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ATTITUDES TOWARD ASSISTED REPRODUCTIVE TECHNOLOGY: THE EFFECTS OF GENDER, RELATIONSHIP STATUS, AGE, AND SEXUAL ORIENTATION

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ATTITUDES TOWARD ASSISTED REPRODUCTIVE TECHNOLOGY:
THE EFFECTS OF GENDER, RELATIONSHIP STATUS, AGE,
AND SEXUAL ORIENTATION

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
College of Agriculture, Food, and Environment
at the University of Kentucky

By

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2014

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ABSTRACT OF THESIS

ATTITUDES TOWARD ASSISTED REPRODUCTIVE TECHNOLOGY: THE EFFECTS OF GENDER, RELATIONSHIP STATUS, AGE, AND SEXUAL ORIENTATION

Reproductive technology has extended procreative options to infertile, subfertile, unpartnered, and same-sex-partnered individuals, but this technology is sometimes used in circumstances that may be deemed unreasonable or inappropriate by some people. The purpose of this study was to assess the effects of five contextual variables—gender, relationship status, age, and sexual orientation of the individual or couple seeking reproductive assistance, as well as the source of gametes—on attitudes toward the procurement of reproductive services. A multiple-segment factorial vignette was administered to a sample of 257 reproductive-aged respondents. Results indicate that ART is generally viewed as an acceptable procedure by reproductive aged individuals, particularly in normative contexts with regard to age and marital status, but differences between single men and single women using ART services were surprising and the effects of sexual orientation were both complex and unexpected. As reproductive norms and medical advances change over time, ethical questions will continue to arise and be discussed by professionals and lay commentators alike. The findings reported here can inform those discussions, while also generating new research to make sense out of the surprising results.

KEYWORDS: Attitudes, Multiple segment factorial vignette, Parenthood, Reproductive technology, Sexual orientation

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January 15, 2014

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Chapter One: Introduction

Although the fertility rate has declined in recent years to the lowest rates ever recorded in the United States (Hamilton, Martin, & Ventura, 2012), and nearly 20% of women 40 to 44 years of age in the United States are childless (U.S. Census Bureau, 2010), the desire for children has remained high and unchanged for decades (Newport & Wilke, 2013). Individuals and couples are increasingly seeking the assistance of reproductive services to assist with fertility in circumstances where they are unable to bring their reproductive desires to fruition, such as when a viable other-sex partner is not available or when thwarted by infertility.

Infertility is commonly defined as the inability of a heterosexual couple to conceive within 12 months of regular sexual intercourse and subsequently carry a child to term (McQuillan, Greil, White, & Jacob, 2003). However, the 12-month timeframe is arbitrary and some couples are able to conceive on their own beyond the one-year threshold. For example, if the window for conception is extended to include two years of regular sexual intercourse, then 27.5% of individuals classified as infertile according to the 12-month standard would conceive and carry a child without intervention (Bryant, 1990). Also, some couples conceive and carry one or more children to term without medical intervention, but subsequently meet the definition of infertility while attempting another conception. These couples are said to experience secondary infertility, or subfertility (Benyamini, Gozlan, & Kokia, 2005).

Major risk factors for infertility include increasing age, obesity, and sexually transmitted infections (Kelly-Weeder, & Cox, 2007; Schmidt, 2008; Van Horn & Reed, 2001; Wingert, Harvey, Duncan, & Berry, 2005). These factors could be related to the

increase of infertility among the childbearing population in the United States, given the trends described below.

Fertility in the United States has remained relatively stable at about two lifetime births per woman over the past few decades (Martin et al., 2011), but maternal age when those births occur has steadily increased. Specifically, since 1990, the birth rate has declined steeply among teenagers and slightly among women in their 20s, while the birth rate has increased steadily among women in their 30s and precipitously among women in their 40s. Consequently, the mean age of first birth for women increased from 21.4 years in 1970 to 25.2 in 2009 (Martin et al.; Matthews & Hamilton, 2002). Similar trends toward delayed childbirth have also occurred among men (Martin et al.).

Although it is unclear whether obesity's impact on fertility is a direct result of obesity or of other complications connected to obesity (Hammoud et al., 2011), being overweight or obese is clearly associated with reduced fertility. Body mass index (BMI) is a measurement of weight relative to height and is used to classify individuals as overweight, obese, and extremely obese. Obesity rates based on BMI have more than doubled in recent decades; about 34% of adults in the United States are overweight, another 34% are obese, and 6% are extremely obese (Ogden & Carroll, 2010). Being overweight can affect fertility by impacting secretion of sex hormones and metabolic functioning, among other ailments associated with being overweight that affect both men and women's fertility (Pasquali, 2006).

Complications that result from sexually transmitted infections (STIs) can also affect fertility (Schmidt, 2008; Wingert, Harvey, Duncan, & Berry, 2005). For example, chlamydia and gonorrhea can cause pelvic inflammatory disease, leading to infertility and

ectopic pregnancies (Hazlina, Zuky, Johari, & Senik, 2005). According to the Centers for Disease Control and Prevention (2011), chlamydia and gonorrhea are the two most common infectious diseases in the United States; chlamydia reports have been on the rise over the last two decades and reached a record high in 2010, while the incidence of gonorrhea has declined in recent years but still remains the second most frequently reported infectious disease. Fertility complications resulting from STIs directly affect female infertility, but males often transmit these infections to their sexual partners, thereby also reducing their own reproductive potential.

Infertility, in conjunction with increased awareness, acceptance, and access to artificial reproductive technology (ART) services, has led an increasing number of individuals and couples to utilize ART to fulfill their reproductive desires. ART procedures have resulted in over 3 million births worldwide since treatments began in 1978 (Siegel, Dittrick, & Vollmann, 2008), and both the demand for and success rate of these procedures is increasing in the United States. For example, comparing 1999 and 2009, ART cycles attempted increased from 87,636 to 146,244 and live births increased from 21,746 to 45,870, respectively (Centers for Disease Control and Prevention, American Society for Reproductive Medicine, Society for Assisted Reproductive Technology, 2008, 2011). In addition, these data show that the percentage of attempted ART cycles resulting in a live birth increased from 24.8% in 1999 to 31.4% in 2009.

Along with increased use and success rates, the procurement of ART services has occasionally created headlines and controversy when used in circumstances deemed unreasonable by the general public. The potential dilemmas of ART took the national media stage in the United States for perhaps the first time in 1986-1988 with the

surrogacy case commonly known as *Baby M*. A surrogate mother had agreed to have her eggs fertilized by artificial insemination, carry the child to term, and relinquish all parental rights and responsibilities to the biological father and his wife. However, once the child was born, the surrogate mother refused to surrender custody of the child. The court case and media attention that followed brought up issues of class exploitation, rights of unborn children and individual autonomy, legal issues related to emerging technologies, and psychological effects associated with surrogacy (Peterson, 1987).

Another example of ART procedures creating media headlines and national discussions occurred in 1997 when septuplets were born after the mother took fertility drugs. Although generally welcomed by the family and community, the medical risks of multiple births were underscored in this case; several of the children developed long-term medical complications stemming from their multiple births (Tribune News Service, 1999).

During the first decades of fertility treatments, physicians would often transplant multiple embryos to increase chances of pregnancy. As treatments became more reliable, efforts were made to reduce the risk of high number multiple births, or mega-births. The American Society for Reproductive Medicine now recommends that physicians implant only one embryo for women who are under 35 years of age, have more than one top quality embryo available for transfer, have completed fewer than two treatment cycles, have had a prior successful IVF, or are using donated eggs (The Practice Committee of the Society for Assisted Reproductive Technology and The Practice Committee of the American Society for Reproductive Medicine, 2011). Nevertheless, a mother made headlines in 2009 when she gave birth to octuplets after having 12 embryos implanted in

one cycle at the age of 32. The medical license of her physician was subsequently revoked due to poor professional judgment, but numerous concerns about the context in which ART is performed were raised in response to the octuplets case. Among those concerns were whether the number of pre-existing children, financial stability, and the psychological state of patients seeking treatment should be considered; the relevance of using existing embryos versus new conceptions; whether ART regulations are enforceable and the role of politics in laws governing ART; and the responsibilities of physicians and patients (Manninen, 2011; Stateman, 2009).

Given the abundance of unresolved issues associated with ART raised by these cases and others like them, the purpose of this study is to examine the influence that various contextual circumstances have on attitudes toward fertility treatments. Specifically, the effects of five contextual variables—gender (of singles seeking an ART procedure), relationship status, age, and sexual orientation of those seeking to procure ART services, as well as the source of the gametes to be used—will be examined using a multiple-segment factorial vignette. Prior to describing the design in more detail, the contextual variables to be examined in this study will be briefly introduced.

Gender

Gendered parenting role attitudes characterize fathers as instrumental providers and mothers as caregivers (Grief, 1995); the more involved and nurturing role ascribed to mothers seems to color perceptions of mothers and fathers. For example, both males and females in the United States hold more favorable attitudes toward single mothers than toward single fathers (Goldscheider & Kaufman, 2006). Similarly, a convenience sample

of undergraduate students believed that never-married fathers have poorer family relations and parenting skills than never-married mothers (Bennett & Jamieson, 1999). Another study found that the personal characteristics and parenting abilities of never-married custodial mothers were viewed less favorably than those of never-married custodial fathers (DeJean, McGeorge, & Carlson, 2012), but this could be due to perceptions of selection effects given custody disparities; that is, these fathers would be perceived as a particularly unique subset of fathers given the rarity of never-married custodial fathers. Indeed, another indicator of a disparate perception of parenting roles and abilities between the genders is the disproportionate numbers of mothers versus fathers who have physical custody of dependent children. Specifically, among mother-father dyads that do not reside in the same household, 82% of mothers have physical custody of their children, compared to 18% of fathers (Grall, 2011). All of these findings, and many others like them, implicitly and consistently suggest that women are viewed as more suitable parents than are men.

Perceptions aside, in practice there seem to be only small and inconsistent differences in parenting behaviors between single mothers and single fathers (Dufur, Howell, Downey, Ainsworth, & Lapray, 2010). In addition, although single-father households tend to have a higher socioeconomic status than single-mother households (Amato, 2000), children's outcomes from single-father and single-mother households are similar after controlling for socioeconomic status (Dufur et al., 2010).

Relationship Status

Social scientists began evaluating attitudes toward variations in household family structure in the second half of the twentieth century, as the prevalence of diverse family forms mushroomed. Compared to married parents, survey respondents generally attributed more negative traits to divorced parents (Bennett & Jamieson, 1999; Bryan, Coleman, Ganong, & Bryan, 1986). Usdansky (2009) argued that Americans held similarly negative sentiments toward never-married parents throughout the twentieth century, although small increases in acceptance of both divorced and never-married parents occurred from the 1960s through 1990s (Thornton & Young-DeMarco, 2001).

In addition to attitudes toward parental relationship status, several studies have focused on how the relationship status of parents impacts child development. A deficit comparison model (Marotz-Baden, Adams, Bueche, Munro, & Munro, 1979), in which family structure is emphasized over family processes in evaluating the suitability of a family environment for raising children, is often used to justify a preference for children to be raised in households with their two biological or adoptive parents who are married to one another. However, as family structure has diversified and nuclear families have become less common, single individuals raising children has become more common and socially acceptable (Pew Research Center, 2010).

Children's social and emotional development is similar in single-parent households and dual-parent households. In fact, single mothers have reported greater warmth, more secure attachment, and more interaction with their children than mothers in dual-parent households (Golombok, Tasker, & Murray, 1997; MacCallum & Golombok, 2004). Compared to mothers in dual-parent households, MacCallum and Golombok

found higher levels of conflict between single mothers and their adolescent children, but Golombok and Badger (2010) found lower levels of conflict between single mothers and their adult children. No studies have been published yet that examine differences within single-parent households according to type of conception.

Age

Another concern that has arisen in the popular press is the appropriate, or socially acceptable, age range of candidates for ART treatment (Boivin et al., 2009). Several scholars and reproductive specialists have also expressed medical, legal, ethical, and social concerns about the age of ART patients, and with good reason given the increased risk of medical complications in younger and older mothers (Jolly, Sebire, Harris, Robinson, Regan, 2000a; 2000b). Legal and ethical issues also arise in the context of minors. For example, Murphy (2010) questioned whether a minor's consent is necessary when parents request ART-related interventions for their children, such as gamete preservation before cancer treatments as insurance against future sterility. Similarly, Habiba (2011) expressed concern over a minor seeking fertility treatments, and that concern may be well-placed given that teenage mothers have a higher risk of hardships than do older mothers (Cornelius et al., 2009; Hofferth & Reid, 2002). Nonetheless, social stigma toward teenage mothers may be diminishing, as evidenced by the decreasing rate of child relinquishment among teenage mothers (Center for Disease Control and Prevention, 2011; Miller & Coyl, 2000).

Others have raised concerns over a person being too old for ART (e.g., Singer, Corning, & Antonucci, 1999). Menopause is a physiological signal for the end of a

woman's natural reproductive capacity, but the median age that women experience menopause is about 51 years (Kato et al., 1998) and the social acceptability of having children declines well before then. In one study, when asked at what age a woman is too old to have children, 57% of respondents believed 40 years of age is the appropriate cutoff (Billari et al., 2010). This contrasts with the roughly 98% of women who have not yet experienced menopause and could therefore naturally conceive at 40 years of age (Kato et al.).

The life course perspective (see Elder, Johnson, & Crosnoe, 2003) provides a framework for understanding why many Americans are transitioning to parenthood at older ages. In short, the intersection of individual and family time have been affected by historical time, marked by several societal-level shifts that have occurred in recent decades, such as those associated with sexual liberation, contraception, women's movement into the paid labor force, and advances in infertility treatment (Heer & Grossbard-Shechtman, 1981; Waite & Stolzenberg, 1976). These historical shifts have helped to push the mean maternal age at first birth back nearly 4 years over the past 4 decades (Martin et al., 2011; Mathews & Hamilton, 2002). However, perceptions of socially acceptable behavior often lag behind when new norms have emerged in response to relatively rapid social change. This lag is particularly pronounced among older individuals who spent the majority of their lives under different normative expectations.

Social acceptance is important for numerous reasons, such as ensuring that social supports are available to ART parents and their offspring as well as for maintaining the credibility of ART itself, but the woman and child's health must be the paramount concern with regard to older women seeking ART treatments (Boivin et al., 2009). A

notable shift in women's reproductive health begins to occur around 35 years of age as fertility declines and the risk of complications during pregnancy increase (Collins & Crosignani, 2005; Jolly, Sebire, & Harris, 2000b). Due to decreasing fertility after 35, older women are more likely to seek fertility treatments, but by age 45 successful treatments are rare (Forman, Treff, & Scott, 2011; Liu & Case, 2011).

Age-related reproductive concerns are not limited to women. Men over 40 years of age are at increased risk for having offspring with affective disorders, such as schizophrenia and autism, typically attributed to chromosomal degradation associated with aging (Bray, Gunnel, & Smith, 2006; Peterson & Mortensen, 2011; Shelton, Tancredi, & Hertz-Picciotto, 2010).

These rule-of-thumb reproductive age turning-points, however, are somewhat arbitrary; reproductive decline is a gradual process that lasts years and the age of onset varies across individuals. Moreover, there is evidence indicating that women over age 35 are well-suited for parenting. For example, Boivin et al. (2009) compared mothers who gave birth before 31 years of age with mothers who gave birth after 38 years of age and did not find any evidence to suggest that mother's age negatively impacted child development. In fact, the study found that the older mothers were more sensitive to their children's needs and provided more structured and cognitively challenging environments than did the younger mothers.

Source of Gametes

Parental disclosure to children may be one way to assess the social acceptability of various methods of conception (Golombok et al., 1996; Golombok et al., 2006). Using

European samples, Golombok and colleagues have found that parents who conceived using donated gametes from a third person were less likely to disclose information about the ART conception to their children compared to parents of other ART procedures (Brewaeys, Ponjaert, van Hall, & Golombok, 1997; Golombok et al, 2002; Golombok, et al., 2004; Murray & Golombok, 2003). Murray and Golombok (2003) found that only 29% of parents who used donated embryos planned on disclosing the method of conception to their children, and another 24% were undecided. In comparison, Nekkebroeck (2008) reported that approximately three-quarters of mothers who used various IVF procedures with the couples' own gametes disclosed the procedure. Based on Golombok and colleagues' argument that disclosure is positively correlated with social acceptability, reported disclosure rates and intentions to disclose suggest that procedures involving donated gametes are less socially acceptable than those that use the parents' own gametes.

Consistent with the disclosure findings described above, the procedures with the highest approval rates in studies of the general population have been those that do not involve donated genetic material (Lasker & Murray, 2001). For example, using a husband's sperm for insemination was approved of by 87% and 85% of respondents in 1984 and 1999, respectively, compared to approval rates of 55% and 57% for using a donor's sperm. Respondents were also more likely to approve of gestational surrogacy (47%), which involves implanting a couple's IVF-conceived embryo in a surrogate mother, than traditional surrogacy (39%) in which the surrogate mother is also the genetic mother. It remains unclear, however, to what extent these differences are due to the use of

donated genetic material versus the potential use of the procedures by individuals wishing to reproduce outside the context of a committed relationship.

ART procedures utilizing pre-existing embryos present additional concerns beyond those of ART procedures using donated gametes. Donated embryos result in neither parent being genetically related to the offspring, but unused embryos are a source of moral concern for individuals who believe that human life begins at fertilization (Gurmankin, Sisti, & Caplan, 2004; Lyerly et al., 2010; Simon, 2011). This may have been an issue in the octuplets case described previously; the mother indicated that her motivation for having all 12 of her remaining embryos implanted was that she did not want to leave any embryos unused (Stateman, 2009).

Despite the perceived social stigma, studies have not found detrimental differences between families in which children were conceived using donated gametes and embryos, or using the parents' own gametes and embryos but with the assistance of reproductive technology, and families where the children were conceived naturally. Mothers and fathers who used their own gametes to reproduce using ART have reported similar levels of parent-child attachment as parents of naturally conceived children at both birth and infancy (Bos & van Balen, 2010; Golombok et al., 2004; Hjelmstedt & Collins, 2008; Hjelmstedt, Windstrom, & Collins, 2007). From birth and through childhood, fathers who used egg donation procedures to reproduce express higher emotional involvement with their children than do fathers of naturally conceived children (Golombok et al., 2004). In early adolescence, compared to parents who naturally conceived, mothers and fathers who utilized ART treatments express more warmth and emotional involvement toward their children and report more enjoyment associated with

parenthood (Golombok et al., 2002). A few gender specific differences are that ART mothers tend to be more over-concerned and over-protective of their children compared to both ART fathers and mothers who conceived naturally (Golombok et al., 2002).

Sexual Orientation

Over the past two decades, legislation in several developed nations has ensured that gay men and lesbians have access to ART. For example, the United Kingdom's Human Fertilisation and Embryology Authority incorporated the Equality Act of 2010 into their code of practice to ensure access to fertility treatments in private clinics regardless of one's sexual orientation. Similarly, citing the Sex Discrimination Act of 1984, the Federal Court of Australia ruled in favor of ART access to all individuals regardless of marital status, including gay men and lesbians (*McBain v. State of Victoria & Ors*, 2000). In the United States, many states define marriage as a union between a man and woman and do not recognize same-sex marriages, and ART treatments in some of those states are restricted to married couples and their surrogates (*Nevada Revised Statute Annotated*, 2007; *Texas Family Code*, 2007; *Utah Code Annotated*, 2007). However, the American Society for Reproductive Medicine has taken the position that fertility clinics should provide services to patients without regard to sexual orientation (Ethics Committee of the American Society for Reproductive Medicine, 2013a), and several legal cases have been filed against clinics for discrimination based on sexual orientation (e.g., *Barros v. Riggall*, 2006; *Benitez v. North Coast Women's Care Medical Group*, 2008).

Sentiment among the general population in the United States has shifted in recent years to become more accepting of gay men and lesbians seeking to reproduce with the assistance of ART. For example, in 1993 only 7% of those surveyed approved of lesbians using donor sperm, but in 2000 that number had risen to 31% (Kovacs, Morgan, Wood, Forbes, & Howlett, 2003). Although gay and lesbian parents are increasingly accepted in the United States, and the majority of people believe that gay and lesbian couples raising children is either good for society (14%) or is at least not bad for society (48%), about one-third (35%) continue believe that it is bad for society (Pew Research Center, 2011).

Chapter Two: Method

Sampling Procedures and Sample Characteristics

Two distinct populations were recruited for this study: (a) a convenience sample of students enrolled in family science courses at a Southern land-grant university and (b) a probability sample of households in the Southern state where the university is located. The sampling procedures and sample characteristics of each sample are described in detail below.

Convenience sample. The sampling frame included 442 students enrolled in undergraduate family science courses at a Southern land-grant university during the Spring 2012 term. With instructor consent and using an approach adapted from Dillman (2009) for maximizing response rate, a study investigator initially visited each class to briefly introduce the study and inform students that they would receive an e-mail inviting them to participate in the study (see Appendix A). That same day, an e-mail was sent to their university-registered e-mail addresses with a hyperlink that allowed those who wished to participate an opportunity to do so anonymously and at their convenience. One week later a reminder e-mail was sent to all recipients of the initial e-mail, and a week after the first reminder a second e-mail reminder was sent. No further recruitment attempts were made.

The hyperlink in the recruitment e-mail directed potential respondents to an online survey, where they were initially provided information that outlined the purpose and risks of the study, what to expect if they chose to respond to the survey, and their rights as research participants (see Appendix B). Those who wished to participate then began the survey, which took approximately 10 minutes to complete.

The convenience sample ($n = 118$) was primarily female (83.1%), White (86.4%), single (89.2%), and heterosexual (95.7%). Compared to the university's overall enrollment statistics, females were overrepresented in the sample (Office of Institutional Effectiveness, University of Kentucky, 2012), but was consistent with enrollment in the sampled classes. Respondents were 19 to 44 years of age ($M = 22.8$, $SD = 4.9$). Religious preference was spread fairly evenly among four categories: Baptist (22.9%), Catholic (22.9%), non-Baptist Protestant (26.3%), and other religious preferences (28.0%). Nearly three-quarters of respondents who identified a preferred religion indicated that they identified *very strongly* (34.6%) or *somewhat strongly* (39.3%) with their preferred religion, compared to just over one-quarter who identified *somewhat weakly* (20.6%) or *very weakly* (5.6%) with that religion. All respondents had completed some college (96.6%) or some post-bachelor's education (3.4%).

Probability sample. Random digit dialing was used to give each household telephone number within a Southern state an equal probability of being contacted. The respondent within each household was randomly selected according to the youngest or oldest adult between 18 and 46 years of age of a given sex living in the household. Up to 10 attempts were made to each telephone number in the sample, and a conversion attempt was made for each refusal. Calls were scheduled across days of the week and at various times of day to maximize the chances of making contact with potential respondents. Upon making contact with the selected member of the household, an informed consent script (see Appendix C) was read and administration of the survey followed for those who wished to participate.

The probability sample ($n = 139$) was primarily female (59.7%), White (94.2%), and married (66.2%). Compared to the state population from which the sample was drawn, females and whites were over represented in the sample (Homefacts, 2010; United States Census Bureau, 2012). Respondents were 19 to 46 years of age ($M = 35.4$, $SD = 7.8$). Religious preferences included Baptist (32.4%), non-Baptist Protestant (30.9%), and Catholic (17.3%), among others (19.4%). Among respondents who identified a preferred religion, about two-thirds of respondents identified *very strongly* (29.2%) or *somewhat strongly* (38.0%) with their preferred religion, compared to one-third who identified *somewhat weakly* (20.4%) or *very weakly* (12.4%) with that religion. Although only 7.2% of respondents had less than a high school diploma, education level was somewhat evenly distributed among those who had a high school diploma (20.9%), had completed some college (23.7%), had a bachelor's degree (23.0%), and had post-bachelor's education (25.2%). Over the preceding calendar year, 35.8% of respondents reported a total household income below \$50,000, 41.0% had household incomes between \$50,000 and \$100,000, 14.9% had household incomes ranging from \$100,000 to less than \$150,000 per year, and 8.2% reported annual household income of \$150,000 or more.

Combined sample. No meaningful differences were found between the two samples on key characteristics and variables of interest, so the two samples were combined into a single sample ($N = 257$) for the analyses conducting in this study. However, sample membership was included as a predictor variable in the statistical models, where appropriate. The individual and combined sample demographics are summarized in Table 2.1.

Survey Design

An author-developed multiple-segment factorial vignette was designed to examine the effects that contextual circumstances have on attitudes toward the use of ART. Brief descriptions of vignettes and factorial designs are provided next, as a foundation for explaining how they were combined in the survey design employed for this study.

Vignettes. Vignettes are short descriptions of either real-world or hypothetical scenarios. When used in research, vignettes are a cost effective and flexible tool for assessing “attitudes, judgments, beliefs, knowledge, opinions or decisions” (Brauer et al., 2009, p. 1938). They are particularly useful for examining uncommon, unethical, illegal, or otherwise inaccessible or difficult-to-observe situations. Vignettes can also be used to assess intentions, although expressed intentions in response to a hypothetical vignette may not accurately reflect one’s actions when faced with the vignette situation in real life (Brauer et al., 2009; Collett, 2011).

Factorial designs. Factorial designs consist of two or more factors (independent variables) with two or more categories, or levels, within each factor. For example, a factorial experiment might randomly assign clients to receive therapy from a male or female clinician using one of three different therapeutic approaches to examine the relative effects that clinician sex, therapeutic approach, and combinations thereof have on outcomes. The number of scenarios in a full factorial design, in which all possible combinations of the factor levels are examined, is the mathematical product of the number of categories within each factor. In the preceding example, a full factorial design would have $2 \times 3 = 6$ groups. Each respondent (or, in the case of the example, each

client) would be randomly assigned to any one of the groups; that is, a male or female clinician using therapeutic approach A, B, or C. Fractional factorial designs, in which some possible combinations of the factor levels are excluded from the factorial design, may be desirable due to an unwieldy number of possible scenarios when there are a large number of factors or levels within the factors (Brauer et al., 2009), when particular combinations of the levels are illogical, or when particular combinations are not of empirical or theoretical interest.

Factorial vignettes. A factorial vignette is simply a factorial design embedded within a vignette; two or more details within the vignette are manipulated to assess how the varied conditions and their interactions affect responses to the situation portrayed in a vignette (Brauer et al., 2009). For example, attitudes toward sexual intercourse according to the actor's sex (male, female) and marital status (not married, married) could be examined by creating a hypothetical scenario in which a male or female is depicted as having intercourse within or outside of marriage, then asking respondents to rate the appropriateness of the behavior.

Multiple-segment factorial vignettes (MSFVs). MSFVs are factorial vignettes that span multiple segments, or vignette paragraphs (Ganong & Coleman, 2006). Each segment presents new information and is followed by questions to assess how the new information affects responses across segments. Thus, MSFV designs have the advantage of observation points both before and after particular factors are revealed to respondents; investigators have the ability to strategically control which segment of the MSFV reveals each factor (Ganong & Coleman).

Measures

A review of the literature and thoughtful consideration of social norms led to the identification of the five variables that will be tested in the three-segment vignette designed for this study: (a) gender, (b) relationship status, (c) age, (d) source of gametes, and (e) sexual orientation. Each vignette segment was designed to provide sufficient information for respondents to assess the situation, while avoiding superfluous details that could distract respondents from the variables of interest (Ganong & Coleman, 2006). Each respondent was randomly assigned to any one of the 32 possible vignette combinations. An example version of the vignette is provided below (see Appendix D for the complete survey).

First segment. The first segment revealed the gender and relationship status—single man, single woman, or a couple—of the vignette character(s) who wanted to have a child using reproductive technology. The following example depicts a single woman (the independent variable is italicized):

Jamie wants to have a child and plans to use reproductive technology because she is currently single. (Segment 1 example)

After hearing this segment, respondents were asked: “Given this information, do you think it is *appropriate* or *inappropriate* for Jamie to utilize reproductive technology to have a child?” Respondents were also asked to provide the rationale for their responses to the forced choice questions: “Briefly explain in your own words why you chose these answers.”

Second segment. The next segment revealed the randomly selected age—18, 28, or 48—of the vignette character(s) seeking treatment. The only limitation placed on the

random selection of age was that if a married couple had been randomly selected in the first segment, then the couple could not be 18 years old. Thus, this is a fractional factorial design, as described previously. This segment also depicted whether the desired treatment would utilize a preexisting embryo or a fertilization procedure. Continuing from the first segment, the following Segment 2 example depicts Jamie's age and the source of the gametes:

Jamie is *48 years old* and when beginning treatment. After consulting with the fertility doctor, Jamie decides her best option is to use a procedure that requires conception using *a donated embryo* that another couple already froze but no longer needs. (Segment 2 example)

After reading this segment, respondents were asked: (a) "Given this additional information, do you think it is *appropriate* or *inappropriate* for Jamie to utilize reproductive technology to have a child?" and, now that they had the full context of the presumed heterosexual situation, (b) "How obligated are medical professionals to assist Jamie with this procedure; would you say *highly obligated*, *moderately obligated*, *slightly obligated*, or *not at all obligated*?" Respondents were also asked to provide the rationale for their responses to the forced choice questions: "Briefly explain in your own words why you chose these answers."

Third segment. The third segment revealed that the single vignette character is a gay man or lesbian, or that the couple is a same-sex couple. The following example reveals that Jamie is a lesbian:

It turns out that, even if in a relationship, Jamie would need to use reproductive technology to reproduce because she is a lesbian. (Segment 3 example)

After hearing this segment, respondents were once again be asked: (a) “Given this additional information, do you think it is *appropriate* or *inappropriate* for Jamie to utilize reproductive technology to have a child?” and (b) “How obligated are medical professionals to assist Jamie with this procedure; would you say *highly obligated*, *moderately obligated*, *slightly obligated*, or *not at all obligated*?” Respondents were also asked to provide the rational for their responses to the forced choice questions: “Briefly explain in your own words why you chose these answers.”

Analytical Approach

Logistic regression models were created for each of the three questions that asked whether the use of ART is *appropriate* or *inappropriate* given the circumstances portrayed, and ordinal regression models were created for the two questions about medical professionals’ obligation to assist. In all five regression models, the main effects of the independent design variables as well as respondent experiences and characteristics were entered into the models. A chi-square analysis was conducted to test the change in responses between the second and third segments (i.e., upon revealing the homosexual orientation of the vignette character(s), which would have been presumed to be a heterosexual orientation to that point).

The rationales respondents provided for their responses to the open-ended items were typed verbatim and coded inductively using content analysis procedures (e.g., Hsieh & Shannon, 2005). The coding unit was a unique rationale, so a single response could have been be coded into multiple categories but most respondents only provided a single rationale per response ($M = 1.15$). The responses were coded by a second coder to test for

inter-rater reliability, which resulted in what Landis and Koch (1977) would describe as a “substantial” amount of agreement between the coders ($\kappa = .70$).

Table 2.1, Demographic Characteristics of Respondents

| Characteristics | Convenience sample (<i>n</i> = 118) | | Probability sample (<i>n</i> = 139) | | Total sample (<i>n</i> = 257) | |
|-------------------------------|---|------|---|------|-----------------------------------|------|
| | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % |
| Gender | | | | | | |
| Man | 20 | 16.9 | 56 | 40.3 | 76 | 29.6 |
| Woman | 98 | 83.1 | 83 | 59.7 | 181 | 70.4 |
| Race/ethnicity | | | | | | |
| African American | 10 | 8.5 | 4 | 2.9 | 14 | 5.5 |
| White (non-Hispanic) | 102 | 86.4 | 130 | 94.2 | 232 | 90.6 |
| Other | 6 | 5.1 | 4 | 2.9 | 10 | 3.9 |
| Marital status | | | | | | |
| Married | 9 | 7.6 | 92 | 66.0 | 101 | 39.3 |
| Separated | 0 | 0.0 | 7 | 5.0 | 7 | 2.7 |
| Divorced | 0 | 0.0 | 8 | 6.4 | 8 | 3.1 |
| Single (never-married) | 109 | 92.4 | 32 | 23.0 | 141 | 54.9 |
| Religious preference | | | | | | |
| Baptist | 27 | 22.9 | 45 | 32.4 | 72 | 28.0 |
| Catholic | 27 | 22.9 | 24 | 17.3 | 51 | 19.8 |
| Protestant, non-Baptist | 31 | 26.3 | 43 | 30.9 | 74 | 28.8 |
| Other | 33 | 28.0 | 27 | 19.4 | 60 | 23.3 |
| Religiosity | | | | | | |
| Very religious | 37 | 31.4 | 40 | 28.8 | 77 | 31.6 |
| Somewhat religious | 42 | 35.6 | 52 | 37.4 | 94 | 38.5 |
| Slightly religious | 22 | 18.6 | 28 | 20.1 | 50 | 20.5 |
| Not very religious | 6 | 5.1 | 17 | 12.2 | 23 | 9.4 |
| Education | | | | | | |
| Less than high school diploma | 0 | 0.0 | 10 | 7.2 | 10 | 3.9 |
| High school diploma | 0 | 0.0 | 29 | 20.9 | 29 | 11.3 |
| Some college | 114 | 96.6 | 33 | 23.7 | 147 | 57.2 |
| BS/BA degree | 0 | 0.0 | 32 | 23.0 | 32 | 12.5 |
| Post BS/BA | 4 | 3.4 | 35 | 25.2 | 39 | 15.2 |
| Age | 19-44 (<i>M</i> = 22.8) | | 19-46 (<i>M</i> = 35.4) | | 19-46 (<i>M</i> = 29.6) | |

Chapter Three: Results

Is the Use of Reproductive Technology Appropriate?

The descriptive statistics presented in Table 3.1 show that, across independent variables, roughly two-thirds of respondents approved of using reproductive technology to conceive a child. However, the proportion of respondents who approved varied according to the vignette conditions presented. For example, the approval rate was notably higher among those who heard about a couple, and somewhat higher among those who heard about a 28-year-old individual or couple, a single gay man, or a lesbian couple. The scenario viewed least favorably was a single 18 year old seeking treatment; fewer than 30% of respondents who heard about a single 18 year old indicated that the use of reproductive technology was an appropriate option.

Logistic regression results across the three vignette segments are presented in Table 3.2. These inferential statistics indicate that respondents were substantially less likely to support treatment if they heard about a single woman or a single man seeking treatment than if they heard about a couple seeking treatment. In fact, when gender and marital status was the only information available to respondents (i.e., Segment 1), the 95% CIs of the odds ratios indicate that support is between 2.6 and 20.0 times less likely for a single man, and between 3.2 and 25.0 times less likely for a single woman, than for a couple. There was not a meaningful difference in responses between those who heard about a single man and those who heard about a single woman.

Compared to respondents who heard about a 28-year-old, those who heard about an 18-year-old in the second segment were substantially (10.0 times, CI [3.7, 25.0]) less likely to express approval. Similarly, those who heard about a 48-year-old were

somewhat (1.8 times) less likely to express approval than were those who heard about a 28-year old, but this estimate of the effect was not consistent or large enough with these data to be generalized with confidence to the population (CI [0.8, 4.0]). Respondents who heard that gametes would be used for the ART procedure were about 1.3 times more likely to express approval than were those who heard that embryos would be used, although the confidence interval of this point estimate ([0.7, 2.6]) was also not sufficiently precise or large to assume that the direction of this finding is true in the population.

Revelation of a homosexual orientation in the third segment impacted responses across vignettes concerning the appropriateness of varying relationship statuses and gender to utilize ART. Respondents who heard of a single male compared to a couple were more likely to support assisted reproduction for the couple when a heterosexual orientation was assumed; however, the preference for couple use was essentially negated ($OR = 0.97$, CI [0.36, 2.62]) upon learning the single male or couple had a homosexual orientation. After revealing sexual orientation, respondents were still more likely to support use of assisted reproduction for a homosexual couple compared to a single lesbian woman, but the difference was less pronounced than prior to the revelation that they had a homosexual orientation ($OR = 0.62$, CI [0.24, 1.62]). Importantly, few respondents who heard about a single man or single woman changed their positions upon learning he or she was gay; rather, support eroded among those who heard about a couple once they learned that it was a same-sex couple.

Interestingly, those who heard about a gay male couple were least likely to express approval of fertility treatments, but those who heard about a single gay male were

most likely to express approval. Among those who heard about lesbians, however, couples seeking treatment were more likely to receive approval than were single lesbians. Lesbian couples were also about 3.2 times more likely (CI [1.1, 10.0]) to receive approval than were gay male couples. In short, as can best be seen in Table 2, a similar percentage of respondents believed it was appropriate for single gay men (69.8%) and lesbian couples (66.7%) to utilize ART, but fewer respondents believed doing so was appropriate for a single lesbian woman (61.0%) and fewer still for a gay male couple (55.3%).

A Fisher's exact chi-square test was used to test for change in *appropriate* versus *inappropriate* responses between the second and third segments. Results indicated that attitudes toward procuring ART services statistically changed upon revealing a homosexual orientation, $X^2(1, N = 249) = 52.61, p < .001$, and the magnitude of this effect was large ($d = 1.04$). Specifically, after learning of the homosexual orientation, respondents were more than twice as likely to change their responses from *inappropriate* to *appropriate* (39.1%) than they were to change their responses from *appropriate* to *inappropriate* (16.0%).

Overall, across the vignette segments, married respondents tended to view ART procedures as less appropriate than did single respondents, and religiosity was negatively associated with the likelihood of approval, although the magnitude of the differences varied somewhat according to religion. Specifically, although few of the differences according to religion were statistically significant with these data, Baptists tended to express more approval than did non-Baptist Protestants, and Catholics tended to be less likely than Protestants to indicate that the desired reproductive treatments were appropriate in the given circumstances.

How Obligated are Medical Professionals?

Following the second segment, once the full context of the presumed heterosexual individual or couple seeking reproductive services had been described, respondents were asked how obligated they believed medical professionals were to provide assistance given the circumstances portrayed. Overall, about three-quarters of respondents indicated medical professionals were at least slightly obligated to assist regardless of which contextual circumstances were presented in the vignette (see Table 3.3).

The effects that the manipulated contextual circumstances and most respondent characteristics had on obligation attributions were generally small and not meaningful (see Table 3.4). A few noteworthy exceptions, however, were that younger and married respondents tended to attribute more obligation to assist in a heterosexual context than did older and single respondents, respectively, and respondent religiosity was negatively associated with perceived obligation regardless of sexual orientation.

Rationale for Responses

The most common rationales respondents provided for their responses to the closed ended questions are summarized in Table 3.5. *Procreative autonomy* was the most frequent rationale offered in support of ART following the first (37.9%) and second (37.3%) vignette segments, and was second (15.1%) to *social justice* (41.9%) following the third vignette segment. In general, respondents who believed the procurement of ART services was appropriate tended to provide rationales focused on autonomy, in one form or another, including a tempered response by some respondents in deference to medical

professionals' autonomy to decide for themselves whether they would perform the desired procedure.

Rationales among those who believed the procedure was inappropriate in the given context were commonly rooted in subjectively defined notions about the appropriate circumstances for procreation. For example, many perceived that the vignette character(s) were violating social norms for procreation associated with relationship status, age, and sexual orientation. Other respondents suggested that the vignette character should *use alternative means to parenthood*, such as adoption, or felt the situation was inappropriate but deferred to medical professionals.

Table 3.1, Percentage of Responses Within Each Level of the Independent Variables

| Independent variable | <i>n</i> | Appropriate or inappropriate? | | |
|---------------------------------------|----------|-------------------------------|-------------|------------|
| | | Inappropriate | Appropriate | Don't know |
| Gender and relationship status | | | | |
| Single man | 88 | 29.5 | 69.3 | 1.1 |
| Single woman | 94 | 33.0 | 61.7 | 5.3 |
| Couple | 81 | 6.2 | 93.8 | 0.0 |
| Age | | | | |
| 18 | 55 | 70.9 | 29.1 | 0.0 |
| 28 | 109 | 18.3 | 75.2 | 6.4 |
| 48 | 99 | 30.3 | 64.6 | 5.1 |
| Donated | | | | |
| Gametes | 144 | 30.6 | 64.6 | 4.9 |
| Embryo | 119 | 37.8 | 58.0 | 4.2 |
| Sexual orientation | | | | |
| Single gay man | 89 | 25.0 | 71.6 | 3.4 |
| Single lesbian woman | 91 | 36.3 | 62.6 | 1.1 |
| Gay male couple | 37 | 43.2 | 56.8 | 0.0 |
| Lesbian couple | 44 | 25.0 | 72.7 | 2.3 |

Table 3.2, Logistic Regression Predicting Whether Use of Reproduction Technology is Appropriate

| Predictor | Segment 1 <i>n</i> = 244, <i>appropriate</i> = 75.0% | | | | | Segment 2 <i>n</i> = 240, <i>appropriate</i> = 63.8% | | | | | Segment 3 <i>n</i> = 242, <i>appropriate</i> = 66.5% | | | | |
|---|---|-----------|----------|-----------|--------------|---|-----------|----------|-----------|--------------|---|-----------|----------|-----------|--------------|
| | <i>B</i> | <i>SE</i> | <i>p</i> | <i>OR</i> | 95% CI | <i>B</i> | <i>SE</i> | <i>p</i> | <i>OR</i> | 95% CI | <i>B</i> | <i>SE</i> | <i>p</i> | <i>OR</i> | 95% CI |
| Single man ^(couple) | -2.03 | 0.54 | < .001 | 0.13 | [0.05, 0.38] | -0.96 | 0.50 | .053 | 0.38 | [0.15, 1.01] | -0.03 | 0.51 | .958 | 0.97 | [0.36, 2.62] |
| Single woman ^(couple) | -2.22 | 0.54 | < .001 | 0.11 | [0.04, 0.31] | -1.87 | 0.48 | < .001 | 0.15 | [0.06, 0.39] | -0.47 | 0.49 | .333 | 0.62 | [0.24, 1.62] |
| Single woman ^(single man) | -0.18 | 0.35 | .592 | 0.83 | [0.42, 1.64] | -0.91 | 0.39 | .018 | 0.40 | [0.19, 0.86] | -0.44 | 0.37 | .232 | 0.64 | [0.31, 1.33] |
| Age 18 ⁽²⁸⁾ | | | | | | -2.29 | 0.49 | < .001 | 0.10 | [0.04, 0.27] | -0.50 | 0.44 | .257 | 0.61 | [0.26, 1.44] |
| Age 48 ⁽²⁸⁾ | | | | | | -0.61 | 0.40 | .126 | 0.55 | [0.25, 1.19] | 0.02 | 0.36 | .949 | 1.02 | [0.51, 2.07] |
| Gametes ^(embryos) | | | | | | 0.28 | 0.35 | .421 | 1.32 | [0.67, 2.62] | 0.02 | 0.32 | .995 | 1.00 | [0.54, 1.87] |
| Gay male couple ^(lesbian couple) | | | | | | | | | | | -1.18 | 0.55 | .032 | 0.31 | [0.10, 0.90] |
| Respondent characteristics | | | | | | | | | | | | | | | |
| Age | 0.04 | 0.03 | .202 | 1.04 | [0.98, 1.10] | 0.02 | 0.03 | .611 | 1.02 | [0.96, 1.08] | 0.03 | 0.03 | .286 | 1.03 | [0.98, 1.08] |
| Male ^(female) | 0.07 | 0.39 | .867 | 1.07 | [0.50, 2.28] | 1.28 | 0.44 | .003 | 3.60 | [1.53, 8.47] | -0.38 | 0.35 | .274 | 0.68 | [0.34, 1.36] |
| Education | 0.33 | 0.18 | .072 | 1.39 | [0.97, 1.98] | 0.12 | 0.20 | .552 | 1.13 | [0.76, 1.66] | 0.29 | 0.17 | .089 | 1.34 | [0.96, 1.88] |
| Convenience ^(Probability) | 0.08 | 0.54 | .880 | 1.09 | [0.38, 3.11] | -0.26 | 0.54 | .627 | 0.77 | [0.27, 2.23] | -0.20 | 0.51 | .701 | 0.82 | [0.30, 2.24] |
| Married ^(single) | -0.98 | 0.53 | .064 | 0.38 | [0.13, 1.06] | -0.39 | 0.54 | .472 | 0.68 | [0.23, 1.96] | -1.24 | 0.51 | .014 | 0.29 | [0.11, 0.78] |
| Religiosity | -0.51 | 0.20 | .009 | 0.60 | [0.41, 0.88] | -0.70 | 0.20 | < .001 | 0.50 | [0.33, 0.73] | -0.80 | 0.20 | < .001 | 0.45 | [0.31, 0.66] |
| Religion | | | | | | | | | | | | | | | |
| Baptist ^(Protestant, non-Baptist) | 0.07 | 0.43 | .864 | 1.08 | [0.47, 2.48] | 0.49 | 0.46 | .286 | 1.63 | [0.67, 3.98] | 0.32 | 0.38 | .412 | 1.38 | [0.64, 2.95] |
| Catholic ^(Protestant, non-Baptist) | -0.31 | 0.48 | .514 | 0.73 | [0.29, 1.86] | -0.87 | 0.49 | .078 | 0.42 | [0.16, 1.10] | 0.17 | 0.44 | .704 | 1.18 | [0.50, 2.78] |
| Catholic ^(Baptist) | -0.38 | 0.47 | .415 | 0.68 | [0.27, 1.71] | -1.35 | 0.49 | .006 | 0.26 | [0.10, 0.68] | -0.15 | 0.44 | .729 | 0.86 | [0.36, 2.04] |

Note. Reference category in parentheses. CI = confidence interval for odds ratio (*OR*).

Table 3.3, Percentage of Responses Within Each Level of the Independent Variable

| Independent Variable | How obligated are medical professionals to assist? | | | | | |
|---------------------------------------|--|------------|----------|------------|--------|------------|
| | <i>n</i> | Not at all | Slightly | Moderately | Highly | Don't know |
| Gender and relationship status | | | | | | |
| Single man | 87 | 25.3 | 20.7 | 19.5 | 27.6 | 6.9 |
| Single woman | 94 | 22.3 | 18.1 | 25.5 | 28.7 | 5.3 |
| Couple | 81 | 14.8 | 19.8 | 29.6 | 33.3 | 2.5 |
| Age at treatment | | | | | | |
| 18 | 55 | 30.9 | 21.8 | 21.8 | 23.6 | 1.8 |
| 28 | 109 | 18.3 | 15.6 | 25.7 | 35.8 | 4.6 |
| 48 | 98 | 18.4 | 22.4 | 25.5 | 26.5 | 7.1 |
| Donor type | | | | | | |
| Gametes | 143 | 18.2 | 18.9 | 27.3 | 32.9 | 2.8 |
| Embryo | 119 | 24.4 | 20.2 | 21.8 | 26.1 | 7.6 |
| Sexual orientation | | | | | | |
| Single gay man | 87 | 24.1 | 16.1 | 19.5 | 36.8 | 3.4 |
| Single lesbian woman | 93 | 19.4 | 12.9 | 31.2 | 32.3 | 4.3 |
| Gay male couple | 36 | 22.2 | 19.4 | 30.6 | 27.8 | 0.0 |
| Lesbian couple | 44 | 27.3 | 11.4 | 25.0 | 34.1 | 2.3 |

Table 3.4, Ordinal Regression Predicting How Obligated Medical Professionals are to Assist with the ART Request

| Predictor | Segment 2 <i>n</i> = 238 | | | | | Segment 3 <i>n</i> = 240 | | | | |
|---|-----------------------------|-----------|----------|-----------|--------------|-----------------------------|-----------|----------|-----------|--------------|
| | <i>B</i> | <i>SE</i> | <i>p</i> | <i>OR</i> | 95% CI | <i>B</i> | <i>SE</i> | <i>P</i> | <i>OR</i> | 95% CI |
| Single man ^(couple) | -0.27 | 0.32 | .404 | 0.77 | [0.41, 1.43] | 0.11 | 0.37 | .764 | 1.12 | [0.54, 2.32] |
| Single woman ^(couple) | -0.23 | 0.31 | .457 | 0.79 | [0.43, 1.46] | 0.11 | 0.37 | .758 | 1.12 | [0.55, 2.29] |
| Single woman ^(single man) | 0.03 | 0.29 | .907 | 1.03 | [0.58, 1.83] | 0.00 | 0.29 | .997 | 1.00 | [0.57, 1.77] |
| Age 18 ⁽²⁸⁾ | -0.46 | 0.34 | .182 | 0.63 | [0.33, 1.24] | -0.26 | 0.34 | .445 | 0.77 | [0.40, 1.50] |
| Age 48 ⁽²⁸⁾ | -0.20 | 0.28 | .474 | 0.82 | [0.47, 1.42] | -0.18 | 0.28 | .529 | 0.84 | [0.49, 1.45] |
| Gametes ^(embryos) | 0.29 | 0.25 | .254 | 1.33 | [0.81, 2.17] | 0.09 | 0.25 | .719 | 1.09 | [0.67, 1.78] |
| Gay male couple ^(lesbian couple) | | | | | | -0.17 | 0.42 | .681 | 0.84 | [0.37, 1.93] |
| Respondent characteristics | | | | | | | | | | |
| Age | -0.05 | 0.02 | .010 | 0.76 | [0.44, 1.30] | -0.02 | 0.02 | .238 | 0.98 | [0.94, 1.02] |
| Male ^(female) | -0.23 | 0.28 | .412 | 0.81 | [0.47, 1.39] | -0.19 | 0.28 | .506 | 0.83 | [0.48, 1.43] |
| Education | 0.03 | 0.13 | .826 | 0.97 | [0.75, 1.25] | -0.03 | 0.13 | .819 | 0.97 | [0.75, 1.26] |
| Convenience ^(Probability) | 0.15 | 0.38 | .693 | 1.85 | [0.94, 3.64] | 0.38 | 0.38 | .321 | 1.46 | [0.69, 3.09] |
| Married ^(single) | 0.94 | 0.39 | .015 | 2.06 | [1.00, 4.21] | 0.47 | 0.38 | .211 | 1.60 | [0.76, 3.36] |
| Religiosity | -0.28 | 0.14 | .042 | 0.75 | [0.58, 0.97] | -0.32 | 0.14 | .017 | 0.72 | [0.55, 0.94] |
| Religion | | | | | | | | | | |
| Baptist ^(Protestant, non-Baptist) | 0.46 | 0.31 | .059 | 1.79 | [0.98, 3.27] | 0.20 | 0.31 | .513 | 1.22 | [0.67, 2.25] |
| Catholic ^(Protestant, non-Baptist) | 0.05 | 0.34 | .377 | 1.34 | [0.70, 2.57] | -0.17 | 0.34 | .615 | 0.84 | [0.43, 1.65] |
| Catholic ^(Baptist) | -0.46 | 0.31 | .325 | 1.44 | [0.70, 2.96] | -0.38 | 0.35 | .284 | 0.69 | [0.35, 2.37] |

Note. Reference category in parentheses. CI = confidence interval for odds ratio (OR).

Table 3.5. Most Common Rationales for Whether Artificial Reproductive Treatment
Should Be Allowed

| Rationale | Segment 1 | | Segment 2 | | Segment 3 | |
|---|-----------|------|-----------|------|-----------|------|
| | <i>n</i> | % | <i>n</i> | % | <i>n</i> | % |
| Appropriate | 116 | | 83 | | 93 | |
| Procreative autonomy | 44 | 37.9 | 31 | 37.3 | 14 | 15.1 |
| Patient autonomy | 23 | 19.8 | 7 | 8.4 | 8 | 8.6 |
| Rights for medical professionals | 17 | 14.7 | 12 | 14.5 | 9 | 9.7 |
| Procreative autonomy for singles | 11 | 9.5 | 1 | 1.2 | 0 | 0.0 |
| Social justice | | | | | 39 | 41.9 |
| Inappropriate | 39 | | 61 | | 48 | |
| Procreation is for couples | 14 | 35.9 | 3 | 4.9 | 8 | 16.7 |
| Rights for medical professionals | 9 | 23.1 | 6 | 9.8 | 2 | 4.2 |
| Use alternative means to parenthood | 8 | 20.5 | 7 | 11.5 | 9 | 18.8 |
| Procreation is for heterosexuals | 6 | 15.4 | 1 | 1.6 | 7 | 14.6 |
| Stated concern for effects (financial, health, etc...) on mother and/or child | 4 | 10.3 | 11 | 18.0 | 2 | 4.2 |
| Too young to procreate | | | 14 | 23.0 | 7 | 14.6 |
| Too old to procreate | | | 13 | 21.3 | 1 | 2.1 |

Chapter Four: Discussion

This study was designed to investigate the effects of contextual factors on attitudes toward the procurement of reproductive technology services for the purpose of procreation. The findings indicate that ART is generally viewed as an acceptable procedure by reproductive aged individuals, particularly in normative contexts with regard to age and marital status, but differences between single men and single women using ART services were surprising and the effects of sexual orientation were both complex and unexpected.

The higher approval rate among those who heard about a single man than among those who heard about a single woman seeking ART services runs counter to a wealth of evidence indicating that mothers are viewed more favorably than fathers. Although the seven percentage point advantage in approval for single men is not a particularly large difference (nor was it a statistical difference with these data), the importance of this finding is magnified by the fact that the *a priori* evidence overwhelmingly indicated that single women should have garnered a much higher approval rate than single men. For example, a series of MSFV studies on posthumous reproduction have consistently found that Americans are unwittingly about twice as likely to support women using ART to produce a child in widowhood than for men to do the same (Hans, 2008; Hans & Dooley, 2013; Hans & Yelland, 2013). More generally, when children's parents do not reside together, children are about 4.5 times more likely to live with their mother than to live with their father (Grall, 2011), perhaps because single mothers are perceived to be more capable parents than are single fathers (Haire & McGeorge, 2012). The unexpected finding of the current study may hint at a double-standard gender bias against women

who pursue intentional single motherhood outside the context of a committed relationship, and absent extraordinary circumstances such as widowhood. However, given that this finding is out of step with what would be expected based on the published literature and that the point estimates were not sufficiently precise with these data to establish a statistical difference, the preference for single males over single females wishing to use ART services should be viewed with due skepticism until replicated.

Respondents were many times more likely to indicate that intentional reproduction in the form of ART was appropriate if they heard about a committed heterosexual couple than if they heard about a single man or a single woman. This finding is not surprising given that the majority of Americans believe that single people having children is bad for society (Pew Research Center, 2010), and research also indicates that children in single-parent households tend to have worse outcomes on several measures of well-being than their counterparts in two-parent households (Brown, 2010). However, nearly two-thirds of those who heard about a single man or woman also indicated that doing so was appropriate, and this percentage may continue to grow as individuals increasingly seek to bring their reproductive desires to fruition independent of marriage. Family structure in the United States has shifted away from the nuclear family household in recent decades (Pew Research Center, 2010); fewer than half of family households in the U.S. with minor children in residence are comprised of the child's biological mother and father who are married to one another (U. S. Census Bureau, 2012). Moreover, the Ethics Committee of the American Society for Reproductive Medicine (2013a) has taken the position that using marital or relationship status as a basis for denying ART services is unjustified.

Although objections to fertility services according to marital or relationship status are largely rooted in social and moral claims, there are valid medical arguments for denying ART services to individuals of advanced age (Ethics Committee of the American Society for Reproductive Medicine, 2013b). Medical contraindications aside, Americans perceive the mid-20s as the ideal age to have a child (Saad, 2013), probably because it balances biological fitness with social norms and expectations concerning emerging adulthood and young adulthood. Congruent with previous research (e.g., Billari et al., 2010), using reproductive technologies at non-normative life course timing was frowned upon by some respondents in the current study. For example, scenarios involving an 18- or 48-year-old were often deemed inappropriate by respondents in the current study out of concerns for the welfare of the child and mother.

Many gay men and lesbians both desire and intend to become parents, albeit at lower rates than their heterosexual counterparts (Riskind & Patterson, 2010). Although there are several ways for childless gay men and lesbians to become parents, they must be intentional about fulfilling their childrearing desires and many will do so by turning to ART services. Access to fertility treatment is legally (in most states) and ethically protected regardless of sexual orientation or relationship status (Ethics Committee of the American Society for Reproductive Medicine, 2013a), but the intersection of sex, sexual orientation, and relationship status in the current study revealed some unexpected attitudinal findings. In particular, (a) revealing a homosexual orientation did not affect the approval rate for single men or single women and, by extension, the approval rate advantage that men held over women remained constant for single gay men over single lesbians; (b) sexual orientation did not affect approval rates for singles but had a large

negative effect on the approval rate for couples; and (c) those who heard about a single gay man were more likely to view the use of ART services as appropriate than were those who heard about a gay male couple or a single lesbian. Each of these key findings will be discussed in turn.

The higher approval rate for men than for women in the current study preceded the introduction of sexual orientation in the vignette so this finding should therefore not be interpreted as one of gay males garnering a higher approval rate than lesbians, per se. Rather, the key finding here, in terms of sexual orientation, is that the approval rate was surprisingly consistent among respondents who heard about a single man or a single woman both before and after learning of a homosexual orientation. The consistency may be attributable in part to a combination of the young (reproductive aged) sample and rapidly changing attitudes toward gay men and lesbians (e.g., Newport & Himelfarb, 2013). Nonetheless, the stability of approval between presumed heterosexual and homosexual singles was particularly surprising in the case of gay men, considering that previous research has consistently found more negative attitudes toward gay men than toward lesbians in a variety of areas, including personality characteristics, equal rights protection, and parenting (Herek, 2002). This finding may signal a shift in attitudes toward gay men in particular, but conclusions are perhaps best reserved until this finding is replicated with other samples.

Although there is no credible evidence that children are harmed by living in households with same-sex parents (e.g., American Academy of Child and Adolescent Psychiatry, 2013; American Psychiatric Association, 2002; American Psychological Association, 2005; but cf. Marks, 2012), the preference for two-parent families

apparently does not extend to same-sex relationships. The percentage of respondents who indicated that it was appropriate for a presumed heterosexual single man or woman to produce a child using ART remained stable upon learning that the single individual was a gay man or lesbian, but support declined precipitously among those who heard about a couple upon learning that it was a same-sex couple. In isolation, one could speculate that the much larger decline in approval among those who heard about a gay male couple compared to those who heard about a lesbian couple may be rooted in a belief that mothers are more important than fathers, particularly in the early years, or the biological fact that men would have to involve a gestational surrogate. Both of these explanations are paradoxical in the context of the current study though, given that those who heard about a single gay man were more likely to express approval than were those who heard about a single lesbian. Considering that the approval rate for same-sex couples fell to levels roughly consistent with those of single males and single females, whether with a heterosexual or homosexual orientation, the most likely explanation for the difference in approval for other-sex versus same-sex couples is not so much a rebuke of same-sex couples per se as it is a loss of approval from those who believe that reproduction should only take place within a committed heterosexual relationship.

The majority of Americans believe that children should be raised in two-parent (albeit, mother-father) households (Pew Research Center, 2010). Given the evidence cited above that children in single parent households are disadvantaged relative to those in two-parent households, and that children with same-sex parents fare no worse than those with other-sex parents, one can deduce that the number of parents in a child's household is more important for a child's well-being than the sex composition of those

two parents. In addition, mothers are generally viewed as more capable parents than fathers (Goldscheider & Kaufman, 2006), and people generally hold more favorable attitudes toward lesbians than toward gay men (Herek, 2002). Accordingly, one would expect the lesbian couple to have the highest approval rate, the single gay male to have the lowest approval rate, and the single lesbian and gay male couple somewhere in between. The lesbian couple did indeed have the highest rate of approval, but the single gay male was surprisingly only one percentage point behind, well ahead of the single lesbian and gay male couple. This results indicates that (a) same-sex two-parent households are not necessarily favored (nor disfavored) over single-parent gay or lesbian households, and (b) the preference for lesbians over gay men and for mothers over fathers may not extend to the realm of single gay men and lesbians rearing children.

It was particularly surprising that a substantially larger percentage of respondents who heard about a single gay man approved of the use of ART than did those who heard about a gay male couple. Here again, the evidence indicates that the preference for two-parent households may be specific to heterosexual households, but the differences in approval rate between those who heard about a gay male couple versus those who heard about a lesbian couple suggests that these findings may be best understood at the intersection of both gender and sexual orientation. In particular, it may be that the negative attributions associated with gay men relative to lesbians (Herek, 2009), and the positive attributions associated with mothers relative to fathers (Goldscheider & Kaufman, 2006), are additive. This could explain the seemingly disparate findings that two gay fathers were viewed less favorably than one gay father and two lesbian mothers were viewed more favorably than one lesbian mother. The caveat in the latter case being

that positive associations with mothers must carry more weight than negative associations with lesbians, but this assertion seems tenable and is consistent with the findings.

Moreover, the counterbalance of positive and negative associations with lesbian mothers can explain why the boost in approval rate for lesbian couples relative to single lesbians is smaller than the drop in approval rate for gay couples relative to single gay men.

Conclusion

As reproductive norms and medical advances change over time, ethical questions will continue to arise and be discussed by professionals and lay commentators alike. The findings reported here can inform those discussions, while also generating new research to make sense out of the surprising results associated with sex and sexual orientation. Moreover, to the extent that attitudes toward access to reproductive services reflect more generally held beliefs concerning the appropriate or optimal circumstances for reproduction, we can conclude that the preferred context for reproduction is within heterosexual marriage a normative ontogenetic age, but that most people view a diverse range of other circumstances as also appropriate for fulfilling one's reproductive desires.

Appendix A: Recruitment Items

Convenience (Student) Sample Recruitment E-mails

First e-mail

Subject: Reproductive Technology Survey

[name]:

As described in your FAM class today, we are conducting a study to better understand young adults' attitudes toward reproductive technology. We would very much appreciate it if you will take a few minutes to complete the online survey at [insert link to informed consent webpage].

Thanks,

Jason Hans, Ph.D.
Associate Professor
Department of Family Sciences
University of Kentucky

Brigitte Dooley, B.S.
Graduate Student
Department of Family Sciences
University of Kentucky

First follow-up e-mail (one week after first e-mail)

Subject: Reminder: Reproductive Technology Survey

[name]:

Just a friendly reminder about that we are conducting a study to better understand young adults' attitudes toward reproductive technology and would very much appreciate it if you will take a few minutes to complete the online survey at [insert link to informed consent webpage].

Thanks,

Jason Hans, Ph.D.
Associate Professor
Department of Family Sciences
University of Kentucky

Brigitte Dooley, B. S.
Graduate Student
Department of Family Sciences
University of Kentucky

Second follow-up e-mail (two weeks after first e-mail)

Subject: Final Reminder: Reproductive Technology Survey

[name]:

Just another friendly reminder about that we are conducting a study to better understand young adults' attitudes toward reproductive technology and would very much appreciate

it if you will take a few minutes to complete the online survey at [insert link to informed consent webpage].

Thanks,
Jason Hans, Ph.D.
Associate Professor
Department of Family Sciences
University of Kentucky

Brigitte Dooley, B. S.
Graduate Student
Department of Family Sciences
University of Kentucky

Appendix B: Convenience (Student) Sample Informed Consent

Thank you for your interest in our study. We are conducting the survey to better understand attitudes towards artificial reproductive technology.

The survey should only take about 10 minutes to complete, but participation is voluntary and can be discontinued at any time. By participating, you will not experience any risk beyond those that would typically be encountered when using the internet.

If you decide to complete the survey, your identity will be kept strictly confidential. Although a code links you to your answers, this is only done so that we know who we still need to follow up with during participant recruitment. Once participant recruitment is completed, all information that may allow anyone to trace your responses back to you will be removed.

If you have questions, suggestions, concerns, or complaints about the study, you can contact Dr. Jason Hans (Jason.Hans@uky.edu; 859-257-7761). If you have any questions about your rights as a volunteer in this research project, you may contact the staff in the Office of Research Integrity at the University of Kentucky at 859-257-9428 or toll free at 1-866-400-9428.

Thank you again for helping us with this important study.

Do you wish to continue?

- Yes (goes to survey)

- No (thanks individuals for their time and indicates that we will not contact them again)

Appendix C: Probability (Telephone) Sample Informed Consent

Hello. My name is [first name] with the University of Kentucky's family sciences research group and we're conducting a survey to better understand various family processes.

The survey should only take about 10 to 15 minutes to complete and your phone number was randomly selected from all households in the Lexington area, so your answers will remain anonymous. Participation is voluntary and can be discontinued at any time.

My instructions are to speak with the [youngest/oldest] [male/female], 18 or older, living in your household. [Would that be you? OR Would you call that person to the phone please?]

Appendix D: Vignette & Demographic Questions

Vignette

Bolded text indicates levels of an independent design variable and italicized text is determined by the level of the randomly selected independent design variable. During survey administration, the computer will randomly select the independent design variables and corresponding language to be displayed.

Randomly selected relationship status is single:

Jamie/Pat wants to have a child and plans to use reproductive technology because *he/she* is currently single.

- 1) Given this information, do you think it is appropriate or inappropriate for *Jamie/Pat* to utilize reproductive technology to have a child?

1 Appropriate
2 Inappropriate

8 Don't Know
9 Refused

- 2) How obligated are medical professionals to assist *Jamie/Pat* with this procedure; would you say they are highly obligated, moderately obligated, slightly obligated, or not at all obligated to assist?

1 Highly Obligated
2 Moderately Obligated
3 Slightly Obligated
4 Not at All Obligated

8 Don't Know
9 Refused

- 3) Briefly explain in your own words why you chose these answers.

[Type responses verbatim.]

Jamie/Pat is **16/28/48** years old when beginning treatment. After consulting with the fertility doctor, *Jamie/Pat* decides that *his/her* best option is to use a procedure that requires conception using a *donor egg/donor sperm/a donated embryo that*

Randomly selected relationship status is coupled:

Jamie and Pat want to have a child and plan to use reproductive technology because they have not been able to conceive naturally in the years they have been married.

- 1) Given this information, do you think it is appropriate or inappropriate for *Jamie and Pat* to utilize reproductive technology to have a child?

1 Appropriate
2 Inappropriate

8 Don't Know
9 Refused

- 2) How obligated are medical professionals to assist *Jamie and Pat* with this procedure; would you say they are highly obligated, moderately obligated, slightly obligated, or not at all obligated to assist?

1 Highly Obligated
2 Moderately Obligated
3 Slightly Obligated
4 Not at All Obligated

8 Don't Know
9 Refused

- 3) Briefly explain in your own words why you chose these answers.

[Type responses verbatim.]

Jamie and Pat are both **28/48** years old when beginning treatment. After consulting with the fertility doctor, they decide that their best option is to use a *donor egg /donor sperm/a donated embryo that another couple already froze but no longer needs.*

another couple already froze but no longer needs.

- 4) Given this additional information, do you think it is appropriate or inappropriate for *Jamie/Pat* to utilize reproductive technology to have a child?
- 1 Appropriate
 - 2 Inappropriate

 - 8 Don't Know
 - 9 Refused
- 5) How obligated are medical professionals to assist *Jamie/Pat* with this procedure; would you say they are highly obligated, moderately obligated, slightly obligated, or not at all obligated to assist?
- 1 Highly Obligated
 - 2 Moderately Obligated
 - 3 Slightly Obligated
 - 4 Not at All Obligated

 - 8 Don't Know
 - 9 Refused
- 6) Briefly explain in your own words why you chose these answers.
[Type responses verbatim.]

It turns out that, even if in a relationship, *Jamie/Pat* would need to use reproductive technology to reproduce because *he/she* is a **gay man/lesbian**.

- 7) Given this additional information, do you think it is appropriate or inappropriate for *Jamie/Pat* to utilize reproductive technology to have a child?
- 1 Appropriate
 - 2 Inappropriate

 - 8 Don't Know
 - 9 Refused
- 8) How obligated are medical professionals to assist *Jamie/Pat* with this procedure; would you say they are

- 4) Given this additional information, do you think it is appropriate or inappropriate for *Jamie and Pat* to utilize reproductive technology to have a child?
- 1 Appropriate
 - 2 Inappropriate

 - 8 Don't Know
 - 9 Refused
- 5) How obligated are medical professionals to assist *Jamie and Pat* with this procedure; would you say they are highly obligated, moderately obligated, slightly obligated, or not at all obligated to assist?
- 1 Highly Obligated
 - 2 Moderately Obligated
 - 3 Slightly Obligated
 - 4 Not at All Obligated

 - 8 Don't Know
 - 9 Refused
- 6) Briefly explain in your own words why you chose these answers.
[Type responses verbatim.]

It turns out that *Jamie and Pat* need to use reproductive technology to reproduce because they are **gay men/lesbians**; both *Jamie and Pat* are *men/women*.

- 7) Given this additional information, do you think it is appropriate or inappropriate for *Jamie and Pat* to utilize reproductive technology to have a child?
- 1 Appropriate
 - 2 Inappropriate

 - 8 Don't Know
 - 9 Refused
- 8) How obligated are medical professionals to assist *Jamie and Pat* with this procedure; would you say they are

highly obligated, moderately obligated, slightly obligated, or not at all obligated to assist?

- 1 Highly Obligated
- 2 Moderately Obligated
- 3 Slightly Obligated
- 4 Not at All Obligated

- 8 Don't Know
- 9 Refused

9) Briefly explain in your own words why you chose these answers.

[Type responses verbatim.]

highly obligated, moderately obligated, slightly obligated, or not at all obligated to assist?

- 1 Highly Obligated
- 2 Moderately Obligated
- 3 Slightly Obligated
- 4 Not at All Obligated

- 8 Don't Know
- 9 Refused

9) Briefly explain in your own words why you chose these answers.

[Type responses verbatim.]

10. What is your sex? [on telephone survey, don't ask respondent, just enter it].

- 1 Male
- 2 Female
- 8 Don't Know (for telephone survey only)
- 9 Refused

11. Do you know anyone who has used reproductive technology to conceive (or attempt to conceive) a child?

- 1 Yes
- 2 No
- 9 Refused

12. Have you ever used reproductive technology to conceive (or attempt to conceive) a child?

- 1 Yes (go to 12b)
- 2 No (go to 13)
- 9 Refused (go to 13)

12a. Which of the following options describe your experience with reproductive technology?

(check all that apply)

- 1 used with current partner
- 2 used with a former partner
- 3 used with same-sex partner
- 4 used without a partner (that is, while single)
- 5 used donated sperm/eggs
- 6 donated own sperm/eggs for others
- 7 other (open-ended)
- 9 Refused

12b. May we contact you again at a later time for a more in-depth research interview about your experiences with reproductive technology?

- 1 Yes
- 2 No (go to 13)

12c. What telephone number and/or e-mail address should we use to contact you?

[enter telephone number and/or e-mail address]

12d. What is your first name?

[enter name]

Demographics

All right, we're almost finished. I just have a few questions that will help us analyze the results of the survey.

13. How old were you on your last birthday?

[insert age]

998 Don't Know

999 Refused

14. Are you currently married, separated, divorced, widowed, or have you never been married?

1 Married

2 Separated

3 Divorced

4 Widowed

5 Single (never married)

9 Refused

15. How many children do you have?

[insert number]

98 Don't Know

99 Refused

16. Which of the following best describes your racial or ethnic group?

1 White / Caucasian

2 Latino or Hispanic

3 Black or African American

4 Asian American

5 Middle Eastern

6 American Indian

7 Other (specify): [open response]

8 Don't Know

9 Refused

17. Which of the following best describes your religious preference? Would you say:

1 Baptist

- 2 Catholic
- 3 Protestant
- 4 Islamic
- 5 Jewish
- 6 Something Else (specify): [open response]
- 7 No Religious Preference
- 9 Refused

18. How strongly do you identify with that religion?

- 1 Very Strongly
- 2 Somewhat Strongly
- 3 Somewhat Weakly
- 4 Vey Weakly
- 9 Refused

19. How often do you attend religious services? Would you say you go:

- 1 Twice per week or more
- 2 Once a week
- 3 Almost every week
- 4 Once or twice a month
- 5 A few times per year
- 6 Rarely
- 7 Never
- 9 Refused

20. Which of the following best describes your highest level of formal education?

- 1 Grade school only
- 2 Some high school
- 3 Graduated high school
- 4 GED
- 5 1 or 2 years college, no degree
- 6 Graduated junior or community college
- 7 Vocational-technical degree
- 8 3 or 4 years of college, no degree
- 9 Bachelor's degree
- 10 Some graduate school work
- 11 Graduate degree (master's, doctoral)
- 98 Don't Know
- 99 Refused

21. Finally, I'm going to read a list of income groups. Please stop me when I reach the category that best estimates your total household income last year (in 2011).

- less than \$10,000
- at least \$10,000 but under \$20,000
- at least \$20,000 but under \$30,000
- at least \$30,000 but under \$50,000

- at least \$50,000 but under \$100,000
- at least \$100,000 but under \$150,000
- \$150,000 or more

- 1 less than \$10k
- 2 \$10k-\$20k
- 3 \$20k-\$30k
- 4 \$30k-\$50k
- 5 \$50k-\$100k
- 6 \$100k-\$150k
- 7 \$150k or more
- 8 Don't Know/Not Sure
- 9 Refused

That's all the questions I have for you. Thanks for your time!

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