

ABSTRACT

As new and more effective human reproductive genetic technologies (RGTs) rapidly develop, religious voices remain an important part of public discussion about the moral standing of such technologies. Here, we compare how individuals from different religious traditions evaluate disease RGTs (detecting genetic diseases in vitro) when compared to enhancement RGTs, allowing parents to select features of a child. Findings are gleaned from analysis of 270 interviews with individuals from twenty-three Christian, Muslim and Jewish religious organizations, with supporting data from a national survey of over 10,000 Americans. We find that respondents engage in clearly defined discursive moral reasoning to evaluate the propriety of disease RGTs; while moral intuitions manifest themselves in responses to enhancement RGTs. We argue that schemas provide resources for moral discourses while also shaping moral intuitions expressed through emotions. Our results have implications for how religious people respond to new technologies when their institutional and denominational structures do not have readily discernable moral frameworks to guide responses.

Key words: reproductive genetic technologies, religion, morality

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INTRODUCTION

According to a recent New York Times article, “Americans aren’t very enthusiastic about using science to enhance the human species.”¹ Yet, technologies that provide information about and facilitate intervention in utero (Evans 2006) or reproductive genetic technologies (hereafter RGTs) are on the rise as are public discussions about them. Such technologies comprise a range of medical procedures that can be broadly divided into two categories. There are “Disease RGTs,” including “prenatal diagnosis” or “preimplantation genetic diagnosis,” that allow prospective parents to gain information about or intervene against genetic diseases before they occur (Bane et al. 2003; Rapp 1999). Meanwhile, “enhancement RGTs” allow parents to potentially select qualities, including eye or hair color, sex, or mental characteristics of the embryo (Roberts and Franklin 2004; Stock and Campbell 2000).

We know that support for both enhancement and disease RGTs varies notably between religiously active and non-religious individuals as well as among religious groups (Evans 2006; 2010; Singer et. al 2004; Singer et. al 2008). Existing research on religious responses to RGTs tends to focus on divisions between conservative and liberal traditions (Evans and Hudson 2007), and emphasizes links between RGTs and specific religious beliefs, such as those about when life begins and the redemptive value of suffering (Doolin and Motion 2010). (For example, tensions arise because some religious groups think knowing about diseases in-utero will increase the rate of abortion, thereby “killing a life”). This body of research, while expanding, mainly focuses on comparisons among Christian groups, however, not considering the perspectives of individuals

¹ See http://www.nytimes.com/2016/07/27/upshot/building-a-better-human-with-science-the-public-says-no-thanks.html?emc=eta1&_r=0, accessed July 27, 2016. Article based on

from a broad variety of religious groups. And researchers do not examine how religious beliefs might act as schemas (D'Andrade 1991; DiMaggio 1997), or complex interpretive frameworks, that come to bear on evaluation of RGTs, as either motivation for or post-hoc justifications of moral assessments.

This area is useful to explore further since existing researchers remain divided on how religious beliefs relate to evaluation of scientific technologies. One stream of scholarship focuses on religion as a motivation for moral evaluation and assumes that religious perspectives on science are the product of intentional deliberation (Lawson and Worsnop 1992). Such scholars also tend to assume that differences in doctrinal perspectives generate different perspectives on controversial scientific issues (Evans and Evans 2008; Oberlin, 2016).

Another stream of research suggests that when people face situations requiring moral evaluation they are partially driven by deep-seated moral intuitions, (evaluative feelings or emotional responses that are not based on intentional deliberation), which produce more immediate moral reactions (Haidt 2001). According to this perspective, it is only after these intuitions are enacted that individuals are able to articulate moral rhetoric that makes sense of, or justifies what was previously understood as a “gut” response (Vaisey 2009; 2014). Using a schemas approach, we consider the role of moral reasoning and moral intuition together in the evaluations of RGTs without prioritizing one over the other.

Through 270 qualitative interviews with individuals from a variety of religious traditions and a nationally-representative survey of Americans, we examine how religious belief and identity might affect moral assessments of RGTs. We carefully analyze interview transcripts to uncover underlying schemas, including those related to moral reasoning and moral intuition (Haidt, Bjorklund, and Murphy 2000). Theoretically, using a schemas analysis means that we are

particularly interested in the way in which social actors make sense of their place in the world (Wuthnow 2011), while also recognizing times when they cannot always discursively make sense of their world (Haidt and Bjorklund 2008).

We find that assessment of enhancement and disease RGTs varies not only between religious and non-religious persons, but also among religious groups. Results reveal two primary schemas, which we term Creator or Co-Creator, and that act as master interpretive frameworks (DiMaggio 1997) for the evaluations of RGTs. We find, in particular, that respondents more easily draw on moral discourse around disease RGTs than around enhancement RGTs. Although capable of discussing moral reasons for enhancement RGTs, moral intuitions manifest themselves predominantly in response to enhancement RGTs.

PREVIOUS RESEARCH ON HUMAN REPRODUCTIVE GENETIC TECHNOLOGIES

What are Reproductive Genetic Technologies?

Disease and enhancement RGTs have important and perhaps differing implications for the public debate surrounding RGTs. Disease RGTs take a number of forms: for example, prenatal genetic diagnosis involves withdrawing chorionic tissue from the placenta at 9 to 11 weeks or amniotic fluid at 15 to 17 weeks during pregnancy (Boss 1994; McNellis 2012). Scientists can then analyze the DNA of the sample or check for proteins or enzymes that would indicate the presence of a gene defect (Post 1992; Singer et al. 2008). In the case of a gene defect, there is a possibility for parents to opt for pregnancy termination. The goal of preimplantation genetic diagnosis is to avoid implantation during in-vitro fertilization (IVF) of embryos known to carry specific diseases. Although abortion would be avoided with pre-implantation diagnoses, embryos would potentially be destroyed, which raises moral issues for some. Enhancement RGTs are similarly diverse. Germ-line gene therapy involves altering the

genes of reproductive tissue either before it is fertilized or very early in the pregnancy (Stock and Campbell 2000).

Public Response to RGTs

Since the early 1990s when RGTs began proliferating (Cole-Turner 1993), it has become clear that attitudes vary across a number of dimensions (Singer et. al 2008). For example, Singer et al. (2008) find that Americans increasingly perceive genetic technologies as doing more good than harm; however, younger adults are more pessimistic. Survey data also show religious divides in support for RGTs. Evans and Hudson (2007) find that more conservative religious individuals, such as evangelicals, are more opposed to RGTs than more liberal religious individuals, such as mainline Protestants.

Especially for religious individuals, disease RGTs often elicit connections to the beginning of life (Doolin and Motion 2010; Evans 2010; Evans and Hudson 2007; Hudson 2006) and narratives about suffering (Evans 2006; 2010; Kerr et al. 1998). Scholars often discuss the extent to which religious groups' views about abortion inform the debate about RGTs (Evans 2002b; Evans and Hudson 2007; Hudson 2006; Susumu 2011), though such concerns are most relevant among evangelicals and Catholics, whose opposition to abortion is well documented (Emerson 1996, Evans 2002b, Harris and Mills 1985; Hoffman and Johnson 2005; Peterson 2001). In contrast, other scholars argue that views about RGTs and views about abortion are not directly linked (Evans and Hudson 2007; Hudson 2006; Kalfoglou et. al. 2005), revealing the need for more exploration of how individuals in different religious traditions morally evaluate RGTs.

Other research finds that some have religious frameworks that find value in suffering. Doolin and Motion (2010:680), for example, find a particularly robust Christian narrative about

suffering and disability as an important “part of the human experience.” Since people with disabilities can greatly enrich the lives of those around them, individuals who hold this Christian perspective would not want society to de-value imperfection. And Evans (2006; 2010) shows that non-religious and politically liberal religious people largely view suffering as something to end as quickly as possible, leaving little question over whether or not reproductive genetic technology ought to be used to prevent suffering.

Still others theorize that RGTs could violate theological understandings of the sovereignty of God (Evans 2002; 2010; Lester and Hefley 1998). Along these lines, Doolin and Motion (2010) found that religious people across different Christian traditions are concerned that the use of genetic technologies constitutes “playing God.” For example, Christian fundamentalist pastors argue that the use of science to change human genetics is essentially man’s attempt to set himself up as a creator and thus deny God’s power (Weasel and Jensen 2005). In contrast, Kalfoglou et al. (2005) argue that many religious people are willing to set aside concerns about whether disease is the “will of God” in order to relieve the suffering of a potential child.

SCHEMAS, MORAL REASONING, AND MORAL INTUITION

Recent research on morality, in particular that which emphasizes a dual-process approach (Haidt and Kesebir 2010; Stets and Carter 2012; Vaisey 2009), is relevant here. Within this framework, *moral intuition* is “the sudden appearance in consciousness, or at the fringe of consciousness, of an evaluative feeling (like-dislike, good-bad) about the character or actions of a person, without any conscious awareness of having gone through steps of search, weighing evidence, or inferring a conclusion” (Haidt and Bjorklund 2008:188). *Moral reasoning*, in contrast, refers to language-based sense-making, which generally happens over a longer period

of time (Stets and Carter 2012). Both forms can be the product of group interaction and influence (Hitlin and Vaisey 2013; Keane 2015).

While scholars tend to agree that both forms of moral evaluation (i.e., moral intuition and moral reasoning) are important, recent research argues for the primacy of moral intuition, especially under conditions of little information (see Haidt and Kesebir 2010 for list of references). Haidt (2001) explains this primacy with the metaphor of a human rider on the back of an untrained elephant. The elephant represents moral intuition in that it powerfully influences the rider's direction of travel. The rider represents moral reasoning in that the rider's prodding can sometimes override the elephant's will, but only marginally. To extend this metaphor, the rider may retroactively claim that he or she wanted to travel in the direction the elephant went. From this perspective, moral reasoning occurs as a post hoc justification exercise after more instantaneous moral intuition processes transpire (Haidt and Kesebir 2010; Vaisey 2009). Such a perspective, however, fails to appreciate the way moral reasoning and moral intuition may be blended. Integrating theoretical ideas around cognitive schemas into the study of moral reasoning and moral intuition will help clarify this relationship.

Schemas are the “knowledge structures that represent objects or events and provide default assumptions about their characteristics, relationships, and entailment under conditions of incomplete information” (DiMaggio 1997:269).² Schemas structure cultural resources, such as beliefs, concepts, and experiences, providing coherence to disparate pieces. Schemas, in other

² Sewell 1992 also discusses schema in this way. See <http://www.pewresearch.org/fact-tank/2016/07/26/key-findings-on-how-americans-view-new-technologies-that-could-enhance-human-abilities/>, accessed August 31, 2016.

words, are dual in nature: they are knowledge, containing a range of beliefs to disparate experiences, *and* mechanisms for organizing knowledge, allowing for the integration or rejection of new knowledge (DiMaggio 1997). Schemas can manifest in both deliberate and automatic cognition. Deliberate cognition encompasses slow reasoning and articulation. Schemas may manifest themselves in non-verbal and emotive expressions through automatic cognition. In other words, moral intuition may point to larger cultural schema or complex interpretations of the world, even if these cannot be exactly articulated but are represented primarily via emotional response. Cognitive anthropologist Roy D'Andrade (1995:229) argues that “[the] cultural shaping of emotions gives certain cultural representations emotional force, in that the individuals experience the truth and rightness of certain ideas as emotions within themselves.” Finally, schemas do not exist in a vacuum; rather, living in communities, such as the family or religious congregations, may help give shape to schemas. Indeed, schemas may be aspects of what Abend (2014) calls the “moral background,” providing legitimacy for some discourse and shaping what issues are even considered moral.

In sum, much of the existing literature on the religious reception of RGTs focuses on the overt moral reasoning of religious actors by considering the logical ways respondents talk about RGTs as they relate to abortion and suffering. But the ability to even engage in discursive moral reasoning is partially dependent upon the presence of schemas in one’s “cultural toolkit” (Swidler 1986). For religious individuals, formally articulated religious statements (e.g., denominational resolutions or doctrinal statements) provide tools useful for moral reasoning. For example, in the U.S. context, abortion is an issue that is saturated with moral reasoning, where

religious statements are particularly codified and amplified. Yet religious denominations³ have public statements about other societal issues, including RGTs, to varying degrees, which affects the number of cultural schemas religious laypeople can use to morally reason about disease and enhancement RGTs. Here we ask what kind of schemas individuals from different religious traditions draw on to evaluate disease RGTs when compared to enhancement RGTs.

DATA AND METHODS

The data analysis that informs this paper draws on two sources: We collected qualitative observational and interview data over a four-year period between 2011 and 2014. Subsequently, these data were used to inform a general population survey of 10,241 Americans during 2014.

Qualitative Data

In total, qualitative data consist of 319 interviews in two cities, one in the mid-West and one in the South. These research sites include Evangelical, Mainline, and Catholic churches, as well as Orthodox and Reform Jewish Synagogues and Sunni Muslim mosques. It is important to note that research sites within the cities were not selected for representativeness or through random selection. Instead, sites were selected for diversity of characteristics theorized to affect the religion and science interface. These features include theological stance, tradition

³ The Southern Baptist Convention has formally addressed RGTs:

<http://erlc.com/article/statement-on-human-species-altering-technologies>. Some groups of Reform Jews have as well and offer cautious support

<http://reformjudaismmag.org/Articles/index.cfm?id=2593> <http://ccarnet.org/responsa/nyp-no-5768-3/> General Convention Resolution Number: 2003-A012. Other denominations bring up genetics, but do not address the issue of reproductive genetic technologies thoroughly.

identification, congregation size and location, and congregational demographics. Sites that were shown to be leader organizations—through their large membership and presence— in each city were also specifically targeted on the assumption that their congregant’s and religious leaders’ attitudes might have an impact on the religion and science relationship. See Table 1 for congregation details.

[INSERT TABLE 1 ABOUT HERE]

After obtaining permission from congregational leaders to study their congregations, researchers selected events and services to attend based on the information on the organizations’ websites; attendance at these events helped researchers find interview respondents. Most interviews lasted about one hour, and all interviews were recorded with informed consent from the respondent. All respondents from primarily Latino congregations were offered the option of completing the interview in Spanish, and interviewers used Spanish language guides for these interviews. We utilized a purposive qualitative sampling approach, by selecting respondents with various levels of involvement in the congregation as well as with representative demographic characteristics (see Table 2 for more details about interview sample).

[INSERT TABLE 2 ABOUT HERE]

This is the first study of its kind to feature in-depth interviews with such a wide array of religious people on their attitudes towards science and includes groups that are not often represented in such studies, such as African American Protestants, Orthodox Jews, and Muslims.

Analysis of Interview Data

For qualitative analyses we focus primarily on the interview data and we primarily analyze data stemming from the following two questions, which prompt responses about disease and enhancement RGTs, respectively:

How do you feel about reproductive technologies that can tell a “to-be” parent about qualities of their unborn child such as whether the unborn child has a disease?

How do you feel about reproductive technologies that would allow a parent to select qualities for their child such as gender, hair or eye color?

We also analyzed information from other relevant questions where issues related to human reproductive genetic technologies were discussed. In sum the questions were asked of 270 respondents.

The interviews were independently transcribed, edited and systematically coded by a team of researchers including the authors and trained students for themes related to the central research questions. We did not test specific hypotheses, but used a modified inductive approach to analyze the interviews (Rubin and Rubin 2012). Specifically, each interview was thematically coded for how respondents discussed their attitudes related to RGTs. In this process, researchers looked for differences in both explanations of and responses to RGTs, such as laughter. Researchers also analyzed the differences in framing and response to RGTs according to the religious traditions studied.

The growing literature on moral intuition tends to view qualitative interviews as unhelpful. Vaisey (2009:1687) states, “Because interview methods engage with discursive consciousness alone, they cannot rule out the possibility that deeply internalized moral attractions and repulsions, (grounded in schematic associations acquired through cultural experience rather than in conscious beliefs), are patterned in motivationally important ways.” (See also Pugh 2013 for an alternative view; and see Vaisey 2014 for a response to Pugh). Contrary to this view, our attention to producing detailed transcriptions of interviews, attentive to laughter and other non-verbal data, or measuring the extent to which respondents pause after a

question, enables us to advance the literature on moral intuition and further specify the literature on moral reasoning related to RGTs. We suggest that moral intuitions may manifest themselves in the process of moral articulation or through non-verbal responses. And we maintain that the narratives respondents use are important because narratives, as well as even attempts at creating narratives, reveal discursive and non-discursive practices individuals use to actively produce social and psychological realities in conversation with the interviewer (Davies and Harre 1990).

Survey Methods

Another piece of data collection is a survey conducted from December 27, 2013 through January 13, 2014, which utilized a research tool called KnowledgePanel®. The KnowledgePanel® is housed by the survey firm GfK and is a probability-based online non-volunteer access panel, meaning that households in the panel are selected through a representative sampling process and not by their own self-selection onto the panel. Panel members are recruited using a statistically valid sampling method with a published sampling frame of residential addresses that covers approximately 97% of U.S. households, reflecting the U.S. Census. When non-Internet households are recruited, they are provided with a netbook computer and free Internet service so they may also participate as online panel members. KnowledgePanel® consists of about 50,000 adults (ages 18 and older) and includes persons living in cell phone only households. For the survey, 16,746 panelists were asked to participate and 10,497 responded.⁴ After invalid respondents were removed, there were a total of 10,241 respondents. In our analysis, post-stratification weights were applied to adjust for over-sampling

⁴ <http://www.people-press.org/methodology/collecting-survey-data/the-problem-of-declining-response-rates/>. The recent Pew polls achieve less than a 10% response for example.

and non-response patterns based on population benchmarks from the 2012 Current Population Survey.⁵ The qualitative data is a matched sample with the survey, meaning that the same demographic groups were examined in the qualitative data as the survey, but the survey and interview respondents were not drawn from the same sample.

FINDINGS

Overview of Findings

We begin by naming the main schemas that we discovered as a result of our qualitative analysis, which we then use to organize our findings. In particular, we find that respondents draw on two schemas related to God. Terming these Creator and Co-Creator schemas, they encompass different understandings of God and human involvement in the world. The Creator Schema focuses on God's role as creator and respondents' intent in maintaining firmly established boundaries around God's very distinctive role as creator. Individuals utilize this reason to suggest both enhancement and disease RGTs are morally wrong. The Co-Creator Schema suggests humans can sometimes help God improve human life and was used to support both forms of RGTs. Lastly, we find that moral intuition visibly manifests itself in discussions of *enhancement* RGTs, rather than disease RGTs. We suggest moral intuitions manifest themselves because respondents lack an articulated framework for the relationship of their religion to enhancement RGTs. At the same time, their unease may be due to a violation of what they hold sacred, objects and symbols that may nonetheless be inviolable because of their cognitive

⁵ The specific benchmarks are for gender, race and Hispanic ethnicity, education, household income, region, household internet access, and household primary language.

schemas. We begin with a discussion of our quantitative data and then discuss our qualitative findings for disease RGTs and then enhancement RGTs.

Quantitative Findings

We find that 23% of Evangelicals claim that disease RGTs are morally wrong (i.e., combining the “always morally wrong” and “morally wrong in most cases” categories), while only 8% of Jews and 9% of Muslims, Hindus, Buddhists, Sikhs, and Jains have this evaluation.

[INSERT TABLE 3 ABOUT HERE]

Except for Evangelicals and Mormons, the majority within all other religious groups think disease RGTs are morally acceptable. At the same time, nearly a third of respondents in all religious groups, except Jews and Nones, view disease RGTs as a non-moral issue. That this group is of decent size may suggest that disease RGTs have gained enough acceptance to be considered prosaic and simply non-moral.

As we see in Table 4, enhancement RGTs elicited much more widespread disapproval among respondents across all religious traditions. Although evangelicals again stand out as particularly concerned about the morality of these technologies, with about 80% of survey respondents claiming that enhancement RGTs are morally wrong (i.e., combining the “always morally wrong” and “morally wrong in most cases” categories), other religious groups, like members of non-western religions or Jews show lower, yet substantial, rates of disapproval (57% and 66%, respectively). Nonetheless, the majority of members of all religious groups disapprove of enhancement RGTs. Finally, around ten to twenty percent of respondents in each religious group felt that enhancement RGTs were a non-moral issue, suggesting that enhancement RGTs have not gained a similar non-moral status as disease RGTs.

[INSERT TABLE 4 ABOUT HERE]

Disease RGTs

Creator Schema and Opposition to Disease RGTs

Among our interview respondents, the Creator schema, (which emphasizes God's control and God's purposes and plans in human suffering). predominated among Evangelical Christians and at times Mainline Protestants and Muslims. Jewish respondents expressed ambivalence towards disease RGTs and did not draw on the Creator schema.

This young member of a non-denominational evangelical Protestant church who works in the medical field⁶ communicates the strong version of a Creator Schema by justifying opposition to disease RGTs:

I believe God is in control, and that He's taking care of everything and this child has a disease, then that's what God wants for this child.

This statement highlights religious opposition to disease RGTs based on a particular understanding of God's purposive nature in creating human life, even if such purposes result in a disease.

A belief that God has a plan for human life and that human meddling should not alter this plan was a critical component in how respondents opposed disease RGTs. When discussing the creator schema as justification for opposition to disease RGTs, our interview respondents often utilized considerations of abortion. Despite interviewers purposeful avoidance of abortion as a topic, when respondents were asked about disease-related RGTs, a proportion of them, especially those from evangelical traditions, nevertheless linked RGTs to selective abortion. Respondents

⁶ Midwest Evangelical Church Int8, conducted 02/20/13

from evangelical Protestant traditions most readily linked disease RGTs to abortion, perceiving the likelihood of abortions for fetuses found to have a disease. Such a decision would violate the sense of God as creator whose plans should not be altered via human action. This evangelical oil company employee describes his belief that abortion is wrong because it rejects God's plan:

God gave you that child for a reason. God puts things in our life for a reason, and even with a disease, that child can give you more joy and love in life than you've ever experienced. And if you choose to abort that child, you're choosing not to accept that gift.

His moral evaluation about abortion is framed in terms of God having a plan for life, a plan that is the best kind of life for people. In fact, some respondents indicate that there will be negative consequences for the decision to alter God's plan in this way. One middle aged evangelical woman⁷ working in education said: "I think they'll suffer for it if they decide to kill a child because they're playing God." Her view seems to be based on an understanding that God is sovereign over creation and is upset by humans usurping that role.

Although less common, individuals in non-evangelical settings also used the Creator Schema. For example, this middle aged mainline Protestant man⁸ emphasized God's sovereignty as a reason to avoid disease RGTs:

When you know things that you really can't do anything about, that's when we tend to try and get in God's way and try to take

⁷ Southwest Evangelical Church Int17, conducted 12/13/11

⁸ Southwest Mainline Church Int14, conducted 8/26/11

over and take control to fix things that He never meant for us to fix.

This man uses God's sovereignty as a reason to oppose RGTs, but departs from the evangelical Protestant pattern in that he does not emphasize abortion. Instead, he emphasizes the psychological consequences on humans who try to have too much control over the world.

Some of our Muslim respondents also utilized a Creator Schema as well as associated disease RGTs with abortion. This young Muslim student⁹ asserts, "I definitely don't think that they should abort the child or anything like that... If God is going to give it to you, he's giving it to you." Her understanding of God includes a perspective that it is God who creates a certain kind of life and that this is not to be altered. Our qualitative data reveal that non-evangelical respondents are much less likely to utilize Creator Schema in relation to disease RGTs and this may explain the groups' disproportionately low disapproval of the technology (as shown in Table 3).

Co-Creator Schema and Support for Disease RGTs

While the Creator Schema emphasizes God's role as creator and boundaries between God and humans, the Co-Creator Schema provides for human partnership with God in improving life. Respondents were able to switch between the Creator Schema and the Co-Creator Schema when considering either abortion or intervention. The same respondents who opposed disease technology when they assumed it would result in abortion—and emphasized the Creator Schema about God—might immediately draw on the Co-Creator Schema to discuss disease RGTs that do not lead to selective abortion. These respondents emphasize the desirability of preparing the

⁹ Southwest Mosque Int5, conducted 09/27/13

parents to raise a child with a serious disease, which they believe results in a better life for the parents and child.

A youth leader from an evangelical church¹⁰ draws on a Creator Schema to assert that abortion is unacceptable: “All human life is precious. And this is who God has knit together and put in her womb.” Then, without prompting, he switches to a Co-Creator perspective to explain that when he and his wife discovered that their child might have Trisomy 18, a condition that in most cases leads to death shortly after birth, he would have utilized disease RGTs if the disease could have been avoided. To justify this perspective, he claims, “If God’s giving me the power and the ability and the know-how to do it, I’d do it.” In one instance his emphasis is on God’s sovereignty and plan, while in the other it is on co-creating with God—by implementing knowledge that God has given to humans—to improve life.

The contours of the Co-Creator Schema were most apparent among the mainline Protestants. A middle-aged mainline Protestant man, who works as a ranger,¹¹ fears that people might not take enough responsibility for taking care of earthly problems if they have particular conceptions of God. When asked to consider disease RGTs, he first claims, “I think, knowing something like that in an early stage where I couldn’t do anything about it will just [*chuckle*] make it easier to doubt and be afraid.” But, when pressed to consider disease RGTs that would facilitate interventions, he adjusts his response and explains “If I could do something, then sure, yes, I would want to know.” He laments that when people reject this possibility and emphasize “just God’s ability to heal and deliver...then people die, because they neglect the physical

¹⁰ Southwest Evangelical Church Int15, conducted 12/10/11

¹¹ Southwest Mainline Church Int14, conducted 06/09/12

responsibilities that God has given them.” A key emphasis in his narrative is the concept of “responsibilities” that God gives people, suggesting that humans have a partner role with God in certain kinds of actions, in this case healing genetic disease.

As part of the Co-Creator schema respondents emphasized concepts of human free choice. The concept of parental personal choice was central for many respondents who drew upon this theology. These mainline Protestant depictions of working with God as a co-creator are very different from respondents who emphasize God’s sovereignty. Instead of usurping God’s role as creator, our respondents talk about a God who has “given” humans “scientific insights,” “physical responsibilities,” or a role as “co-creators.” This permissive discussion begins to corroborate the trend in the survey data where 55% of non-evangelical Protestants conclude that disease RGT is sometimes or always morally acceptable, compared with only 44% of evangelical respondents who come to this conclusion (see Table 3).

Enhancement RGTs

Co-Creator Schema Support for Enhancement RGTs

The small number of people who did support enhancement RGTs mostly did so by subsuming enhancement RGTs within the abilities that God provides to humans, thereby drawing on the Co-Creator Schema. For example, a retired librarian from an African American congregation¹² concludes: “None of this is really a problem for me because if it happens, I believe God provided the way for it to happen.” A member of an Orthodox Synagogue and former engineer¹³ explains that, “Anything that God allows scientists to do generally is God’s

¹² Midwest African American Evangelical Church Int7, conducted 07/21/13

¹³ Southwest Orthodox Temple Int2, conducted 09/03/13

allowance of it, if it's healthy...So, you could choose a kid, who's stronger smarter, faster If it doesn't hurt society, I don't think that's [not] choosing the hand of God." Therefore, it is up to humans to determine what might hurt society and morally evaluate technologies. Although rare, a few respondents from conservative settings had this perspective. A member of an evangelical congregation working in advertising¹⁴ states:

[enhancement RGTs] don't necessarily bother me. Like genetic [ones], like changing the hair color and all that stuff. So the question is: are we playing God? Um, maybe but . . . if we are able to do it, it just doesn't bother me even in the slightest. I think that'd be kind of cool.... I don't think that there's any particular teaching in the Bible that would say that that would be overstepping our bounds.

In general, most respondents did not know what enhancement RGTs were, nor did they have many words to express a moral framework related to them. The lack of moral narratives for respondents to make sense of enhancement RGTs may mirror the lack of support for these technologies found in the survey data. No religious group had more than 20% agree that enhancement RGTs are morally acceptable.

Creator Schema Opposition to Enhancement RGTs

When respondents referred to "playing God" in response to questions about enhancement RGTs, they did not want to usurp God's creative function, arguing that to do so would be to overstep the boundaries of God's sovereignty. Respondents worried that manipulating human

¹⁴ Midwest Evangelical Church Int3, conducted 07/17/13

genetics was a form of “creation” that posed the danger of placing humanity on an equal plane with God.

Respondents often used Biblical tropes to oppose enhancement RGTs on Creator Schema related grounds. One man¹⁵ from an evangelical congregation, who was employed in the military, drew upon a biblical story to frame his opposition, arguing that the use of RGTs would be a modern-day retelling of the Tower of Babel:

I referenced the Tower of Babel a little bit earlier and people tried to build a tower so high that they could get to God. So that they could be equal with God. [...] And I think when we start playing God with human genetics we are doing the same thing. We’re putting ourselves equal with God, so [...] I think that would be sinful.

His response makes theological claims about God’s active role and intentionality in the creative process. Furthermore, he sees it as sinful to engage in enhancement RGTs, which ultimately lead to people acting as God. Similarly, a middle-aged mainline Protestant woman working in academia¹⁶ categorized human attempts to select the sex of a child through enhancement RGTs as “a sin; a sin is when you think that you’re God, that you know more than he does.” Subsequently, altering this God-intended creative process through selective RGTs would constitute immoral interference.

¹⁵ Southwest Evangelical Church Int5, conducted 07/05/11

¹⁶ Southwest Mainline Church Int7, conducted 09/02/11

Others feared that enhancement RGTs might be used for unwise ends. They often opposed enhancement RGTs because they saw this as related to eugenics, fearing that people would actively select or preference embryos with certain characteristics. A middle-aged African American teacher¹⁷ in an evangelical congregation explains:

That's obviously going to the *Brave New World* extreme of we're going to be our own gods and choose our own destiny. That goes back to another level [*slight pause*] it reminds me of Nazi Germany, those things that- you want certain types- certain types of people in your society, you know I want my child to have this color or whatever.

Her opposition to enhancement RGTs first draws on Huxley's early 20th century dystopian novel, *Brave New World*, which portrays a society where people's life trajectories are established through genetic selection. At the same time, she fears that humans "trying to be our own gods" will lead to humans selecting one another's characteristics in a discriminatory and harmful manner. She, therefore, emphasizes that humans should not take on this role in order to avoid these outcomes. Similarly, a middle aged Reform Jewish teacher¹⁸ fears that meddling with a child's skin color can lead to unwanted and unexpected outcomes, such as cancer. Therefore, while the damage may not be societal, there can still be biological consequences to enhancement RGTs. She explains: "So if this baby was meant to be brown, and it was blond, it might go along

¹⁷ Southwest Evangelical Church Int17, conducted 12/13/11

¹⁸ Southwest Reform Synagogue Int3, conducted 07/28/11

with fair skin – they might develop cancer because they are so more sensitive. So when you start playing God . . . , you don't know what you're doing.”

“Moral Intuition” Opposition to Enhancement RGTs

While we did not detect moral intuition without articulate reasoning in response to the question about disease RGTs we did with response to the question about enhancement RGTs. Many respondents displayed opposition to enhancement technologies that were not based on well-articulated moral reasons. We come across interesting evidence that some respondents had intuitive opposition to enhancement RGTs, but were unable to easily articulate why. Our findings above suggest they “could have” used creator or co-creator schemas because other respondents did.

Respondents across religious traditions reported that enhancement technologies made them uncomfortable and often could not express a reason why. This middle-aged Orthodox Jewish musician¹⁹ explains that enhancement RGTs are simply “A little bit scary” but that “if it's something that's available I don't see why not. But I think personally it's a little bit scary. It's not something I would want to do myself.” These respondents had an immediate moral intuition against the technology (often expressed through an emotional response) and often could not explain why.

An older woman from a synagogue in the Southern city,²⁰ who works as a consultant, simply laughs in response to the question. Then she goes on to reply: “I think there's a line you have to draw. I don't know what that line is, it just creeps me out.” When the interviewer asks

¹⁹ Midwest Orthodox Temple Int9, conducted 07/19/13

²⁰ Southwest Reform Synagogue Int8, conducted 07/01/13

her to describe this in greater detail she is at a loss and can only say by replying with an emotional response, “It’s creepy. I’m sorry.” It is important to note that this respondent has a bachelor’s degree. Her opposition, therefore, is unlikely to be birthed from a deficit model, in which public skepticism about science or scientific issues are explained by a lack of education (see Dickson 2005). Such a strong, immediate, and visceral reaction against enhancement RGTs is common among respondents from all religious traditions. This might suggest that without a strong pre-established moral framework, or at least a set of amenable moral tropes upon which to draw, lay persons oppose new technologies based mainly on a lack of familiarity or because enhancement RGTs evoke things they are uncomfortable with but do not have the moral reasoning frame from which to say why they are afraid.

Perceptions that enhancement RGTs are removed from reality might contribute to respondents’ laughter when faced with a question about this topic. One retired African American woman responds, “[*Laughs and then pauses*] That’s questionable. [*Both interviewer and respondent laugh*] Can you really do that?” Her laughter and question that follows suggest that she does not think technology will ever be able to do such a thing. Her laughter suggests that such a possibility is, at best, absurd. In contrast, a young teacher from an evangelical church²¹ said, “I think that’s a little bit too ‘Big Brother’ or, I don’t know, futuristic [*both interviewer and respondent laugh*]. I realize that that’s available, but it kind of creeps me out, because I think that’s us trying to play God a little bit too much. Have too much control.” Similar to the previous respondent, this evangelical woman laughs as she considers enhancement RGTs, seeing them as something futuristic. After laughing, she focuses on a basic feeling of being “creeped

²¹ Southwest African American Evangelical Church Int5, conducted 07/06/11

out” by enhancement RGTs. At the end of the interview, drawing on post hoc analysis she is able to provide a reason for her discomfort, drawing on the Creator schema. Such a response shows the manifestation of moral intuition as well as the use of moral discourse.

DISCUSSION AND CONCLUSION

We began this paper with an interest in how moral reasoning and moral intuition may reveal underlying religious schemas related to RGTs. Our survey data show that the moral acceptability of disease and enhancement RGTs vary by religious affiliation, and largely corroborate other research on RGTs, although we broadened the number of religious groups studied when compared to this previous research (Evans 2010). Our interview data allowed us to explore the moral reasoning and moral intuitions (as expressed through emotions, such as nervous laughter) that are associated with these trends.

We found that respondents used the Creator Schema to oppose disease and enhancement RGTs. The Co-Creator Schema was primarily used to support disease and enhancement RGTs. Furthermore, it was only in discussions of enhancement RGTs that oppositional moral intuitions manifested themselves primarily in the form of nervous laughter or other emotions. It should be noted that this does not necessarily mean that individuals did not experience moral emotions during their consideration of disease RGTs. Rather, moral intuitions may be present but remain unobservable to qualitative methodologists in relationship to issues where moral reasoning is established.

A traditional “schema” approach might interpret laughter and awkward pauses as evidence that an individual does not have a moral position on the matter, because they cannot articulate it. Then the researcher might be tempted to conclude that denominations have not provided a doctrine. But with a dual process model, the conclusion may actually be clearer.

Moral intuition may be at work, and we shouldn't be surprised that moral intuition is often followed up by attempts at articulating moral reasoning.

The lack of moral reasoning among those who felt uncertainty about enhancement RGTs does not necessarily mean the absence of cognitive schemas. Rather, their unease may point to the violation of a schema as well as the lack of available formal reasoning specific to enhancement RGTs, such as denominational doctrines or teachings. We might argue then that as denominations write doctrinal statements about enhancement RGTs, these may be integrated into a person's schema and shape intuition and reasoning.

Our findings also allowed us to observe whether moral schemas around disease and enhancement RGTs vary by religious tradition. We find that the more traditional branches of the religious traditions— Orthodox Jews, Muslims, and evangelical Christians— were likely to be wary of usurping God's role as creator when discussing both disease and enhancement RGTs. Such schemas were similar to fears of "playing God" found in the literature (Doolin and Motion 2010; Evans 2006; Weasel and Jensen 2005). Members of liberal traditions were likely to emphasize the more humanistic perspective of humans as co-creators and see the possibility of disease RGTs being utilized for positive ends.

More broadly, the differences in the use of Creator and Co-Creator schemas for disease RGTs across religious traditions suggest that liberal and conservative traditions promulgate different conceptions of God. Indeed, some scholars argue that beliefs about God are associated with moral attitudes (Froese and Bader 2008; 2010), with more active and immanent views of God leading to greater concern about usurping God's will (Bader and Finke 2013; Stark 2001). Such conceptions of God matter in relationship to how a respondent views RGTs. Evans (2010:100) shows that evangelicals and conservative Catholics espouse a "promethean fatalism"

discourse, which suggests that God has a plan that should not be disrupted, a conception largely absent from liberal mainline Protestant and Jewish traditions. Our findings largely corroborate this. Overall, we find a greater degree of similarity in schemas within the conservative traditions than within the more liberal traditions; here views are more disparate. Such findings suggest that conservative religious institutions may be more likely to communicate moral schemas with solutions to moral problems, while more liberal traditions may be more likely to communicate schemas of ambiguity in relation to certain kinds of moral questions.

While our findings corroborate previous research on schemas surrounding disease RGTs (Doolin and Motion 2010; Evans 2006; 2010; Evans and Hudson 2007; Weasel and Jensen 2005), we move beyond this literature by offering insights on the role of moral intuition. One important finding from our analysis is the tendency of interview respondents across multiple religious traditions to laugh or say nothing except to indicate that discussion of RGTs “is creepy” in response to the topic of enhancement RGTs. It is possible to infer from our data that schemas are more readily articulated, and therefore observable to the qualitative researcher, under conditions of societal discord on the topic. But when most people agree (i.e. societal harmony), the schemas can still be doing some work at an intuitive level but people are never forced to articulate it. In the case of enhancement RGTs, many denominations and traditions have not crystalized their official statements. So, perhaps in what is a counterintuitive situation, what looks like an obvious moral position quantitatively, (i.e., the majority of people agree that enhancement technologies are wrong), can actually be quite muddled qualitatively.

Hence, we interpret these inarticulate utterances and emotional responses as evidence of an individual’s inability to clearly articulate a moral justification for the moral intuition she immediately feels. Laughter reflected both a sense of fear and absurdity about the possibility of

genetically modifying or enhancing a child as well as reflect the violation of a schema. As enhancement RGTs become more imminent, religious people may stop responding to enhancement RGTs as transgressive through laughter and nervousness, and begin considering them as moral issues that require serious reflection. Perhaps the serious reflection (e.g., official denominational statements) is a necessary step (although perhaps not a sufficient one) for religious participants to frame a new technology as an important moral issue. Indeed, we predict this emotional response will become more circumspect as religious traditions (or societal institutions) codify more coherent moral reasoning around the issue of enhancement RGTs. Future research should take a more longitudinal approach to the study of schemas. As technology becomes more imminent, the manifestation of schemas may change. Furthermore, our analysis of the moral reasoning that sometimes followed the more lighthearted laughter seemed to suggest that the religious moral reasoning surrounding enhancement RGTs is likely to revolve around Creator and Co-Creator schemas.

Our study also highlights a methodological insight. It was only through careful transcription of interviews, attentive to laughter of both the respondent and the interviewer who was taking part in a subjective social interaction, that we were able to observe patterns of laughter around enhancement RGT discussion. This led to a key finding we emphasize in this article. We suggest that scholars interested in moral reasoning and moral intuition draw on such methodology in future analysis.

How do these findings generalize to other health technologies that are likely to come down the pike? For one, it is important to recognize that technologies come to us much more quickly than institutions are able to create coherent moral schemas for society's non-specialists (see Guillebaud 2001; Somerville 2004). Our findings suggest that moral intuition rather than

moral reasoning is likely to be employed as a way of addressing issues that are technologically complex under conditions where there is a paucity of codified moral reasoning, as is the case with enhancement RGTs. As moral reasoning becomes codified, we expect moral intuition to become less manifestly apparent as individuals begin to draw more readily on established cultural repertoires.

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