist is female and dummy variables that proxy for respondent characteristics. *Affluent* is equal to one if the respondent has a family income above $100,000; *Art Expert* is equal to one if the respondent visits a museum or art exhibition at least a few times a year; *Male* is equal to one for male respondents; *Mature* is equal to one for respondents in the 45-59 and 60+ age groups; *College Educated* is equal to one if the respondent has a college degree. In every model, we also control for respondents' guesses concerning the perceived period of the painting and the perceived geographic origin of the artist. We also control for participants' responses about their parents and state of residence. Finally, we include painting-fixed effects to control for the characteristics of the individual artworks as well as the actual gender of the artist. Standard errors are clustered at the respondent level.

-Insert Table 10 about here-

In column 1 of Table 10, we report the regressions of the appreciation score on *Female Guess* and controls. In columns 2-7, we add interaction terms between *Female Guess* and respondent characteristics. The coefficient on the perceived female gender of the artist is positive 0.19 and significant in column 1. However, the coefficients on all interaction terms except *Female Guess* x Mature and *Female Guess* x College Educated are negative and significant.[14] Respondent who are men, affluent respondents, and respondents who often visit art galleries appreciate paintings less whose artists they perceive to be female. For example, for male respondents the perceived femininity of the painter is associated with a 0.66 reduction in appreciation, which represents a 13% "discount" from the

[14] Coefficients on the interaction terms are similar if we use OLS regressions and include participant-fixed effects in addition to painting-fixed effects.

average score.

The fact that the perceived gender of the artist is related to respondents' appreciation after controlling for the artist's actual gender is consistent with our hypothesis that attitudes towards women can play a role in explaining the gender price discount we document in earlier sections. The fact that affluent males who visit art galleries appreciate art by artists they believe to be female less is particularly striking as these respondents are likely to be the most similar to participants in auction markets.

Experiment #2: What's in a name?

While the results of this first experiment support our main hypothesis, they do not represent a direct test of culturally motivated gender bias in art auction prices. To test this hypothesis more directly, we design a second experiment in which we again ask our participants to rate how much they like ten paintings on a 0 – 10 scale. The difference from experiment #1 is that the participant can see a randomly drawn male or female artist's name beneath the painting before scoring it.

To avoid ethical issues related to misattribution of real paintings we generate the ten images using the algorithm in Gatys et al. (2015), which is available online at https://deepart.io/. The authors develop an artificial system based on a Deep Neural Network that creates artistic images of high perceptual quality. The system uses neural representations to combine content from an image (in our case pictures of everyday objects and scenery) with the artistic style of arbitrary images (in our case an existing painting). The result is an artistic representation, a "painting", with the subject of the first image and the artistic style of the second (see Table A3 in Appendix A for these 10 generated images).

We associate each image with one of two possible artist names. To create names that are immediately recognizable as male and female but that are neutral

with respect to race or country of origin, we choose the ten most common last names in the US from the 2000 census and combine them with the ten most popular given names for male and female babies born during 1980 – 1989 taken from the SSA.[15]

Similar to experiment #1, we run OLS regressions of the artistic appreciation score on the name of the artist, *Female Name*, which is equal to one if the name is female, respondent characteristics, painting-fixed effects and family background controls and state-fixed effects. Table 11 presents our regression results. Standard errors are clustered at the respondent level.

-Insert Table 11 about here-

In contrast to our previous findings, Panel A of Table 11 indicates that female artists' names are on average unrelated to respondents' appreciation. In general, fewer respondent characteristics are significantly related to their appreciation and fewer interaction terms are significant. One reason may be that because we have fewer questions about the paintings, respondents pay less attention to the paintings. Moreover, the gender of the artist may be less salient in this experiment than it is in experiment #1. If participants focus on rating the painting, they may have overlooked the artist's name.

Nevertheless, we still observe that female names are associated with lower scores for affluent individuals. The result is even stronger in Panel B where we restrict our analysis to individuals who indicate they visit an art gallery or exhibition at least a few times a year. The magnitude of the discount (a score reduction of 0.32) for affluent individuals in Panel B represents a 6% gender

[15] The last names come from http://www.census.gov/topics/population/genealogy/data/2000_surnames.html. We skip three names of Hispanic origin to keep the names as neutral as possible. The first names come from https://www.ssa.gov/oact/babynames/decades/names1980s.html.

discount, which can be considered economically significant. As in experiment #1, the evidence from experiment #2 provides suggestive evidence that participants who are more likely to represent typical art auction participants may value art by women less.

V. Conclusion

In her landmark 1971 article, Nochlin (1971) famously asks: "Why Have There Been No Great Women Artists?" She argues that the answer lies in the nature of social institutions, rather than in the nature of individual genius or the lack thereof. We are the first to provide empirical and experimental evidence consistent with her argument. By focusing on the secondary art market, we isolate a role of social institutions that is distinct from the process of art production. We believe it is difficult to argue that our evidence that the gender discount in art auction prices varies with country-level factors related to gender inequality can be explained by the nature of genius.

While the gender discount may decrease over time as gender equality increases, the impact of historic social institutions on woman's participation in the art market are likely to be long-lasting. As Nochlin (1971) writes:

> *"And while great achievement is rare and difficult at best, it is still rarer and more difficult if, while you work, you must at the same time wrestle with inner demons of self-doubt and guilt and outer monsters of ridicule or patronizing encouragement, neither of which have any specific connection with the quality of the art work as such."*

While gender inequality is a serious policy concern, it is often challenging to argue that economic outcomes for women are a product of culture, not biology. Using the market for art, we highlight the importance of continuing to eliminate gender inequality.

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Appendix A: Inputs into experiments

Table A1. Summary statistics for experimental populations

	Experiment #1 Can you guess?	Experiment #2 What's in a name?	Chi-2	*p*-value
No. of participants	880	1,823		
Gender				
Female	51.7%	51.0%		
Male	48.3%	49.0%	0.113	0.737
Age				
18 - 29	20.8%	20.2%		
30 - 44	26.9%	26.3%		
45 - 59	28.3%	28.3%		
60 +	24.0%	25.2%	0.516	0.915
Education				
Less than high school degree	0.8%	2.0%		
High school degree	9.4%	9.5%		
Some college but no degree	25.1%	22.9%		
Associate degree	10.5%	9.8%		
Bachelor degree	29.5%	31.9%		
Graduate degree	24.7%	23.9%	8.180	0.147
Income				
$0 to $9,999	6.8%	8.0%		
$10,000 to $24,999	11.4%	10.4%		
$25,000 to $49,999	19.8%	20.6%		
$50,000 to $74,999	18.4%	17.6%		
$75,000 to $99,999	14.5%	15.0%		
$100,000 to $124,999	11.6%	9.8%		
$125,000 to $149,999	6.3%	5.2%		
$150,000 to $174,999	3.3%	3.9%		
$175,000 to $199,999	2.0%	2.8%		
$200,000 and up	5.9%	6.7%	7.639	0.571
Visits to museums				
Rarely or never	58.2%	56.4%		
A few times a year	38.1%	40.2%		
Once a month or more	3.8%	3.4%	1.173	0.556
Region				
East North Central	15.1%	16.0%		
East South Central	3.8%	4.7%		
Middle Atlantic	12.4%	13.2%		
Mountain	6.8%	8.0%		
New England	5.9%	6.5%		
Pacific	19.8%	18.6%		
South Atlantic	16.3%	15.6%		
West North Central	8.4%	7.1%		
West South Central	9.5%	8.8%	5.216	0.734

Notes: The table reports the demographic and socio-economic distribution of the participants with complete income data in our two experiments. Gender, age, region, and income are supplied by SurveyMonkey. Education, visits to museums, state, and family background are self-reported. We also provide a Chi-2 test against the null hypothesis that the two samples share the same distribution.

Table A2. Images for experiment #1 "Can you guess?"

Painting 1
David Bierk, *After Gustave Courbet; The Love Valley*
(1/3/2013 - Heffel Fine Art)

Painting 2
Maud Lewis, *Harbour; Nova Scotia*
(1/3/2013 - Heffel Fine Art)

Painting 3
Benny Andrews, *The Pride of Flesh*
(1/8/2013 - Christie's)

Painting 4
Cheryl Laemmle, *Bullocks Oriole; from American Decoy Series*
(1/8/2013 - Christie's)

Painting 5
Nikolai Kozlenko, *Still Life with Fruit*
(1/9/2013 - Skinner Auctioneers)

Painting 6
Oliver Clare, *Still life of fruit*
(1/10/2013 - George Kidner Fine Art)

Painting 7
John Alexander, *Birds in Love*
(1/12/2013 - Brunk Auctions)

Painting 8
Joyce Wahl Treiman, *Ruins & Visions*
(1/12/2013 - Clark Cierlak Fine Arts)

Painting 9
Betty M Bowes, *Quiet Harbor*
(1/13/2013 - Kaminski Auctions)

Painting 10
Marie Lucie Nessi-Valtat, *Vase de fleurs au pichet vert*
(1/13/2013 - Eric Pillon Enchères)

Notes: The table shows the ten paintings used in our "Can you guess?" experiment. To keep our selection as neutral as possible, we choose the first paintings in our sample auctioned at the beginning of 2013. We impose the following restrictions on the selection: a) Five paintings from male and five from female painters; b) Only one painting per artist; c) Auction price below US $100,000 (we want relatively unknown paintings); d) Availability of an electronic image with sufficient resolution.

Table A3. Generated images for experiment #2 "What's in a name?"

Content	Style	Final
 [pixabay.com]	 *Impressionist Landscape, Lynne French*	 Jessica / Michael Smith
 [pixabay.com]	 *Cubo-futurist rendering of Trotsky, uncredited (probably Yuri Annenkov, 1922)*	 Jennifer / Christopher Johnson
 [pixabay.com]	 *Rousse, Henri de Toulouse-Lautrec*	 Amanda / Matthew Williams
 [pixabay.com]	 *Uncredited Picture*	 Ashley / Joshua Brown
 [pixabay.com]	 *Fabrizio Acciaro, Untitled*	 Sarah / David Jones

 [pixabay.com]	 *Patrick Gunderson, Composition #53*	 Stephanie / James Miller
 [pixabay.com]	 *Girl with mandolin, Pablo Picasso*	 Melissa / Daniel Davis
 [pixabay.com]	 *Geoff Hands, Cornish Coast*	 Nicole / Robert Wilson
 [pixabay.com]	 *Grass, Dheeraj Kattula*	 Elizabeth / John Anderson
 [pixabay.com]	 *Setting fire to the Sugar Cane, Timmy Mallett*	 Heather / Joseph Taylor

Notes: The table shows the artificially generated pictures used in our second experiment. The first column contains the picture used as the "subject" of our final image, while the second contains the picture that provided the "visual style". The third column shows the final image obtained combining subject and visual style with the algorithm developed in Gatys et al. (2015). The last column contains the male/female names we paired with the image. We generated the names using the ten most common last names in the US from the 2000 census and the ten most popular given names for male and female babies born during 1980 – 1989 from the US Social Security Administration. Hyperlinks in the table redirect to the original images.

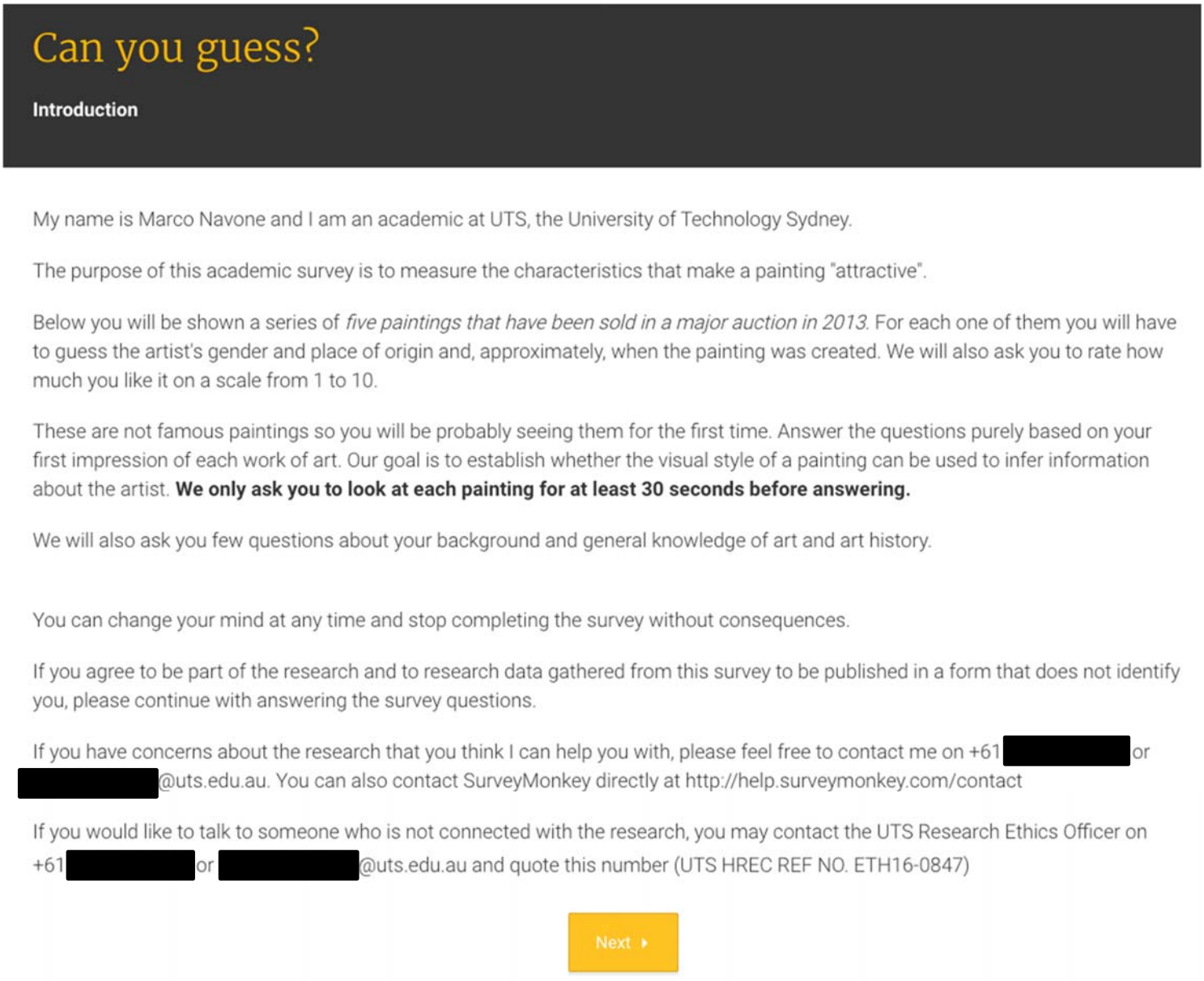
Online Appendix 1: Surveys in experiments

In this appendix, we show screenshots of the surveys we used in the two experiments. We provide comments explaining the purpose of the screenshots in italics.

Experiment #1

Step 1 – Introduction

Each subject is shown an introductory page that explains the purpose of the experiment.



Can you guess?

Introduction

My name is Marco Navone and I am an academic at UTS, the University of Technology Sydney.

The purpose of this academic survey is to measure the characteristics that make a painting "attractive".

Below you will be shown a series of *five paintings that have been sold in a major auction in 2013.* For each one of them you will have to guess the artist's gender and place of origin and, approximately, when the painting was created. We will also ask you to rate how much you like it on a scale from 1 to 10.

These are not famous paintings so you will be probably seeing them for the first time. Answer the questions purely based on your first impression of each work of art. Our goal is to establish whether the visual style of a painting can be used to infer information about the artist. **We only ask you to look at each painting for at least 30 seconds before answering.**

We will also ask you few questions about your background and general knowledge of art and art history.

You can change your mind at any time and stop completing the survey without consequences.

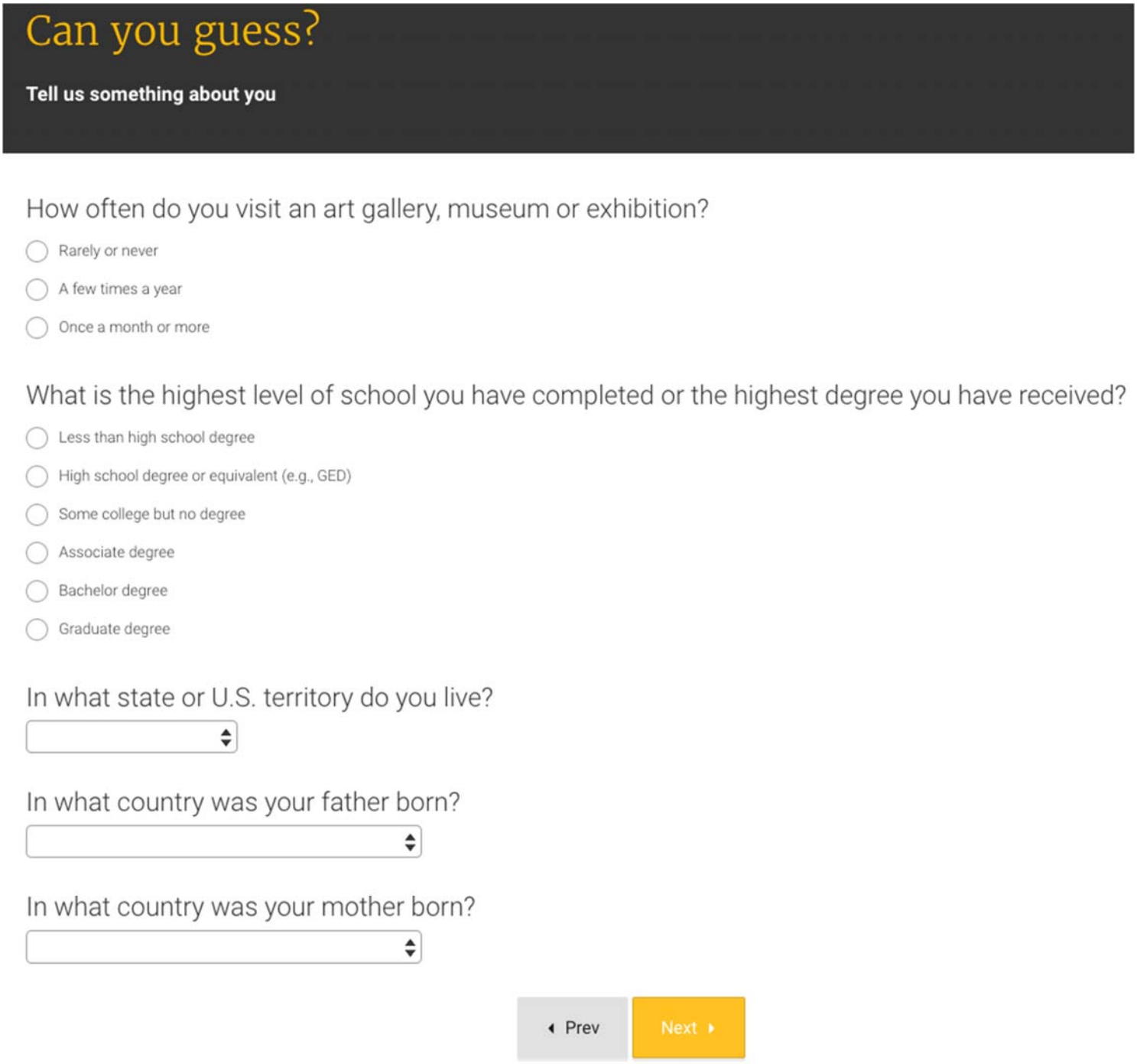
If you agree to be part of the research and to research data gathered from this survey to be published in a form that does not identify you, please continue with answering the survey questions.

If you have concerns about the research that you think I can help you with, please feel free to contact me on +61 [redacted] or [redacted]@uts.edu.au. You can also contact SurveyMonkey directly at http://help.surveymonkey.com/contact

If you would like to talk to someone who is not connected with the research, you may contact the UTS Research Ethics Officer on +61 [redacted] or [redacted]@uts.edu.au and quote this number (UTS HREC REF NO. ETH16-0847)

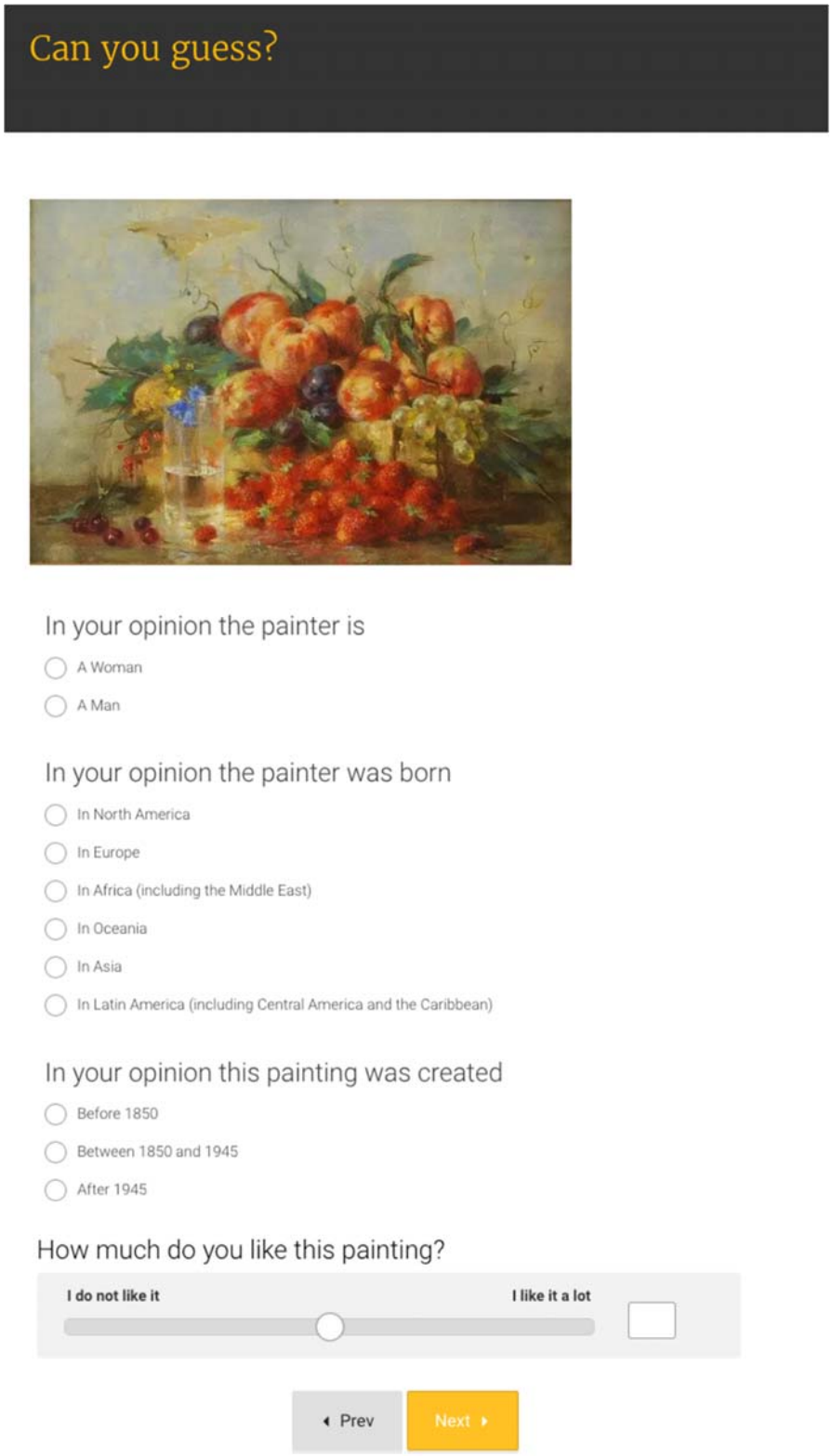
Next

Step 2 – Biographical information
The survey provider supplies us with basic demographic information on each subject (gender, age range and geographical provenance). Here we augment this set with five additional questions.

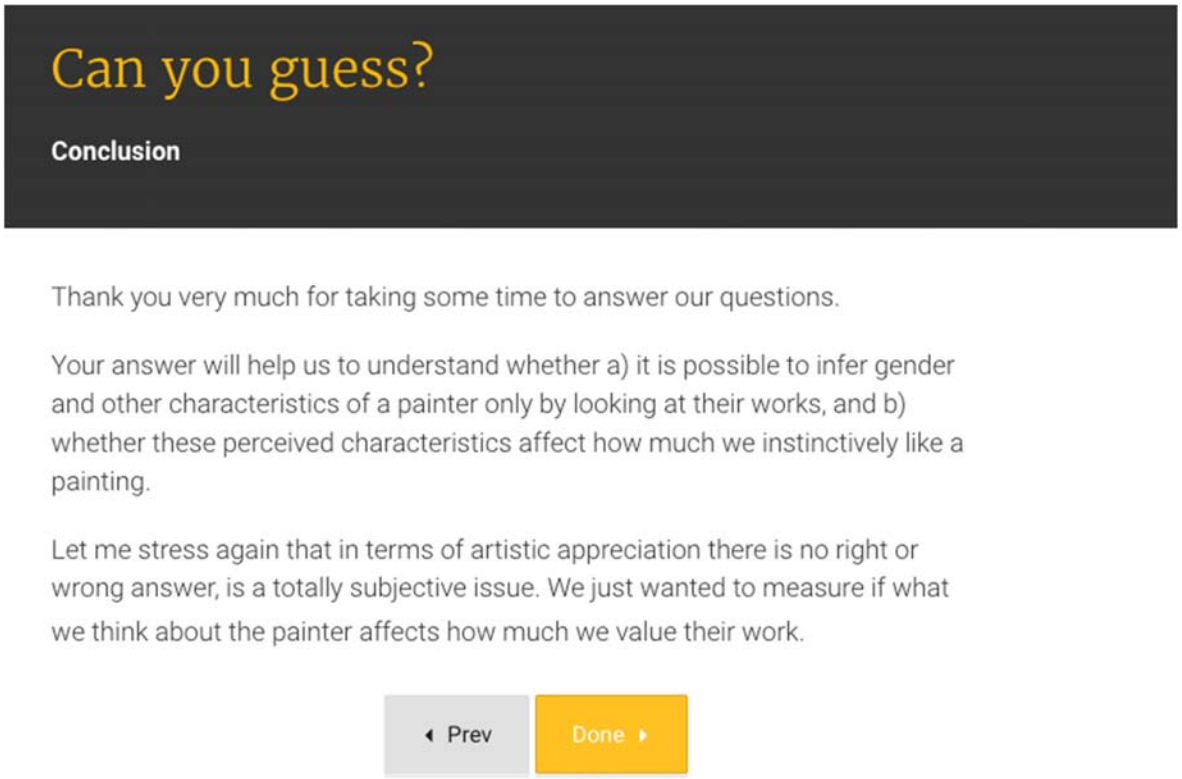


Steps 3 to 7 – The experiment

Each subject is shown a random selection of five paintings. For each painting the subject must guess gender and place of origin of the painter and approximate creation period of the painting. After this, the subject is asked to rate the painting on a 1-10 scale.



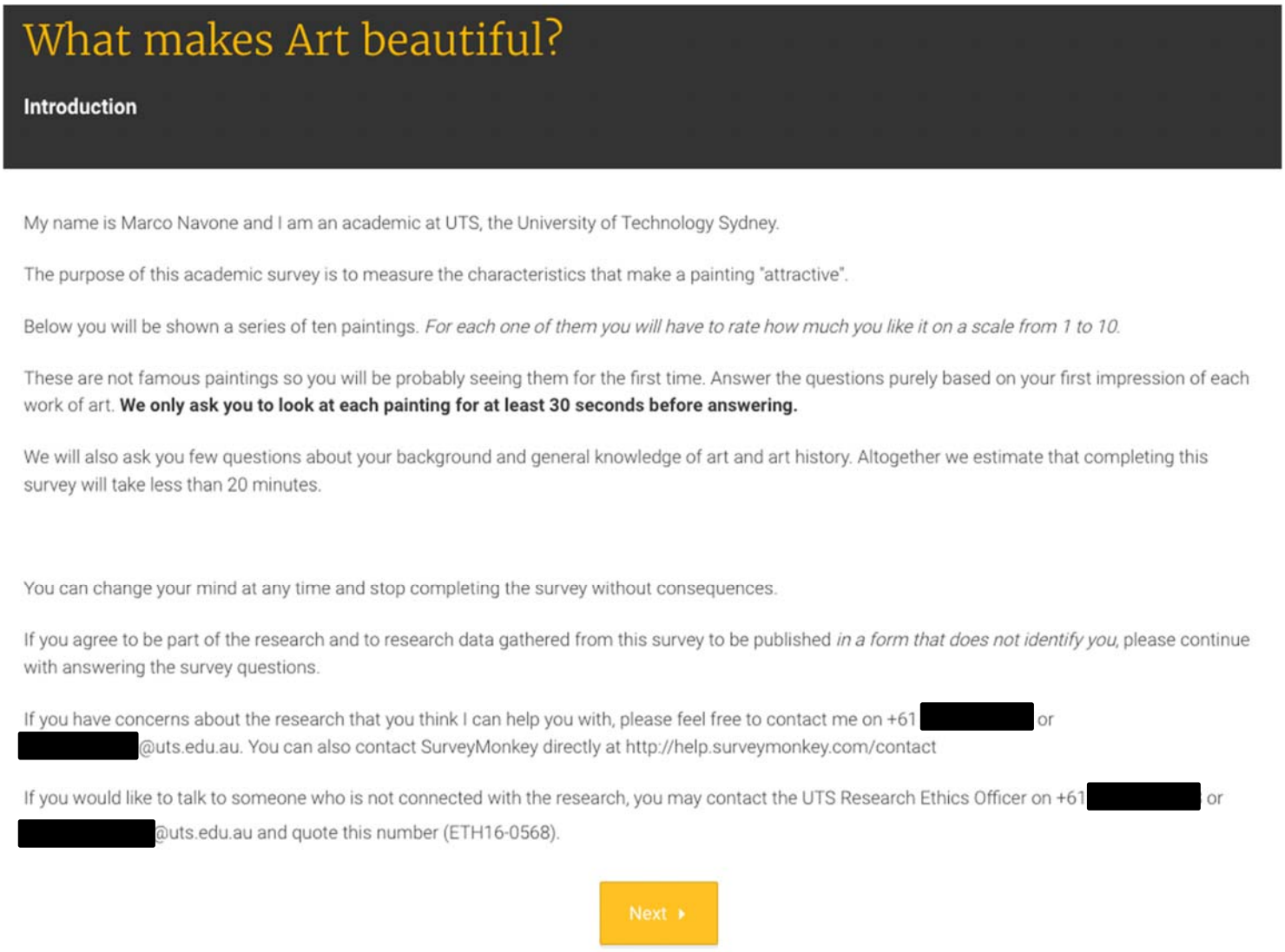
Step 8 – Conclusion
The survey concludes with a closing page where we thank the subject.



Experiment #2

Step 1 – Introduction

Each subject is shown an introductory page that explains the purpose of the experiment.



What makes Art beautiful?

Introduction

My name is Marco Navone and I am an academic at UTS, the University of Technology Sydney.

The purpose of this academic survey is to measure the characteristics that make a painting "attractive".

Below you will be shown a series of ten paintings. *For each one of them you will have to rate how much you like it on a scale from 1 to 10.*

These are not famous paintings so you will be probably seeing them for the first time. Answer the questions purely based on your first impression of each work of art. **We only ask you to look at each painting for at least 30 seconds before answering.**

We will also ask you few questions about your background and general knowledge of art and art history. Altogether we estimate that completing this survey will take less than 20 minutes.

You can change your mind at any time and stop completing the survey without consequences.

If you agree to be part of the research and to research data gathered from this survey to be published *in a form that does not identify you*, please continue with answering the survey questions.

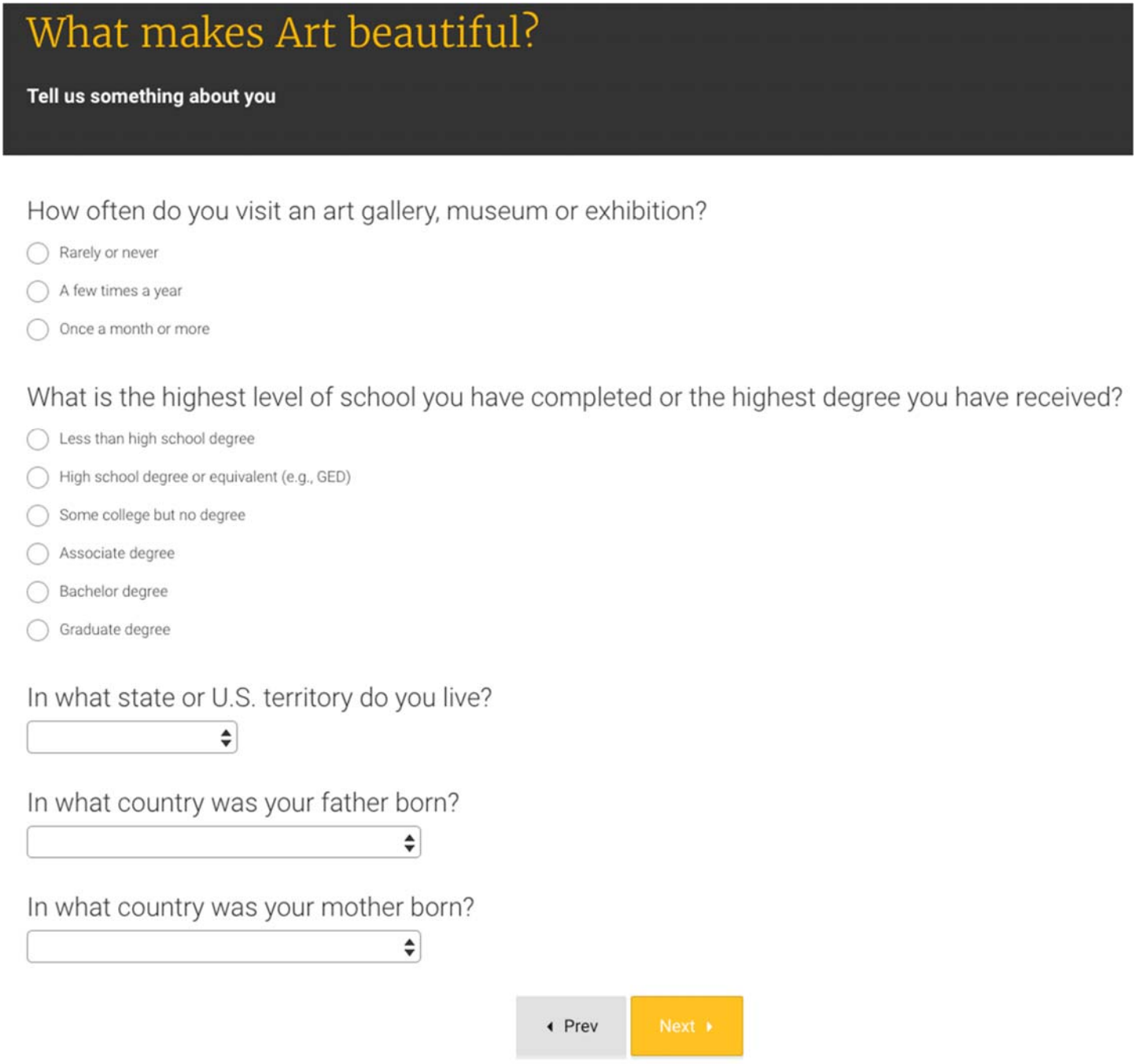
If you have concerns about the research that you think I can help you with, please feel free to contact me on +61 [redacted] or [redacted]@uts.edu.au. You can also contact SurveyMonkey directly at http://help.surveymonkey.com/contact

If you would like to talk to someone who is not connected with the research, you may contact the UTS Research Ethics Officer on +61 [redacted] or [redacted]@uts.edu.au and quote this number (ETH16-0568).

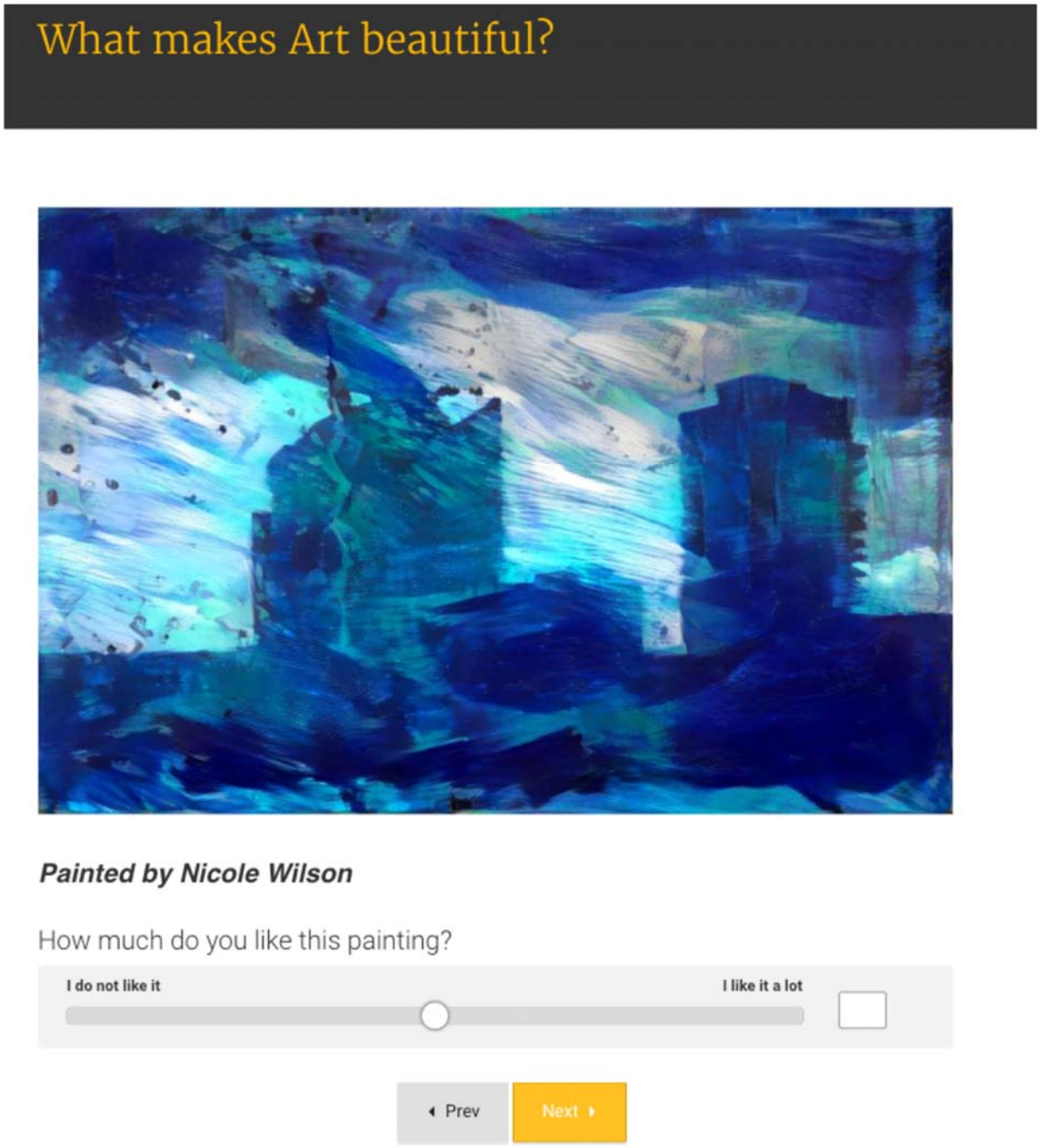
Next ▸

Step 2 – Biographical information

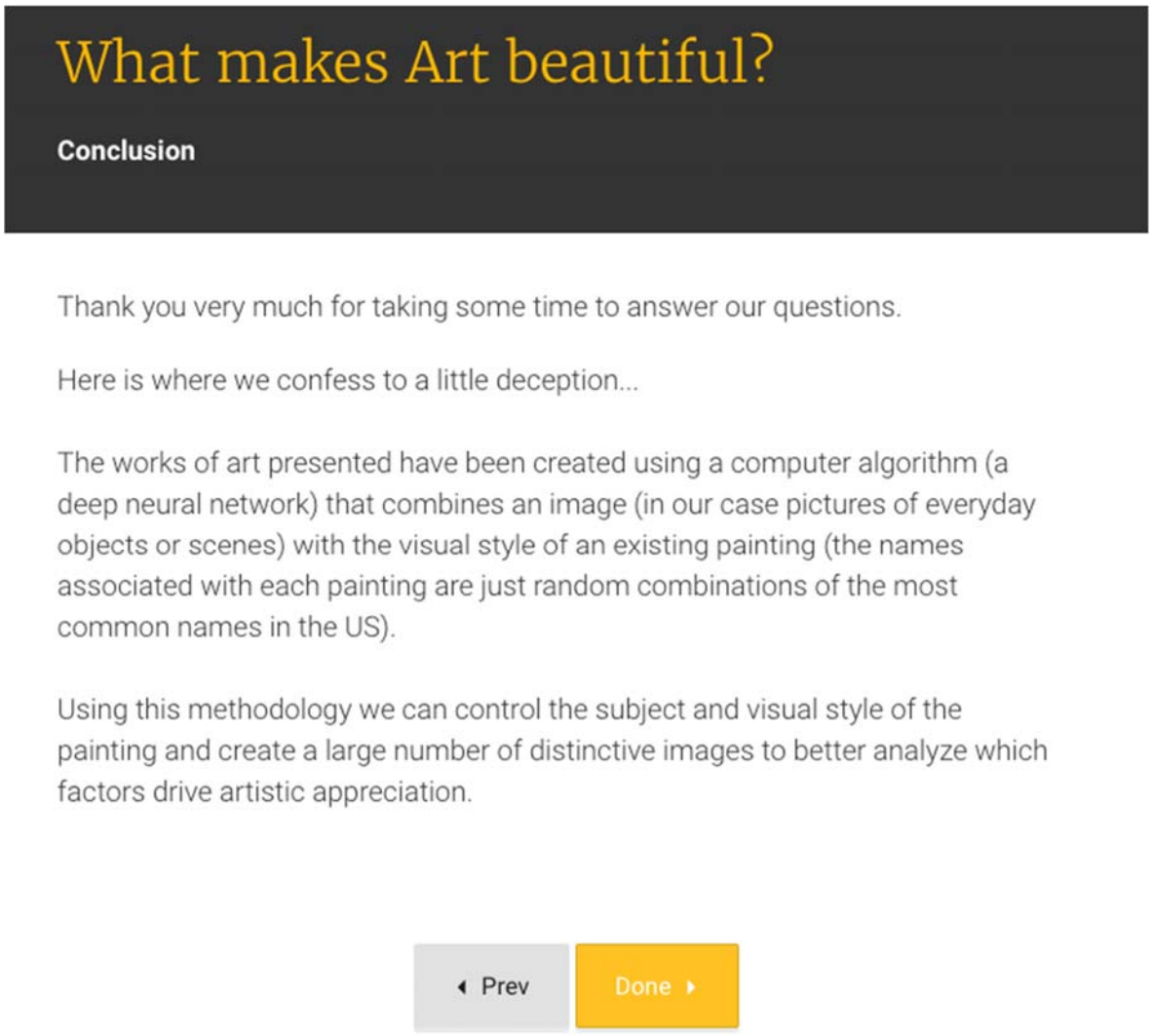
The survey provider supplies us with basic demographic information on each subject (gender, age range and geographical provenance). Here we augment this set with five additional questions.



Steps 3 to 12 – The experiment
Each subject is shown the ten synthetic images in random order. Each image is randomly associated with a male or a female artist name. The subject is asked to rate the painting on a 1-10 scale.



Step 13 – Conclusion
The survey concludes with a closing page where we thank the subject.



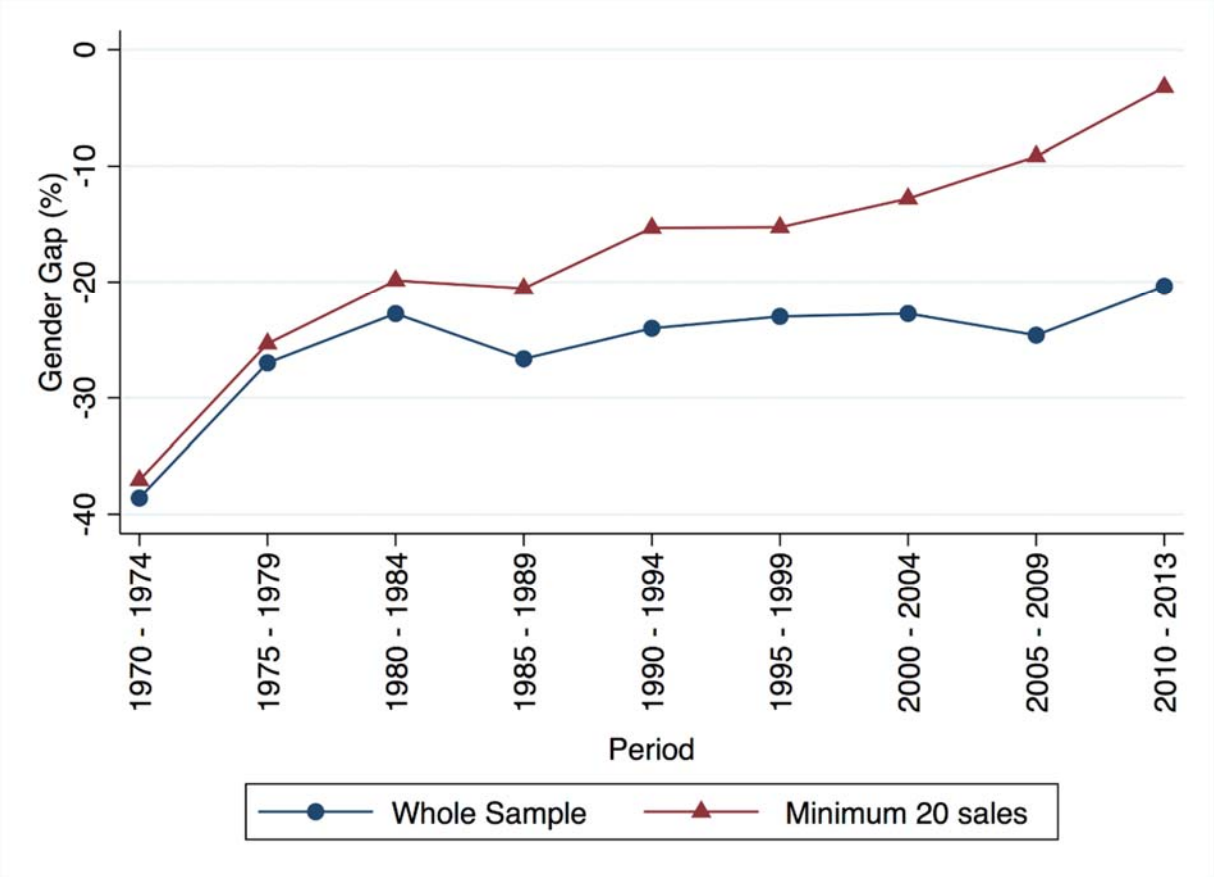
Online Appendix 2: Summary statistics of survey responses

Table A1. Summary statistics for our experiments

Panel A: Experiment #1				Panel B: Experiment #2		
Artist Name	**Gender**	**Female Guess**	**Male Guess**	**Painting**	**Female Name**	**Male Name**
John Alexander	Male	5.524 (84)	4.506*** (340)	1	5.403	5.203*
Benny Andrews	Male	3.456 (228)	2.89** (219)	2	5.273	5.209
David Bierk	Male	6.409 (88)	5.654*** (341)	3	5.583	5.556
Betty M Bowes	Female	5.596 (109)	5.497 (342)	4	6.269	6.417
Oliver Clare	Male	5.679 (184)	5.743 (269)	5	5.959	6.01
Nikolai Kozlenko	Male	5.921 (228)	6.005 (194)	6	4.805	4.633
Cheryl Laemmle	Female	4.649 (174)	4.638 (282)	7	4.338	4.274
Maud Lewis	Female	5.046 (130)	4.735 (291)	8	5.263	5.352
Marie Lucie Nessi-Valtat	Female	5.466 (281)	5.469 (145)	9	5.988	5.935
Joyce Wahl Treiman	Female	4.122 (131)	4.019 (321)	10	5.675	5.607

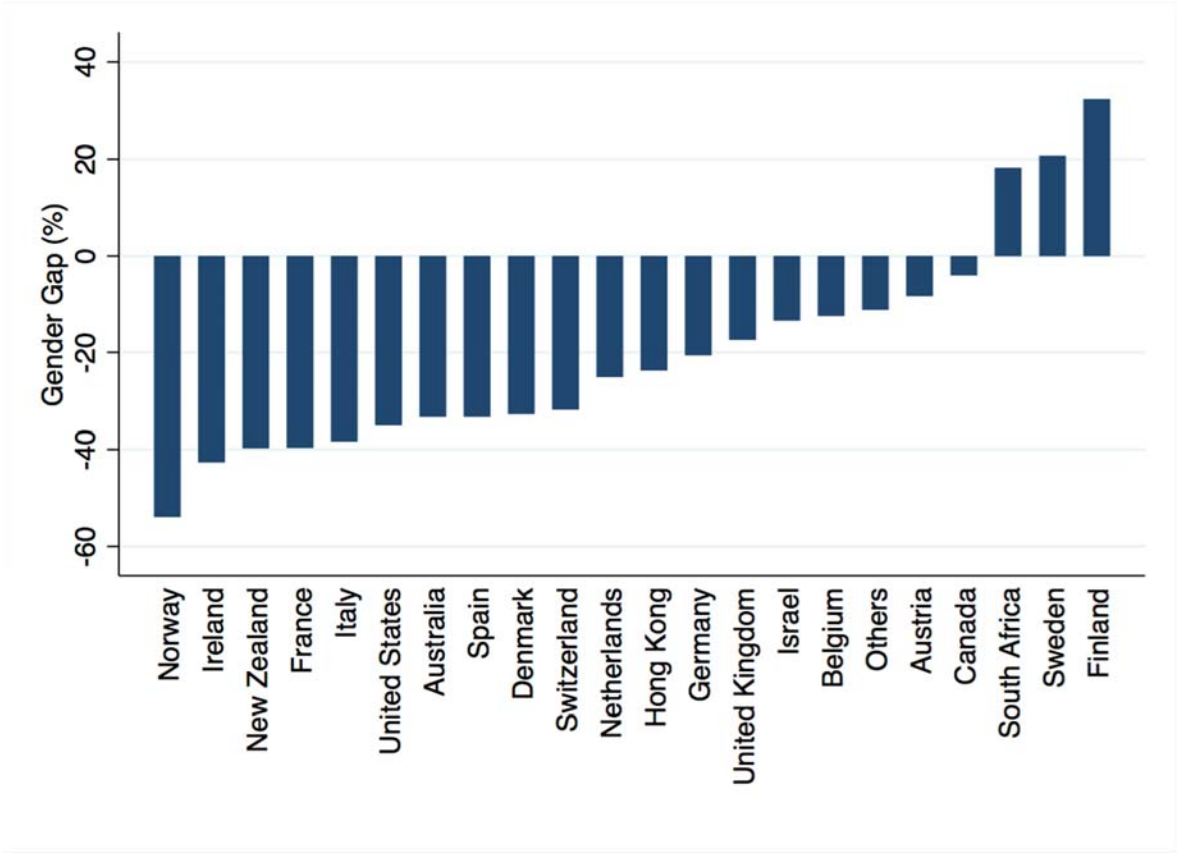
The table reports descriptive statistics for the appreciation scores received by the images in our two experiments divided by gender guess (experiment #1) and gender of the associated artist name (experiment #2). For the first experiment we also report the number of female and male guesses received by each painting. The table also provides the result of a *t*-test for the difference between the average score each painting received when associated with male or female artist gender. The asterisks ***, **, * indicate significance at the 1%, 5% and 10%, respectively.

Figure 1. Marginal effect of time on gender price discount



Notes: The graph shows the predicted price gender discount (in %) for different time periods derived from the OLS estimation of the (natural log of) inflation-adjusted sales price on a gender dummy (female=1), its interaction with a time-period dummy variable, and a series of control variables detailed in Table 1. We also introduce style-, year- and country-fixed effects. The model corresponds to adding period dummies to the regression in column 4 of Table 4.

Figure 2. Marginal effect of country on gender price discount



Notes: The graph shows the predicted price gender discount (in %) for different countries derived from the OLS regression of the (natural log of) inflation-adjusted sale price on a gender dummy, its interaction with a number of country dummy variables, and a series of control variables detailed in Table 1. We also introduce style-, year- and country-fixed effects. Countries with fewer than five hundred transactions involving female artists are lumped into "Others".

Table 1. Variable description

Panel A. Regression variables	
Female Painter	Dummy variable equal to one when the artist is female, and zero if male.
Log(Surface)	Natural logarithm of the surface of the painting measured in squared millimetres.
Marked	Dummy variable that denotes whether the painting is signed or otherwise marked.
Log(Age)	Natural logarithm of the age of the artist at the time of the auction in years. The variable is calculated regardless of whether the artist is dead or alive at the time of the auction.
Deceased	Dummy variable equal to one when the artist is deceased at the time of the auction.
Style	Synthetic classification of the artistic style of the painter. Artists are classified as: 19th Century European, American, Asian, Impressionist and Modern, Latin American, Post-War and Contemporary, Other.
Price	Sale price of the painting in 2013 US$. In regression frameworks we consider the natural logarithm of this quantity labelled as Log (Price).
Panel B. Proxies for gender culture	
UN Gender Inequality Index	A composite measure reflecting inequality in achievements between women and men in three dimensions: reproductive health, empowerment and the labour market. Available for the years 2000, 2005, 2010 and 2013. We use linear interpolation between the available years and use the 2000 value for all the previous years. The index is scaled between 0 and 1 and increasing in inequality. For sake of comparability with other results we reformulate the index as one minus the original value in order to obtain an indicator increasing in inequality.
WEF Gender Gap Index	This index is calculated yearly by the World Economic Forum and ranks countries according to how well they are leveraging their female talent pool, based on economic, educational, health-based and political indicators. The index is calculated yearly from 2006 for la large sample of countries. For a smaller subsample data is available from 2000. We use the first available value for each country for all the previous years. The index is decreasing in inequality.
% of Women in Parliament	From World Bank Data. Proportion of seats held by women in national parliaments (%) (code SG.GEN.PARL.ZS), defined as the percentage of parliamentary seats in a single or lower chamber held by women. Available for 1990 and with continuity from 1997. The indicator is decreasing in inequality.
Tertiary Education Enrolment Ratio	From World Bank Data. Formally known as the "Gross enrolment ratio, tertiary, gender parity index (GPI)" (code SE.ENR.TERT.FM.ZS). Ratio of female gross enrolment ratio for tertiary education to male gross enrolment ratio. It is calculated by dividing the female value for the indicator by the male value for the indicator. A value equal to 1 indicates parity between females and males. In general, a value less than 1 indicates disparity in favor of males and a value greater than 1 indicates disparity in favor of females. Available from 1971. The indicator is decreasing in inequality.
Labor Force Participation Ratio	From World Bank Data. Calculated as the ratio between female (code SL.TLF.CACT.FE.ZS) and male (code SL.TLF.CACT.MA.ZS) labor force participation (population age 15+, modelled ILO estimates). Available from 1990. The indicator is decreasing in inequality.

Panel C. Experiment variables	
Score	Artistic appreciation of a painting expressed on a scale from 0 to 10.
Affluent	Household income of 100,000 US$ or more.
Mature	Age of 45 years or more.
Art Expert	Self-reports visiting a museum or art gallery at least “few times a year”.
College Educated	Self-reported attainment of an associate degree or higher.
Male	Gender of the respondent.
Female Name	Painting associated with a female artist name (first experiment).
Female Guess	Respondent guess about the gender of the artist (second experiment).
Family Background	A series of five dummy variables set equal to one if at least one of the parents of the respondent was born in 1) Asia, 2) Africa (including the Middle East), 3) Latin America(including Central America and the Carribean), 4) Europe, 5) Oceania.
Guessed Country	A series of six dummy variables set equal to one if the respondent in experiment #1 guessed that the painter was born in 1) Asia, 2) Africa (including the Middle East) , 3) Latin America (including Central America and the Carribean), 4) North America, 5) Europe, 6) Oceania.
Guessed Period	A series of three dummy variables set equal to one if the respondent in experiment #1 guessed that the painging was created 1) Before 1850, 2) Between 1850 and 1945, 3) After 1945.

Table 2. Descriptive statistics for auction data

Panel A: Auction variables

	Total Sample	Female Artists	Male Artists	Difference	Gender Gap (%)
N. of Transactions	1,547,810	107,296	1,440,514		
% of Mega Transactions	0.60%	0.32%	0.62%		
Price	46,621	25,262	48,212	-22950***	-47.6%
	(621866)	(256907)	(640757)	(1968)	
Price (Excluding	23,385	16,999	23,862	-6863***	-28.8%
Mega Transactions)	(74530)	(59630)	(75504)	(236)	
Log(Price)	8.615	8.322	8.637	-0.315***	
	(1.587)	(1.498)	(1.591)	(0.005)	
Surface	0.511	0.537	0.509	0.028***	
	(0.634)	(0.692)	(0.630)	(0.002)	
Marked	0.77	0.72	0.77	-0.05***	
	(0.421)	(0.447)	(0.418)	(0.001)	
Age	102.961	97.585	103.362	-5.776***	
	(28.975)	(30.196)	(28.842)	(0.092)	
Deceased	0.746	0.651	0.753	-0.101***	
	(0.435)	(0.477)	(0.431)	(0.001)	

Panel B: Gender culture variables

	Mean	St. Dev.	Percentiles		
			10	50	90
UN Gender Inequality Index	0.793	0.139	0.526	0.836	0.921
WEF Gender Gap Index	0.690	0.048	0.636	0.687	0.752
% of Women in Parliament	22.899	10.968	9.700	21.300	38.000
Tertiary Education Enrolment Ratio	1.075	0.364	0.656	1.087	1.421
Labor Participation Ratio	0.718	0.118	0.544	0.743	0.848

Notes: Our sample consists of Blouin Art Sales Index (BASI) auction data between 1970 to 2013 involving paintings created by all artists born after 1850 for whom we can identify the gender of the artist. Panle A reports mean values (and standard deviations in parentheses) for a number of relevant characteristics of our dataset. Statistics are calculated both for the total sample and for the subsamples of transactions involving male and female artists. The table also provides a *t*-test for the difference between the two subsamples (standard errors in parentheses). Panel B reports descriptive statistics for our gender culture proxy variables. The asterisks ***, **, * indicate significance at the 1%, 5% and 10%, respectively.

Table 3. Gender discount in space and time

Panel A: Gender price discount by subperiod

Subperiod	Full Sample				Excluding Mega Transactions		
	Number of Transactions	% of Trans-actions incl. female artists	Gender Discount (2013 US$)	Gender Discount (%)	% of Mega Transactions	Gender Discount (2013 US$)	Gender Discount (%)
1970 – 1974	26,704	3.01%	–18,361*** (4,298)	–47.0%	0.25%	–14,212*** (2,789)	–40.7%
1975 – 1979	59,203	3.63%	–8,934*** (1,549)	–46.5%	0.07%	–7,681*** (1,066)	–42.8%
1980 – 1984	89,815	4.10%	–8,616*** (2,147)	–43.4%	0.10%	–5,795*** (916)	–34.0%
1985 – 1989	152,721	5.72%	–28,060*** (7,118)	–53.0%	0.61%	–10,165*** (920)	–33.5%
1990 – 1994	162,832	6.20%	–16,868*** (5,668)	–41.7%	0.44%	–8,954*** (734)	–37.4%
1995 – 1999	217,979	6.70%	–19,929*** (3,978)	–61.8%	0.35%	–7,215*** (519)	–39.9%
2000 – 2004	280,513	7.69%	–14,610*** (2,721)	–50.9%	0.34%	–5,531*** (413)	–33.4%
2005 – 2009	321,776	8.19%	–31,262*** (4,487)	–48.3%	0.89%	–8,009*** (549)	–27.5%
2010 – 2013	236,267	8.17%	–44,376*** (7,527)	–51.4%	1.22%	–5,474*** (695)	–18.5%

[Panel B follows in next page]

[Panel A in previous page]

Panel B: Gender price discount by geographic area

Area	Full sample				Excluding mega transactions		
	Number of Transactions	% of Trans-actions incl. female artists	Gender Discount (2013 US$)	Gender Discount (%)	% of Mega Transactions	Gender Discount (2013 US$)	Gender Discount (%)
North America	347,210	8.53%	–61,783*** (6,902)	–60.3%	1.32%	–12,869*** (600)	–35.5%
UK	272,412	7.87%	–42,784*** (4,326)	–57.9%	1.12%	–13,749*** (691)	–39.3%
France	210,202	5.01%	–7,769** (3,116)	–30.6%	0.23%	–5,709*** (575)	–30.6%
Italy	116,655	2.64%	–8,460*** (1,098)	–51.2%	0.06%	–7,582*** (888)	–48.5%
Germany	102,637	4.21%	–3,310*** (1,064)	–23.8%	0.07%	–2,431*** (649)	–19.3%
Other Europe	370,845	6.77%	–1,362 (1,423)	–9.7%	0.07%	–1,688*** (247)	–14.5%
Oceania	67,681	12.33%	–8,569*** (874)	–47.4%	0.09%	–6,950*** (559)	–42.5%
Other	60,168	8.04%	–36,575*** (5,562)	–48.5%	1.24%	–14,335*** (1,605)	–32.5%

Notes: The table reports the number of transactions, the percentage of transactions involving female artists and the average gender discount for different sub-periods (Panel A) as well as the different geographical regions (Panel B). The gender discount is calculated as the difference between the average sale price (in 2013 US$) of paintings of female and male artists. We also provide the result of a *t*-test on this difference (standard errors in parentheses). We repeat the analysis both including and excluding transactions with price above one million (mega transactions) of 2013 US$. The asterisks ***, **, * indicate significance at the 1%, 5% and 10%, respectively.

Table 4. Gender discount in art prices

	Full sample					Excluding mega transactions	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female Painter	–0.315***	–0.285***	–0.341***	–0.247***	–0.122***	–0.232***	–0.120***
	(–6.123)	(–5.746)	(–7.040)	(–5.776)	(–5.068)	(–5.679)	(–5.070)
Log (Surface)				0.387***	0.264***	0.363***	0.259***
				(47.874)	(57.877)	(44.459)	(56.020)
Marked				–0.468***	–0.049***	–0.424***	–0.046***
				(–21.858)	(–6.051)	(–22.490)	(–5.878)
Log (Age)				0.979***	0.825***	0.924***	0.805***
				(11.515)	(18.413)	(11.995)	(18.696)
Deceased				0.235***	0.106***	0.219***	0.104***
				(4.321)	(4.170)	(4.734)	(4.338)
Constant	8.637***						
	(363.689)						
Year-FE	N	Y	Y	Y	N	Y	N
Country-FE	N	N	Y	Y	N	Y	N
Style-FE	N	N	N	Y	Y	Y	Y
Auction-FE	N	N	N	N	Y	N	Y
Obs.	1,547,810	1,547,810	1,547,810	1,547,810	1,540,918	1,538,507	1,531,599
adj. R-sq.	0.003	0.044	0.112	0.256	0.634	0.243	0.609
	Only painters with at least 20 sales						
Female Painter	-0.171***	-0.153**	-0.199***	-0.138**	-0.047	-0.124**	-0.045
	(-2.605)	(-2.411)	(-3.198)	(-2.508)	(-1.494)	(-2.355)	(-1.451)

Notes: The table reports results for the OLS estimation of a model where the (natural log of) inflation-adjusted sale price is regressed on a gender dummy, and a series of control variables detailed in Table 1. In different specifications we introduce style-, time-, country-, and auction-fixed effects. We repeat the analysis both including and excluding transactions with auction sales prices above one million (mega transactions) of 2013 US$. The last line reports the main coefficient of interest re-estimated on the subsample of artists for which we have at least 20 transactions in our sample. All standard errors are clustered at the individual artist and auction level. The asterisls ***, **, * indicate significance at the 1%, 5% and 10%, respectively. *t*-statistics are given in parentheses.

Table 5. Gender culture and gender discount in art prices

	(1)	(2)	(3)	(4)	(5)
	UN Gender Inequality Index (backfilled)	WEF Gender Gap Index (backfilled)	% of Women in Parliament	Tertiary Education Enrolment Ratio	Labor Participation Ratio
Period Covered	1970 - 2012	1970 - 2012	1990 - 2012	1970 - 2012	1990 - 2012
Female x Culture Proxy	1.372***	1.630**	0.016***	0.123	0.564
	(2.701)	(2.026)	(3.680)	(1.113)	(1.036)
Female Painter	1.013	0.337	1.288*	0.795	1.231*
	(1.609)	(0.469)	(1.755)	(1.431)	(1.732)
Culture Proxy	–4.159***	2.020***	–0.020***	0.609***	1.357***
	(–14.364)	(5.871)	(–11.563)	(7.298)	(5.554)
Log (GDP)	0.479***	0.051*	0.120***	0.115***	0.019
	(11.080)	(1.649)	(3.472)	(3.192)	(0.625)
Female x Log (GDP)	–0.226***	–0.164**	–0.176**	–0.112**	–0.180**
	(–3.270)	(–2.320)	(–2.452)	(–1.964)	(–2.246)
Log (Surface)	0.380***	0.380***	0.437***	0.398***	0.406***
	(44.397)	(42.706)	(45.906)	(42.811)	(44.861)
Marked	–0.456***	–0.518***	–0.632***	–0.560***	–0.601***
	(–20.418)	(–19.790)	(–20.662)	(–20.127)	(–21.301)
Log (Age)	0.893***	0.859***	0.906***	0.891***	0.843***
	(10.262)	(9.149)	(9.015)	(9.123)	(8.738)
Deceased	0.220***	0.206***	0.231***	0.219***	0.222***
	(3.922)	(3.425)	(3.211)	(3.381)	(3.284)
Year-FE	Y	Y	Y	Y	Y
Style-FE	Y	Y	Y	Y	Y
Obs.	1,493,439	1,484,751	938,082	1,302,087	1,164,895
adj. R-sq.	0.221	0.186	0.193	0.201	0.191
Marginal effects of changes in country gender culture on gender price discount					
Mean Culture Proxy - 1 SD	-31.25%	-27.80%	-34.66%	-25.03%	-25.58%
Mean Culture Proxy	-19.88%	-20.98%	-19.57%	-22.13%	-21.39%
Mean Culture Proxy + 1 SD	-8.52%	-14.15%	-4.49%	-19.23%	-17.19%
Only painters with at least 20 sales					
Female x Culture Proxy	0.941	1.904*	0.017***	0.345**	0.993
	(1.386)	(1.854)	(3.135)	(2.336)	(1.394)

Notes: The table reports results for the OLS estimation of the (natural log of) inflation-adjusted sale price on a gender dummy, a country/year-level proxy for gender culture and their interaction. We also control for year of the transaction, style of the painting, and a series of control variables detailed in Table 1. We also report the marginal effect of a (±1 SD) change in the gender culture proxy on the price gender discount (in %), calculated as the difference between the predicted (log-) prices for paintings of female and male artists. The last line reports the main coefficient of interest re-estimated on the subsample of artists for which we have at least 20 transactions in our sample. All standard errors are clustered at the individual artist and auction level. The asterisks ***, **, * indicate significance at the 1%, 5% and 10%, respectively. *t*-statistics are given in parentheses.

Table 6. Gender culture and gender discount controlling for artist's' talent

	(1)	(2)	(3)	(4)	(5)
	UN Gender Inequality Index (Backfilled)	WEF Gender Gap Index (Backfilled)	% of Women in Parliament	Tertiary Education Enrolment Ratio	Labor Participation Ratio
Period Covered	1970 – 2012	1970 – 2012	1990 – 2012	1970 – 2012	1990 – 2012
Female x Culture Proxy	0.273	-0.028	0.006***	0.268***	0.668***
	(1.153)	(-0.082)	(3.000)	(2.756)	(2.675)
Culture Proxy	-1.436***	-0.191	-0.007***	0.120***	-0.516***
	(-16.847)	(-1.357)	(-11.220)	(3.600)	(-5.288)
Log (GDP)	0.124***	0.049***	-0.005	0.026	0.055***
	(7.696)	(2.882)	(-0.347)	(1.462)	(3.629)
Female x Log (GDP)	0.102**	0.132***	0.021	0.030	0.004
	(2.033)	(2.594)	(0.636)	(0.693)	(0.120)
Log (Surface)	0.503***	0.506***	0.531***	0.514***	0.525***
	(123.809)	(119.906)	(122.638)	(119.598)	(125.096)
Marked	-0.047***	-0.049***	-0.082***	-0.061***	-0.075***
	(-6.042)	(-6.257)	(-10.701)	(-7.328)	(-9.691)
Log (Age)	1.658***	1.549***	2.378***	1.605***	2.344***
	(8.763)	(8.114)	(9.871)	(8.001)	(10.140)
Deceased	0.017	0.021	0.102***	0.016	0.083***
	(0.761)	(0.950)	(4.196)	(0.686)	(3.461)
Year-FE	Y	Y	Y	Y	Y
Style-FE	Y	Y	Y	Y	Y
Artist-FE	Y	Y	Y	Y	Y
Obs.	1,476,591	1,467,897	921,174	1,285,991	1,147,906
adj. R-sq.	0.737	0.733	0.770	0.743	0.759
Marginal effects of changes in country gender culture on gender price discount					
Mean Culture Proxy - 1 SD	-23.53%	-20.42%	-12.59%	-30.65%	-14.24%
Mean Culture Proxy	-21.27%	-20.54%	-7.06%	-24.33%	-9.27%
Mean Culture Proxy + 1 SD	-19.01%	-20.66%	-1.54%	-18.01%	-4.30%
Only painters with at least 20 sales					
Female x Culture Proxy	0.232	0.338	0.009***	0.363***	1.236***
	(0.797)	(0.813)	(3.748)	(3.244)	(4.019)

Notes: The table reports results for the OLS estimation of the (natural log of) inflation-adjusted sale price on a country/year-level proxy for gender culture and its interaction with a gender dummy. The model includes artist fixed effects and thus a standalone gender dummy is not included. We also control for year of the transaction, style of the painting and a series of control variables detailed in Table 1. We also report the marginal effect of a (±1 SD) change in the gender culture proxy on the price gender discount (in %) calculated as the difference between the predicted (log-) prices for paintings of female and male artists. The last line reports the main coefficient of interest re-estimated on the subsample of artists for which we have at least 20 transactions in our sample. All standard errors are clustered at the individual artist and auction level. The asterisks ***, **, * indicate significance at the 1%, 5% and 10%, respectively. *t*-statistics in parentheses.

Table 7. Gender culture and percentage of transactions involving female artists

Panel A: Entire sample

	(1)	(2)	(3)	(4)	(5)
	UN Gender Inequality Index	WEF Gender Gap Index	% of Women in Parliament	Tertiary Education Enrolment Ratio	Labor Participation Ratio
Period Covered	1970 – 2012	1970 –2012	1990 –2012	1970 – 2012	1990 – 2012
Culture Proxy	-1.310	26.313***	-0.026	-0.013	7.761**
	(-0.660)	(5.476)	(-0.750)	(-0.016)	(2.491)
Log (GDP)	-0.436	-1.005***	0.067	-0.450	-0.552*
	(-1.366)	(-3.693)	(0.217)	(-1.250)	(-1.758)
Year-FE	Y	Y	Y	Y	Y
Obs.	1030	990	492	790	677
adj. R-sq.	0.129	0.157	0.028	0.124	0.049

Panel B: Year-country observations with more than 100 transactions

	(1)	(2)	(3)	(4)	(5)
	UN Gender Inequality Index	WEF Gender Gap Index	% of Women in Parliament	Tertiary Education Enrolment Ratio	Labor Participation Ratio
Period Covered	1970 – 2012	1970 – 2012	1990 – 2012	1970 – 2012	1990 – 2012
Culture Proxy	-2.588	33.556***	0.011	2.594***	14.986***
	(-1.389)	(8.701)	(0.434)	(3.080)	(5.730)
Log (GDP)	0.153	-0.833***	0.063	-0.446*	-0.770***
	(0.554)	(-3.927)	(0.272)	(-1.663)	(-2.845)
Year-FE	Y	Y	Y	Y	Y
Obs.	838	824	426	662	578
adj. R-sq.	0.179	0.268	0.023	0.171	0.114

Notes: The table reports results for the OLS estimation of the fraction of transactions involving female artists in each year/country on a country/year-level proxy for gender culture and the (natural logarithm of) inflation-adjusted per-capita GDP for the specific country/year. We also control for year of the transaction. The analysis is repeated for the whole sample (Panel A) and for the sub-sample of country/year observations with a minimum of 100 transactions (Panel B). We use Huber-White Standard Errors. The atserisks ***, **, * indicate significance at the 1%, 5% and 10%, respectively. *t*-statistics are given in parentheses.

Table 8. Ability to guess the gender of a painter by looking at his/her work

Artist name	Artwork title	Artist gender	% of male guesses	% of female guesses	% of correct guesses	Z-Stat	*p*-value (Non-random)
Individual paintings							
Betty M Bowes	Quiet Harbor	Female	75.8%	24.2%	24.2%	-11.837	0.000
Cheryl Laemmle	Bullocks Oriole, from American Decoy Series	Female	61.3%	38.7%	38.7%	-5.287	0.000
Joyce Wahl Treiman	Ruins & Visions	Female	70.6%	29.4%	29.4%	-9.571	0.000
Marie Lucie Nessi-Valtat	Vase de fleurs au pichet vert	Female	34.0%	66.0%	66.0%	7.225	0.000
Maud Lewis	Harbour; Nova Scotia	Female	68.2%	31.8%	31.8%	-8.180	0.000
Benny Andrews	The Pride of Flesh	Male	50.2%	49.8%	50.2%	0.086	0.931
David Bierk	The Love Valley in Thunderstorm (After Gustave Courbet)	Male	79.8%	20.2%	79.8%	13.426	0.000
John Alexander	Birds in Love	Male	80.2%	19.8%	80.2%	13.735	0.000
Nikolai Kozlenko	Still Life with Fruit	Male	46.6%	53.4%	46.6%	-1.521	0.128
Oliver Clare	Still life of fruit	Male	60.2%	39.8%	60.2%	4.784	0.000
Grouped by gender							
Female Artists		Female	62.1%	37.9%	37.9%	-12.458	0.000
Male Artists		Male	63.3%	36.7%	63.3%	13.584	0.000
Entire sample							
All Artists			62.7%	37.3%	50.5%	0.760	0.447

Notes: The table reports the results of an experiment where a sample of 1,000 individuals representative of the US population have been asked to guess the gender of the painters of the following artworks. The table reports the percentage of Male/Female guesses together with the percentage of correct guesses and the *p*-value of a test against the null hypothesis that this last quantity is different from what would result from a random guess.

Table 9. Frequency of "male" guesses and characteristics of the respondents

By Age of the Respondent	I	II	III	IV
	18-29	**30-44**	**45-59**	**60+**
% of Male Guesses	0.605	0.596	0.645	0.658
Difference		-0.009	0.041*	0.053**
		(-0.417)	(1.924)	(2.434)
By Income of the Respondent				
	<50 k$	**50k$ - 100k$**	**100k$ - 175k$**	**175k$+**
% of Male Guesses	0.599	0.640	0.635	0.667
Difference		0.041**	0.036*	0.069***
		(2.360)	(1.712)	(2.756)
By Education of the Respondent				
	No college degree	**Associate degree**	**Bachelor degree**	**Graduate degree**
% of Male Guesses	0.602	0.609	0.636	0.657
Difference		0.007	0.034*	0.055***
		(0.258)	(1.844)	(2.869)
By Art Experience of the Respondent (frequency of visits to museums)				
	Rarely or never	**At least few times a year**		
% of Male Guesses	0.619	0.637		
Difference		0.018		
		(1.237)		
By Gender of the Respondent				
	Female	**Male**		
% of Male Guesses	0.627	0.625		
Difference		-0.002		
		(-0.123)		

Notes: The table reports the frequency with which groups of respondents with different characteristics in terms of age, income education art experience and gender have answered "Male" when asked to guess the gender of the artist who painted one of the 10 artworks listed in Table 8. The table also reports Z-stats (in parentheses) on tests on the difference between the different sub-groups and the group in the first column (I). The asterisks ***, **, * indicate significance at the 1%, 5% and 10%, respectively.

Table 10. Perceived gender and artistic appreciation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female Guess	0.172**	0.265***	0.292***	0.497***	0.018	0.092	0.422***
	(2.197)	(3.013)	(3.149)	(4.585)	(0.161)	(0.776)	(2.636)
Affluent	-0.173	-0.058	-0.172	-0.175	-0.174	-0.173	-0.061
	(-1.486)	(-0.434)	(-1.478)	(-1.495)	(-1.491)	(-1.484)	(-0.454)
Art Expert	0.406***	0.408***	0.513***	0.412***	0.404***	0.406***	0.522***
	(3.810)	(3.825)	(4.159)	(3.864)	(3.787)	(3.809)	(4.237)
Male	0.093	0.092	0.096	0.341***	0.095	0.095	0.341***
	(0.911)	(0.901)	(0.932)	(2.844)	(0.924)	(0.927)	(2.845)
Mature	-0.048	-0.047	-0.046	-0.046	-0.163	-0.047	-0.168
	(-0.446)	(-0.441)	(-0.431)	(-0.432)	(-1.326)	(-0.442)	(-1.362)
College Educated	-0.372***	-0.371***	-0.371***	-0.382***	-0.371***	-0.420***	-0.449***
	(-3.347)	(-3.340)	(-3.336)	(-3.436)	(-3.331)	(-3.318)	(-3.533)
Female Guess x Affluent		-0.321*					-0.316*
		(-1.893)					(-1.833)
Female Guess x Art Expert			-0.290*				-0.299**
			(-1.873)				(-1.967)
Female Guess x Male				-0.664***			-0.649***
				(-4.514)			(-4.442)
Female Guess x Mature					0.308**		0.331**
					(2.066)		(2.236)
Female Guess x College Educated						0.126	0.185
						(0.835)	(1.237)
Family Background	Y	Y	Y	Y	Y	Y	Y
Guessed Country	Y	Y	Y	Y	Y	Y	Y
Guessed Period	Y	Y	Y	Y	Y	Y	Y
State-FE	Y	Y	Y	Y	Y	Y	Y
Painting-FE	Y	Y	Y	Y	Y	Y	Y
Obs.	4,354	4,354	4,354	4,354	4,354	4,354	4,354
adj. R-sq.	0.150	0.150	0.150	0.153	0.150	0.150	0.155

Notes: The table reports results for an OLS estimation of the effect of a female artist guess on artistic appreciation after controlling for respondent characteristics. In every model we also control for the guessed period of the painting and the guessed geographic origin of the artist. We also control for family background and state of residence of the respondent. Finally, we include painting-fixed effects to control for the characteristics of the individual works of art. All standard errors are clustered at the survey respondent level. The asterisks ***, **, * indicate significance at the 1%, 5% and 10%, respectively. *t*-statistics are given in parentheses.

Table 11. Associated gender and artistic appreciation

Panel A: Entire sample							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female Name	0.037	0.075*	0.039	0.066	0.018	0.048	0.060
	(1.011)	(1.729)	(0.772)	(1.276)	(0.351)	(0.794)	(0.723)
Affluent	-0.133	-0.064	-0.133	-0.133	-0.133	-0.133	-0.057
	(-1.574)	(-0.684)	(-1.573)	(-1.572)	(-1.571)	(-1.574)	(-0.593)
Art Expert	0.576***	0.575***	0.579***	0.576***	0.576***	0.576***	0.572***
	(7.864)	(7.854)	(7.114)	(7.863)	(7.862)	(7.864)	(7.022)
Male	-0.137*	-0.137*	-0.137*	-0.107	-0.137*	-0.137*	-0.111
	(-1.858)	(-1.856)	(-1.858)	(-1.310)	(-1.857)	(-1.858)	(-1.354)
Mature	-0.201***	-0.202***	-0.201***	-0.201***	-0.218***	-0.201***	-0.232***
	(-2.682)	(-2.695)	(-2.681)	(-2.683)	(-2.627)	(-2.684)	(-2.768)
College Educated	-0.131	-0.131	-0.131	-0.131	-0.130	-0.122	-0.138
	(-1.553)	(-1.559)	(-1.553)	(-1.555)	(-1.550)	(-1.319)	(-1.491)
Female Name x Affluent		-0.136*					-0.149*
		(-1.716)					(-1.755)
Female Name x Art Expert			-0.005				0.005
			(-0.073)				(0.069)
Female Name x Male				-0.059			-0.051
				(-0.818)			(-0.705)
Female Name x Mature					0.034		0.059
					(0.469)		(0.789)
Female Name x College Educated						-0.018	0.015
						(-0.235)	(0.190)
Family Background	Y	Y	Y	Y	Y	Y	Y
State-FE	Y	Y	Y	Y	Y	Y	Y
Painting-FE	Y	Y	Y	Y	Y	Y	Y
Obs.	18,230	18,230	18,230	18,230	18,230	18,230	18,230
adj. R-sq.	0.083	0.083	0.083	0.083	0.083	0.083	0.083

[Panel B on next page]

[Panel A in previous page]

Panel B: Only people who visit museums

	(1)	(2)	(3)	(4)	(5)	(6)
Female Name	0.040	0.114*	-0.030	-0.061	-0.061	-0.197*
	(0.775)	(1.818)	(-0.436)	(-0.841)	(-0.682)	(-1.823)
Affluent	0.064	0.174	0.063	0.066	0.065	0.230*
	(0.572)	(1.455)	(0.561)	(0.588)	(0.581)	(1.888)
Male	0.012	0.013	-0.064	0.014	0.013	-0.066
	(0.126)	(0.136)	(-0.588)	(0.138)	(0.132)	(-0.601)
Mature	-0.226**	-0.228**	-0.225**	-0.321***	-0.226**	-0.355***
	(-2.206)	(-2.226)	(-2.194)	(-2.861)	(-2.203)	(-3.153)
College Educated	-0.238*	-0.239*	-0.237*	-0.238*	-0.306**	-0.330**
	(-1.953)	(-1.962)	(-1.946)	(-1.957)	(-2.322)	(-2.506)
Female Name x Affluent		-0.218**				-0.324***
		(-2.023)				(-2.829)
Female Name x Male			0.153			0.163
			(1.475)			(1.594)
Female Name x Mature				0.190*		0.257**
				(1.861)		(2.437)
Female Name x College Educated					0.134	0.181
					(1.235)	(1.624)
Family Background	Y	Y	Y	Y	Y	Y
State-FE	Y	Y	Y	Y	Y	Y
Painting-FE	Y	Y	Y	Y	Y	Y
Obs.	7,940	7,940	7,940	7,940	7,940	7,940
adj. R-sq.	0.063	0.064	0.064	0.064	0.064	0.065

Notes: The table reports results for an OLS estimation of the effect of association with a female artist name on artistic appreciation after controlling for respondent characteristics. Panel A analyzes the entire sample, while Panel B focuses on respondents who visit museums or art galleries at least few times a year. We also control for family background and state of residence of the respondent. Finally, we include painting-fixed effects to control for the characteristics of the individual works of art. All standard errors are clustered at the survey respondent level. The asterisks ***, **, * indicate significance at the 1%, 5% and 10%, respectively. *t*-statistics are given in parentheses.

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