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Assisted reproduction and Middle East kinship: a regional and religious comparison

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Abstract This article compares the use of assisted reproductive technology (ART) and resultant kinship formations in four Middle Eastern settings: the Sunni Muslim Arab world, the Sunni Muslim but officially 'secular' country of Turkey, Shia Muslim Iran and Jewish Israel. This four-way comparison reveals considerable similarities, as well as stark differences, in matters of Middle Eastern kinship and assisted reproduction. The permissions and restrictions on ART, often determined by religious decrees, may lead to counter-intuitive outcomes, many of which defy prevailing stereotypes about which parts of the Middle East are more 'progressive' or 'conservative'. Local considerations – be they social, cultural, economic, religious or political – have shaped the ways in which ART treatments are offered to, and received by, infertile couples in different parts of the Middle East. Yet, across the region, clerics, in dialogue with clinicians and patients, have paved the way for ART practices that have had significant implications for Middle Eastern kinship and family life.

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Introduction

Around the world, assisted reproductive technology (ART) has been used primarily by heterosexual married couples to overcome the problem of infertility. However, these technologies have also created numerous options for non-traditional kinship and family formations, including genetically related gay families, postmenopausal motherhood, and posthumous reproduction using the cryopreserved gametes

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(sperm or eggs) of a dead mother or father (Inhorn and Birenbaum-Carmeli, 2008). As such, ART presents epistemological and ethical challenges, creating new dilemmas for regulators and religious leaders, as well as for practitioners and people facing infertility problems. Religious authorities have been especially assertive in some parts of the world, attempting to influence the contemporary understanding and shaping of ART-created families. Even though religious rulings can be extremely deterministic, they are sometimes surprisingly adaptable.

In this article, we compare the various modes of ART application, religious intervention and resultant kinship formations in four Middle Eastern settings: the Sunni Muslim Arab world, the Sunni Muslim but officially 'secular' country of Turkey, Shia Muslim Iran and Jewish Israel. This four-way comparison reveals considerable similarities, as well as stark differences, in matters of kinship and assisted reproduction in the Middle East. The permissions and restrictions on ART, often determined by religious decrees, may lead to counter-intuitive outcomes, many of which defy prevailing stereotypes about which parts of the Middle East are more 'progressive' or 'conservative' (Gürtin et al., 2015; Inhorn, 2012). Indeed, as ART has travelled to regions such as the Middle East, local considerations – be they social, cultural, economic, ethical or political – have shaped the ways in which ART treatments are offered to, and received by, infertile couples in different parts of the Middle East. Yet, across the region, clerics, in dialogue with clinicians and patients, have paved the way for ART practices that have had significant implications for Middle Eastern kinship and family life (Inhorn, 2003).

We begin this article with an outline of the major family features that are common to all of these Middle Eastern settings, as well as a description of significant local diversity. We then move on to explore how specific reproductive technologies are applied in each setting, focusing on third-party assisted reproduction (i.e. the use of donor sperm, donor eggs, donor embryos or gestational surrogacy). As we will argue, it is the use of third-party reproductive assistance – allowed in both Israel and Iran, but disallowed in the Arab countries and Turkey – that has highlighted and cemented profound regional differences in attitudes towards 'biological' versus 'social' parenthood and kinship. Indeed, in the Middle East, as elsewhere, ART has had both reinforcing and destabilizing impacts on the meanings of parenthood and family life. By means of their very existence and availability, these new technologies have expanded the limits of acceptable kinship and family formations in some parts of the Middle East, while re-entrenching and solidifying traditional family structures in others. In the Sunni Muslim world in particular, ART has re-inscribed religious and cultural mandates regarding the primacy of biogenetic inheritance and the social sanctity of patrilineal kinship structures.

Middle East kinship: regional similarities and differences

From Morocco to Iran, Middle Eastern societies can be described as family oriented, with a high value placed on marriage and childbearing (Inhorn, 1996, 2012). Across the Middle East, reproduction comprises a major organizing principle, the significance of which goes well beyond individuals' emotional desires for children. Indeed, on a cultural level, reproduction within marriage is deemed a social obligation – a way to perpetuate the family lineage, as well as a vehicle for parents to receive support in their old age and help with family labour. Contrary to popular stereotypes, reproduction is not the sole remit of women in the Middle East; both Muslim and Jewish Middle Eastern men often desire children and want to experience parenthood as active fathers (Birenbaum-Carmeli et al., 2014; Gürtin, 2014; Inhorn, 2012, 2014). Thus, they are often fully involved in reproductive decision-making (Inhorn, 2017) and child rearing. In other words, common to all of these settings is a strong social desire for children among both men and women; a desire that is first and foremost based on affection and love towards children, rather than on instrumental values. Given this, the Middle East can be described as 'pronatalist'; in other words, aspirations for childbearing occur at the individual, social, religious and political levels (Inhorn, 1996; Kahn, 2000). Yet, having said this, the number of children desired within each family has declined dramatically over the past 40 years. As shown in Table 1, total fertility rates in the Arab countries have plummeted since the late 1970s, from an average of more than five children per family in most countries, to an average of two children per family today (Eberstadt and Shah, 2012; Inhorn, 2017). In Iran, the average annual population growth rate has fallen to 1.2%, well below replacement level, with many young Iranians having only one child or no children at all. However, as in other parts of the Middle East, this has not diminished the deep-seated values attached to reproduction and its importance *per se* (Tremayne and Akhondi, 2016). In Turkey, despite the overtly pronatalist rhetoric of the government, the total fertility rate for 2015 was 2.14, remaining just above replacement level (Turkish Statistical Institute, 2016). In comparison, Israel continues to have one of the highest total fertility rates in the region, with all segments of the Israeli population (i.e. Palestinians and Jews, both secular and orthodox) maintaining fertility rates well above replacement level (i.e. more than two children per family).

In addition to positive attitudes towards childbearing, another shared feature of these Middle Eastern settings is

Table 1 Arab nations in the top 15 countries for global fertility decline between the years 1975–1980 and 2005–2010.

Country	Total fertility rate[a]		Difference	Percentage decline
	1975–1980	2005–2010		
Libya	7.94	2.67	−4.39	69.9
United Arab Emirates	5.66	1.97	−3.69	65.2
Oman	8.10	2.89	−5.21	64.3
Tunisia	5.69	2.05	−3.64	63.9
Qatar	6.11	2.21	−3.90	63.8
Lebanon	4.23	1.58	−2.66	62.8
Algeria	7.18	2.72	−4.45	62.0

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, 2013 (United Nations, 2013). World Populations Prospects: the 2012 Revision. United Nations, New York.

[a] Number of children born per woman.

belief in science and medicine, including the contributions of technoscience to the control and facilitation of fertility (Inhorn, 2003, 2012). Both Islam and Judaism valorize scientific and medical achievements, including those that enable married heterosexual couples to have biological offspring. In this respect, both religions have taken a much more positive stance towards medically assisted reproduction than either Catholicism or other Christian denominations (Inhorn et al., 2010). In fact, both Islam and Judaism positively encourage biomedical treatment of infertility as a means of preserving marriage and overcoming the conjugal suffering of childlessness.

Having said this, Jewish and Muslim religious authorities have differed considerably in their attitudes towards the use of ART outside of marriage. Within the Middle Eastern region as a whole, Israel is the only country in which single and lesbian women are entitled to receive the same ART services that are available to married women. One consequence of this entitlement is that many single Israeli women, often those at the end of their reproductive lifespan, decide to conceive and raise a child even though they are not married. Many of these women require technological assistance and turn to ART in order to conceive. In such cases, women's increasing age when attempting to conceive is leading to significant age-related female infertility problems.

Age-related female infertility is also a growing concern in the Muslim Middle Eastern countries (Inhorn, 2015), as is male infertility which accounts for approximately 60–90% of all cases in some in-vitro fertilization (IVF) clinics (Inhorn, 2012). Many of these male infertility cases are severe, involving very low sperm count, poor motility (movement) or azoospermia (total absence of sperm in the ejaculate). Such male infertility tends to cluster in families, with multiple brothers, cousins and other male relatives affected (Inhorn et al., 2009). Familial male infertility is probably genetic, linked to the high rates of consanguineous (cousin) marriage in the region (Inhorn, 2012).

In Islam but not in Judaism, marrying one's blood relatives is condoned on religious grounds. Across the Muslim Middle East, consanguineous marriage rates range from 16 to 78% of all marriages (Abbasi-Shavazi et al., 2008; Inhorn, 2012). Patrilineal parallel cousin marriage (i.e. marriage of the son and daughter of two brothers) is considered the ideal form. However, consanguineous marriages may occur between other types of first cousins, as well as more distant relatives. In general, consanguineous marriage with close relatives is considered to be the ideal way to achieve familial solidarity, retain the transfer of wealth and inheritance within the family, and to ensure 'purity' within the patrilineage.

As Judaism does not abide by this preference for cousin marriage, the rates of male infertility among Jews in Israel is closer to the global average of 50% of all cases (Farhi and Ben-Haroush, 2011; Sella et al., 2011). Furthermore, in the state of Israel and within Judaism more generally, when men or women are infertile, they are allowed to adopt, unlike the situation in most Muslim countries. Although adoption receives no financial or logistical state support in Israel, it is still undertaken by some infertile Jewish couples. Adopted children are issued a new birth certificate that carries the names of their adoptive parents. At 18 years of age, adopted children may obtain information regarding their biological parents, if they wish. However, as healthy newborns are rarely available for adoption in Israel, international adoption is more commonly undertaken, meaning that adopted children may have no information at all regarding their biological parents.

The Islamic attitude towards adoption is quite different. Muslim couples may foster a child (through an institution of guardianship, called *kafala*). However, permanent legal adoption as it is practised in the West is not allowed in family law in the vast majority of Muslim countries. Adoption is considered to be *haram* (religiously illicit) for a number of reasons. Adoption is believed to blur a child's *nasab* (genealogy), which is considered unjust to the child and creates concerns regarding future incest (between adoptees who do not realize that they are siblings) (Inhorn, 1996, 2003, 2012; Sonbol, 1995). This injunction against adoption is also upheld in Muslim inheritance laws that require the disbursement of assets to biological heirs alone (Bargach, 2002). Having said this, in Shia-dominant Iran, as well as in the more secular Muslim countries of Turkey and Tunisia, adoption is legally practised, even if it remains an unpopular and uncommon way of creating a family. In general, negative attitudes towards adoption across the Muslim Middle East, as well as the dearth of children available for adoption in Israel, mean that infertile Middle Easterners of all religions must turn to ART to form their families.

ART in the Middle East

Given strong regional pronatalism, high rates of male and female infertility, religious and cultural prohibitions against adoption, and the valorization of science and medicine, it is no surprise that ART has been embraced with enthusiasm across the Middle Eastern region. Indeed, the Middle East hosts one of the strongest ART industries in the world, with many countries performing among the highest number of IVF cycles per capita (Gürtin et al., 2015; Inhorn and Patrizio, 2015; Jones et al., 2010).

Israel was the first country in the region to perform IVF, with clinics opening in 1981, just 3 years after the birth of the first 'test-tube baby' in England (Birenbaum-Carmeli, 2000a). Since then, Israel has become the world's leading IVF 'capital', performing more cycles of IVF per capita per year than any other country (ESHRE, 2014; Israel Ministry of Health, 2013). Virtually all forms of ART are allowed and practised in Israel. This welcome embrace of ART has allowed married couples to overcome their infertility, single and gay men and women to form families, and Israel's population to increase overall. Moreover, in Israel, IVF and intracytoplasmic sperm injection (ICSI) are publically funded, up to the birth of two live children (with the woman's current partner). The coverage applies to all Israeli women aged 18–45 years, including single and lesbian women (Birenbaum-Carmeli, 2004). The state also entitles women, and – to some extent – their partners, to generous paid leave and employment protection while undergoing IVF treatment. Not surprisingly, given this high level of state support, Israeli women have been the world's most active consumers of IVF and other ART for many years (Collins, 2002; Birenbaum-Carmeli, 2016; Schenker, 2003).

Although Israel has always been at the forefront of Middle Eastern IVF trends, the Muslim Middle East is also home to a robust IVF industry. The Sunni-majority Arab countries of Egypt, Jordan and Saudi Arabia were the first to open IVF

clinics in 1986, following the 1980 *fatwa* endorsement of IVF for married couples by the Grand Shaykh of Egypt's famous religious university, Al Azhar. Since then, the Al Azhar *fatwa* condoning IVF has been upheld by leading clerics and religious institutions in many Middle Eastern countries. In general, Sunni authorities view IVF and related technologies as religiously permissible solutions to marital infertility, provided that the treatment incorporates only the gametes (egg and sperm) of a wife and a husband during the course of their legal marriage. All forms of third-party assisted reproduction – including egg donation, sperm donation, embryo donation or surrogacy (Moosa, 2003; Serour, 2008) – are disallowed. Thus, in the Sunni Muslim world, which includes most Arab countries and Turkey, third-party reproductive assistance is never practised, with this ban in place through various religious edicts, bioethical and professional codes of medical conduct, and legal formulations. Furthermore, in Turkey, a recent law has made all forms of third-party assistance illegal, including travel to another country for such purposes (Gürtin, 2011).

Like its Arab neighbours, Turkey boasts a history of IVF dating back to the late 1980s, with the first IVF baby born in 1989. As suggested above, Turkey has closely followed the Sunni Muslim religious rulings regarding IVF, including the prohibition of any form of third-party reproductive assistance. However, for married infertile couples who wish to use their own gametes, Turkey has been a generous supporter of IVF, introducing public insurance financing in 2005 and generally supporting the use of reproductive assistance by heterosexual married couples through 'patriarchal pronatalist' policies (Gürtin, 2016). In the last decade, the number of IVF clinics has 'mushroomed' across the country, with Turkey now hosting more IVF clinics (over 110) than any other nation in the Middle East (Gürtin, 2011, 2012, 2016; Jones et al., 2010; Urman and Yakin, 2010).

Whereas Turkey and the Arab countries now perform thousands of cycles of IVF without any form of donor assistance, the ban on third-party reproductive assistance is not upheld within Shia-dominant Iran, where – during the 1990s – some senior clerical sources endorsed the practice of third-party involvement, culminating in a final *fatwa* by the Supreme Leader, Ayatollah Ali Hussein Al-Khamanei, issued in 1999, which allowed both egg and sperm donation to be used by infertile couples (Tremayne and Inhorn, 2012). Hence, in Iran, which is the demographic epicentre of Shia Islam, all forms of assisted reproduction – including donation of eggs, sperm and embryos, as well as surrogacy – are now practised. At the same time, the use of ART is restricted to heterosexual married couples, thereby enforcing Iran's punishable ban on homosexuality and conception outside of marriage.

Third-party reproduction across the Middle East

But the question remains: why do these Middle Eastern countries, all of which embrace ART, differ so considerably in attitudes towards third-party reproductive assistance? Why do Iran and Israel agree upon the use of third-party assisted reproduction? And why does Turkey – which, despite recent political turmoil, is usually upheld as the most 'Western' and 'secular' of the Middle Eastern Muslim nations – uphold an anti-donation stance that links it to the more 'conservative' Arab states? These questions can be answered by turning to both religion and culture, and to particular local variants of 'kinship thinking'. As we argue here, Sunni Islam is scripturally and legally oriented, turning to Qur'anic mandates regarding the importance of *nasab*. Shia Islam, on the other hand, places a high premium on *ijtihad* (independent reasoning), which has allowed individual clerics to permit third-party reproductive assistance among their Shia Muslim followers. In some instances, Sunni Muslims are also abiding by these Shia 'permissions', leading to a private world of Shia-to-Sunni gamete donation in multisectarian settings such as Lebanon (Inhorn, 2012). Finally, in Israel, the Jewish rabbinical world, despite its high level of diversity, shows nearly universal acceptance of ART, including third-party donation and surrogacy. This has allowed Jewish infertile couples, as well as single people and gay couples, to access a multiplicity of forms of ART within a state that is technically Jewish, but where both rabbis and secular medical forces have combined to allow virtually every form of ART-assisted kinship reckoning.

The Sunni Muslim preservation of *nasab*

To understand the prohibition against third-party reproductive assistance in the Arab countries, as well as Turkey, it is important to examine Sunni-inspired ethical stances regarding *nasab* (usually defined as 'genealogy', 'kinship', 'lineage' or, on an individual level, one's biological 'relations' or 'origins'). In Sunni Islam, which is scripturally oriented, preservation of *nasab* is considered a moral imperative because the importance of knowing each person's *nasab* is described in numerous passages from the Islamic scriptures, including the Qur'an and *hadith*, or the sayings and deeds of the Prophet Muhammad. In other words, preservation of *nasab* is considered not only ideal, but a moral imperative for the constitution of legitimate personhood. As all Sunni Muslim societies are organized patrilineally – with descent and inheritance, as well as individual names and identities, figured through the father's side – knowledge of paternity is critical, not only for individual men as fathers, but for the patrilineal system as a whole.

Third-party reproductive assistance is thus viewed in Sunni Islam as destroying *nasab* through the 'mixing' of genealogical relations. Third-party assisted conception of a donor child violates the child's rights to known parentage, which is considered not only immoral, but also cruel and unjust to donor children themselves. Furthermore, donor children whose *nasab* is unknown face the threat of potential incest as, if two offspring of the same anonymous donor meet and marry, they unwittingly commit incest as biological half-siblings.

Third-party reproductive assistance is also considered tantamount to *zina* (adultery) in Sunni Islamic thinking. Although third-party donation does not involve the 'touch and gaze' of adulterous relations, it is nonetheless like adultery by virtue of introducing the sperm of another man, or the egg or womb of another woman, into the marital relationship. The donor child who results from such a forbidden mode of reproduction is considered a *walad il-zina* (literally, a child of illicit sex or an out-of-wedlock bastard). Such a donor child cannot be made legitimate through any means, including adoption by the non-biologically related parent.

In short, donor technologies, because of their association with adultery, incest and genealogical confusion, are considered to be *haram* (religiously forbidden and illegal) according to Sunni Islamic jurisprudence. Accordingly, a religiously inspired ban on third-party reproductive assistance is in place in all Sunni-majority countries around the world, including all of the Sunni Arab states. Couples who need donor technologies in order to conceive are told that these technologies are *haram*, going 'against' the religion by 'mixing' genealogical relations (Inhorn, 2003). These moral concerns are taken quite seriously. IVF clinics in Sunni-dominant Muslim countries do not practise third-party assisted conception. Although some patients may be advised to travel abroad for such services (Gürtin, 2011; Inhorn, 2012), the majority of infertile Sunni Muslim couples agree with, and thus abide by, the religious mandates to preserve *nasab* and to avoid incest and adultery (Inhorn, 2003, 2012).

Even in Turkey – a country whose formal commitment to secularism dates back to the rule of Ataturk in the 1920s (Arda, 2007), and which continues to be important today – ART is governed by a distinctly Sunni Muslim ethos. Indeed, the same prohibitions against third-party reproduction are enshrined in Turkish law, keeping ART within strict 'conjugal confines', although the prohibitions are often justified with reference to bioethical reasoning, cultural morals and a current political atmosphere of 'patriarchal pronatalism' (Gürtin, 2012, 2016). Under the Turkish Ministry of Health, the Assisted Reproduction Treatment Centers Directorate has restricted ART to married heterosexual couples using their own gametes, making it impossible for single people, those in same-sex relationships, or those requiring donor sperm or donor eggs to access ART (Gürtin, 2012, 2016). Moreover, in 2010, Turkey banned its citizens from seeking donor technologies abroad, thereby becoming the first country in the world to regulate against 'cross-border reproductive care' or, more specifically, the travel of its citizens seeking third-party assisted reproduction in other jurisdictions (Gürtin, 2011). Turkey's highest religious authority, the Presidency of Religious Affairs, has supported this sweeping prohibition against third-party reproduction, explaining that 'according to the general principles of the religion of Islam, there is an imperative for a legitimate child to belong, whether by sperm or egg or womb, to a wedded husband–wife couple' [Presidency of Religious Affairs of the Republic of Turkey, 2006 (Gürtin's translation)].

This attitude does not apply, obviously, to every Turkish man or woman, many of whom are non-religious, or who subscribe to different schools of thought than Sunni Islam. While it is generally true that third-party reproductive assistance – especially the use of donor sperm – is highly stigmatized in Turkey, there have been reports of Turkish couples crossing borders surreptitiously to nearby Cyprus and Greece in order to access donor gametes, particularly donor eggs. Indeed, according to the Director of the Ministry of Health's Treatment Services Department, the legal ban on reproductive travel in 2010 was introduced in response to the growing popularity of these cross-border journeys to access donor gametes (Gürtin, 2011).

Given Turkey's heterogeneity, including a growing social divide between those Turks committed to secularism and those devoted to increasing Islamic piety in the public sphere (White, 2002, 2014), it is difficult to gain an accurate picture of public opinion on third-party reproductive assistance in Turkey (Baykal et al., 2008; Isikoglu et al., 2006; Kilic et al., 2009). The available evidence points to a diversity of opinions, with levels of support for egg donation varying widely (Baykal et al., 2008; Isikoglu et al., 2006; Kilic et al., 2009). Nonetheless, in one survey, sperm donation was rejected almost unanimously by Turkish respondents, in keeping with the Sunni Muslim position on the necessity of known paternity (Baykal et al., 2008). Indeed, these differential views regarding egg versus sperm donation appear to reflect the Sunni Muslim concern with patrilineal kinship reckoning and the need for 'known fathers' of all children. Having said this, Turkey is one of three Middle Eastern Muslim countries (along with Iran and Tunisia) where adoption is allowed in the civil legal code. Thus, some Turks are willing to consider adoption as a way to form a family (Kilic et al., 2009).

In short, the heterogeneous views towards egg donation, sperm donation and adoption in Turkey reveal how contemporary Turks, the vast majority of whom are Sunni Muslims, are deliberating according to their own moral stances in order to reach decisions regarding the family structure that they find acceptable. The fact that some Turks take positions that are not aligned with the official Sunni Islamic positions or the secular law in the country indicates the degree to which ideas of 'modernity' and an identification with 'Western' values have also shaped moral discourses surrounding kinship and family life in Turkey.

Shia Muslim *ijtihad* – opening the path to donation

The Islamic Republic of Iran, which is the demographic epicentre of Shia Islam, presents a quite different moral landscape. The leading Shia jurists, who are considered *maraji* (plural of *marja*; sources of emulation), have also deliberated on the permissibility of third-party assisted reproduction among their Shia followers. Like their Sunni counterparts, Shia authorities have been concerned about conception outside of wedlock, the impact on the *nasab* of the resulting child, and the ensuing question of inheritance. However, the Shia tradition of Islam gives precedence to *ijtihad* based on the power of *aql* (human intellect). Thus, through processes of *ijtihad* – or independent interpretations of the Islamic scriptures, including their relevance for contemporary social life – individual Shia jurists have reached quite dissimilar verdicts, ranging from total opposition to conditional approval to full acceptance of all forms of third-party reproductive assistance.

Those Shia *maraji* who are in favour of third-party donor technologies distinguish between *nasab* and parenting via 'consent' between the donor and the recipients. Through such consent, the donor's biological right to parenthood is effectively transferred to the recipient parents. Moreover, in order to ensure that no births take place out of wedlock, some of the Shia *maraji* who support third-party reproductive assistance generally extend the definition of marriage to include 'temporary marriage' (*mut^{c}a*); this practice is only legitimate in Shia Islam and is not practised by Sunni Muslims (Haeri, 1989). Through the use of temporary marriage, egg and sperm donors can become legitimate – albeit temporary – spouses, by donating their gametes within the confines of *mut^{c}a* marriage (Clarke, 2006, 2009; Tremayne, 2006, 2008).

Furthermore, embryo donation has been legitimized through a law passed in parliament. Although no law has been passed on surrogacy, surrogacy is practised following the same rules as those of embryo donation. As a result, Shia-dominant Iran has become more open to third-party reproductive assistance than any other Muslim country in the world, as well as many Western nations (Inhorn and Tremayne, 2012).

Indeed, in Shia Islam, *ijtihad* has allowed each senior *marja* to form a valid opinion on third-party reproductive assistance, creating a truly dynamic space for ART practice in Iran. Iranian medical practitioners and infertile couples are able to choose the particular religious opinions on third-party reproduction that best meet their needs, without breaching any legal or religious rules. In fact, the final endorsement of third-party reproductive assistance by Iran's leading cleric, Ayatollah Khamenei, has given third-party reproductive assistance 'official' legitimacy since the late 1990s, even though ART had been practised in all forms through the approval of other leading Shia Islamic jurists (Clarke, 2009; Garmaroudi, 2012; Tremayne, 2012).

Having said this, the high-ranking clerical approval of third-party assisted reproduction in Iran has also paved the way for some counter-intuitive outcomes. For example, in their own efforts to maintain *nasab* many infertile Iranian couples prefer to use close relatives as donors. Thus, siblings have become the major source of gamete donation in some Iranian IVF clinics (Garmaroudi, 2012; Tremayne, 2008, 2012), creating real potential for sibling incest and genetic inbreeding. This preference for sibling donation must also be understood within the context of marital and gender relations in Iran. Relatives who are not potential marriage partners (i.e. parents, grandparents, siblings, aunts and uncles, children and grandchildren) are considered to be *mahram* (individuals with whom one can freely associate). *Na-mahram*, on the other hand, are those individuals of the opposite sex who are potential marriage partners and with whom sexual contact outside of marriage is forbidden. Thus, choosing *mahram* relatives as gamete donors constitutes the 'safer' option – basically keeping gamete donation 'in the family' – even though, in effect, it means breaching the incest and adultery taboos (Tremayne, 2012).

When donors are not family members, another cultural mechanism is invoked to create kinship ties between the infertile mother and her donor-conceived child. In Islam, a woman who has breastfed a baby is considered to be its *madare rezayi* ('milk mother') and is recognized as being equivalent to a biological mother in terms of kinship relations. Applying this system of milk kinship, Iranian women who have used donor eggs, embryos or surrogates but who can still breastfeed the donor child are thereby able to form a biological bond through the nurturance of their own breast milk. In the context of third-party assisted reproduction, milk kinship could potentially serve to mediate and enable social parenthood of donor children, establishing a biological connection based on milk rather than 'blood' or genes (Al-Torki, 1980; Clarke, 2009; Khatib-Chahidi, 1982, 1992).

However, legitimizing sperm donation has proven to be more problematic (Tremayne, 2012), with male infertility being stigmatized within the predominantly patriarchal Iranian culture. Regardless of the choice of sperm donor, the process leaves the infertile husband in a very 'passive' position, as the donor, rather than the husband, is responsible for the wife's pregnancy. Some Iranian men seem to feel emasculated by this process, struggling to reconcile their sperm donation decisions and even harming their families in the process (Tremayne, 2012). Although the acceptance of sperm donation and other forms of third-party reproductive assistance in Iran has been couched in the language of 'happy families', the available evidence suggests that third-party donation has been a mixed blessing, with biological incest and family violence as the possible end results (Inhorn and Tremayne, 2016).

Having said this, most Shia Muslim clerics now accept the validity of at least egg donation, which has become a popular option for Shia Muslim couples with age-related female infertility problems. Egg donation is now available in both Iran and Lebanon, the latter of which is a multisectarian Arab country with a Shia-majority population. At the time of writing, Iran and Lebanon are the only two nations in the Muslim Middle East where third-party reproductive assistance is being practised (Inhorn, 2012). In fact, with the decrease in population growth in Iran and the concerns for encouraging larger families, the state has turned to providing facilities for infertile couples to seek treatment. This includes the opening of a considerable number of public infertility centres, as well as insurance coverage designed for low-income couples receiving treatment. Interestingly, this has led to the commercialization of gamete donation and the flourishing of commercial agencies, which now openly sell eggs, sperm, embryos and surrogacy services. Even though these have not been authorized officially, the state does not seem to have taken any action against these commercial practices.

As in Iran, egg donation in Lebanon has become a popular option, with egg donors consisting of close female relatives or friends, even though anonymous egg donors, sometimes from other countries, are also commercially employed. Allowing egg donation in Lebanon has facilitated reproductive travel within the Arab world (Inhorn, 2012, 2015). Both Shia and Sunni Muslims from other Arab countries are travelling to Beirut in pursuit of donor eggs. Although most Sunni Muslim couples realize that they are 'going against' the tenets of their religion, they often justify this choice based on the biological connection that will be created when an infertile woman becomes pregnant and ultimately breastfeeds the donor-egg-conceived child. Furthermore, Sunni Muslim men who agree to egg donation often point out that they are allowed, via polygyny, to marry more than one wife. Egg donation is thus being construed as 'like' polygyny, even if no formal temporary marriage is taking place (because Sunni Islam does not allow temporary marriage).

The religious resistance of Sunni Muslim couples to the ban on third-party reproductive assistance in the Arab countries is not surprising, given that other routes to parenthood, including gestational surrogacy and child adoption, are also banned. Thus, some Sunni Muslim couples are taking oppositional stances, accepting the benefits of donor technologies by invoking the more 'permissive' Shia opinions and practices.

Indeed, the willingness of some Muslim men, both Sunni and Shia, to overcome their wives' infertility through egg donation is a powerful sign of contemporary conjugal commitments. The embrace of new forms of ART by both Muslim men and women has gone hand in hand with the emergence of the 'companionate couple' – a kinship unit that challenges stereotypical images of patrilineal, patrilocal, patriarchal and polygynous Middle Eastern marriages (Inhorn, 2012). Having said this, the

willingness of couples to employ donor technologies for the sake of companionate marriage stops short of sperm donation. In the Arab world, the vast majority of both Sunni and Shia men view sperm donation as a major violator of *nasab*. Sperm donation confuses paternity and destroys kinship based on patrilineal descent. Furthermore, among individual men, belief in the importance of biological fatherhood remains strong. Thus, a sperm-donor child 'won't be my son' according to the vast majority of Muslim men, both Sunni and Shia (Inhorn, 2006, 2012). However, in the case of Shia Iran, there is an emerging trend among more-educated urban infertile men to resort to sperm donation and keep it a secret from everybody, claiming that they are the biological father. Such actions suggest that, for these men, being seen as 'fertile' is of greater importance than the child being biologically theirs (Tremayne, 2012).

Israeli Jewish kinship accommodations

The same types of moral concerns about sperm and egg donation also have resonance in Israel, even though virtually all forms of ART are practised. The application of donor technologies, which has stirred considerable moral debate in the Muslim world, has never raised serious clerical objections in Israel. Unlike Muslim religious authorities, Jewish authorities have allowed ART innovations to be incorporated smoothly within accepted Judaic law. Having been included in every significant ART-related policy discussion in Israel, rabbinical authorities have been able to introduce their requirements and modifications to ART practice, but have invariably demonstrated openness and flexibility towards the use of these new technologies.

The scene in Israel, however, is not trouble free. Although lineage and descent are less crucial for most Israelis than they are for Muslims, paternity is still the basis of one's family name and sense of family belonging in Israeli society. Thus, male infertility is associated with significant social stigma. Until the development of ICSI in the early 1990s, sperm donation was practised informally by private gynaecologists under conditions of extreme secrecy (Birenbaum-Carmeli et al., 2000a, 2000b; Carmeli and Birenbaum-Carmeli, 2000). The parents tended never to disclose the donor conception, also keeping it secret from the child, in order to create the appearance of a 'natural family'. This concealment of the child's origin accorded with state policy, which continues to view social paternity as inferior to genetic fatherhood. Thus, unlike IVF and ICSI cycles, donor insemination has never been publically funded in Israel. Furthermore, for years, the Ministry of Health's regulations instructed doctors to maintain permanent secrecy, and to mix the donor's sperm with the husband's sperm whenever possible in order to create ambiguity regarding the identity of the actual biological father (Carmeli and Birenbaum-Carmeli, 2000; Carmeli et al., 2001). In other words, in sharp contrast to Muslim countries where the preservation of *nasab* is deemed essential, Israel has actively encouraged a form of counterfeiting of the child's lineage by completely removing any trace of the donor father and masking social fatherhood as presumably genetic.

Having said this, ultraorthodox Jews – who are not allowed to 'waste' any sperm, including for the purpose of semen collection in IVF clinics – make use of donor sperm in a somewhat different way. In fact, ultraorthodox couples typically use the donor sperm of non-Jewish men because use of such sperm bypasses the prohibition on sperm wasting (via masturbation in semen collection), which does not apply to non-Jewish men. Additionally, using 'foreign sperm' removes the concern of unwitting future incest (Kahn, 2000). In recent years, ultraorthodox Jewish Israeli couples have typically purchased donor sperm abroad via the Internet. Single and lesbian women, who appreciate knowing more details about potential sperm donors, also tend to prefer international sperm banks. Once again, the Israeli state, in support of this form of third-party reproductive assistance, has set a fast-track procedure for individuals to import donor sperm of their choice.

There is one instance, however, in which paternity concerns are real and cannot be feigned. This is in the transmission of the 'Cohen' or 'Levi' elevated ritual statuses that are transferred patrilineally and carry ritual significance in ultraorthodox communities. Since a son conceived by sperm donation is not entitled to the father's Cohen or Levi label, the birth of a donor son would expose the father's infertility and treatment. Apparently, the stigma of infertility and donor insemination are so great in ultraorthodox communities that such couples would rather forego the crucial commandment to reproduce, unless they can ensure that sperm donation results in the birth of a daughter. Increasingly, this is being done through government-approved preimplantation genetic sex selection (Hashiloni-Dolev et al., 2010), which allows such ultraorthodox families to select female embryos alone for conception.

In some ways, egg donation is even more problematic than sperm donation as a form of third-party reproductive assistance in Israel. In Judaism, it is the mother's Jewishness that ensures the Jewishness of the child. Egg donation, which separates the genetic mother from the gestational mother, thus problematizes the matrilineal inheritance of a donor child's Jewish identity. Most rabbis consider the womb to be the decisive factor in the transmission of Jewishness, and therefore minimize the religious significance of the egg donor. Some of these rabbis actually prefer non-Jewish egg donors, again to remove the concern of future incest. Still, other rabbis insist that both the womb and the egg must be those of Jewish women in order to ensure the child's Jewishness.

Egg donation is rare in Israel, even though it is legal. Israeli women who require donor eggs must usually search for egg donation in other countries. Women who endorse the stricter religious view usually seek the eggs of Jewish women, mostly in the USA. Yet, the high prices charged for American 'Jewish eggs' ($30,000 to $50,000) may prevent Israeli Jewish couples from obtaining American eggs, even in cases where they believe in the importance of Jewish genetic origin in defining a child's identity (Nahman, 2006). Most Israelis, therefore, opt for the more readily available supply of eggs from non-Jewish donors, usually purchased in Eastern Europe (Nahman, 2011, 2013). The Israeli state, for its part, approves of both of these modes of egg donation and accepts the resulting children as fully Jewish Israelis.

Interestingly, surrogacy is legal in Israel, but for heterosexual couples alone (Teman, 2010). Single people and gay couples who wish to take this road to family formation need to travel abroad. In the past few years, gay male couples in Israel have made extensive use of overseas surrogacy options

(Farber, 2014). As in all other modes of third-party reproduction, the child's birth certificate records the names of the social parents alone, and carries no sign of the biological parents, including the egg donor and the gestational surrogate (who may be the same woman or two different women).

In general, these gay surrogate families instantiate many of the general characteristics of Israeli families. The popular attempt to have twins by surrogacy maximizes the enormous financial investment, but also embodies the desire to have 'a full family' rather than raising an only child. Bearing in mind that the state funds IVF up to the birth of two live children, the contemporary Israeli family is thought of as having at least two children to be whole. Gay men's efforts to found such normative nuclear families reveals the strength of this norm beyond heteronormative couples. Furthermore, gay men have consistently described how the baby's birth via surrogacy has brought them closer to their extended families. These non-traditional families are often actively supported by their traditional, sometimes religious, parents and relatives. Similar accounts have been provided by single and lesbian mothers in Israel who have used ART to found their own families. This intensified closeness suggests that in family-centred Israel, becoming a parent is, in and of itself, a 'normalizing' transition to full adult personhood.

Throughout Israel's active ART scene, it is the parents' desires and hopes that are the focus of attention, while the best interests of the resulting children are secondary in most ethical and clinical discussions. Furthermore, the presence and acceptance of all forms of assisted reproduction and family formations does not mean that these forms are of equal status. IVF and ICSI using a married couple's own gametes is free of charge, while donor sperm, which presents no threat to the child's Jewish identity, is not state funded although it is relatively inexpensive. Egg donation, a more complex technology both clinically and religiously, costs three to six times the average Israeli monthly salary, placing this technology beyond the reach of many couples and older single women, whose salaries, on average, are approximately one-third lower than men's salaries. Finally, the most expensive ART is gestational surrogacy, which is not funded by the Israeli state and is not allowed for gay men within their own country. In this respect, Israel's generous funding of IVF and ICSI for married infertile couples, but not for non-traditional uses of ART, has led to a two-tiered system of reproduction and kinship, where biologically based, heteronormative families are definitely privileged.

Assisted reproduction and Middle East kinship: major comparisons

It is fair to say that the globalization of ART to the Middle East has reinforced the biogenetic element of kinship and relatedness, even in Israel and Iran where third-party reproductive assistance is allowed. In Israel, all forms of ART are allowed by law, but those that perpetuate biologically related, heteronormative family forms are the only ones actively encouraged and funded by the state. Similarly, in Shia Iran, all manner of ART treatment are allowed. Yet, ART services are restricted to heteronormative couples, and such couples often choose to approach the closest-possible, genetically related donors to preserve a semblance of *nasab*. Preservation of *nasab* is also a religious and cultural mandate in the Sunni Muslim countries, where preservation of paternity, patrilineage and biological kinship more generally are deemed to be critical moral imperatives. This aim for biogenetic kinship – or at least partial biogenetic kinship through the use of ART – in all of these countries bespeaks the inferiority of social parenthood, and the problems that men, in particular, have in accepting social fatherhood without true biological paternity. Having said that, beyond this common feature, in all of the Muslim countries compared in this analysis, ART is applied in order to reaffirm traditional family formations, whereas in Israel, the universal entitlement to ART effectively expands the scope of non-traditional families, which thereby subtly erodes the hegemony of heteronormativity.

At the same time, third-party reproductive assistance is beginning to destabilize notions of biogenetic relatedness, even for Muslim Middle Eastern couples, who are increasingly turning to egg donation. Women, their husbands, their clinicians and their clerics are increasingly invoking innovative measures to make egg donation religiously and culturally acceptable. In the Muslim world, this includes new instantiations of the ancient practice of milk kinship, as well as temporary marriage and 'as if' polygyny. In Israel, the religious validity of non-Jewish donor eggs has been accepted by wide swathes of Israeli society, including many rabbis, who have reinforced the sanctity of Jewish wombs in conferring Jewishness to donor offspring.

What is most remarkable about many of these biotechnological developments is that they have been incorporated under a variety of political and religious systems in the Middle East. Shia-dominant Iran is a theocracy, in which religious officials play key roles in both government administration and management of medical ethics. Officially, Turkey is a secular country, but it is now governed by an openly Sunni Muslim political party with explicitly conservative family values. Sunni Arab countries are politically diverse, but have been remarkably convergent in their attitudes towards ART, including the widely enforced religious ban on third-party assisted reproduction. Israel is one of the few formal democracies in the region, but it is a state defined on religious grounds as Jewish, with religious parties and authorities concentrating considerable political power and authority.

In all of these diverse political systems, the religious establishment plays a critical role in the reproductive medical sector, with medical practitioners effectively educating the religious leaders about assisted reproduction, thereby influencing the decisions of the religious authorities. Perhaps because of this medical influence, the prominence of religious authority does not necessarily translate into ART conservatism. All of these Middle Eastern settings have been quick to endorse assisted reproduction. Whether due to the power of pronatalism, the high prevalence of both male and female infertility, or the ban on adoption in most Muslim countries, each Middle Eastern setting described in this article has developed an active, prosperous ART industry. In some cases, such as Israel and Turkey, public funding has been provided, leading to a major boost in local ART consumption. Furthermore, a few Arab countries (e.g. Egypt, United Arab Emirates), as well as Iran, have provided partial public financing of ART, either through government hospitals or some form of insurance funding (Inhorn, 2015). In each case, these Middle Eastern

states are helping citizens to achieve a norm of two children per family, a contemporary state of affairs reflected in Table 1.

In Iran, on the other hand, infertility and its treatment has not been a matter of national interest, and the state itself has not played any official role in either endorsing or rejecting ART. In Iran, ART was introduced, and subsequently developed, by the private sector, albeit with support from some of the senior Islamic jurists. However, since 2012, when the realities of the demographic transition and a drastic drop in the fertility rate to below the replacement level became apparent, the Iranian state has started taking more interest and action in promoting the treatment of infertility (Tremayne and Akhondi, 2016).

Table 2 provides a summary of current ART permissions and prohibitions in the countries described and compared in this article. As the table shows, in each setting, the state, in conjunction with religious authorities, attempts to contain the revolutionary potential of ART in one way or another. Although Israel is clearly the most permissive ART regime, Iran is close behind, and both abide by the worldwide ethical ban on human reproductive cloning, which entails the autonomous asexual reproduction of offspring who are the genetic clones of their parents.

Although Iran is often cast in Western media as one of the most conservative countries of the Middle East, Table 2 shows that its ART regime is surprisingly permissive, allowing virtually all ART provided that the treatments are used within the bounds of marriage. Indeed, in the Muslim world in general, it is fair to state that both governments and religious establishments have prioritized marriage as the most important ART kinship form. Even in Iran, where the boundaries of both marriage and *nasab* are being stretched, Shia religious and legal forces mandate the containment of ART within marriage, just as the Sunni establishment does in neighbouring Arab countries and Turkey. Although Islam is popularly conceived of as a religion that undermines conjugal bonds – by allowing men relatively free access to polygyny and divorce (Charrad, 2001) – marriage within Islam is held up as 'half of the religion'. Marriage itself is also the major point of wealth transfer between the generations (Singerman, 2007). Thus, in general, Muslims take the call to marriage quite seriously, and families often intervene to prevent divorce (Inhorn, 2003, 2012). Within this 'predominantly married' Middle East – indeed, one of the 'most married' regions of the world, with more than 90% of adults marrying at some point in their lives – marriage is being reinforced by the presence of ART, technologies that are truly focused on the 'couple'. Reciprocally, the desire of many infertile Muslim couples to 'save' their marriages is fuelling the tremendous growth and success of the ART sector in both Sunni- and Shia-dominant regions of the Muslim world. Although voluntary childlessness is on the increase in Shia Iran, where approximately 11 million young men and women of marriageable age remain unmarried (46% of men and 48% of women), there are currently an estimated three million infertile couples, comprising 20% of all married couples, who suffer from involuntary childlessness in Iran, and thus are desperate to have children (Tremayne and Akhondi, 2016).

Even in Israel, where third-party assisted reproduction and non-traditional family forms are subsumed within the prevailing ART regime, the normative aspirations of ART-seeking Israelis, their IVF doctors, and the rabbinical and state authorities who regulate these technologies are nonetheless all highly family centred, if not 'couple' centered *per se*. This 'focus on the family' in Israeli assisted reproduction is ultimately supportive of a rather conservative and pronatalist cultural ethos, in which individuals who do not conceive their own families are left behind. Indeed, the quest of 'non-traditional' Israeli individuals – including single and gay men and women – for acceptance and integration into mainstream circles does little to challenge traditional family norms.

Table 2 Middle Eastern assisted reproductive technology (ART): permissions (Y) and prohibitions (N).

Procedure	Iran	Arab countries	Turkey	Israel
Anonymous third-party reproductive assistance	N	N	N	Y
Cryopreservation of embryos	Y	Y	Y	Y
Cryopreservation of gametes	Y	Y	Y	Y
Donation of embryos	Y	N	N	Y
Donation of gametes	Y	N	N	Y
Embryo banks	Y	Y	Y	Y
Embryo couriers	Y	Y	Y	Y
Embryo transfer	Y	Y	Y	Y
Experimentation on the embryo	Y	N	N	Y
Gender selection	Y	N	N	Y
Gender selection for family balancing	Y	Y	N	Y
Intracytoplasmic sperm injection	Y	Y	Y	Y
Intrauterine insemination	Y	Y	Y	Y
In vitro fertilization	Y	Y	Y	Y
Multifetal pregnancy reduction	Y	Y	Y	Y
Gestational surrogacy	Y	N	N	N
Gestational surrogacy by a polygynous cowife	Y	N	N	N
Posthumous insemination	Y	N	N	Y
Preimplantation genetic diagnosis	Y	Y	Y	Y
Reproductive cloning	N	N	N	N
Same-sex couples using ART	N	N	N	Y
Single women using ART	N	N	N	Y
Surrogacy via IVF	Y	N	N	Y
Therapeutic stem cell cloning (from human embryos)	Y	N	N	Y

Adapted from: Jones, H.W., Cooke, I., Kempers, R., Brinsden, P., Saunders, D., 2010. International Federation of Fertility Societies: Surveillance 2010. http://www.iffs-reproduction.org/documents/IFFS_Surveillance_2010.pdf.

Conclusion

In short, the globalization of ART into diverse regions of the Middle East serves as a potent reminder that kinship is of major importance, and that new reproductive technologies with potentially transgressive social potential often still serve to re-inscribe fundamental principles of kinship and family life. A Middle Eastern comparison juxtaposing Jewish versus Muslim, Sunni versus Shia, secular versus theocratic and 'conservative'

versus 'progressive' forces also proves that many of these dualisms require scholarly interrogation. In matters of kinship and assisted reproduction, the convergences between countries such as Israel and Iran are more apparent than the divergences. This finding may be counter-intuitive, but is nonetheless helpful in deconstructing prevalent Middle Eastern stereotypes.

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