Attitudes towards Assisted Reproductive Technologies: A Vignette Study

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Abstract

While delayed parenthood and medical advancements have increased ART utilization across Europe, existing studies largely treat infertility as a medical issue, overlooking its *socially constructed* nature. This gap is particularly problematic in light of the growing societal and political debates around ART, which resemble other polarized, partisan ethical issues. This paper examines attitudes toward ART, with a focus on Italy—a country traditionally known for conservative family norms, yet where ART use has become more widespread in recent years. We employ a factorial survey experiment (FSE) in which respondents evaluate vignettes describing fictitious couples facing infertility, and express judgments regarding whether they should pursue ART (on a 0-10 response scale). Descriptive results reveal polarized attitudes toward ART use: approximately 15% of responses in our sample are strongly in favor, while about 10% are strongly opposed. Nonetheless, our findings also indicate that certain characteristics of the fictitious couples—such as having tried to conceive for over a year and advanced maternal age—positively influence support for ART. In contrast, heterologous treatments, going abroad, and being already a parent are generally associated with more negative attitudes. By demonstrating that views on ART are polarized, yet also fluid, context-dependent, and shaped by the specific relational dynamics within couples, this study lays a foundation for future research on ART in contemporary aging societies.

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Introduction

Many couples encounter fertility challenges when trying to conceive. The rising trend of delayed childbearing has led to an increased demand for medical assistance, as advancing age reduces the natural ability to conceive and carry a pregnancy to term (Schmidt et al. 2012). As a result, postponing parenthood increases the likelihood that individuals and couples will experience sub-fertility or infertility issues and turn to Assisted Reproductive Technology (ART) to fulfill their childbearing intentions. ART encompasses fertility treatments in which eggs, sperm, and embryos are manipulated in a laboratory before being transferred into the uterus in the hope of achieving pregnancy (Zegers-Hochschild et al. 2017). Its use has expanded significantly in Europe, with over 2 million ART-conceived babies born as of 2019 (Smeenk et al. 2023).

While extensive research has examined the factors influencing medical help-seeking for infertility (see Passet-Wittig & Greil 2021 for a review), the underlying mechanisms remain only partially understood. This persistent knowledge gap stems, in part, from the tendency of much of the medical literature on ART to overlook the fact that help-seeking is a *socially constructed phenomenon* (Greil et al. 2011a), negotiated by professionals, suffers, and embedded within a socio-cultural context. A significant limitation of most studies on the determinants of ART use is the all-too-often adoption of a framework that treats infertility primarily as a health issue (White et al. 2006). This paper addresses this key limitation by examining attitudes toward ART.

We contend that research on infertility-related behaviors should also be firmly grounded in the field of social demography. They should be conceptualized as a fertility behavior, where the goal of seeking help is not merely to address a health condition, but to overcome barriers to parenthood and achieve a desired family size (Passet-Wittig et al., 2020). Fertility research has long emphasized that beyond structural barriers, deeply ingrained social norms and attitudinal factors can be decisive in shaping individuals' choices about fertility (van de Kaa, 2001; Lesthaeghe, 2010, 2020). However, this perspective has yet to be fully integrated into the ART literature (Präg and Mills 2017; Haug and Milewski 2018). Understanding how normative and attitudinal forces operate is essential for a more comprehensive account of infertility help-seeking behaviors, calling for a paradigm shift in research that moves beyond access and affordability to also consider the social and cultural underpinnings of ART utilization.

The focus on attitudes towards ART aligns with the growing relevance of ART in contemporary societies not only as a medical and demographic phenomenon but also within the social, political and ethical debate (Vayena et al. 2002). Advances in reproductive technologies and the trend toward delayed parenthood combined with individual and societal aging, have expanded access to parenthood

for groups previously excluded (Lazzari et al. 2021, 2022). However, this expansion has also ignited ethical, moral and political debates about the legitimacy, regulation, and societal implications of ART (Compans and Zagel 2025). As reproductive technologies increasingly interact with deeply held beliefs about family, life, and societal values, ART has become part of broader societal discussions that align with divisive and politically charged topics, such as abortion and euthanasia (Aurrekoetxea-Casaus et al. 2022; Ramos et al. 2024). Like these issues, ART utilization has evolved into a partisan dispute, reflecting broader ideological divides. To what extent this remains the case, however, is an open empirical question. On one side, proponents emphasize individual autonomy, reproductive rights, and the potential for technology to overcome biological limitations. On the other, opponents often invoke concerns about the natural order, ethical boundaries of scientific intervention, the commodification of women's bodies, and the potential commercialization of reproduction. This polarization mirrors the dynamics of the so-called "cultural wars" observed across Europe, where questions of reproductive autonomy and technological intervention have become markers of broader political and ideological affiliations (Parel et al. 2024). The partisan nature of these debates underscores the importance of studying attitudes toward ART utilization.

The empirical investigation focuses on Italy—a country often portrayed as the antidote to the broad changes to the family occurring in other wealthy countries. However, the stereotypical view of Italy as an old-fashioned and traditional society, at least demographically, stands to fall (Aassve et al. 2024) and ART has recently become a standard infertility treatment (Scaravelli et al. 2024). Specifically, this study addresses the following research questions: (1) To what extent are attitudes toward ART polarized? (2) How do couples' specific characteristics related to infertility—such as female partner's age, reproductive history, and type of ART treatment—shape attitudes toward ART? (3) Are respondents' socio-demographic profiles—such as gender, education, and socioeconomic status—more or less influential than personal cultural orientations in shaping attitudes toward ART?

This paper addresses these questions by taking a novel perspective to assess the role of attitudes towards ART in Italy through the use of a factorial survey experiment (FSE). The use of experiments has been successfully employed in family demography research in recent years (e.g., Lappegård et al. 2022; Vignoli et al. 2022; Matera et al. 2023; Guetto et al. 2025). In our experimental setting, we expose the respondents to several scenarios (vignettes) characterized by different couple's characteristics and diverse ART conditions (female partner's age; parity; duration of the couple's attempts to conceive a child; expenses of the procedure; type of treatment recommended by the doctor; proximity to a fertility centre) and ask them what this couple *should* do with respect to the eventual use of ART to achieve their fertility goals. Rather than directly asking respondents to express

their attitudes toward ART, this approach reduces the social desirability biases inherent in such attitudinal questions and allows us to assess how respondents' attitudes are shaped by the characteristics of both the couple and the treatment of the vignette. This perspective enables us to capture the underlying flexibility of ART-related attitudes. Our findings suggest that such attitudes are not fixed, but rather context-dependent and sensitive to the specific relational dynamics of the couple. By adopting a socio-demographic perspective, this paper moves beyond the medical and technical dimensions of ART to gain a more comprehensive understanding of how individuals make decisions in the context of infertility.

Attitudes Toward ART: Evidence and Gaps

Qualitative studies (e.g., Van Steijvoort 2024, for Flanders) and research based on convenience samples (e.g., Wenberg et al. 2016 for Sweden; Fauser et al. 2019 for France, Germany, Italy, Spain, Sweden, and the UK; Szalma and Bitó 2021 for Hungary) generally indicate broad public acceptance of ART, especially when it is used to address biomedical fertility impairments. A systematic review and meta-analysis by Demissei and colleagues (2024) analyzed national surveys and published research on attitudes toward donor eggs, embryos, and sperm. Drawing from multiple databases, including PubMed, CINAHL, and Medline, the study revealed that 38.6% of infertile couples held positive attitudes toward donor eggs, while 33.2% and 31.3% were favorable toward donor embryos and sperm, respectively. Notably, women were more accepting of donor gametes than men, and non-Asian countries reported higher positive attitudes across all categories.

A key limitation of existing research is the lack of context-specific assessments that situate ART attitudes within concrete couple scenarios. While most people may oppose donor eggs in principle—often on the grounds that it is preferable to have a biologically related child of both parents —their views may shift when confronted with more realistic circumstances, such as how long a couple has been trying to conceive or whether they already have children. Even among infertile couples, whose views may be shaped by more direct experience, variation in key factors such as time spent trying to conceive and parity may influence attitudes toward ART. Hence, our understanding of how situational and experiential factors shape their attitudes remains limited.

In their narrative literature review, Passet-Wittig and Greil (2021) analyze 39 studies from 11 high-income countries, highlighting key conceptual and methodological limitations in existing research while outlining directions for future inquiry. They categorize the determinants of help-seeking behavior into five main groups: socio-demographic characteristics, socio-economic status,

reproductive history, personal attitudes, and psychological factors. The review suggests that although much of the existing knowledge focuses on socio-demographic aspects (such as age and race/ethnicity) and socio-economic influences (including income, health insurance, and financial barriers to fertility treatment), there is growing evidence that personal values and individual attitudes play a crucial role in shaping the help-seeking process (Greil et al. 2010, 2011b). Overall, the authors advocate for more research based on large, representative samples, particularly from non-U.S. contexts, as both timely and warranted.

Attitudes towards ART can play a crucial role, either facilitating or hindering access to medical assistance. Prior research generally shows that socio-demographic factors such as gender, education, and age often have limited influence on these attitudes (e.g., Szalma and Bitó 2021). Instead, social norms and personal values appear to play a more significant role (Bunting et al., 2013). Greil et al. (2011a) revealed that ethical concerns about ART did not influence the likelihood of consulting a doctor but did reduce the probability of undergoing diagnostic tests and pursuing treatment. Bunting and Boivin (2007) provided evidence suggesting that positive beliefs about fertility and treatment were linked to an increased likelihood of seeking medical assistance. The degree of support then varies depending on the specific method. Homologous in Vitro Fertilization (IVF) using a couple's own gametes tends to be more widely approved than procedures involving third-party contributions, like sperm or egg donation, embryo donation, or surrogacy (e.g., Stöbel-Richter et al., 2009, for Germany; Daniluk and Koert, 2012, for Canada).

In this paper, we situate the study of ART and infertility help-seeking within fertility research (e.g., Balbo et al., 2014; Vignoli et al., 2020; Mills et al., 2011). The socio-demographic literature has so far examined the determinants of ART and infertility help-seeking, indicating that ART utilization is socially stratified, both globally and within Western societies (e.g., Goisis et al., 2020, 2023). However, a key insight from fertility research (see van de Kaa, 2001; Lesthaeghe, 2010, 2020)—which has yet to receive sufficient attention in the ART literature—is that beyond structural barriers, social norms and attitudinal factors may play a critical role in shaping individuals' decisions to seek medical help for infertility. Life course research has in fact often overlooked reproduction as a key sphere subject to state intervention and deeply ingrained institutional norms that shape individuals' decisions regarding if, when, and how to have children (Zagel 2024). More research is needed to clarify how attitudes and social norms influence infertility help-seeking behaviors (Präg and Mills 2017). In addition, from a demographic standpoint, it is challenging to generalize many findings from the medical and psychological literature on attitudes toward ART, as these studies often rely on small, non-representative samples. Relevant questions remain unanswered—for example, how attitudes

toward ART are distributed in the population and what factors make ART more or less socially acceptable. This paper addresses these limitations.

A case for Italy

Italy has been labelled 'traditional' in terms of values orientation; a feature due in no small part to the dominant role of the Roman Catholic Church. However, the perception of Italy as a demographically old-fashioned and traditional society is increasingly challenged (Aassve et al. 2024). Recent data suggest that new family-related behaviors, i.e. cohabitation, out-of-wedlock childbearing, and divorce, are now spreading rapidly (De Rose 1992; Castiglioni and Dalla Zuanna 2008; Meggiolaro and Ongaro 2008 Salvini and Vignoli 2011; Meggiolaro and Ongaro 2015; Pirani and Vignoli 2016; Vignoli et al. 2018; Tomassini and Vignoli 2023). The only indicator consistent with SDT would be Italy's 40-year history of low fertility. In 2022, the TFR is below 1.3 and the mean age of first childbearing stands nearly at 32 years (ISTAT, 2023). After Spain, Italy has the highest incidence of births from women over 40 (8.4%), 3 percentage points over the EU27 average.

The conundrum of rapid changes in family-related behaviors, on the one side, and the enduring low fertility and sky-rocking age at first birth, on the other, make Italy especially interesting to study prevailing social norms and attitudes towards ART. Despite a restrictive legislation compared to that of other high-income countries, ART has allowed new opportunities for many couples who desired to have children at later ages or were previously considered sterile. According to the Italian Ministry of Health, the use of ART remains relatively uncommon compared to the potential demand. Nonetheless, its usage has experienced a substantial increase (Castagnaro et al., in press). Over the past decade, there has been a noteworthy 73% surge in ART-related deliveries, escalating from 8,000 in 2012 to surpass 14,000 in 2022. On average, in 2022 ART constitutes 3.7% of all deliveries, marking a twofold increase from the share observed a decade ago (1.76% in 2012). Additionally, the proportion of deliveries involving ART rises with age, with nearly one out of every five deliveries for women over 40 being accomplished through ART (18.1%). This percentage has notably expanded over the past 10 years, as in 2012 it was just 6.9%.

In Italy, as in much of Europe, women's reproductive health issues often spark intense debate, frequently becoming entangled with political, social, and religious considerations (Cioffi et al. 2022; Parel et al. 2024). The regulation of ART in Italy is no exception, as it has been shaped by a contentious and complex legislative trajectory. The existing legal framework appears to be rooted in

broadly accepted norms; however, it remains uncertain whether these regulations align with contemporary attitudes toward ART or if they reflect cultural conventions in the present day.

Italy's regulation of ART dates back to Law 40/2004, which has undergone several amendments since its enactment. These legal changes have had significant impacts on ART outcomes. For example, the original law restricted the fertilization of more than three oocytes per treatment and required the simultaneous transfer of all embryos into the uterus, which resulted in a high rate of multiple pregnancies and births (Esposito et al., 2024). However, in 2009, when the law's restriction on embryo transfer was ruled unconstitutional, the incidence of multiple births decreased significantly (Levi Setti et al., 2011). The same fate befell heterologous fertilization, which was initially prohibited by the legislation but was later introduced following a ruling by the Constitutional Court in 2014. Under the current legislation, access to ART is limited to married or cohabiting opposite-sex couples, provided both partners are alive and of potentially fertile age. Surrogacy is not permitted, even for heterosexual couples. Additionally, single individuals and same-sex couples are excluded from accessing ART. At present, the availability of public ART centers, waiting times, costs, and age-related access criteria vary across Italian regions. This regional disparity has led to inequalities in access to treatment, but recent developments are set to address this. Infertility is officially recognized as a medical condition by the National Health System (NHS), and starting in January 2025, ART will be included in the "Essential Assistance Levels" (LEA) program. This means that homologous fertilization (using the couple's own gametes) will be provided free of charge, while heterologous fertilization (using external donors' gametes) will require a fee, with the cost partially covered by the NHS.

Cioffi and colleagues (2023) conducted a study investigating the perspectives of Italian women with fertility problems regarding ART. The authors surveyed 448 women receiving clinical fertility care, using a questionnaire developed through a qualitative approach that considered key bioethical issues and the legal constraints of Law 40/2004. Their findings indicate that many participants opposed core restrictions imposed by the law, including the age limit of 43 for access to ART and the ban on pre-implantation genetic diagnosis and embryo cryopreservation. While the study sheds light on the misalignment between legal provisions and patient preferences, its conclusions are limited by the relatively small sample size and the exclusive focus on clinical patients, potentially overlooking the views of women with unmet fertility needs who have not sought medical care.

Data and Methods

The experimental setting

We aim to assess the role of attitudes and social norms towards ART in Italy through the use of a Factorial Survey Experiment (FSE), a multivariate experimental method in which the researcher constructs various descriptions of hypothetical situations, called vignettes (Auspurg & Hinz 2014). These vignettes are assessed by respondents based on a fictitious couple's ART-related behavior under different couple's situations, whose assessment represents the "dependent variable" of the experiment.

The use of a FSE ensures internal validity, as variations solely influence respondents' reactions in the randomly assigned vignettes. Unlike single-item questions, vignettes enable the creation of hypothetical scenarios that incorporate multiple varying dimensions. Moreover, using a fictional couple rather than addressing the survey participant directly offers several methodological advantages. First, it facilitates a more plausible assessment of counterfactual scenarios. For instance, respondents can assess the likelihood of the hypothetical couple recurring to the use of ART with homologous gametes or heterologous gametes without envisioning themselves experiencing this technique, which can be challenging. Second, incorporating a fictional couple into our survey helps minimize the impact of person-specific contingent situations, in contrast to alternative direct questioning methods. When participants are directly questioned about their attitudes towards ART, they may feel obligated to consider external factors such as the female partner's health status. Conversely, when presented with a hypothetical couple's scenario, respondents are prompted to focus on the elements outlined in that specific scenario. Finally, it mitigates social desirability bias, wherein individuals tend to respond in a manner they perceive as socially acceptable or expected, which can be particularly relevant in our setting dealing with a sensitive topic such as infertility treatments.

Before illustrating the scenario to our respondents, we provide them with a short text to read, offering an overview of what an ART cycle entails (see Figure A1 in the Supplementary Material for the full introductory text). The text indicates that ART is a medical procedure aimed at helping couples facing infertility to conceive a child. It outlines the process involving sperm and egg manipulation in a laboratory to create an embryo for the couple, known as "homologous fertilization", followed by implantation into the woman's uterus to initiate pregnancy. Additionally, it mentions cases where donated sperm or eggs are used, termed "heterologous fertilization". The text emphasizes the necessity of multiple clinic visits for each attempt and notes that success rates decrease with age.

After that introduction, the vignette describes a hypothetical situation of a fictitious heterosexual couple (Caterina and Tommaso), who "*have been trying to conceive for a year and are considering assisted reproductive techniques because they have not yet succeeded with natural conception*." In each vignette, we manipulate six dimensions for the study. More specifically, the first set of

dimensions refers to the couple's characteristics, whereas the second set refers to the recommended treatment needed to solve their fecundity problems. Table 1 provides an overview of the six dimensions, along with the corresponding levels for each dimension, whereas Figure A1 in the Supplementary Material illustrates a typical vignette in the questionnaire.

The first domain we manipulated concerns the couple's characteristics within the context of infertility. We distinguished between childless couples and couples with a child. The second dimension belongs to the female partner's age in four levels: Caterina is less than 35, she is between 35 and 39, she is between 40 and 42, or she is 43 and over. We define the last category as individuals above 43 years old, as several Italian regions—with legislative authority over medical procedures—set this age as the maximum age to access ART treatments covered by the National Health Service, or impose higher out-of-pocket costs on this group (see, for example, the Resolution No. 1197 of October 1, 2019 by the Tuscany Region). Finally, the third couple dimension is about the duration of the couple's attempts to conceive a child, with three possible levels in the vignettes: one year; two years; or three or more years. The baseline level was settled to one year because a couple is medically considered infertile or experiencing fertility issues if it is unable to conceive after 12 months of regular, unprotected intercourse (World Health Organization, 2023). Beyond the couple's characteristics, we acknowledge that many other factors may influence the decision to use ART, or the social norms and attitudes towards ART. In particular, the fictitious couple's income level might affect attitudes toward ART irrespective of the other listed characteristics. To prevent interference, we 'fixed' the income level by specifying in the initial description what annual net income is available to the couple, computed for childless and parents separately and corresponding to the median annual income[1] for childless couples and couples with at least one child younger than 18, respectively (Istat, 2024).

The second domain we manipulated concerns the couple's access to ART. A first varying dimension regards the expenses that the fictitious couple should face, with two possible alternatives: the overall expenses of ART treatment are equal to 3,000 euros, or there are no living costs. Expenses for ART treatments vary much by type of treatment, region of residence and centers. Thus, we opted for two contrasting scenarios: one describing an affordable treatment option for the couple (€3,000, representing the average cost for a couple living in Italy[2]), and the other depicting a completely free option. With this choice, we aimed to assess respondents' perception that ART techniques can be regarded as fundamental healthcare treatments, to which everyone should have access at minimal and

[1] Following the described procedure, the annual net income is set to 35k euros for childless couple and to 38k for parents.
[2] https://www.trovanorme.salute.gov.it/ norme/dettaglioAtto?id=104476

income-adjusted costs. This perspective aligns with recent legislation, which has classified ART treatments as part of the 'Essential Levels of Care.' The second dimension relates to the type of treatment recommended by the doctor, with three levels: in the vignette, the couple may need a homologous treatment, or a heterologous treatment where the sperm comes from the donor, or a heterologous treatment where the egg comes from the donor. We aimed to test the overall acceptance of heterologous fertilization by young and middle-aged people, which occurred only after a ruling by the Constitutional Court in 2014, ten years after the enactment of Law 40/2004. Finally, the last dimension pertains to the couple's proximity to a fertility center, which in the vignette could be within the region of residence, outside the region, or abroad.

A key strength of this experimental setting is that, unlike previous research that asked respondents to express their attitudes toward an ART procedure in absolute terms (e.g., "Are you in favour or against it?"), our design situates the ART experience within a realistic scenario involving a couple. As a result, respondents are called to take the situation into account and to weigh potential trade-offs with respect to several aspects related to the fictitious couples' characteristics and access to ART, rather than offering a purely abstract judgment.

At the end of each vignette, respondents are asked two questions: First, *should* – on a scale from 0 ('absolutely no') to 10 ('absolutely yes') – the fictitious couple use ART. Second, what *should* the fictitious couple do, allowing several possible alternatives: 'Initiate ART treatment without delay;' 'Persist in natural conception attempts for an additional year before considering ART;' 'Persist in natural conception attempts for two years before considering ART;' 'Continue trying to conceive naturally without a specific time frame;' 'Evaluate the possibility of adopting a child;' 'Abandon their plan of having a child.'

[Table 1 about here]

Data

The data collection on Attitudes towards ART (A-ART), funded by the Age-It Research Program (Ageing Well in an Ageing Society), was carried out between July 4 and October 15, 2024, by the survey firm Demetra using its opt-in online panel. Demetra is well known in Italian academic circles for its high-quality and methodologically rigorous data collection. We relied on a quota sampling strategy, imposing national quotas by 5-year age classes, gender, region of residence, and education by gender. Quota sampling ensures that the final sample is virtually distributed as the country benchmark given by the statistics provided by the National Statistical Office on key sociodemographic factors. Additionally, we added post-stratification weights to adjust for small

deviations from the benchmark population statistics. At the end of the collection procedure, after having excluded those individuals who failed our check question (see below for some details), we could rely on a sample of 4,728 individuals in a heterosexual union (being married, cohabiting, or LAT) aged 25-49 years old.

For the six dimensions incorporated into our design, the fully crossed vignette universe comprises 2^2 x 3^3 x 4^1 = 432 unique combinations of vignette characteristics. Given this complexity, we adopted a mixed design, in which different groups of respondents are assigned different sets of vignettes, while all respondents within each group evaluate the same set. This approach allows us to obtain enough observations for each vignette while requiring a smaller sample size compared to a between-subject design.

Vignette sets (decks) were generated through random sampling, a method particularly efficient for large sample sizes. To determine the size of each vignette set, we followed the recommendations of Auspurg and Hinz (2015), who advise limiting the number of vignettes per respondent to a maximum of ten. We, therefore, selected six vignettes per deck, striking a balance between minimizing respondent fatigue and ensuring sufficient within-subject variation. Given that each of the 4,728 respondents evaluated six vignettes, resulting in a total of 28,368 observations, we achieved an average of 66 replications per unique vignette and a standard deviation of 2.45 replications (the minimum number of replicated vignettes is 59 and the maximum number is 76).

To ensure high-quality responses across all the vignettes, we added a question after the first vignette with the sole purpose of verifying if the respondent read the text carefully. More specifically, we asked about the fictitious couple's annual income, with three possible answers[3], and excluded from the final sample those providing a wrong answer (namely, 825 respondents).

After the vignettes, the questionnaire asked for some socio-economic and demographic information about the respondent and the partner's respondent. Then, we asked for personal experience with ART techniques and fecundity problems, like if the respondent has ever done any exams or treatments to help conception. Finally, we investigated the respondent's attitudes towards ART based on a set of 9 Likert-scale items. For each item, respondents indicated their level of agreement with statements regarding ART procedures, funding schemes, and use of ART by singles, lesbian, and gay couples[4]. The response options for these questions were: 1, that corresponds to 'strongly agree,' 2 = 'agree,' 3 = 'neutral,' 4 = 'disagree,' 5 = 'strongly disagree.'

[3] The three possible answers were: 20,000 euros; 40,000 euros; or the annual income reported in the vignette, namely 35,000/38,000 euros.
[4] The full text of each item is reported in Table A1 in the Appendix.

Analyses

We followed a "within approach", with the six vignettes evaluated by each respondent nested within individuals. At the onset of the analysis, we noted a strong polarization of the main dependent variable about whether the fictitious couple *should* use ART with a relevant concentration at levels 0 or 10 in the 0-10 Likert scale. Coherently with the nested nature of the data, for answering our first research question to what extent are attitudes toward ART polarized, we estimated two multilevel logistic models—with the evaluated six vignettes nested within respondents—predicting polarized views on what the fictitious couple *should* do, namely one model for the zero answers (corresponding to 'absolutely no') and another equivalent model for the ten answers ('absolutely yes), with all vignette dimensions as independent variables.

Then, for understanding how couples' specific characteristics related to infertility—such as female partner's age, reproductive history, and type of ART treatment—shape attitudes toward ART, namely our second research question, we implemented an OLS random-effect regression model with a truncated version of the response variable, in which we excluded the two extremes equal to 0 (corresponding to 'absolutely no') and 10 (corresponding to "absolutely yes') about whether the couple *should* use ART (thus considering only the 1-9 answer categories), and the six vignette dimensions as categorical, explanatory variables. We opted for random-effect regression models after having tested OLS regression models and fixed-effects OLS regression models to deal with the nested structure of the data.

Next, for investigating our third research question about whether respondents' socio-demographic characteristics are more or less influential than personal cultural orientations in shaping attitudes toward ART, as in our first research question we estimated other two multilevel logistic models predicting negative/positive polarized views (i.e., the zero answers corresponding to 'absolutely no' and the ten answers 'absolutely yes, respectively), in which we also controlled for the respondents' own socio-demographic characteristics, and their knowledge about ART as independent variables. In particular, we included: gender, birth cohort (1975-1984, 1985-1999), education (at most lower secondary, vocational-upper secondary, tertiary), macroarea of residence (North-West, North-East, Center, South and Islands), occupation (employed or self-employed, unemployed, inactive or student), partnership (married, cohabiting, LAT), parenthood, informed about ART (yes, no), had problems conceiving (yes, no), previous use of ART (no, no FIVET but other actions, FIVET and eventual other actions).

Moreover, we created a respondent's index of cultural orientation, which rises as the respondent's level of conservativism increases, combining the nine items of the Likert scale about the respondent's

attitudes towards ART. First, we summed up all responses to the items, thus having an additive scale that varies from 9 to 45; then, we standardized the additive scale and estimated again the previous models to see if the cultural orientation index could be considered a mediator of the relationship between respondents' socio-demographic characteristics and their propensity towards ART recommendation.

Results

Descriptive Results

Figure 1 presents the distribution of our main dependent variable, which is measured on a scale from zero to ten (0: 'absolutely no'; 10: 'absolutely yes') and captures the extent to which respondents of the FSE believe the fictitious couple should pursue ART given the experimental circumstances. The distribution of attitudes towards ART is quite polarized, with approximately 10–15% of responses falling into the extreme categories (0 and 10), while the remaining responses are concentrated in the more positive range between five and eight.

[Figure 1 about here]

Predicting Polarized Attitudes: FSE Conditions

Here, we present the average marginal effects (AMEs) and associated 95% confidence intervals (CIs) resulting from the two multilevel logistic models predicting the polarized views on whether the fictitious couple should use ART (negative attitudes = 0; positive attitudes = 10) and with experimental conditions as covariates, aiming to answer RQ#1. Figure 2 displays negative views in the left panel and positive views on whether the couple should use ART in the right panel. To maintain conciseness, we refer to respondents as having either a negative or a positive view, corresponding to the extreme categories of the 0–10 scale measuring views about ART. Table A2 in the appendix report the results for the same analyses using 'will' as outcome, results are consistent.

Most conditions influence the likelihood of ascribing either positive or negative views, and they generally exhibit a mirrored pattern across the two outcomes. On the left panel, we observe that having a child increases the probability of negative view on whether the couple should use ART by approximately four percentage points (pp) (P-value < 0.05). Age also plays a role: being between 35-39 and 40-42 years old reduces the likelihood of a negative attitude by approximately 3 and 1.5 pp, respectively (P-value < 0.05). The longer a couple has been trying to conceive, the lower the likelihood of a negative view. Higher costs increase the probability of believing the couple should

not pursue ART. Additionally, requiring heterologous techniques raises the likelihood of a negative view (i.e. the fictitious couple should not use ART), as does an ART center located abroad.

Positive attitudes, displayed on the right panel, follow a somewhat mirrored pattern: having a child, high costs, heterologous treatments, and distance from an ART center all decrease the probability of believing the couple should pursue ART. However, maternal age above 35 increases the probability of ascribing a positive view, as does attempting to conceive for more than a year.

Overall, the effect sizes we just described are quite large, especially for conditions associated with negative attitudes. If the fictitious couple already has a child or has to resort to heterologous treatment, the probability of being associated with negative attitudes increases by about 4 percentage points—more than one-third of the sample average level of negative attitudes (about 12%).

[Figure 2 about here]

Predicting Attitudes About ART: FSE Conditions

Figure 3 presents the effects of different FSE conditions on views about whether the fictitious couple should pursue ART, estimated with a random-effect OLS model and using the full scale of the variable, excluding extreme categories (namely, the 1-9 answer categories). The results mirror those found for positive views (see Figure 2, right panel). These results remain consistent when using the social norms toward ART as 'will' as the outcome or when including the extreme categories (see Table A3 and Table A4 in the Supplementary Material, respectively). On the one hand, if the fictitious couple already has a child, faces high costs, requires heterologous procedures, or must travel a considerable distance for treatment, respondents are more likely to express negative views on whether the couple should use ART. On the other hand, if the mother is older or the couple has been trying to conceive for two years or more, respondents are more likely to ascribe positive views to the fictitious couple.

[Figure 3 about here]

Thus, the impact of couples' specific characteristics on polarized attitudes and more nuanced attitudes are consistent in the different models. With respect to the effect sizes discussed for the experimental conditions in shaping polarized views, we find smaller estimates here. The largest coefficients are around 0.3 on a 1–9 scale, and they correspond to roughly one-seventh of a standard deviation of the outcome variable (SD = 2). Overall, some experimental conditions (such as heterologous treatment or parenthood) are more salient in influencing polarized views than in affecting individuals with more moderate opinions.

Views on What the Couple Should Do Based on the Fictitious Couple's Characteristics

Table 2 below presents respondents' answers regarding what the fictitious couple *should* do to conceive given the varying FSE conditions. We report responses for different combinations of the FSE, based on whether the fictitious couple is in a most favorable or least favorable scenario, as well as by maternal age (35–39 vs. 43+) and parity (attempting to conceive a first child or a higher-order child). The most- and least-favorable scenarios are defined based on how likely the couple's characteristics are to lead to a successful treatment. The most favorable scenario refers to a fictitious couple who has been trying to conceive for only one year, faces no financial burden for the procedure, has access to treatment in their region of residence, and can use their own gametes (homologous). In contrast, the least favorable scenario refers to a couple who has been attempting to conceive for more than three years, and must bear a cost of 3,000 euros for a heterologous treatment abroad.

Regardless of the fictitious couple's characteristics, we observe that the modal response is that the couple should start treatment right away, with this option being selected by between 32.8% and 47.7% of respondents across different groups. The only exception is for fictitious couples in a least favorable scenario who already have a child. For this group, the modal response for the younger group is that they should keep trying for an additional year (35.9%), while for those aged 43+, the most frequent recommendation is to resort to adoption (26.2%). Overall, choosing to pursue ART immediately or within a year is the preferred option for more than half of the sample across different couple characteristics. This may indicate a certain degree of acceptance toward ART.

[Table 2 about here]

Adoption emerges as a less preferred option, particularly when ART allows for conception using the couple's own gametes. Even in heterologous cases, ART remains favored over adoption, suggesting a strong value placed on having at least one biologically related parent, as well as on the experience of pregnancy. Abandoning the goal of parenthood is consistently viewed as the least desirable outcome.

Predicting Polarized Attitudes: Socio-Demographic Characteristics, Knowledge About ART, and Cultural orientation Index

Finally, in the third research question we examine the relationship between respondents' characteristics and the likelihood of ascribing a polarized view on whether the fictitious couple should pursue ART. This analysis aims to capture the association between respondents' traits and their opinion on ART use, independent of the vignette dimensions (which are not included in the model estimation). In Figure 4 below, the orange diamonds indicate estimates from models including only

respondents' socio-demographic characteristics, while the black dots represent estimates that additionally control for the cultural orientation index.

Overall, socio-demographic characteristics are not strong predictors of ascribing a polarized view on whether the couple should/should not use ART (orange dots, Figure 3). Younger cohorts appear less likely to ascribe a negative view, while women are more likely to ascribe a positive one. Tertiary education appears to reduce the likelihood of believing the fictitious couple should very likely pursue ART, but it is not associated with ascribing a negative view, suggesting that tertiary-educated individuals may be less prone to polarization. Stronger associations with a polarized positive view on whether the fictitious couple should use ART include being a parent, being informed about ART, or having personal experience with ART. Specifically, having undergone ART procedures both decreases the likelihood of ascribing a negative view and increases the likelihood of ascribing a positive one. When the cultural orientation index is introduced (black dots), it exhibits the strongest effect: one standard deviation increase in the index increases the probability of ascribing a polarized negative view by approximately five pp and decreases the probability of ascribing a positive view by about 10 pp (p-value < 0.05).

[Figure 4 about here]

Concluding discussion

In this paper, we posit that infertility help-seeking and ART utilization need to be rooted in fertility and life course research as they represent socially constructed processes. As such, individuals define the experience of infertility as problematic, interpret its meaning, and decide on a course of action in a context shaped by societal norms and personal convictions. ART behaviors are shaped by social dynamics even more so than other health-related behaviors (Greil et al. 2011b). Seeking treatment for infertility is closely tied to the personal and social significance individuals attach to parenthood (Mencarini et al., 2018), rather than to clinical definitions alone (Greil et al., 2011a). The decision to pursue help is not made in isolation; it typically emerges from a process of negotiation within the couple and interactions with their broader social networks (Präg and Mills, 2017). Unlike many other medical conditions, infertility is characterized not by the presence of physical symptoms but by the absence of a desired life outcome—biological parenthood (Greil et al., 2011a). Moreover, treatment is only one among several possible responses to infertility, distinguishing it further from other health-related issues (Greil et al., 2011a).

This paper makes a case for Italy. Attention to ART in Italy is particularly timely in light of the implementation of the Essential Levels of Care for ART (Ministerial Decree of November, 25, 2024). The forthcoming legislation is expected to lead to a substantial reduction and standardization of the costs associated with accessing ART services for heterosexual couples nationwide. Exploring Italians' perspectives on ART is thus crucial not only for informing potential policy adjustments but also for grasping the social and cultural factors that influence attitudes toward fertility treatments. Overall, with this paper, we seek to contribute to the ongoing discourse on reproductive rights and healthcare accessibility in Italy.

We employed a factorial survey experiment (FSE) in which respondents evaluate vignettes describing fictitious couples facing infertility, and express judgments they ascribe to those couples regarding whether they *should* pursue ART. Results indicate that attitudes toward ART are relatively polarized in Italy, with about one-quarter of the opinions ascribing either extremely positive (15%) or extremely negative (10%) attitudes to the fictitious couple. This highlights how ART, like other sensitive issues, may risk becoming a partisan topic in an already polarized political landscape. Nonetheless, the rest of the distribution leans more toward positive views, suggesting a relatively high degree of acceptance.

Despite this polarization, attitudes are not static or universally held, but rather flexible and context-dependent. The variations in responses across different couple and treatment scenarios suggest that individuals' moral judgments and support for ART are shaped by situational factors, such as the couple's characteristics or the cost of the procedure. This flexibility reflects not only individual-level ambivalence but also the dynamic nature of social norms surrounding ART. In a society traditionally marked by conservative family values, such as Italy, the observed adaptability of attitudes—and, by extension, of normative frameworks—underscores an important shift. Respondents are more supportive of ART when the fictitious couple is attempting to conceive their first child, when maternal age is more advanced, and when they have been trying to conceive for more than a year. These findings suggest that as age-related infertility becomes more common, acceptance of ART (and demand for treatment) may increase. Conversely, high treatment costs and the need to travel for care negatively affect attitudes toward ART. This suggests that reducing economic and geographical barriers to treatment may foster more positive attitudes toward ART, and, in turn, support higher utilization rates, as shown in previous studies (Goisis et al., 2020, 2023; Lazzari et al. 2022). Furthermore, heterologous treatments are viewed with greater skepticism, in line with previous studies on the topic (i.e. Daniluk and Koert, 2012). Attitudes towards these treatments are

nevertheless responsive to the couples' specific circumstances and show a degree of flexibility, especially when the possibility of achieving parenthood is more at risk.

Views on ART are only partially stratified by respondents' socio-demographic characteristics, irrespective of the manipulated dimensions in the vignettes. As observed in previous research (Demissei et al. 2024), women tend to have a more positive view, as do those who are already parents. Being informed about ART or having personally undergone ART also has a positive association with attitudes towards ART. Proper information campaigns could, therefore, help foster more favorable views. However, the factor with the strongest substantive effect is an individual's cultural orientation emphasizing how—consistent with the observed polarization of ART opinions—conservative or progressive orientations may play a fundamental role in shaping attitudes toward ART.

One notable limitation of our study is the limited attention given to psychological factors, which remain underexplored in the existing literature on infertility help-seeking. Psychological factors such as anxiety, coping mechanisms, health locus of control, and mental health status have not been collected in the used survey. Future research would benefit from a more comprehensive exploration of these psychological dimensions, which may provide a deeper understanding of why some individuals are more or less likely to seek medical assistance for infertility. Furthermore, we did not examine how political orientation and religious beliefs stratify attitudes toward ART, as this information was not collected. Religion, for instance, has a mixed impact (Chilaoutakis et al., 2002; Shreffler et al., 2010; Sudhinaraset et al., 2014). While most religions encourage procreation, some oppose certain treatments, such as those involving donor sperm or eggs (Schenker, 2005). Given these conflicting influences, religion exacerbates polarization of views on ART (Noy and O'Brien, 2016), presumably based on the couple's specific infertility condition, which could polarize attitudes on one side or on the other with regard to the kind of treatment.

In conclusion, our findings suggest that attitudes towards ART are not static, but rather context-dependent and sensitive to the specific couple's situation. In particular, the personal characteristics of the fictitious couples, particularly the woman's age, parity, and the length of time spent trying to conceive, emerge as the most significant factors influencing attitudes toward ART, and their polarization. The cost of ART remains an important consideration in shaping these attitudes. Moreover, the type of ART used plays a critical role in how it is perceived: methods that allow infertile heterosexual couples to have biological children (homologous ART) are generally viewed more favorably, likely because they tend to replicate traditional family structures. The importance placed on biological relatedness is also reflected in the limited support for adoption, which is seen as a less desirable solution to infertility.

By acknowledging the social construction of ART utilization, we conclude that attitudes play a fundamental role in shaping the experience of infertility. Our findings call for the need to better situate the study of infertility within partners' family life courses and within a demographic framework. We conclude that future research on infertility and ART decision-making must move beyond purely medical perspectives to fully account for the complex interplay of social, cultural, and demographic factors. We show that views on ART are deeply polarized, yet also fluid, context-dependent, and shaped by the specific relational dynamics within couples. Recognizing this malleability opens up valuable avenues for further research at the intersection of individual attitudes, social norms, and reproductive decision-making.

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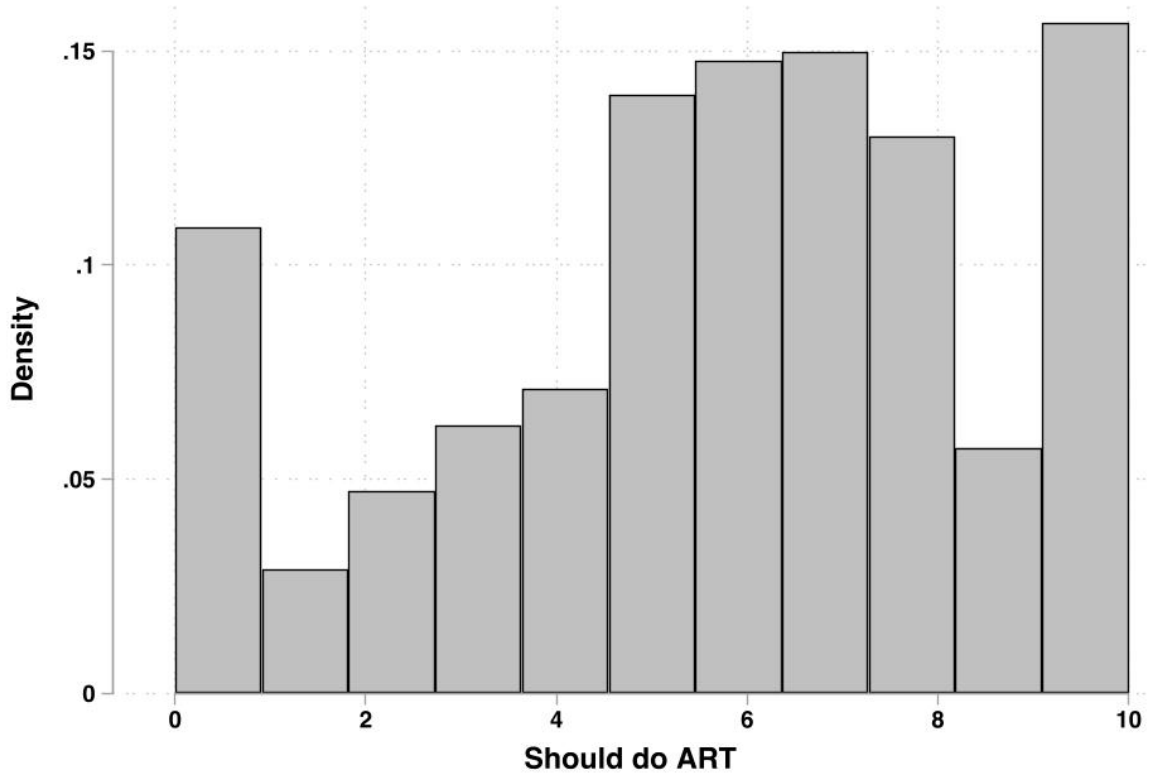
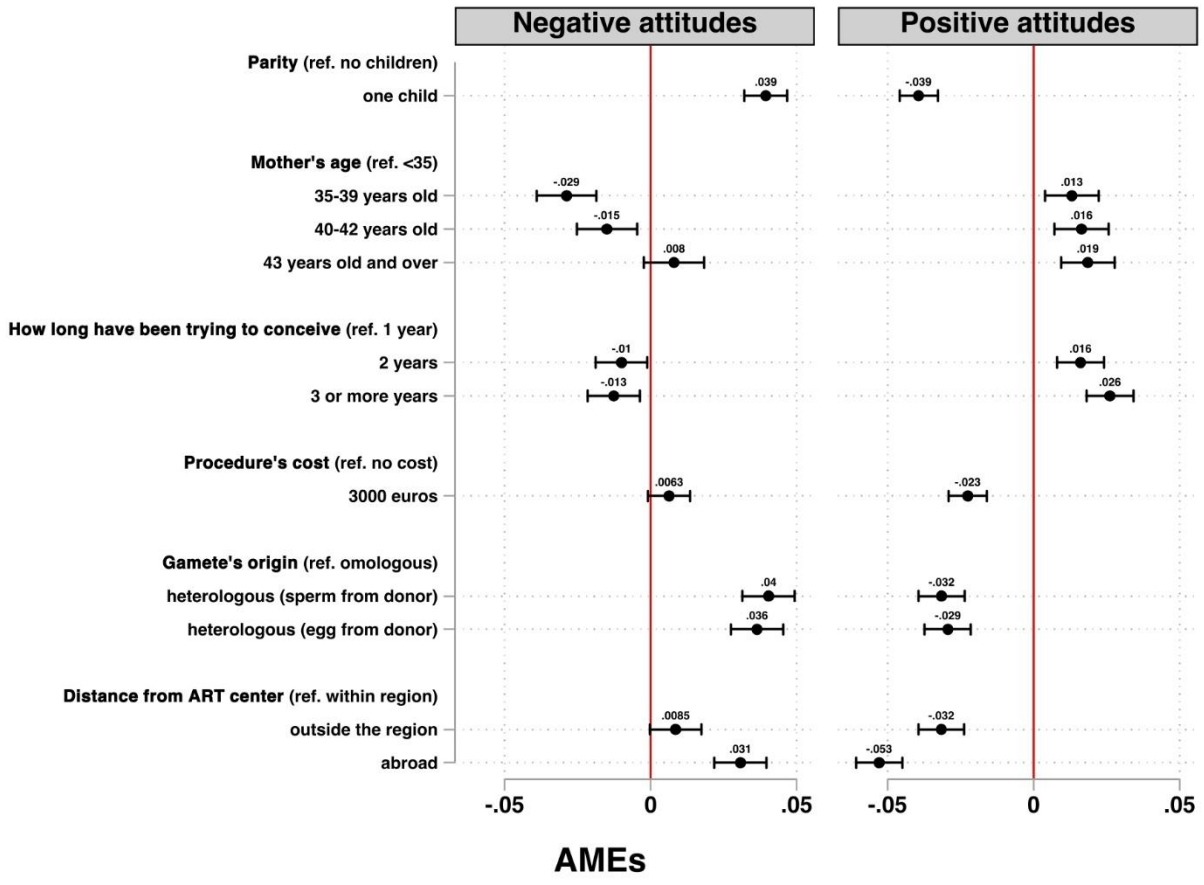
Figures

Figure 1. Distribution of views on whether the fictitious couple should do ART



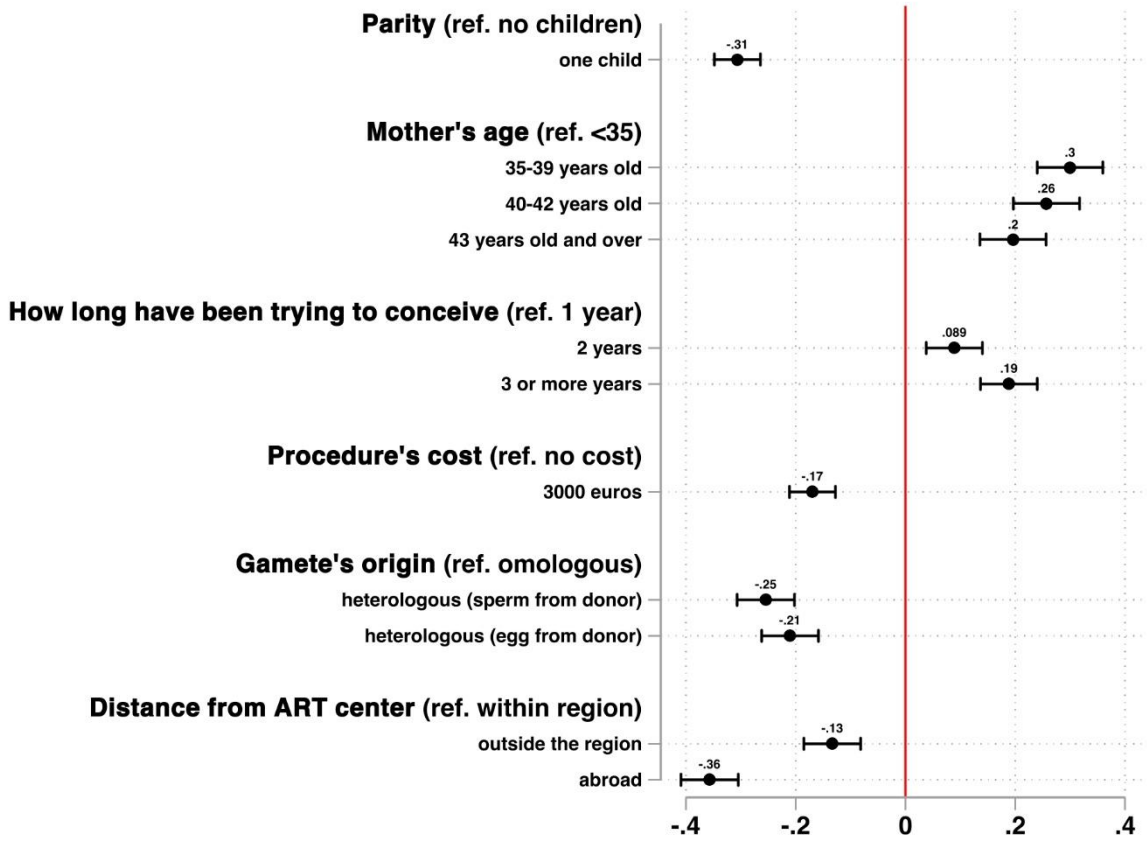
Note: 0 absolutely no; 10 absolutely yes; that a couple should pursue ART.

Figure 2. AMEs of experimental conditions on polarized views towards whether the fictitious couple should do ART



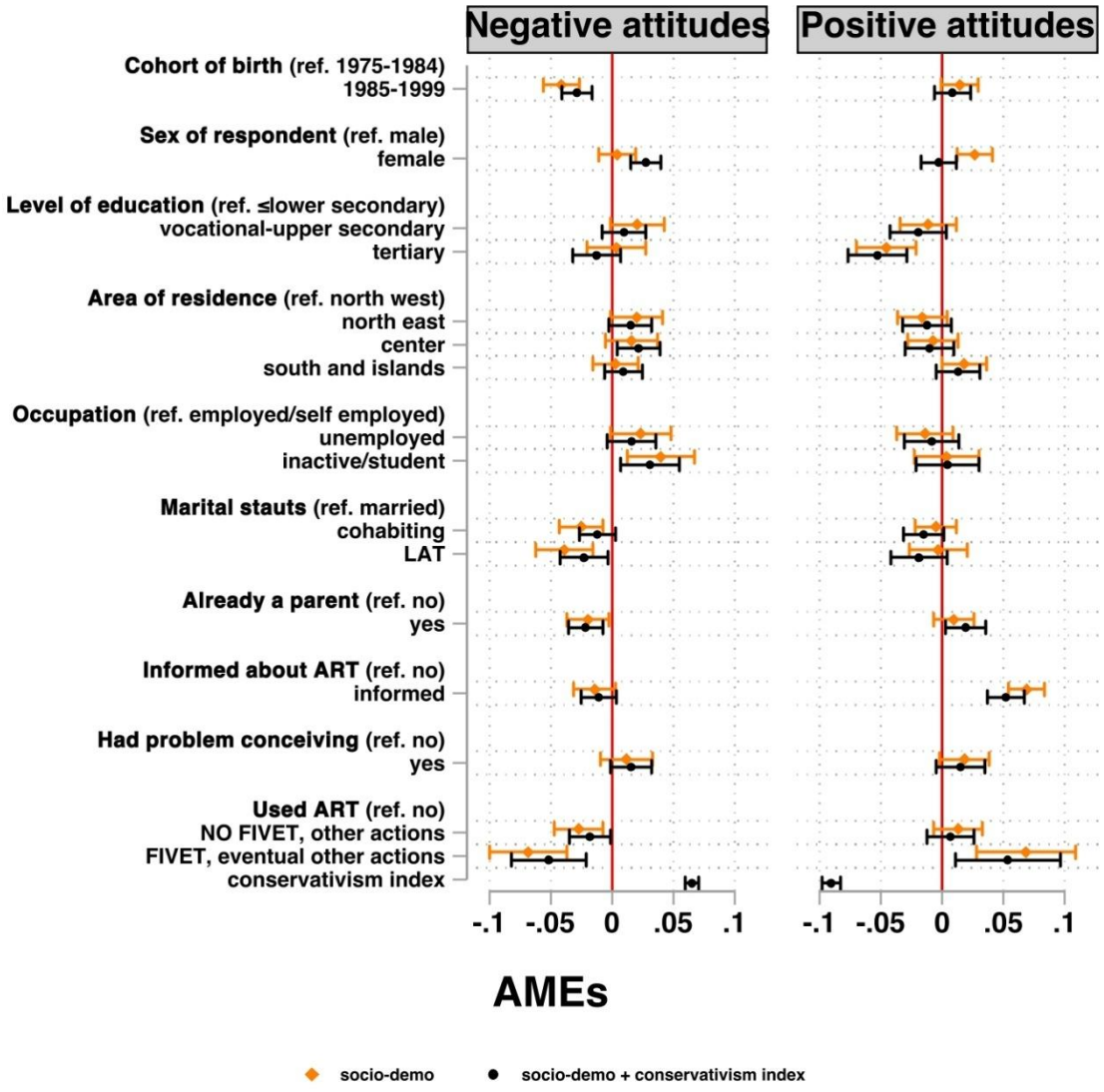
Note: AMEs and 95% CIs of FSE conditions on the probability of having a negative/positive view on whether the couple should use ART are obtained from estimating multilevel logistic models.

Figure 3. OLS random effect regression estimates of experimental conditions on views towards whether the fictitious couple should do ART



Note: marginal effects of FSE conditions on the view towards whether the fictitious couple should recur to ART are (with a 1-9 scale, excluding the two extreme categories 0 and 10) are obtained by estimating OLS models with random effects.).

Figure 4. AMEs of respondent's socio-demographic characteristics on polarized views towards whether the fictitious couple should do ART



Note: AMEs and 95% CIs of socio-demographic characteristics of the respondent on the probability of having a negative/positive view on ART are obtained from estimating multilevel logistic models.

Tables

Table 1 – Vignette dimensions and levels

Vignette dimension	Levels of dimensions
Couple's characteristics	
Couple's parity	1 Childless
	2 Parents of one child
Female partner's age	1 less than 35
	2 35-39
	3 40-42
	4 43 and over
Duration of the couple's attempts to conceive	1 1 year
	2 2 years
	3 3 or more years
Treatment details	
Expenses of ART treatment	1 3,000 euros
	2 No living costs
Type of treatment recommended by the physician	1 Homologous treatment
	2 Heterologous treatment (sperm donor)
	3 Heterologous treatment (egg donor)
Couple's proximity to a fertility center	1 Within the resident region
	2 Outside the region
	3 Abroad

Table 2 - Percentage distribution on respondents' answers regarding what the fictitious couple should do to conceive

What should Caterina and Tommaso do?	**Fictitious couple without children**					**Fictitious couple with children**			
	MOST FAVORABLE SCENARIO		LEAST FAVORABLE SCENARIO			MOST FAVORABLE SCENARIO		LEAST FAVORABLE SCENARIO	
	woman's age		woman's age			woman's age		woman's age	
	35-39	>42	35-39	>42		35-39	>42	35-39	>42
Initiate ART treatment without delay	32.8	37.7	38.5	47.7		39.4	33.9	17.2	18.5
Persist in natural conception attempts for an additional year before considering ART	29.7	26.1	33.9	16.9		25.8	15.4	35.9	23.1
Persist in natural conception attempts for two years before considering ART	14.1	7.3	15.4	13.9		12.1	4.6	12.5	9.2
Continue trying to conceive naturally without a specific time frame	14.1	4.4	7.7	16.9		12.1	9.2	18.8	13.9
Consider the possibility of adopting a child	7.8	20.3	3.1	1.5		10.6	32.3	10.9	26.2
Abandon their plan of having a child	1.6	4.4	1.5	3.1		0.0	4.6	4.7	9.2
Total	100.0	100.0	100.0	100.0		100.0	100.0	100.0	100.0

Note: Experimental conditions in the two scenarios: A) Most favorable scenario: the fictitious couple has been trying to conceive for only one year, faces no financial burden for the procedure, has access to treatment in their region of residence, and can use their own gametes (homologous). B) Least favorable scenario: the couple has been attempting to conceive for more than three years, and must bear a cost of 3,000 euros for a heterologous treatment abroad.

Supplementary Material

Figure A1. Example vignette with introductory text (translated version)

Introduction to ART:

Assisted Reproductive Technologies (ART) are medical procedures that help couples facing fertility challenges in their journey to conceive a child. These methods involve the manipulation of sperm and eggs in a laboratory to create an embryo from the couple (known as "homologous fertilization"). The embryo is then implanted into the woman's uterus to initiate a pregnancy.

In some cases, couples may find that their fertility challenges can only be overcome by using donated sperm or eggs (known as "heterologous fertilization"). Typically, couples must attend multiple clinic visits for each attempt. The success rate of these techniques decreases with age.

Introductory text to the vignette:

You will see six different possible scenarios, each describing the hypothetical situation of a couple. After each scenario, indicate whether you think the couple should resort to medically assisted reproduction techniques, how likely you believe they are to actually use these techniques, and, more generally, what you think the couple should do.

Caterina and Tommaso are a **childless couple** who have been trying to conceive **for a year** and are considering assisted reproductive techniques because they have not yet succeeded with natural conception. The couple's net annual income is 35,000 euros. Since Caterina is **under 35**, the total cost of the assisted reproduction procedure they would undergo is **3,000 euros**, and the type of treatment recommended by their doctor is **homologous fertilization**. Finally, the infertility centre they are considering is located in the **couple's region of residence**.

In your opinion, should Caterina and Tommaso use ART?

0	1	2	3	4	5	6	7	8	9	10

Absolutely no Absolutely yes

How likely will Caterina and Tommaso use ART?

0	1	2	3	4	5	6	7	8	9	10

Very unlikely Very likely

Lastly, what should Caterina and Tommaso do?

- Initiate ART treatment without delay;
- Persist in natural conception attempts for an additional year before considering ART;
- Persist in natural conception attempts for two years before considering ART;
- Continue trying to conceive naturally without a specific time frame;

- Consider the possibility of adopting a child;
- Abandon their plan of having a child

Table A1. Survey questions assessing respondents' opinions about ART procedures, funding schemes, and access.

Item number	Full text of question
Item 1	Couples who are unable to conceive naturally should be allowed to use homologous fertilization (that is, with both gametes coming from the couple).
Item 2	Couples who are unable to conceive naturally should be allowed to use heterologous fertilization, which uses a male donor's gamete.
Item 3	Couples who are unable to have a child naturally should be allowed to use heterologous fertilization, which uses the female gamete of a donor.
Item 4	In Italy, ART should be free of charge, regardless of the number of attempts made.
Item 5	In Italy, all women should be guaranteed the possibility of freezing their eggs free of charge, so they can potentially use them at a later time.
Item 6	In Italy, the government should not impose a limit on the number of cycles allowed.
Item 7	In Italy, ART should be accessible to other individuals as well, such as single people (without a partner).
Item 8	In Italy, ART should be accessible to other individuals as well, such as lesbian couples.
Item 9	In Italy, ART should be accessible to other individuals as well, such as gay couples.

Figure A2. Distribution about the view on whether the couple should or will use ART

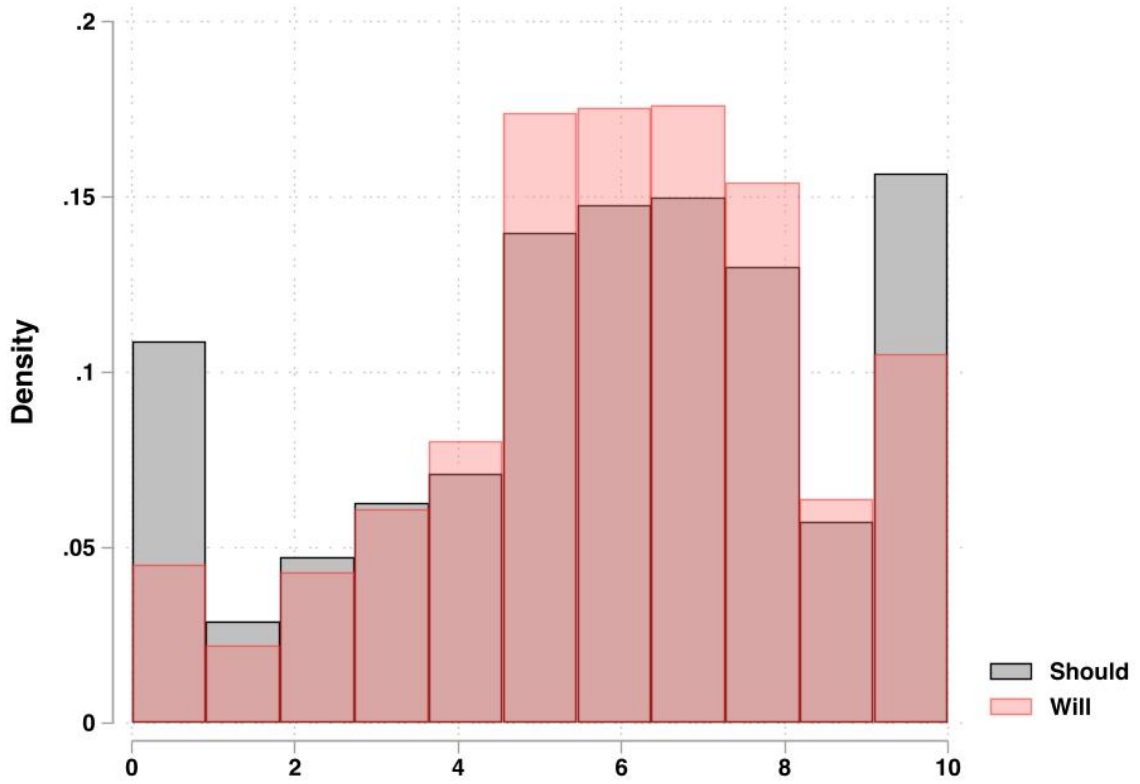


Table A2. Multilevel linear probability model predicting whether the fictitious couple will recur to ART (polarized views)

	Negative attitudes		Positive attitudes	
	Beta	(s.e.)	Beta	(s.e.)
Parity (ref. no children)	--		--	
one child	0.012***	(0.002)	-0.027***	(0.003)
Mother's age (ref. <35)	--	--	--	
35-39	-0.009***	(0.003)	0.004	(0.004)
40-42	-0.007*	(0.003)	0.016***	(0.004)
43+	0.002	(0.003)	0.014***	(0.004)
Trying to conceive (ref. 1 year)	--		--	
2 years	-0.004	(0.002)	0.006	(0.003)
3+ years	-0.004	(0.002)	0.015***	(0.003)
Procedure's cost (ref. no cost)	--		--	
3000 euro	0.004*	(0.002)	-0.019***	(0.003)
Ref. homologous	--		--	
heterologous (sperm)	0.010***	(0.002)	-0.020***	(0.003)
heterologous (egg)	0.010***	(0.002)	-0.016***	(0.003)
Distance (ref. within region)	--		--	
outside region	0.002	(0.002)	-0.022***	(0.003)
abroad	0.013***	(0.002)	-0.046***	(0.003)
Constant	0.028***	(0.004)	0.138***	(0.006)
N	28,368		28,368	

Table A3. Random effect OLS model predicting whether the fictitious couple will recur to ART (1-9 values)

	Beta	(s.e.)
Parity (ref. no children)	--	
one child	-0.315***	(0.020)
Mother's age (ref. <35)	--	
35-39	0.288***	(0.028)
40-42	0.283***	(0.028)
43+	0.281***	(0.028)
Trying to conceive (ref. 1 year)	--	
2 years	0.113***	(0.024)
3+ years	0.209***	(0.025)
Procedure's cost (ref. no cost)	--	
3000 euro	-0.179***	(0.020)
Ref. homologous	--	
heterologous (sperm)	-0.275***	(0.025)
heterologous (egg)	-0.194***	(0.025)
Distance (ref. within region)	--	
outside region	-0.204***	(0.025)
abroad	-0.415***	(0.025)
Constant	6.182***	(0.040)
N	24,493	

Table A4. Random effect OLS model predicting whether the fictitious couple should recur to ART (0-10 values)

	Beta	(SE)
Parity (ref. no children)	--	
one child	-0.485***	(0.024)
Mother's age (ref. <35)	--	
35-39	0.360***	(0.034)
40-42	0.306***	(0.034)
43+	0.190***	(0.034)
Trying to conceive (ref. 1 year)		
2 years	0.154***	(0.030)
3+ years	0.273***	(0.030)
Procedure's cost (ref. no cost)	--	
3000 euro	-0.207***	(0.024)
Ref. homologous	--	
heterologous (sperm)	-0.456***	(0.030)
heterologous (egg)	-0.391***	(0.030)
Distance (ref. within region)	--	
outside region	-0.232***	(0.030)
abroad	-0.540***	(0.030)
Constant	6.303***	(0.054)
N	28,368	