Abstract

This study investigated the role of moral foundations, regulatory focus, and threat perception in attitudes toward sex education using a crowd-sourced sample of 473 participants (48% women, 52% men; ages 18-80, median age 33.5). Two dimensions of attitudes were identified (58.2% of total variance): Pragmatism, reflecting importance of sex education and its focus on tangible outcomes; and Moral Threat, reflecting perceptions that sex education could be threatening to moral values about sexuality or have harmful moral consequences. Regression analysis showed that combining social conservatism, religious attendance, moral foundations, and regulatory focus accounts for 37% of variance explained in Pragmatism and 44% in Moral Threat (p < .001). Mediation analyses indicated that most effects were direct rather than conveyed through threat perception. Findings showed that regulatory fit is unlikely to improve communication effectiveness of sex education materials, yet individualizing moral foundations and promotion focus represent promising targets for future research.
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List of Abbreviations

Adj. $R^2$: Adjusted Coefficient of Determination

HIV/AIDS: Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome

HPV: Human Papilloma Virus

IBM SPSS: International Business Machines Statistical Package for the Social Sciences

LLCI: Lower Limit Confidence Interval

MFQ: Moral Foundations Questionnaire

MTurk: Amazon.Com’s Mechanical Turk

P-P Plot: Probability Plot

RFQ: Regulatory Focus Questionnaire

RMSEA: Root Mean Square Error of Approximation,

SE (B): Standard Error of B (Raw Regression Coefficient)

Sig.: Statistical Significance, i.e. p-value

SR: Semi-Partial Correlation Coefficient

STI: Sexually Transmitted Infection

ULCI: Upper Limit Confidence Interval

UMACL: University of Wales Institute of Science and Technology Mood Adjective Checklist
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CHAPTER ONE: INTRODUCTION

In Canada, sex education is defined as "the process of equipping individuals, couples, families and communities with the information, motivation and behavioural skills needed to enhance sexual health and avoid negative sexual health outcomes" (p. 5, Public Health Agency of Canada, 2008). Sex education is thus defined through focus on health, with emphasis on making it available to all Canadians as part of overall health promotion. Sex education in Canada is designed to address the following two major goals: (a) to avoid negative outcomes, such as sexually transmitted diseases, sexual coercion, and unintended pregnancy; and (b) to achieve positive outcomes, such as respect for self and others, rewarding human relationships, non-exploitive sexual relations, and informed sexual and/or reproductive choices (Public Health Agency of Canada, 2008).

A significant body of evidence points toward the need for sex education to start reasonably early in order to achieve proposed goals. Several studies indicated that between 15% and 22% of Canadians report first intercourse before 16 years of age, although this percentage has been decreasing in later cohorts (Maticka-Tyndale, 2008). In 2005, 43% of 15- to 19-year-olds reported having sexual intercourse at least once (Rotermann, 2008). In a diverse cohort of 1200 urban youth, 7.5% and 3% of 13-year-old participants reported having experienced oral sex and intercourse at least once, respectively (Pole & Flicker, 2010). Although earlier onset of sexual activity is becoming less frequent, it has been associated with higher rates of sexually transmitted diseases and pregnancy, lower condom use, and higher chances of unplanned sex due to substance use (Kaestle, Halpern, Miller, & Ford, 2005; Langille, Asbridge, Flowerdew, & Allen, 2009). Therefore, despite decreasing percentages, absolute numbers of youth engaging in
early sexual activity are still significant, and these individuals appear to be at the highest risk for negative outcomes.

The Canadian curriculum for sex education varies by province yet tends to follow common guidelines (i.e., Public Health Agency of Canada, 2008). Some important expectations set by these guidelines include (a) sensitivity and respect for individual beliefs and cultural backgrounds, (b) meeting diverse needs of Canadian population, and (c) teaching knowledge, decision-making skills, and relationship skills to promote informed individual choice (which can range from abstinence to multiple forms of relational and sexual activity). These expectations have been derived from cognitive theoretical models that describe the role of social norms and attitudes, as well as individual motivation, intent, planning, skills, and behaviour in shaping sexual health (Public Health Agency of Canada, 2008).

McKay and Bissel (2010) summarized the key components of behaviourally effective comprehensive sex education delivery as follows:

...In order for sexual health education to be effective it must provide information that is directly relevant to sexual health (e.g., information on effective forms of birth control and where to access them), address motivational factors that influence sexual health behaviour (e.g., discussion of social pressures on youth to become sexually active and benefits of delaying first intercourse), and teach the specific behavioural skills that are needed to protect and enhance sexual health (e.g., learning to negotiate condom use and/or sexual limit setting). (p. 10)

Notably, abstinence represents an important part of comprehensive sex education. Teaching abstinence is consistent both with respect for various values and beliefs, and with effective prevention of negative sexual outcomes (Santelli et al., 2006). Concerns with
abstinence arise predominantly in the context of abstinence-only programs: These programs tend to (a) present abstinence as the only viable, effective, or moral option for pre-marital sexual behaviour and (b) exclude information about alternative perspectives or harm-reducing behaviours (Santelli et al., 2006).

Sex education programs have been meticulously, rigorously, and repeatedly studied (McKay & Bissel, 2010). Many conclusions regarding sex education effectiveness have been derived from literature reviews of (a) 16 randomized controlled studies on pregnancy prevention in the U.S. (Bennett & Assefi, 2005) and (b) 83 studies of various designs, assessing both sexually transmitted infection and pregnancy prevention around the world (Kirby, Laris, & Rolleri, 2007). These reviews found that generally, among comprehensive sex education programs, between one third and one half achieved targeted positive outcomes, between one half and two thirds had no effects, and few to no studies at all had negative impacts. In contrast, sex education programs that prioritize abstinence only and exclude comprehensive coverage tend to show no practical effectiveness (McKay & Bissel, 2010; Santelli et al., 2006).

Multiple studies in Canada and the U.S. also found substantial parental support for the provision of comprehensive school-based sex education. Large representative surveys conducted within the last 15 years in Canada generally found that the numbers of parents agreeing or strongly agreeing that sex education should be provided in schools represent an overwhelming majority: 87% in a most recent survey of 1002 parents in Ontario, with no significant differences between public and catholic school affiliation (McKay, Byers, Voyer, Humphreys, & Markham, 2014), 92% in a telephone survey of 800 parents in Saskatchewan (Advisory Committee on Family Planning, 2008, as cited by McKay & Bissel, 2010), and 94% of 4200 parents in New Brunswick (Weaver, Byers, Sears, Cohen, & Randal, 2002). A similar picture exists in the U.S.,
with nationwide polls finding support for comprehensive school-based sex education among 90% of parents (Bleakley, Hennessy, & Fishbein, 2006).

And yet, attempts to promote comprehensive sex education often encounter strong opposition. The most notable recent Canadian example is the decision by Ontario government to update the sex education curriculum for the province in both 2010 and 2015. According to Forum Research poll conducted in February 2015 among 996 Ontario residents, 49% approved of the curriculum changes, 34% disapproved, and 17% had no opinion (Bozinoff, 2015). Furthermore, among parents of children under 18, the rate of disapproval was as high as 44% (Bozinoff, 2015). According to media reports, thousands of parents have expressed their disapproval in the form of active protests and drastically reduced school attendance (e.g., Ferguson, 2015; Selley, 2015). Irvine (2000, 2006) examined several examples of backlash toward comprehensive sex education in U.S. municipalities, characterized by heated public disapproval and active protests.

Given previous findings of widespread parental support for comprehensive sex education, what are the sources of such disapproval? If scientific evidence points to multiple advantages of comprehensive sex education curriculum, what drives the opposition to it? What have the studies of parental attitudes been missing? Answers to these questions most likely lie in moral values surrounding sexuality.

Attitudes toward sex education can vary greatly depending on value frameworks applied to them. Given the intensity of emotion surrounding sex education, some of these frameworks are likely to evoke moral conviction: That is, connection to "core beliefs about fundamental right and wrong" (Skitka & Morgan, 2014, p. 96). If a belief is held with moral conviction, it is likely to be perceived as objectively or universally true (Skitka & Morgan, 2014). Disagreements over
questions of core or universal moral values seen can create a fertile ground for miscommunication and opposition in ways that are reasonable and understandable.

My positioning of attitudes toward sex education is based on several threads in social psychological research and interpretivist research that have separately covered many perspectives on sexuality and sex education. However, to my knowledge, these threads have never before been woven together to help provide a deeper understanding of this matter. These threads primarily concern individual differences in perceptions of morality and the way they in turn shape the perceptions of sex education. Positioning these threads in the domain of moral perception means that I approach all the positions on this debate as genuinely concerned with the questions of right and wrong. I am curious about how right and wrong are defined, as well as about consequences of these definitions.

A likely reason that this information has been missing from previous research on parental attitudes toward sex education is two-fold. First, although many regional studies described levels support for sex education among parents, they rarely looked into what contributes to differences in support. That is, it has been common to look at the differences between mothers and fathers or between types of school (e.g., public schools and catholic schools). However, questions of deeper cultural beliefs or attitudes have remained largely unexplored by attitude surveys. Second, these studies tend to leave the definitions of sex education relatively open-ended or omit them entirely. Thus, interpretation of many key terms is commonly left entirely to the respondents (McKay et al., 2014). For example, what exactly do concepts such as up-to-date curriculum or age-appropriate education mean? If parental conceptualizations of such ideas conflict with conceptualizations shared by researchers and government agencies, then reasons for opposition to specific policies become easier to understand.
To maintain a realistic thesis scope, I chose to focus on how differences in deeply held values and motivations could contribute to understanding the differences in attitudes toward sex education. Explaining these differences requires an integration of a number of theories of sexuality, morality, and motivation into a single comprehensive narrative. Specifically, I combined studies of sex education discourse in Western culture, recent overviews of research on psychological threat and defense, with the theories of moral foundations and regulatory focus. All these threads can be gathered into an interconnected framework capable of explaining the opposition to sex education. That is, they highlight the interplay of psychological factors potentially arising when sex education becomes a concrete matter for parents thinking about their own children. Understanding differences in motivation also has potential to improve communication on emotionally charged topics such as sex education, by matching educational information to person's motivational style.

My ambition for this study has been driven by more than a desire to address a gap in research literature, although I provide evidence that this gap exists. My ambition is also practical. In 2010, the Ontario government reversed proposed curriculum changes in response to the protests encountered at the time. In 2015, although the Ontario government has been standing its ground, this political and cultural issue may have as of yet unknown but divisive cultural legacy. For example, local activism aiming to reverse the curriculum changes continued through the end of 2015 (e.g., Laurence, 2015), as did sharp criticism of this activism (e.g., Kochany, 2016). My hope has been to produce some tangible understanding that could help to promote dialogue between different sides of the debate, as well as increased adoption of evidence-based policies on sex education.
CHAPTER TWO: LITERATURE REVIEW

Understanding attitudes toward sex education is inseparable from understanding what is at stake when we describe this issue. As the following sections illustrate, some of the differences in attitudes are likely connected to different interpretation of the stakes involved, with respect to goals, content, and implications of sex education.

**Sex Education Discourses**

Opposition to the advancement of comprehensive sex education is not unique to Ontario. At the very least, similar phenomena have been taking place in the U.S. and Australia, judging by the work of Jones (2011a, 2011b) and Irvine (2000, 2006, 2008), who have studied them in detail. These phenomena are characterized by profound differences in discourses and worldview around sexuality. Discourses can be defined as "institutionally supported and culturally influenced interpretive and conceptual schemas that produce particular understandings of issues and events" (Bacchi, 2005, p. 199). Worldview can be described as an implicit conceptual framework: A set of beliefs that delineates assumptions about the world and evaluative criteria to judge events and experiences (Koltko-Rivera, 2004). These two concepts seem to significantly overlap, so this thesis treats them as interchangeable for the time being.

Jones (2011a, 2011b) proposed a framework for multiple discourses regarding sex education. Two of these proposed discourses appear to be especially relevant to understanding competing worldviews embedded in concerns about sex education.

A sex education discourse that Jones labeled *conservative* presents sexuality as an ideal determined by authority (e.g., creator, natural order, institutions, parents) and then guards against threats to this ideal (Jones, 2011a). Specific educational narratives vary, yet legitimate sexual expression tends to be procreative and to occur within a committed relationship (usually,
marriage). At the same time, "diversity beyond this model is negated: rendered invisible, pathologized, demonized, or declared a fallacy or a mistaken choice" (Jones, 2011a, p. 136).

Conversely, discussion of comprehensiveness, risks, and effective healthy choices are examples of *liberal* discourse, which emphasizes "skills and knowledge for personal choice and development" (Jones, 2011a, p. 144). Individuals are constructed as their own authorities, influenced by knowledge from multiple sources but making their own choices. Thus, key goals of sex education are about improving the capacity to make informed choices (Jones, 2011a). Many Canadian materials on sex education (e.g., McKay & Bissel, 2010; Public Health Agency of Canada, 2008) seem highly congruent with this discourse.

According to Jones (2011b), another important difference between these discourses lies in how they construct children and what educational needs follow from these constructions. The conservative discourse presents children as either blank slates that can be indiscriminately filled with any knowledge, or as beings that have a rudimentary sexual awareness yet are currently pure. Both discursive subtypes focus on the danger of corruption and on important need to preserve innocence and purity, although the latter discourse also places particular emphasis on controlling urges. The liberal discourse presents children as discerning and agentic decision-makers, capable of evaluating and acting on information they receive. Thus, liberal and conservative discourses assign substantially different importance to various educational needs. Specifically, the liberal discourse prioritizes the need for knowledge and skills related to sexual behaviour whereas the conservative discourse prioritizes the need for protection of innocence.

These differences in the construction of children and sexuality explain why some people may interpret comprehensive sex education as harmful. Irvine (2000) reviewed conservative narratives surrounding comprehensive sex education, finding that it is viewed as *performative:*
That is, talking about sex, regardless of context, triggers children to be more sexual and pollutes their innocence. Thus, at the extremes of this socially conservative worldview continuum, sex education becomes constructed as abusive or evil. Such construction understandably fuels a panic of justified resistance (Irvine, 2000, 2008).

Conversely, it is also clear that within a liberal perspective, failure to provide developing minds with relevant knowledge and skills, leaving the youth to deal with the consequences of sexually transmitted diseases and unintended pregnancy, is seen as profoundly harmful. Santelli et al. (2006) provided an unintended yet interesting illustration of these discursive differences. The authors highlighted that proponents of abstinence-only education tend to frame it as a moral issue, whereas academic literature usually frames sex education as a public health issue. They also described abstinence-only sex education as morally and ethically problematic due to denying students basic human rights of access to accurate and complete sexual health information.

Review of sex education discourses indicates a clash of perspectives, which are difficult to reconcile. It may nonetheless be possible to address some of the concerns present in these perspectives with empirical evidence.

**Discourses and evidence.** Jones (2011b) highlighted that any discourse has limits, which can only be overcome by consistently checking with the youth themselves about their perceptions, needs, and expectations. Contemporary comprehensive approaches to sex education appear to be taking these concerns into account, as they incorporate research into youth perceptions of needs and quality of sex education they received. For example, the Toronto Teen Survey of ethnically and religiously diverse youth (ages 13-18+) found that adolescents listed healthy relationships, HIV/AIDS, sexual pleasure, and better communication about sex among
the top topics they wanted to learn more about (Causarano, Pole, Flicker, & Toronto Teen Survey Team, 2010).

Canadian sex education policy (as described by Public Health Agency of Canada, 2008) seems to align well with the liberal sex education discourse (as described by Jones, 2011a, 2011b). A possible consequence of this alignment is that individuals who share a socially conservative worldview may feel that their concerns are not properly heard or addressed. How could this situation be remediated?

It is not clear to what extent the concerns regarding exposure to alternative values per se could be ameliorated, especially in a multicultural pluralistic society. The Public Health Agency of Canada (2008) adopted the approach of "an open and non-discriminatory dialogue that respects individual beliefs" (p. 5), implying that multiple cultural viewpoints have a right to airtime. However, the effects of such exposure may be limited. If values around sex are held with moral conviction, then they are less likely to be affected by either authority or peer influences. Although no previous research evaluated the extent of moral conviction in values toward sex education, behavioural evidence supports this notion. For example, the youth from relatively more conservative backgrounds are more likely to report both lower sexual activity (e.g., Homma, Saewyc, Wong, & Zumbo, 2013) and lower interest in further sex education (Causarano et al., 2010). Furthermore, concerns about comprehensive sex education potentially promoting sexual behaviour have been studied. Evaluation research into comprehensive sex education programs concludes that they do not lead to earlier onset of sexual activity and may even delay or decrease youth sexual behaviour (Bennett & Assefi, 2005; Kirby, Laris, & Rolleri, 2007; McKay & Bissel, 2010).
Information and Threats

Research findings exist that could help to alleviate some concerns about behavioural consequences of comprehensive sex education. It is possible that for some people, the opposition to sex education is so deeply principled that these findings do not matter: One consequence of moral conviction is reduced importance of procedural fairness and reluctance to come to consensus on moral issues (Skitka & Morgan, 2014). Yet for others, perhaps, agreement on sex education policy could be achieved if proponents of comprehensive sex education focused more on understanding their concerns and communicating ways to address them.

Yet, success of providing information on sensitive subjects remains dubious. People often continue believing misinformation that fits their deeply held beliefs and worldviews even after exposure to correct information (e.g., Lewandowsky, Ecker, Seifert, Schwarz, & Cook, 2012). For example, Nyhan, Reifler, Richey, and Freed (2014) tested the effectiveness of several typical U.S. public health communication messages that dispel the link between vaccines and autism in a large nationally representative trial. They found that none of the messages improved parental intent to vaccinate, and some even backfired among some parental groups. Munro (2010) found that exposure to scientific evidence that disconfirms beliefs about homosexuality is not only unlikely to produce a belief change, but could also lead participants to discount the validity of evidence by suggesting that the issue at hand is not one to be resolved scientifically.

Lewandowsky et al. (2012) suggested that coherence, compatibility with existing knowledge, and credibility of information are important contributors to judgments of whether information is true. Therefore, information that fits a worldview is more likely to be accepted as true than information that contradicts a worldview, because it feels more coherent, compatible, and credible. Lewandowsky et al. proposed that worldview could act as a frame of reference, or
an organizing schema for information acquisition and processing, as "if one’s investment in a consistent worldview is strong, changing that worldview to accommodate inconsistencies may be too costly or effortful" (p. 120).

Lewandowsky et al. (2012) stated that our knowledge of underlying processes related to worldview and information processing is still limited. Literature on psychological threat and defense provides intriguing additional insights into these processes, especially the mechanisms of backfiring. Jonas et al. (2014) integrated decades of research on dozens of threat and defense theories into a comprehensive review, arriving at a general process model of anxiety-to-approach (see Figure 1). The rest of this section describes how this integrated process model unfolds.

*Figure 1. A schematic illustration of the anxiety-to-approach model of threat and defense, adapted from Jonas et al., (2014).*

First, people note a "motivationally relevant" (Jonas et al., 2014, p. 231) discrepancy between reality and their expectations. This experience of discrepancy triggers the Behavioural Inhibition System, which is felt as a sense of anxiety. Functionally, this is a signal to stop and pay attention, as situation at hand likely needs to be reassessed to resolve the discrepancy. Therefore, activation of the Behavioural Inhibition System triggers immediate, or *proximal*, defenses including physiological arousal, anxious vigilance, and avoidance. However, actually resolving the discrepancy relies on the second step in this model: the Behavioural Approach
System. Typically, after several minutes of anxiety, the Behavioural Inhibition System activity is downregulated so that distal defenses triggered by the Behavioural Approach System can begin. These defenses constitute a variety of strategies that range along two axes, from personal to social and from concrete to abstract.

Concrete defenses focus on immediate aspects of environment that could relieve a sense of discomfort, such as tangible rewards or social connection (e.g., a cup of hot chocolate is a concrete personal defense and calling a friend is a concrete social defense). The abstract defenses refer to "conceptual, identity-based, or idealistic commitments" (Jonas et al., 2014, p. 246). Abstract defenses are most relevant to the matter at hand for several reasons. First, ideals and values likely hold more power than concrete defenses because they (a) can be accessed within one's own mind independent of immediate surroundings; (b) tend to guide concrete lower level goals; and (c) due to relative unattainability, do not "lose their motivational value through habituation" Jonas et al., 2014, p. 250). Second, a substantial body of literature indicates that "threats also increase adherence to personal and moral values" (Jonas et al., 2014, p. 251). When these values already involve suspicion of other groups or concepts, threats often lead to an increase in intolerance and dismissal of threatening information as biased, as well as recommitment to salient in-group identities (see Jonas et al., 2014, pp. 251-255 for a detailed review of evidence).

Scientific evidence related to sex education programs could represent two levels of threats for socially conservative parents. The first level has already been described in the section about sex education discourses: A threat of corruption and promiscuity. However, it is possible that even information that attempts to address these concerns could still be threatening if, as Jonas et al. (2014) suggested, any salient discrepancy constitutes a threat. That is, findings that
comprehensive sex education does not lead to increased promiscuity could be inconsistent with the sexually conservative worldview. Thus, they could indirectly indicate that the sexually conservative worldview may not be fully correct, which represents a substantial worldview threat. Consequently, it is highly possible that for socially conservative parents, typically used promotional materials about sex education may not only fail to produce attitude change, but may even lead to strengthening of existing positions.

It is important to highlight that promotion of evidence-based practices in sex education does not aim to change values for parents or children. The goal of Canadian sex education guidelines is to empower people to follow their values in their own lives, which requires exposure to a diverse set of approaches to sexuality (Public Health Agency of Canada, 2008). The goal of increasing communication effectiveness is to make it easier for people to engage with the information presented and to consciously evaluate it. Yet it seems that achieving this goal requires effectively counteracting automatic reactions that tend to occur when information is experienced as a moral threat.

**Diving Deeper: What Underlies Moral Resistance to Sex Education?**

Is all hope lost, then? Not necessarily. Several interesting directions in contemporary social psychology provide both glimpses into underlying mechanisms of ideological differences and ideas regarding framing communication in ways that take these differences into account.

**Moral foundations.** The first direction is Moral Foundation Theory. Haidt (2013) summarized its tenets in the following three points. First, moral judgment and reasoning both follow and justify the *felt* signals of moral intuition, which is based on immediate intuitive response to stimuli. Second, by taking into account multiple cultures around the world and evolutionary theory (a kind of innate preparedness to care about some things more than others,
consistent with established evolutionary models), five general content domains of morality were identified: harm/care, fairness/reciprocity, ingroup/loyalty, authority/respect and purity/sanctity. These domains produce automatic affective evaluations, are culturally widespread, and represent common concerns identified in moral judgment. Third, endorsing these moral concerns "binds and blinds" (Haidt, 2013, p. 292): It facilitates bonding and group cohesion for groups with shared values, while increasing bias against morally dissimilar out-groups and confirmation bias in attending to information.

The moral intuitions about harm and fairness have been referred to as the individualizing foundations, whereas the moral intuitions about authority, in-group, and purity have been referred to as the binding foundations (Graham, Haidt, & Nosek, 2009). The distinction lies in orienting toward an individual or toward the group as the "locus of moral value" (Graham et al., p. 1030). Social liberals tend to rely most on the individualizing foundations and significantly downplay the binding foundations, whereas social conservatives tend to rely on all five foundations (Graham et al., 2009). When it comes to political issues related to sexuality, the foundation of purity and its underlying emotion of disgust take the leading role, predicting judgments above and beyond, ideology, religious attendance, or political orientation (Koleva, Graham, Iyer, Ditto, & Haidt, 2012). Furthermore, disgust sensitivity has been directly associated with social conservatism overall, and specific sexuality areas such as anti-gay attitudes and upholding purity as a moral good (see Crawford, Inbar, and Maloney, 2014 for extensive review).

I was unable to find any study that directly tested a possible connection between sex education attitudes and moral foundations. However, research into relevant discourse and positioning of sex education as a divisive cultural issue (e.g., Irvine, 2000; Jones 2011a, 2011b;
Santelli et al., 2006) all point in one direction: Moral intuitions on purity are likely to strongly predict attitudes toward sex education and may account for a substantial portion of differences in these attitudes.

**Regulatory focus.** The second crucial piece of this puzzle comes from research into potential cognitive and motivational antecedents of political ideology. By now, a number of researchers have pointed out a multitude of differences in perception, attention, and motivation between the people who find themselves on the opposites of the socially conservative to socially liberal continuum. For example, Jost, Glaser, Kruglanski, and Sulloway (2003) found in a meta-analysis of over 20,000 cases that social conservatism is significantly associated with death anxiety, perceptions of system instability, intolerance of ambiguity and uncertainty, as well as needs for structure and closure. Hibbing, Smith, and Alford (2014) expanded on these findings, suggesting that social conservatism is connected to paying more attention and responding stronger than social liberalism to features of one's environment evaluated as negative or aversive. According to Hibbing et al., this mechanism also explains the differences identified by Jost et al. (2003). It is important to note that the definition of threat suggested by Jonas et al. (2014) includes discrepancies of both positive and aversive nature: That is, salience of discrepancy is more important to the experience of threat than its averseness. However, stronger response to negative stimuli suggests that social conservatives may have a stronger response to perceived discrepancies of negative nature than social liberals.

Regulatory focus is a motivational principle that postulates a human ability to self-regulate toward desired end states (i.e., reducing the discrepancy between the current state and a goal) alongside two primary motivational systems, *promotion* and *prevention* (Higgins, 1998). More specifically,
The promotion system is associated with attaining gains, achieving hopes and aspirations (ideals), and is concerned with growth and nurturance. The prevention system is associated with maintaining non-losses, meeting duties and obligations (oughts), and is concerned with safety and security. (Cornwell & Higgins, 2013, p. 1165)

Although Hibbing et al. (2014) have integrated enormous amounts of data and therefore present some very convincing arguments describing social conservatism, they lack a similarly detailed description of social liberalism. This is why I have two reasons to prefer the regulatory focus framework (Higgins, 1998). First, this model is consistent with the social conservatism models proposed by Jost et al. (2003) and Hibbing et al. (2014), yet also provides a potential model consistent with social liberalism, as described below. Second, the concepts of regulatory focus and regulatory fit led to significant research activity addressing communication and persuasion, which has obvious practical applications for communication about sex education.

Cornwell and Higgins (2013) stated that many previous studies suggested an indirect connection between regulatory focus and political orientation, but their work was the first to directly test this connection, as well as to explore how regulatory focus interacts with the moral foundations theory. As expected, the authors found a relationship between chronic promotion focus and liberalism as well as chronic prevention focus and conservatism, with a small-to-moderate effect size (i.e., $R^2$ of .18). Cornwell and Higgins also linked their regulatory focus model of personal motivation to the approach/avoidance model of social behaviour (Janoff-Bulman, Sheikh, & Baldacci, 2008; Janoff-Bulman, 2009): This model attributes to social liberals the motivation to regulate society via approach/activation through advancing positive outcomes and providing, and to social conservatives the motivation to regulate society via avoidance/inhibition by advancing order and protection. Janoff-Bulman, Sheikh, and Hepp
(2009) expanded this connection between approach and avoidance motives to corresponding aspects of morality: "...Proscriptive morality entails avoidance motives – overcoming a negative desire and restraining a motivation to do something bad. Prescriptive morality involves approach motives – establishing a positive desire, overcoming inertia and activating a motivation to do something good" (p. 523).

All these studies suggest a clustering of related personal traits, including motivation, values, and attitudes toward society, that may inform individuals' personal and social positions. Hatemi and McDermott (2012) summarized such positioning as follows:

...A promotion style potentiates a humanistic worldview, which assumes that people are basically good and governments and societies should help support them, whereas a prevention style encourages a more normative view, suggesting that people are basically bad and the job of society should be to regulate and constrain the behavior of those who can hurt others. (p. 683)

**Theoretical Framework: Weaving the Threads Together**

All the psychological theories described so far share a commonality in their working mechanisms. They all treat emotion and emotional experience as centerpiece: Felt sense delivers crucial information that produces judgment and motivates behaviour. Both moral foundations theory and regulatory focus theory describe a sense of feeling right or wrong about something a person encounters that transfers to moral evaluations (Camacho, Higgins, & Luger, 2003; Haidt, 2001, 2013). In threat and defense theories, this crucial feeling is anxiety, which dissipates as defenses are activated (Jonas et al., 2014). These positions are consistent with recent neurobiological reviews: Emotions represent deep instinctual action-oriented programmes that developed to help organisms survive (Damasio & Carvalho, 2013). However, the deployment
of these programs is influenced by experience and learning (Damasio & Caravalho, 2013), thus opening doorways for rich cultural variation present in human societies.

Cognitive models of sex education also acknowledge the role of emotions in the overall picture. For example, sex education theories are conceptually integrated into a practical model under the Information, Motivation and Behavioural Skills Model (Public Health Agency of Canada, 2008). The model emphasizes providing evidence-based and pragmatic information while simultaneously addressing motivational factors in order to facilitate skill acquisition that promotes sexual health. Motivational factors consist of social norms, personal beliefs, and emotional responses to the matters of sexuality. Program development recommendations include (a) evaluating current state all these matters in the community, (b) engaging stakeholders to cooperatively develop customized programs, and (c) addressing emotional and motivational obstacles to sex education promotion (Public Health Agency of Canada, 2008).

Unfortunately, these recommendations are not clear on how exactly negative emotional responses can be addressed in practice. This gap becomes particularly important because reasoning tends to take a step back when overwhelmed by intense emotion. This notion is referred to as affective primacy, and it has been convincingly demonstrated to be especially true in matters of morality (for detailed reviews see Haidt, 2001, and Olatunji & Puncochar, 2014). Several areas of developing research are of particular relevance to these questions. One area explores the concept of moral outrage: That is, strong emotions "felt in response to moral violations and associated with an urge to respond" (Olatunji & Puncochar, 2014, p. 200). Irvine's (2008) mechanism of sexual panics relies on transient and intense moral emotions that seem remarkably similar to moral outrage. The concept of moral conviction explores these notions specifically in the context of attitude research: Attitudes held with moral conviction behave
differently from other strong attitudes (Skitka & Morgan, 2014). Such attitudes motivate principled behaviour that can manifest on a wide spectrum, from increased civic engagement despite personal costs to righteously justified intolerance and violence (Skitka & Morgan, 2014). All these phenomena involve intentional morally justified responses to what is experienced as acutely wrong and interpreted as a severe moral threat.

Lacking effective ways to address polarizing effects of intense moral emotions once they are triggered, prevention may be the next best strategy. The question thus becomes, what influences automatic moral evaluations: What information is and is not evaluated as a moral threat (i.e., feels wrong or anxiety-inducing), to what extent, and under what circumstances? And could this knowledge potentially be employed to understand and reduce triggers for automatic emotional arousal on morally charged issues?

I propose that moral foundations, regulatory focus, and threat and defense intersect with and complement each other in moral concerns regarding sexuality. Connecting these dots and applying them to attitudes toward sex education specifically leads me to suggest the conceptual model shown in Figure 2 (Figure 2a displays an overall model and Figure 2b displays the specific links to be tested by the current study). In this model, moral foundations and regulatory focus mutually help define how and why certain stimuli are interpreted when it comes to sexuality. The extent to which stimuli are interpreted as negative or threatening, and positive or non-threatening, is expected to shape attitudes toward sex education.

Specifically, moral foundations likely contribute to substantial content differences between sexuality-related values. The value of sexual purity is an important moral value for social conservatives whereas it carries far less relevance as a moral value for social liberals. Meanwhile, regulatory focus influences what strategies people may find appealing in order to
pursue their values. So, not only are social liberals less concerned about purity than social conservatives, but they are also more likely to encourage people to follow their own direction and act as their own authority due to promotion-oriented motivation. Whereas social conservatives would be more likely to be concerned about purity and emphasize a need for social control and restrain in pursuing these values due to prevention-oriented motivation.

*Figure 2a.* Proposed integrated model for moral foundations, regulatory focus, threat perception and attitudes toward sex education.

The liberal discourse locates moral authority within an individual, and maps onto motivation related to personal development and growth (i.e., the promotion system). This placement of authority is also consistent with individualizing foundations, where moral locus is on the individual. The threats related to sex education likely take two major forms, based on the priorities and values identified by Public Health Agency of Canada (2008) and Jones (2011a, 2011b). The first form of threat is about missing the opportunity to develop knowledge and skills to guide decisions toward personal happiness. The second form of threat reflects more tangible harms, as it comprises negative sexual outcomes, such as sexually transmitted infections, coercion, or unintended pregnancy.
The conservative discourse places moral authority outside an individual and maps onto motivation related to oughts and to controlling behaviour (i.e., the prevention system). This placement of authority is consistent with binding foundations, where moral locus is on the group. The threats related to sex education also take several forms. The most obvious threat appears to be to purity as reflected in the discourse on children and sexuality (e.g., Jones, 2011b). However, threats to authority, ingroup, and worldview might also be present. For example, if comprehensive sex education is built on values present in the liberal discourse, then exposure to it could facilitate relocation of moral locus from group authority to individual. The threat of harm may be present for the conservatives as well, albeit in a different form: A violation of purity could be interpreted as harm, as highlighted by Irvine (2000, 2008).

These various definitions of harm fit with recent research by Schein and Gray (2015) on harm as a potential unifying template for both liberals and conservatives. Schein and Gray contested the notion of distinct moral foundations and proposed that harm is the most accessible moral content that overlaps across all other content domains. In the case of sex education, this unifying aspect seems especially clear. Both social liberals and social conservatives have reasons to interpret various aspects of the situation as potentially harmful to the well-being of their children. So it should not be surprising when questions of sex education provoke intense moral emotions from all stakeholders. At the same time, it also provides rationale to clarify our understanding of what exactly is at stake here, for whom, and under what circumstances.

I suspect that all of these links primarily work through influencing perceptions of threat. However, they may also directly and explicitly impact formation and content of attitudes. Exploring all of these links in sufficient depth would go beyond a realistic scope for this study. Therefore, I focus on the following aspects of this proposed model.
The goal of this study is to develop a better understanding of differences in attitudes toward sex education. This theoretical framework effectively posits that attitude differences are related to different perceptions of the moral questions involved and different overarching motivational styles. Therefore, this study will explore the associations between (a) moral foundations and attitudes toward sex education, (b) regulatory focus and attitudes toward sex education, as well as (c) how threat perception might affect these associations (see Figure 2b). As I suspect that regulatory focus and moral foundations may be working in tandem, it makes sense to examine these constructs together simultaneously.

Figure 2b. Specific testable connections between moral foundations, regulatory focus, threat perception and attitudes toward sex education.

Note. "+" represents direct relationship and "−" represents inverse relationship between specified constructs.

Framework application: Ontario protests. The opposition against Ontario sex education curriculum change illustrates how this theoretical framework unfolds on the ground. At the time of writing this thesis, most information about the events of 2015 has only been available through media coverage. Reviewing newspaper coverage of most recent Ontario protests provides interesting glimpses into both the rationale for curriculum update and fears of
many parents. The people who promote updated curriculum talk about evidence-based and age-appropriate information to facilitate informed decisions and learning of skills (e.g., Boesweld, 2015; Ross & Fatima, 2015).

Judging by media coverage, parents and advocates opposing the curriculum are concerned about the way values are discussed and about what kind of information is delivered at what age. Their concerns include delivering age-inappropriate sexual information, which is seen as harmful by destroying innocence and promoting non-traditional values (e.g., see Boesweld, 2015; Gyapong, 2015). Another source of concern is lack of emphasis on love, commitment, and staying with one partner (Ross & Fatima, 2015). Some examples of interview quotes chosen to describe the proposed curriculum are "promoted sexually explicit information to children at ages when it will only harm and disturb them" (Gyapong, 2015, para. 15); "would also instill in young, vulnerable minds the acceptance of non-traditional family values" (Gyapong, 2015, para. 19); and concerns over exclusion of "the values of self-control, morals and marriage" (Boesweld, 2015, para. 9).

Many of these concerns seem to originate from Catholic schools (e.g., Gyapong, 2015). Yet, according to journalists and activists, many people in the Toronto Muslim community as well as the Canadian-Chinese, Canadian-Polish, and Canadian-Russian communities also appear to share the same concerns (Laurence, 2015; Ross & Fatima, 2015). However, awareness-raising materials by Catholic organizations have been the most easily accessible and highly instructive in describing the content of fears and concerns. Examples from Campaign For Life Coalition (Campaign For Life Coalition, n.d.) include (a) raising awareness regarding the use of graphic language in teaching medical names for body parts at age 6 (e.g., penis, vagina; Grade 1 section, para. 1); (b) warning that the curriculum "aims to indoctrinate" (Grade 3 "Gender" section, para.
3) regarding understanding of gender identity theory and sexual orientation at age 8 while showing "no respect nor tolerance for traditionally-principled families" (Grade 3 "Homosexuality" section, para. 3); (c) describing advice at age 14 that "people who think they will be having sex sometime soon should keep a condom with them so they will have it when they need it" as "a recipe for launching children into a lifestyle of promiscuity" (Grade 8 "Keep A Condom" section, para. 2). The Campaign For Life Coalition (n.d.) also remains unconvinced about the stated goals of the proposed curriculum, for example:

By claiming that this curriculum is about encouraging kids to "delay" these high risk sexual activities, many casual readers won't notice that what has actually occurred is that the teacher has planted ideas in the minds of children that might not otherwise be present, regarding "anal intercourse", "oral-genital contact", etc. (Grade 7 section, para. 2)

Furthermore, Campaign For Life Coalition (n.d.) questioned how the stated goals of cultural sensitivity could possibly be achieved when the very content of teachings is culturally incompatible with Catholic faith-based worldviews (e.g., the very idea of presenting homosexuality or sex for pleasure as normal or valid).

All these concerns illustrate how communication about sex education does not work as intended. Parental opposition is complex and seems to be driven by genuine and valid concerns about values and behaviour, by the feeling of not being heard, and even by direct misinformation (Ross & Fatima, 2015). As such, being able to discuss the merits of sex education in good faith, with mutual respect, and with understanding of different concerns related to morality and values, could be considered an improvement over the status quo. From my perspective, achieving such results is an important goal of effective communication.
Improving Communication Effectiveness

In addition to testing theoretical associations, I am interested in studying and potentially improving communication effectiveness on sex education. The regulatory focus theory provides intriguing data that could help with this task. The idea of regulatory fit refers to pairing a regulatory goal with a strategy that produces a more appropriate fit: Approach goals involve eager striving whereas avoidance goals involve vigilance, thus corresponding better to a promotion or a prevention focus respectively (Cesario, Grant, & Higgins, 2004; Lee & Aaker, 2004). Consequently, the impact of the exact same information content differs depending on how it is presented, because presentation affects how recipients process it (Cesario, Higgins, & Scholer, 2008). Regulatory fit theory also emphasizes that a message is matched to aspects of motivational process, rather than outcome (i.e., the need satisfaction or end states), which previous persuasion research has been focusing on (Cesario et al., 2008). This shift in emphasis could be particularly relevant to fears or concerns regarding sex education, because realistically, no communication can actually meet a need for security or certainty. However, designing a message to fit the recipients’ style of information processing is a far more feasible endeavour.

Presumably, when regulatory fit occurs, the information presented may produce increased engagement and/or "feels right" to the recipient (Cesario et al., 2008). Designing sex education communication to induce a regulatory fit could help reduce a sense of worldview violation when it occurs, and thus prevent or at least reduce defensive reactions.

To date, regulatory fit persuasion research has focused on consumer products and health promotion. The evidence is mixed. Some studies point toward notable advantages of regulatory fit, including a meta-analysis on consumer behaviour (with practically significant effects, odd ratios of about 1.9 of fit vs. non-fit on intention to buy; Motyka et al., 2014). Unfortunately,
several meta-analyses on health communication found that regulatory focus framing showed limited practical significance in promoting health-oriented behaviours (O'Keefe & Jensen, 2008, 2009; O'Keefe & Nan, 2012). A more recent systematic analysis of health communication (Ludolph & Schulz, 2015) concluded that regulatory fit made a difference, but did not cite the work of O'Keefe and Jensen (2008, 2009) and cited only five studies that reported effect sizes (mostly small). All together, this evidence indicates that the message domain makes a difference to the effectiveness of regulatory fit (i.e., consumer products versus health promotion).

Health is a sufficiently wide topic that large reviews may not be as relevant and studies on specific domains of health promotion may be more informative. The most relevant domains likely consist of prevention of sexually transmitted infections and promotion of human papilloma virus (HPV) vaccination in order to prevent cervical cancer. Although most of these studies do not explore morality or values, sexually transmitted infections and HPV vaccination arguably overlap with sex education. After all, they are all located in sexuality domain, and sex education includes information on prevention of sexually transmitted infections.

A meta-analysis investigating the effects of message framing on vaccination intent (32 studies, with 13 on HPV vaccination) did not find evidence for reliable effects (O'Keefe & Nan, 2012). However, the authors cautioned that a challenge with such meta-analytic reviews is inability to directly evaluate regulatory focus and regulatory fit as moderators of frame effectiveness (O'Keefe & Nan, 2012). For studies that were able to investigate the effects of regulatory fit directly, the results were more encouraging.

One study looked at "cultural worldviews" and attitudes toward HPV vaccination, examining hierarchical vs. egalitarian worldviews among a convenience sample of 559 college students (Nan & Madden, 2014). These worldviews have shown correlations with conservative
vs. liberal political positions. The definitions of worldviews in this article also seemed to roughly map onto the authority vs. fairness moral foundations. The authors concluded that individuals with a hierarchical worldview were more likely to see HPV vaccination as risky and less beneficial, and they also responded the best to a loss-frame (the reverse was found for individuals with egalitarian worldviews).

Other useful findings come from a review of dispositional influences on message framing (Covey, 2014). Specifically, loss-frames seemed more persuasive for individuals with high ambivalence regarding several health behaviours including condom use/safer sex (two studies) as well as for individuals with avoidance orientation. With avoidance orientation, significant effects of loss-frame were found in six experiments (including one study of attitudes toward HPV vaccination) and no effects were found in four experiments (general health behaviours, none on sexually transmitted infections or HPV vaccination). Perceptions of risk demonstrated no consistent effects.

I was able to find limited information so far on the use of regulatory fit in political persuasion (specifically, promotion/prevention and gain/loss frames). Johnston and Lavine (2012) tested the effects of framing a range of political positions in terms of gains achieved versus losses avoided by a particular social policy. The authors found that persuasion increased when message framing matched chronic regulatory focus of respondents. However, none of the positions explored policy issues related to the so-called culture war or sexuality.

Putting all this information together, it seems safe to conclude that aiming for regulatory fit does not hurt and may help to reduce some subconscious barriers affecting the way communication is perceived. Therefore, the goal of studying communication effectiveness could
be achieved by testing the effects of regulatory fit or non-fit on message persuasiveness in sex education communications.

Compared to regulatory focus theory, the moral foundations theory is younger and to date, produced more limited amount of research on attitude change or persuasion. This research has been diverse, looking into a variety of possible strategies, such as moral elevation (Lai, Haidt, & Nosek, 2014), emotion reappraisal (e.g., Feinberg, Antonenko, Willer, Horberg, & John, 2013; Lee, Sohn, & Fowler, 2013), or writing tasks (Day, Fiske, Downing, & Trail, 2014). However, these studies have been too few to produce clear guidelines on intervention design. Furthermore, these interventions are arguably harder to apply outside of experimental conditions, as they require that participants follow specific instructions. The appeal of regulatory fit is in the potential of framing alone to make a difference. This makes it highly pragmatic and immediately transferable to written communication.

**Research Questions and Hypotheses**

The goal of the literature review was to show that (a) strong theoretical reasons exist for moral foundations, chronic regulatory focus, and perceptions of threat to mutually affect attitudes toward sex education; and (b) knowledge of these connections has potential practical implications if it can be used to improve mutual understanding in sex education debates. In order to explore these connections I propose the following research questions and hypotheses, together with some important preliminary considerations:

**Research question 1.** To what extent do individual differences on moral foundations, chronic regulatory focus, and perceptions of threat predict attitudes toward sex education? This research question aims to advance theoretical knowledge of how attitudes toward sex education relate to potential personality correlates. Answering this question could also potentially identify
which personality correlates may be more promising than others as targets for intervention or future research.

**Research question 2.** Can matching promotional materials on sex education to chronic regulatory focus improve the persuasiveness of these materials? This research question drives the applied aspect of this thesis (i.e., the hope of better potentially improving communication on sex education).

**Conceptual hypotheses.** The first research question is exploratory. As such, attempts to answer it are vulnerable to drawing misleading inferences based on spurious correlations in observed data. Consequently, I propose the following conceptual hypotheses in order to purposefully test proposed connections within my theoretical framework.

**Moral foundations.** Endorsement of the moral foundation of purity will be a strong predictor of attitudes toward sex education: Specifically, endorsement of purity will have an inverse relationship with support for comprehensive sex education. The respondents who self-identify as socially conservative and highly endorse purity will likely show the most opposition to broad-based sex education. Regardless of ideology, perception of the moral foundation of harm is likely to be another strong predictor of sex education attitudes. However, in addition to the moral foundation of harm as defined by the moral foundations theory, a definition based on Schein and Gray (2015) may be necessary to fully capture this effect. I hesitate to speculate about directionality of harm-related prediction, because previous sections outline good reasons why both social liberals and social conservatives pay attention to harm to harm.

**Regulatory focus.** The direction of relationship between regulatory focus and sex education attitudes will indicate a direct association between chronic promotion focus and positive attitudes toward broad-based sex education, and an inverse association between chronic
prevention focus and positive attitudes toward broad-based sex education. The respondents with chronic prevention focus who also self-identify as socially conservative will likely show the most opposition to broad-based sex education. The risk in making these predictions, however, is in not knowing whether the numbers of respondents who oppose broad-based sex education will be high enough to explore these effects. The associations between chronic regulatory focus, endorsement of binding and individualizing moral foundations, as well as social liberalism and social conservatism should replicate the findings by Cornwell and Higgins (2013).

Perceptions of threat. As depicted in the theoretical framework conceptual diagram (i.e., figure 1), the perception of threat, measured through state anxiety, should mediate the effects of moral foundations and chronic regulatory focus on attitudes toward sex education.

Experimental hypotheses. The prevention frame will resonate more strongly with individuals higher in chronic prevention focus or in binding foundation endorsement, and the promotion frame will resonate more strongly with individuals higher in chronic promotion focus or in individualizing foundations endorsement. At the same time, two notes of caution are warranted here. First note is that successful testing of this hypothesis depends on how likely the experimental manipulation is to induce regulatory fit. The second note is that practical size of such effects may be negligible.
CHAPTER THREE: METHOD

This chapter starts with the current study's research paradigm. It then outlines study design suitable for answering the research questions and concludes with a brief review of limitations inherent in the design.

Research Methods: Overall Conceptualization

My default position as a researcher lies within the post-positivist paradigm of critical realism, such as outlined by Harper (2012). This position is grounded in combining realist ontology with relativist and constructionist epistemology (Harper, 2012). My view of this position resembles McGuire's perspectivism, which strives for "detecting patterns of covariation in reality" (Jost & Kruglanski, 2002, p. 177). That is, I accept that scientific knowledge is socially constructed yet nevertheless I do hold a hope of exploring plausible hypotheses regarding some relatively universal aspects of human nature, as well as limits of their application and their cultural variability. Interpretation of findings in this perspective requires researchers to engage and acknowledge their understanding of broader sociocultural context (Harper, 2012). This research position is also appropriate for integrating knowledge from qualitative social constructionist and quantitative social psychological traditions (Jost & Kruglanski, 2002).

Although conceptual foundations of this thesis are integrative, the current study is situated in quantitative research tradition. The reason for this decision is my interest in generalizable individual differences, which are usually studied by methods of social psychology.

Reflexivity. Reflexivity refers to the notion of examining researcher's role in knowledge construction through analyzing the process of analysis (Potter & Wetherell, 1987). I believe reflexivity to be necessary (and position it prior to describing the rest of my methodology) for two main reasons.
The first reason is that the content under investigation is about moral values. This study is built on solid theory of how a sense of right or wrong affects judgment. It would be disingenuous to pretend that my own judgment as a researcher is immune from the same considerations. I am not neutral: (a) I am situated in the extreme-left side of cultural divide on sexuality, (b) my literature review explains what is good about sex education, and (c) my second research question is driven by desire to promote sex education. Thus, reflexivity enables understanding of how my own stake on these matters affects the way I conceptualize, interpret, and construct knowledge derived from this study. Reflexivity means explicitly noting my positions and thinking through their effects on research methods, analysis, and interpretation throughout research activities.

The second reason for reflexivity is more general and applies to research practices overall. This current study takes place against the unfolding backdrop of the *reproducibility crisis*. This term refers to accumulated questions by other researchers about the validity and trustworthiness of published results due to multiple factors, including publication and research practices. The first published results of the reproducibility project estimated that reproducibility of psychological studies is around 39% and limited knowledge exists on what contributes to it (Open Science Collaboration, 2015). This study received serious methodological criticism (Gilbert, King, Pettigrew, & Wilson, 2016), followed by criticism of the criticism (Anderson et al., 2016). All these events call for serious attention to research practices and their impacts on results. One of these practices is increased transparency about research decisions. Yet what exactly does that mean?

Lance and Vandenberg (2009) provided evidence that many applied researchers use methods that methodologists and statisticians claim are suboptimal for their purposes. Yet an
important obstacle toward adoption of improved quantitative methods is that they are difficult to understand (Sharpe, 2013). Furthermore, some decisions are clear from methodological literature yet others are less so. For these reasons, my definition of transparency includes more than clearly stating every procedural choice and its rationale. It also includes acknowledging situations where confusion and uncertainty remained about the methodological judgment call I ended up making.

Combined, these two arguments mean that I tend to be suspicious of my own findings and inferences drawn from them for the following reasons. An exploratory study with a large number of participants, predictors, and analyses is likely to produce a large number of statistically significant findings. Some of these findings may be false (Cohen et al., 2003; Ioannidis, 2005). My motivation will inevitably affect which of these findings I pay attention to and how I interpret them. My plan to address these vulnerabilities includes (a) placing more trust into findings that show up consistently among multiple analyses rather than any single statistically significant result, (b) examining statistical significance in the context of practical significance, and (c) clearly outlining instances where data disconfirms my expectations.

**Study Design: Considerations and Decisions**

In order to answer research questions, the study design incorporates correlational and experimental elements. Specifically, answering the first research question (connection between moral foundations, regulatory focus, and perceptions of threat) involves correlational data alone; whereas answering the second research question (testing communication effectiveness) relies on both experimental and correlational data. The following section outlines the study settings, sampling considerations, and protocol. Relevant ethical considerations embedded in design are also described here.
Settings and sample. In order to explore generalizable individual differences, a study needs to have a large and diverse sample. The most practical way to obtain such a sample quickly is crowdsourcing. Presently, the utility of crowdsourcing as a research method has been extensively studied. It is important to note that crowdsourcing samples should not be treated as representative of the populations they are drawn from, yet they do tend to be more diverse than typical undergraduate convenience samples (Paolacci & Chandler, 2014). Furthermore, for studies based on self-reported individual differences and simple or novel experiments (where learning effects are less of a concern), crowdsourcing samples tend to deliver results comparable to laboratory studies (Chandler, Mueller, & Paolacci, 2014; Paolacci & Chandler, 2014). The crowdsourcing platform most commonly used for academic research, the Amazon Mechanical Turk (MTurk), is no longer directly accessible to Canadian researchers. However, other platforms exist. An empirical investigation of several platforms identified CrowdFlower as a comparable alternative to MTurk in terms of participant data quality (Peer, Samat, Brandimarte, & Acquisti, 2015).

Sample characteristics. As the current study is primarily about parental perceptions and concerns regarding sex education, inclusion criteria and recruiting materials targeted parents only. The sample was also limited geographically to participants from North America due to relative cultural and institutional similarities in how sex education is taught and perceived across the U.S. and Canada.

A sample restriction to native English speakers was considered and discarded for two reasons. First, given the prominence of opposition to sex education among immigrant communities, this restriction could reduce practical generalizability of this study. Second, as data-generating platforms, crowdsourcing websites rely on their participants having a working
knowledge of English language to complete required tasks. Therefore, anybody eligible to participate was deemed to most likely have sufficient command of English to complete the study.

**Sample size.** The notion of statistical power refers to the probability of detecting an effect when it actually exists in the population, and is determined by a combination of sample size and the size of the effect in question (Aguinis & Harden, 2009). Cohen's rule of thumb for small, medium, and large effects in determining required sample size is only one of three potential strategies, and recommended to be only used as a last resort (Aguinis & Harden, 2009; Cohen et al., 2003). The first strategy for power analysis originally recommended by Cohen involved looking at existing literature for expected effects sizes in order to estimate likely power to be obtained at different sample sizes (Aguinis & Harden, 2009; Cohen et al., 2003). Unfortunately, this recommendation was impractical because the range of effect sizes (where reported) in studies integrated during the literature review has been too vast to be useful, both in terms of types of effect sizes and reported magnitudes.

The next best strategy is to decide what effect size would have theoretical or practical significance (Aguinis & Harden, 2009; Cohen et al., 2003). From this perspective, it is a matter of judgment calls. In social psychology, one could almost always find theoretical reasons for relationships between constructs. Therefore, my personal inclination has always been to start caring about associations when they reach small-to-medium effect size range, although powerful arguments for importance of small effects have been raised (Prentice & Miller, 1992). In social psychology, most effects appear to be in the vicinity of $r = .1$ to $.3$ (meta-analytic estimates based on converting effect sizes to Pearson product–moment correlation coefficient; Richard, Bond, & Stokes-Zoota, 2003). So the current study should likely aim to detect effects within this range.
Many sample size calculations exist, depending on the method of analysis. In this case, several of my hypotheses would require multiple regression analysis and moderated regression analysis. One rule of thumb for multiple regression analysis that accounts for effect size requires a sample of at least $400 + (m-1)$, where $m$ is the number of predictors, to detect small effects (Green, 1991, as cited by Tabachnik & Fidel, 2013). Cohen’s (1992) original power analysis tables indicate that a sample size of 481 to 757 is needed to detect small effects, depending on the number of predictors, whereas only about a 100 is sufficient for detection of medium size effects. With moderated regression analysis, reliability of an interaction term is a product of first-order predictor reliabilities, and reduces noticeably even when the first-order predictor reliabilities are considered good. For example, when predictor reliability is .7, sample sizes of over 200 and over 700 are required to detect interactions of moderate and small effect sizes respectively (Aiken & West, 1991). These numbers do not account for unpredictable losses due to participant inattention (e.g., Curran, 2016; Maniacci & Rogge, 2014) and missing data.

With these considerations in mind, a sample size to aim for seemed to be at least 400 participants, as it suffices for detection of both small-to-medium first-order effects and mid-size interaction effects. If the goal is to detect small interactions, then at least 700 participants are required. Yet, once fair payment for the study was added to this equation as described in the next section, my budget topped out at 500 participants.

**Ethical considerations.** This study was approved by the Conjoint Faculties Research Ethics Board. The key ethical considerations involved were as follows.

In crowdsourcing studies, potential participants are already registered at a crowdsourcing platform. They actively select tasks to take based on the information available about the task (e.g., expected time, pay, and nature of the task). The researcher's responsibility is to provide
accurate information, and then the participants make their own informed decisions on whether to take part in the study.

This study carried minimal risks to participants, clearly outlined expectations, and did not collect personally identifying information (other than IP addresses, which were removed immediately after downloading data). The primary benefit of this study to participants was direct financial compensation for time spent. Researchers have no access to individual participant financial information as all compensation is handled by the crowdsourcing platform. Studies of crowdsourcing samples also indicate that many participants think research surveys are enjoyable and respond well when researchers highlight the meaning of the study and thank participants for their contribution (Paolacci & Chandler, 2014). Consequently, all the recruiting and debriefing materials (see Appendix A) were developed with this consideration in mind.

This study sought informed consent from participants, all of whom were competent adults. Consent was implied by participants choosing to click a button after reading the consent form (see Appendix B) to proceed to the study. Participants were also encouraged to save a pdf copy of the consent form for their own records. Participants were informed about the freedom to withdraw at any time and still receive compensation. Financial compensation is an important incentive in crowdsourcing marketplace (Dynamo Wiki, n.d.). Therefore, assuring participants that they would still be paid if they withdraw was important to mitigate any coercion to continue they might have felt otherwise. No deception was involved in the study design.

Compensation in previous crowdsourcing research varied significantly and has often been very low. However, grassroots ethical guidelines for crowdsourcing research have been emerging from the MTurk community (Dynamo Wiki, n.d.). These guidelines highlight that many participants are poor and rely on crowdsourcing income. Therefore, a practical minimum
fair payment should be $0.10 a minute, or $6.00 (USD) per hour, and it is even better to tie it to minimum wage (Dynamo Wiki, n.d.). Consequently, I chose to compensate the participants $3.00 for estimated 20 minutes to comply with fair payment guidelines and to attempt mitigating financial pressure to skim through the study. Participants who dropped out were supposed to receive payment proportionate to the time spent. Yet, due to my inexperience with CrowdFlower, all of them effectively received the same compensation as the participants who completed the study.

**Procedure.** The CrowdFlower participants who read the recruitment materials and were interested in taking the study were directed to the study link on Qualtrics (an online platform for questionnaire research). Upon completion, they received a unique code they then entered into CrowdFlower to confirm completion and receive full payment for participation. The study's protocol consisted of the following elements (full details on the design of experimental manipulation and specific measures are outlined further in their respective sections):

1. Questionnaires that measured dispositional individual differences in moral foundations, regulatory focus, and pre-existing sex education attitudes. Answers to these questionnaires formed the basis for most correlational analyses in this study. These questionnaires were counterbalanced.

2. An experimental manipulation with two randomly assigned conditions (promotion frame and prevention frame). In both conditions, participants read a brief article (~250 words) on the impacts of various sex education programs on adolescent behaviour. The articles were identical in content and factually correct, based on information from McKay and Bissel (2010).

3. After the manipulation, all participants completed the same dependent variable items for manipulation check, article persuasiveness, and state anxiety. The state anxiety questionnaire
was placed at the very end to allow for some delay between manipulation and measurement. Delay between manipulation and measurement has been crucial in mortality salience research, yet how delay applies to other threats and whether this timing is affected by the nature of threat (i.e., mortality versus other less intense threats) is not reliably known (Jonas et al., 2014). The shift from inhibition to approach in threat responses supposedly takes place within minutes (Jonas et al., 2014). Thus, excess delay for threats other than mortality may even prove counterproductive to the ability to measure threat-related anxiety. Because this current study was not investigating mortality salience and budgetary considerations were important, I chose to omit non-essential filler tasks and instead to use other dependent variable items as a natural source of delay.

**Instrumentation**

This section describes considerations that went into developing experimental manipulation and selecting specific measures for data collection.

**Experimental manipulation.** Testing potential effects of regulatory fit on communication effectiveness requires making choices about the content of the communication. Given the size of the typical sex education curriculum, the number of concerns about it raised by socially conservative opponents, and lack of research on concern prevalence or importance, this was a challenging task. I decided to focus on the fears of promiscuity because these fears (a) feature prominently in conservative sex education discourses, (b) can be conceptualized as behavioural rather than identity-related, and (c) research demonstrates that on average, these behavioural concerns are unfounded (McKay & Bissel, 2010). My decision was also affected by U.S.-based literature that focuses heavily on the debate between comprehensive and abstinence-focused sex education (e.g., Bleakley et al., 2006, 2010). Canadian sex education materials also
address this debate (e.g. McKay & Bissel, 2010). Crowdsourcing North American samples tend to be dominated by U.S. residents (Paolacci & Chandler, 2014), so my ability to gather a sizeable Canadian sample was uncertain. Therefore, it was reasonable to address concerns that appear to be shared between the U.S. and Canada.

Another shared concern is related to sexual orientation and gender identity. However, I felt that sexual prejudice is a subject that already receives significant attention from researchers and policy makers: A significant amount of both theoretical and practical action research have been conducted to address prejudice and discrimination (e.g., Feinberg et al., 2013; Irvine, 2008; Lai et al., 2014; Paluck & Green, 2009; Rayside, 2010; Shipley, 2015). Therefore, it was important to me to prioritize sexual behaviour in this study rather than sexual orientation and gender identity.

I have chosen brief excerpts from McKay and Bissel (2010) that compared the impact of comprehensive sex education programs and abstinence-only sex education programs on adolescent sexual behaviour. The key points outlined in the excerpts were that (a) sex education programs have been extensively studied, and (b) comprehensive sex education does not lead to earlier or increased sexual activity while (c) abstinence-only sex education is not effective in actually achieving abstinence.

I used Cesario et al. (2008) as a guideline for creating regulatory fit. The most important consideration in creating fit could be summarized as follows:

As for the use of regulatory focus in testing fit predictions, a common confusion is to equate promotion focus with approaching desired end states and prevention focus with avoiding undesired end states. Promotion and prevention focus refer both to approaching desired end states and to avoiding undesired end states; that is, both promotion-focus and
prevention-focused individuals are concerned with approaching success and avoiding failure, but they represent these states differently. For promotion-focus individuals, success is the presence of positives and failure is the absence of positives, and there is motivation toward both these states. Conversely, for prevention-focus individuals, success is the absence of negatives and failure is the presence of negatives, and again, there is motivation toward both. (Cesario et al., 2008, p. 456)

To represent each desired and undesired state, I created a table (see Table 1) based on factual information contained in McKay and Bissel (2010) and the theoretical framework presented earlier. It summarizes what prevention and promotion focused individuals were likely to see as desired and undesired events, given information about sex education discourses.

Table 1

<table>
<thead>
<tr>
<th>Prevention Frame</th>
<th>Promotion Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Absence of negatives/non-loss</strong> in broad-based sex education curriculum:</td>
<td><strong>Presence of positives/gain</strong> in broad-based sex education curriculum:</td>
</tr>
<tr>
<td>• No increase in sexual behaviour or earlier onset (i.e., no promiscuity)</td>
<td>• Develop skills and knowledge that match one's values to make informed decisions</td>
</tr>
<tr>
<td>• No attack on values (e.g., abstinence)</td>
<td>• Achieve delayed sexual onset and reduced risk</td>
</tr>
</tbody>
</table>

| **Presence of negatives/loss** in abstinence-only curriculum: Negative sexual outcomes teenagers still have sex, and in risker ways (higher STI risk due to less contraception) | **Absence of positives/non-gain** in abstinence-only curriculum: Missed opportunity to develop skills and achieve harm reduction |

I then re-wrote the selected excerpts from McKay and Bissel (2010) to emphasize both the content and language related to approaching the desired states and avoiding the undesired states for both prevention and promotion focused individuals. Although the emphasis differed, actual factual content was identical in both conditions. Final experimental articles for promotion
and prevention frames as well as the original excerpt are available in Appendix C. I aimed for readability at the grade eight level.

I considered using a control group that would read the original unmodified excerpt. However, none of the regulatory fit literature encountered during my literature review discussed control groups. As a result, I knew that previous literature found differences between the experiences of fit and non-fit, but I was not sure what kind of control group would be valid in this type of research or what differences between fit and control or non-fit and control could be expected. My greatest concern was that adding a control group would increase sample size requirements by 50%, leading to an unmanageable budget strain. Given that my existing sample size was suitable only for detection of mid-size interaction effects at best, adding another group without increasing the number of participants seemed too risky. For all these reasons, I chose to proceed with what appeared to be typical practice in regulatory fit research tradition and to forego the control group.

**Manipulation check.** Inserting a manipulation check seemed especially important in a design that lacked a control group. Key perceptual difference between promotion and prevention in the experience of regulatory fit is described as a difference of means in goal striving: Prevention is associated with *vigilant means* whereas promotion is associated with *eager means* (Cesario et al., 2008). However, *vigilant means* and *eager means* did not seem like terms in common use that would be intuitively understood by participants. Consequently, the manipulation check item asked the participants to rate the tone of the article on a continuum from cautious to enthusiastic. The response options presented a Likert scale ranging from 1 (very cautious) to 7 (very enthusiastic).
Measures. Choosing crowdsourcing as a setting also affected decisions about measures. That is, an important consideration in study design has been balancing data collection needs with time expected to complete the study. Due to budgetary considerations, it was important to ensure that reasonable time expected to complete the study would not exceed 20 minutes for the majority of participants. I used descriptive data from my Bachelors thesis of a similar design (i.e., the number of items and the time it took participants to complete the study) at the planning stage: My goal was to limit the total number of items to approximately 100. Therefore, I needed measures that were reasonably brief. Once measures were chosen, I pre-tested the study on friends and family (n = 6) for time to complete the study and any other comments.

It is important to use valid and reliable instruments to measure all constructs of interest. However, availability of such instruments varied significantly, as described further.

Moral foundations. For moral foundations, the instrument choice was straightforward, as only one established questionnaire exists: the moral foundations questionnaire (the MFQ, Graham et al., 2011). The MFQ is a 30-item self-report measure divided into two parts (moral relevance and moral judgment), both of which are measured on a Likert scale. Moral relevance asks participants to rate how relevant certain considerations are when they think about questions of right and wrong, and the response options range from 0 (not at all relevant) to 5 (extremely relevant). Moral judgment asks participants to rate agreement or disagreement with a set of statements, and the response options range from 0 (strongly disagree) to 5 (strongly agree).

Each moral foundation is measured by a total of six items, derived from three moral relevance items and three moral judgment items. The higher the score, the more an individual invokes a particular foundation when making moral evaluations. Internal consistencies in the online validation sample of over 30,000 respondents were .69 for harm, .65 for fairness, .71 for
ingroup, .74 for authority, and .84 for purity. Test-retest reliability was explored in a sample of 123 college students over the period of 28 to 43 days, with coefficients of .71 for harm, .68 for fairness, .69 for ingroup, .71 for authority, and .82 for purity (all $p$-values were <.001).

**Regulatory focus.** The academic literature is populated by several measures of chronic regulatory focus that reflect different conceptualizations of the underlying phenomena. Haws, Dholakia, and Bearden (2010) empirically evaluated five commonly used questionnaires over seven different studies, concluding that the regulatory focus questionnaire (RFQ; Higgins et al., 2001) consistently outperformed other measures on predictive validity and stability over time. However, Haws et al. also complicated the picture by proposing a composite scale based on the best conceptually representative and empirically performing items from all evaluated questionnaires. I ultimately chose the RFQ over the Haws et al. composite measure due to its reported validity, reliability, and popularity. The latter consideration matters as it enables direct comparisons with previous research.

The RFQ is an 11-item self-report measure that uses Likert scale with varied response options ranging from 1 to 5. The RFQ conceptualizes aspects of chronic regulatory focus as prevention pride (5 items) and promotion pride (6 items). These concepts reflect motivational orientations developed over lifelong experiences of achievement and self-regulation, as related to distinct prevention and promotion styles of goal pursuit (Higgins et al., 2001). The RFQ "primarily centers on... ideals versus obligations, with a significant portion of items dealing with parental interaction" (Summerville & Roese, 2008, p. 249). The RFQ internal consistencies have been reported as .64 to .73 for promotion pride and as .8 for prevention pride (Haws et al. 2010; Higgins et al., 2001;). The test-retest reliability after two months was reported at .79 for promotion pride and .81 for prevention pride ($p <.001$ in both cases; Higgins et al., 2001).
Lastly, another intriguing conceptualization and way of measuring regulatory focus comes from research on values. Specifically, Schwartz (1992, 2012) axis of *conservation* versus *openness to change* has been used in research as a conceptual substitute for promotion and prevention motivations (Lukas & Molden, 2011; Malka, Soto, Inzlicht, & Lelkes, 2014). Schwartz (1992, 2012) postulated a number of universal values that could be aligned along several dimensions. The values of security, conformity, and tradition fall under the conceptual umbrella of conservation, and are associated with self-protection against threat and loss (Schwartz, 2012). The values of stimulation, self-direction, and hedonism fall under the conceptual umbrella of openness to change, and are associated with self-expansion, growth, and promotion of gain-oriented goals (Schwartz, 2012). As such, this value continuum reflects "a fundamental trade-off that humans face: seeking novel and potentially rewarding experience versus playing it safe and conforming" (Malka et al., 2014, p. 1032).

The short Schwarz value survey (the SSVS; Lindeman & Verkasalo, 2005) is a brief 10-item adaptation of the original 57-item Schwartz value survey (the SVS; Schwartz, 1992). The scale is a self-report measure that asks respondents to rate the importance of specific values as life-guiding principles. It provides Likert-style response options on a continuum from *against my principles* to *of supreme importance* with seven or nine response options. The axis of conservation versus openness to change involves only six items. This axis had reported internal consistency of .6 and two-week test-retest reliability of .71 (Lindeman & Verkasalo, 2005). Adding this 6-item axis to the study inventory provided the benefit of an additional brief measure that could (a) help decide which regulatory focus measure works best for this study and (b) potentially enable wider cross-cultural comparisons due to previous research based on Schwartz values surveys (e.g., Moltka et al., 2014).
**Sex education attitudes.** Unfortunately, literature searches for sex education attitudes did not identify a pre-existing reliable measure suitable for the goals of this study. That is, multiple studies of parental sex education attitudes have been published that follow a similar descriptive format (e.g., Bleakley et al., 2006; McKay et al., 2014). These studies commonly focused on whether parents agree with the importance of sex education provision in schools, grades when sex education should start, satisfaction with exposure to existing programs, importance of various topics, and parents' level of comfort with talking to their children about sex education and with multiple potential sources of related information (McKay et al., 2014). I was only able to locate one quantitative study that explored conceptual foundations of sex education attitudes based on effectiveness beliefs: Bleakley et al. (2010) found that parental support for type of sex education in the U.S. depended on how much people believed in the effectiveness of comprehensive or abstinence-only sex education, as well as on political ideology and religious attendance. Bleakly et al. designed their own dependent measures for their study.

None of the questionnaires used in previous research were conceptually reflective of the current study's underlying theoretical framework. Consequently, answering my research questions required developing my own sex education attitude items. Bleakley et al. (2010), despite a different focus of investigation, provided some of the blueprints for the current study. Important considerations for item development included the scope of this thesis: That is, the goals were to answer exploratory research questions rather than to create and validate a new scale. My final questionnaire consisted of nine self-report items. The rationale for each item was as follows.

One item assessed overall issue importance to the respondent. Another assessed perceived importance of sex education provision in schools, copied verbatim from McKay et al.
Two items measured the perceived importance for sex education to align with the goals established by Public Health Agency of Canada (2008): Avoidance of negative outcomes and achievement of positive outcomes, with outcome descriptions copied verbatim from the source. These two distinct goals seemed to fit extremely well with prevention and promotion motivations. Furthermore, as these are listed as major goals of Canadian public policy on sex education, I was curious to see how much respondents would endorse them. One item attempted to directly reflect the liberal discourse on sex education by assessing the importance of knowledge acquisition and skill development in sex education. In fact, when conceptualizing this questionnaire, I expected for all of the latter three items to be reflective of the liberal discourse given their focus on tangible goals and outcomes.

The next four items attempted to reflect concerns raised by the conservative discourse on sex education. Specifically, two items were based on Crawford et al. (2014), who investigated how threatening various groups were to traditional moral values about sex. The items assessed beliefs about the threatening nature of comprehensive sex education to traditional moral values and to personal moral values of the respondent. One item inquired about the importance of sexual abstinence, based on the prominence of abstinence in the U.S.-based literature. Lastly, one item was inspired by the Schein and Gray (2015) argument that all moral concerns are linked to harm and in particular the idea that purity violation is most importantly a kind of harm. Specifically, it asked people to rate to what extent they believed sex education could have harmful moral consequences.

All items were Likert scale with similar response options. Depending on whether the item stem asked to rate importance or agreement, the responses ranged from 1 (strongly disagree) to 6 (strongly agree), or from 1 (not important at all) to 6 (very important). This way,
higher rating corresponded with the extent of statement endorsement. The final questionnaire is available in Appendix D.

**Persuasion.** The items assessing article persuasiveness were based primarily on Cohen et al. (2007); a conceptually similar study identified during my literature search for potential effective interventions. Cohen et al. investigated the impact of a self-affirmation exercise on participants' willingness to be open to ideologically threatening information. Specifically, as a dependent variable in study 1, Cohen et al. asked the participants to rate (a) how convincing and valid they found the intervention article they read; and (b) how reasonable, objective, intelligent, informed, and biased they found its author. Additionally, Lewandowsky et al. (2012) stated that when information fits a person's worldview, it is perceived as coherent and credible. Therefore, having participants evaluate how coherent and credible they found the information they read seemed like a meaningful addition to the items developed by Cohen et al.

For the current study, I modified the items to be equally balanced between evaluating the article and evaluating its author. The final persuasion items asked the participants to rate how credible, logical, convincing, and reasonable they found the article and how objective, informed, intelligent, and biased (reverse-coded) they thought its author was. The response options presented a Likert scale from 1 (not at all) to 6 (a great deal), so that higher ratings corresponded to higher article persuasiveness.

Other items based on Cohen et al. (2007) included asking participants to assess the validity of specific claims made by the intervention article. For the current study, I asked participants to rate how true the following two claims were: (a) comprehensive sex education can be compatible with values of sexual chastity and abstinence, and (b) reduction or delay in sexual activity are some of the outcomes of broad-based comprehensive sex education. The response
options were Likert scales ranging from 1 (certainly false) to 7 (certainly true), so that higher rating corresponded to higher agreement.

Lastly, I wanted to include some kind of behavioural measure rather than to rely solely on self-report. After brainstorming possible options, I arrived at the following two items. The first item asked participants to what extent they would support researchers making more information about comprehensive sex education available to their local school board. The response options on this item ranged from 1 (definitely not) to 7 (definitely yes). The second item was explicitly marked as optional and provided space to type in the name of participant's school district if the answer to the previous question was positive. This way, the decision to provide school district information was treated as a binary behavioural measure. To ensure no deception, I will follow up with school districts for the participants who chose to input this information after this thesis write-up is finalized.

The full listing of all persuasion items is available in Appendix D.

Anxiety. Reviewing information provided by Jonas et al. (2014) indicated that research into psychological threat and defense does not appear to rely on specific state anxiety scales. Instead, it seemed that most researchers employed a number of varied dissonance thermometer adjectives such as bothered or uneasy (Jonas et al., 2014). Although multiple anxiety scales have been developed for clinical application and clinical research purposes, none of them were listed in the enormous systematic review compiled by Jonas et al. The reasons may be budgetary, as my own search for reliable state anxiety scales indicated that most were cost-prohibitive for the current study.

Boyle, Saklofske, and Matthews (2014) completed a thorough review of measurement tools for personality and social psychology research, including measures of transient affective
states, such as anxiety. Their work helped me to identify the Tense Arousal subscale of the UWIST Mood Adjective Checklist (the UMACL; Mathews, Jones, & Chamberlain, 1990) as a brief, reliable, and free scale that seemed conceptually fitting to measure state anxiety. Specifically, UMACL has been used to study situational stress responses in field studies of driver stress and test anxiety (Boyle et al., 2014). The Tense Arousal subscale includes eight items asking respondents to rate how they are feeling in the moment. Four items are worded to reflect an anxious state and four items are worded to reflect a calm state (reverse-coded), with all items measured on a Likert scale self-report that ranges from 1 (definitely) to 4 (definitely not). The subscale’s reported internal consistency is .86 (Mathews et al., 1990). As it is a state measure, test-retest reliability varies significantly, and the Tense Arousal subscale specifically showed convergent validity with autonomic arousal (Boyle et al., 2014).

Although the UMACL Tense Arousal subscale seemed like a valid measure of felt anxiety, it has not been previously tested in psychological threat and defense research. Therefore, I also included five dissonance thermometer adjectives that were reliably and specifically associated with the activation of behavioural inhibition system under psychological threat: bothered, uneasy, uncomfortable, uncertain, and frustrated (Jonas et al., 2014; Nash, McGregor, & Prentice, 2011). The response options for these adjectives were the same as for the UMACL Tense Arousal scale to maintain consistency. To help with interpretation during analysis, I reverse-coded anxiety composites so that lower ratings indicated lower anxiety.

**Control variables.** In this study, the difference between control variables and substantive variables is a question of focus. I am interested in what additional contributions moral foundations and regulatory focus could bring to understanding sex education attitudes beyond
what was studied by previous research. Therefore, I am treating the concepts described below as control variables.

Previous research on attitudes toward sex education included a number of potential control variables. However, the findings were mixed. First, given that most studies of sex education attitudes explicitly targeted parents of school-aged children, it seems an expectation exists that parental attitudes are more important than those of non-parents. Furthermore, the Forum Poll in Ontario found higher rates of disapproval toward proposed curriculum changes among the parents of children under 18 than among the population overall (Bozinoff, 2015). Yet interestingly, Bleakley et al. (2010) did not find that having an adolescent in the household significantly affected respondents' beliefs or policy outcomes.

Furthermore, Bleakley et al. (2010) found that religious attendance and political ideology had multiple strong relationships with sex education attitudes and policy beliefs. McKay et al. (2014) used attendance in Catholic schools and in secular public schools as a proxy for religiously and found no significant differences in parental attitudes between these two factors. It also appears that some other demographic factors have demonstrated statistical but not practical significance in previous research. Specifically, Bleakley et al. also found some impact of education, race or ethnicity, gender, and income, yet in terms of variance explained, these factors accounted for much less relative to religious attendance and political ideology. McKay et al. (2014) found some statistically significant differences between mothers and fathers but indicated that these differences explained less than 1% of overall variance and therefore were likely unimportant in practice.

Given confusing findings from previous literature and importance of replication, I decided to include multiple potentially relevant control variables in this study to empirically test
their importance. Specifically, I chose to include single-item measures of age, gender, education, and religious attendance. I also included an item asking if respondents were from the U.S. or from Canada. Given the prevalence of U.S. residents in crowd-sourcing populations (Paolacci & Chandler, 2014), the possibility of obtaining a sizeable Canadian sample was uncertain. Accomplishing this goal also required having the survey restricted to Canadians only for approximately two weeks before opening it to allow U.S. residents as well. Political ideology was measured as well yet in a different way than the typical single-item tool, as described below.

Choma, Busseri, and Sadava (2009) proposed functional independence between liberalism and conservatism: Specifically, they found that liberalism and conservatism are differentially related to negative and positive affect. Choma, Hafer, Dywan, Segalowitz, and Busseri (2012) continued this line of investigation. They found that when measured separately, (a) conservatism and liberalism are differentially related to a number of psychological correlates of ideology, such as general inclusive orientation or dogmatism and (b) two-factor correlated model of conservatism and liberalism ($r = -.5$) fits data significantly better than a single-factor model or a two-factor orthogonal model. These findings of functional differences were consistent with regulatory focus conceptualizations of ideology (e.g., Cornwell & Higgins, 2013), connecting chronic prevention focus with conservatism and chronic promotion focus with liberalism. Therefore, I employed two different items to measure social conservatism and social liberalism rather than a more commonly used single-item measure. I did not adopt Choma et al. (2012) entire 6-item measure of political ideology because for this study, only social aspects of ideology were relevant (each measured by a separate single item by Choma et al., 2012).
CHAPTER FOUR: RESULTS

This chapter summarizes data cleaning steps and descriptive results, discusses various procedures employed for data analysis and their rationale, and presents a summary of results for both hypothesis-testing and exploratory analyses.

Preliminary Data Cleaning: Procedures and Outcomes

The following section summarizes the rationale and steps taken for initial data cleaning. IBM SPSS was used for all statistical analyses (versions 23.0 and 24.0). Data cleaning procedures included dealing with inattentive responses, missing data, as well as univariate and bivariate outliers. Screening for more complex multivariate outliers affecting procedures such as regression was done as needed during main analyses. In making decisions to remove cases before conducting main analyses, I followed well-established guidelines for caution (e.g., Tabachnick & Fidell, 2013). That is, to repeat the analyses with all cases included to see whether doing so affects inferences drawn from the results.

Inattentive responding. The total number of participants recruited using the CrowdFlower platform was 524. The total number of completed surveys in Qualtrics was 503, which indicates that 21 participants (4%) dropped out of the study. The dataset was examined for carelessly invalid responses using guidelines developed by Curran (2016), based on a recent systematic review of relevant methods and techniques. Curran described carelessly invalid responding as "missing data that is not actually missing" (p. 1) due to thoughtless, inattentive, or inaccurate responses. This type of responding is a common problem in quantitative self-report data and represents a potential threat to internal validity of analysis (Curran, 2016; Maniaci & Rogge, 2014). For example, established findings connecting personality traits and self-esteem
have been shown to replicate in attentive samples and fail to replicate in inattentive samples (Maniaci & Rogge, 2014).

Curran (2016) recommended conservatively employing a combination of several techniques to detect multiple potential patterns of carelessness while minimizing power loss. Selection and combination of these techniques usually depends on survey design: That is, some techniques are available in any study (e.g., total response time), yet other techniques can only be used if their corresponding prerequisite measures were originally included in study design. My dataset had the following options available: (a) response time, (b) self-report items on data quality, (c) string or invariability analysis, (d) as well as semantic and psychometric antonyms. I removed a total of 26 participants (5.2%) for the following reasons: (a) 11 participants for failing the total response time criteria (at least 2 seconds per item); (b) three participants for indicating their data was problematic (data quality self-report); (c) three participants for extreme invariance on multiple questionnaires (e.g., all the same answers on four questionnaires); (d) four participants for failing the semantic antonyms criteria (e.g., claiming to be a parent in the beginning and then denying it later); (e) and five participants for failing the psychometric antonym criteria (i.e., indicating extremely high social conservatism simultaneously with extremely high social liberalism).

Detection of careless responding involves the need to make difficult trade-off decisions. This trade-off is between potentially losing internal validity due to keeping inattentive responses in the dataset, and losing both statistical power and generalizability due to removing too many participants who may actually be genuine. One way in which such internal validity loss could be conceptualized and estimated is through erosion in internal consistencies for scale-based variables of interest. Specifically, Maniaci and Rogge (2014) found that confirmed inattentive
respondents produced drastically reduced internal consistencies relative to attentive respondents: That is, reductions of approximately .2 to .5 using Cronbach's alpha coefficient. However, no meaningful differences in Cronbach's alpha coefficients were found when comparing the data sets before and after inattention detection procedures. Nonetheless, the findings reported throughout this study are based on the data set that removed potentially inattentive respondents, as explained above.

On another note, I aimed to include parents only in my survey and specified this requirement in my recruiting materials. However, I did not develop screening measures to specifically exclude non-parents. Because a notable number of non-parents ignored these instructions and participated, their responses could be classified as inattentive. However, removing over 23% of participants would produce a notable loss of power. Furthermore, skipping instructions is a particularly common form of inattention that, depending on the context, may not necessarily constitute the kind of excessive inattention that noticeably degrades results (Maniaci & Rogge, 2014). My own data seemed to support this notion: Differences in internal consistency (Cronbach's alpha coefficients) for scale-based variables between the total sample and the parents' sample were around .01-.02, and between the parents and the non-parents respectively these differences were around .02-.05. Moreover, in some cases, the direction of these differences favoured the non-parent sample. Therefore, I made a decision to include these participants in the main analyses, especially as it also opened up an avenue to explore potential differences between parents and non-parents.

**Missing data.** The next step was to examine the amount of missing data. Three participants were removed for failing to answer most items on at least one full questionnaire, resulting in a data set of 474 participants. The overall amount of missing data was very small at
only 0.5% of data missing on average across all items. Per item percentages of missing data ranged from none (on 17 items) to 2.1% (on 1 item).

In SPSS, inferential tests for potential patterns in missing data are only available for items that have more than 5% of missing data (Tabachnick & Fidell, 2013), so I was unable to establish whether the data was missing completely at random or at random for any item. However, when the amount of missing data is small, such as 5% or less, the choice of missing data strategy is practically inconsequential as results are expected to be very similar (Tabachnick & Fidell, 2013). Nonetheless, I considered several options, including multiple imputation as it has been described as "the most respectable method" (Tabachnick & Fidell, 2013, p. 72). Yet multiple imputation is not compatible with Hayes' PROCESS module for conditional analysis, so relying on it would have restricted available analytical techniques.

A fundamental principle for dealing with missing data is to use all available information (Newman, 2009). When variables of interest are scale-based composites and data is missing at item-level only, using each individual's mean of available scale items when calculating the individual's scale score has been recommended (Newman, 2009). Several control variables were represented by single items (e.g., age, gender, social conservatism, social liberalism, and religious attendance). Analyses involving these variables, as well as factor analysis, effectively relied on listwise exclusion as needed during each analytic procedure. Given the relatively large total sample size and low per-item percentages of missing data, the resulting loss of power was of little consequence.

Outliers. Outliers can be defined and detected in an overwhelming variety of ways: Aguinis, Gottfredson, and Joo (2013) described 14 mutually exclusive definitions and 39 various identification techniques. Aguinis et al. (2013) recommend that researchers (a) choose
definitions and techniques that are consistent with each other and with their research purpose, and (b) report these selections for increased transparency. Following their recommendations, my choices for dealing with outliers are presented in detail.

As this current analysis relies primarily on regression, my main concern has been with outliers defined by undue influence: That is, with outliers that impact model fit or parameter estimates so much that their presence changes inferences drawn from the analysis. I relied on recommendations by Tabachnick and Fidell (2013) for dealing with univariate and bivariate outliers in the overall data set and on recommendations by Aguinis et al. (2013) for dealing with multiple-construct outliers with potential influence on each regression.

After computing all scale-based variables of interest, I reviewed them and the single-tem control variables for out of range values and for univariate outliers. The single out-of-range value (a 510-year-old participant) was changed to missing. A small number of univariate outliers (defined as values with absolute standardized scores in excess of 3.29; Tabachnick & Fidell, 2013) were found for most variables. Except for demographic characteristics, all of them were winsorized to reduce potential influence on further analyses.

Then the data were reviewed for bivariate correlations between all constructs of interest and for bivariate outliers. Eyeballing bivariate plots indicated a significant amount of scatter for most variables with few to none outliers noticeably contradicting the direction of bivariate correlations. However, one individual's data appeared as a consistent and noticeable outlier on four bivariate plots of interest to further analyses. I made the decision to remove this person's data from the dataset before continuing with further analyses designed to directly answer research questions. Therefore, the final data set consisted of 473 participants.
For potentially influential outliers, Aguinis et al. (2013) suggest the following. First, potential outliers should be identified using a multiple-construct measure. Aguinis et al. (2013) and Tabachnick and Fidell (2013) described Mahalanobis distance and leverage values as interchangeable approaches for this purpose, yet they provided different suggested cutoffs for Mahalonobis distance. No such confusion was found for leverage values. Therefore, I used leverage values (centered, as that is what SPSS output provides) instead of Mahalonobis distance. For centered leverage values, the suggested cutoffs were \(2k/N\) for large sample sizes, where \(k\) = number of predictors and \(N\) = sample size (Cohen et al., 2003; Aguinis et al., 2013; although no guidance was provided to help distinguish between large and small sample sizes).

The next step is to directly investigate the effect of potential outliers on regression fit. This is done by checking whether removing these outliers changes the model fit index in question (e.g., \(R^2\)) "either from statistically significant to statistically non-significant, or vice versa" (Aguinis et al., 2013, p. 289). In addition to model fit, outliers could also have effect on parameter estimates. Aguinis et al. (2013) recommend identifying potential presence of such outliers by using direct measures of influence. I chose Cook's \(D_i\) as a global indicator of influence on all coefficients, with cutoff values calculated as follows:

We suggest the following cutoffs... where \(k\) represents the number of predictors, and \(n\) represents the number of observations. For Cook’s \(D_i\), the recommendation is to use the \(F\) distribution, with \(\text{df} = (k + 1, n - k - 1)\) and \(\alpha = .50\), to determine the statistical significance of the values at hand.

(Aguinis et al., 2013, p. 291)

The cutoff value of 1.90 for was chosen as the single most conservative value for all numbers of predictors and participants in these analyses.
Descriptive Results: Sample Characteristics

The final sample consisted of 473 participants. Participant ages ranged from 18 to 80, with a mean of 37 years, median of 33.5 years, and standard deviation of 12.4 years. Despite a request that only parents complete the survey, 110 participants said they were not parents (23.3%), 358 participants identified as parents (75.7%), and five participants did not indicate their parental status (1.1%). Among those who identified as parents, examination of children ages revealed that 165 participants (34.9% of the total sample) were currently parenting a teenager or an adolescent (defined as nine to 19 years old). Because my original conceptualization did not include implications of parental status, I treated this variable the same way as gender or country of residence: That is, as a potential control variable.

The rest of demographic data together with information on religious attendance is summarized in Table 2. For political ideology, the means and standard deviations were 4.5 (out of 9) and 2.0 for social conservatism and 5.9 (out of 9) and 1.9 for social liberalism, respectively.

Table 2

Demographic Characteristics And Religious Attendance Summary For The Final Sample

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>227</td>
<td>48%</td>
</tr>
<tr>
<td>Male</td>
<td>246</td>
<td>52%</td>
</tr>
<tr>
<td>Country of residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>U.S.A</td>
<td>246</td>
<td>51.7%</td>
</tr>
<tr>
<td>Canada</td>
<td>220</td>
<td>46.5%</td>
</tr>
<tr>
<td>Undisclosed</td>
<td>7</td>
<td>1.5%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>376</td>
<td>79.5%</td>
</tr>
<tr>
<td>Asian</td>
<td>39</td>
<td>8.2%</td>
</tr>
<tr>
<td>Hispanic or Latin American</td>
<td>23</td>
<td>4.9%</td>
</tr>
<tr>
<td>African American or Black</td>
<td>20</td>
<td>4.2%</td>
</tr>
<tr>
<td>Native American, Indigenous, Aboriginal, or First Nations</td>
<td>11</td>
<td>2.3%</td>
</tr>
<tr>
<td>Other or undisclosed</td>
<td>4</td>
<td>0.8%</td>
</tr>
<tr>
<td>Characteristic</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>---------------</td>
<td>----</td>
<td>------</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school or less</td>
<td>91</td>
<td>19.2%</td>
</tr>
<tr>
<td>Attended or completed community or technical college</td>
<td>118</td>
<td>24.9%</td>
</tr>
<tr>
<td>Attended university or completed an undergraduate degree</td>
<td>207</td>
<td>43.8%</td>
</tr>
<tr>
<td>Completed post-graduate or a professional degree</td>
<td>55</td>
<td>11.6%</td>
</tr>
<tr>
<td>Undisclosed</td>
<td>2</td>
<td>.4%</td>
</tr>
<tr>
<td>Religious attendance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not attend religious services,</td>
<td>195</td>
<td>41.2%</td>
</tr>
<tr>
<td>Less than once or twice a year,</td>
<td>79</td>
<td>16.7%</td>
</tr>
<tr>
<td>A few to many times a year</td>
<td>103</td>
<td>21.8%</td>
</tr>
<tr>
<td>1-3 times a month,</td>
<td>48</td>
<td>10.1%</td>
</tr>
<tr>
<td>Once a week or more</td>
<td>47</td>
<td>9.9%</td>
</tr>
<tr>
<td>Undisclosed</td>
<td>1</td>
<td>.2%</td>
</tr>
</tbody>
</table>

**Data Analysis: Key Procedures and Considerations**

All of my research questions fall into the broad category of understanding relationships between simultaneously measured variables of interest. In quantitative methods, regression analysis is viewed as a good method for answering these kinds of questions in both experimental and correlational designs (Hayes, 2013; Tabachnick & Fidell, 2013). It is worth noting that previous experimental literature on regulatory focus, including seminal articles (e.g., Cesario et al., 2004; Higgins et al., 2001) routinely relied on median splits of the continuous difference between promotion scores and prevention scores. However, the methodological literature seems unanimous in condemning median splits for needlessly discarding valuable information that regression can utilize fully to answer the same questions (e.g., Cohen, 1990; Hayes, 2013). Furthermore, Haws et al. (2010) evaluated several chronic regulatory focus measures, concluding that both theoretically and empirically, there is little to no relationship between promotion and prevention scores: Thus, promotion and prevention should be treated as separate variables in analysis rather than opposites on a single dimension, whether dichotomous or continuous.
In using regression to answer my research questions, I relied primarily on Hayes (2013) framework for conditional process analysis (i.e., mediation, moderation, and models involving their combinations). Many moderation and mediation analyses were performed using the Hayes' PROCESS SPSS custom dialog (version 2.13). However, as PROCESS does not provide semipartial correlations for individual variables or outlier evaluation measures (e.g., leverage values or Cook's distance), regular SPSS regression procedures were also utilized to obtain this information, where both meaningful and practical.

Substantively, regulatory focus and moral foundations could play a multitude of roles in predicting sex education attitudes, separately, together, or interacting with each other. Exploring every single possibility would be an impractical task. In accordance with Hayes (2013) model building suggestions, I developed a small number of plausible models to investigate and compare with each other. Some of these models reflected my original preconceptions. However, other models were developed on the go based on sample characteristics and emerging results. An unexpected opportunity to compare parents and non-parents is an example of this logic. In presenting results, I aim to clearly delineate which models and predictions were specified in advance and which were purely exploratory.

Cohen (1990) strongly advocated against reporting multiple decimal places when presenting numerical results because additional precision becomes illusionary once standard error of estimate is considered. Moreover, Cohen referred to such reporting practice as "worse than useless because the clutter... particularly in tables, serves to distract the eye and mind from the necessary comparisons among the meaningful leading digits" (Cohen, 1990, p. 1305). Therefore, except where conventionally expected to provide three decimal places (e.g., p-value), I report the results up to only one or two decimal places depending on what is most meaningful.
Sex Education Attitudes: Preliminary Data Analysis

Answering questions about sex education attitudes requires a clear measure of these attitudes. As I did not find a satisfactory measure in previous literature and had to develop my own items, my first task was to determine whether these items reflected the underlying constructs I expected to see.

**Factor analysis procedure.** When researchers aim to understand the presence and nature of potential latent constructs behind a set of questions, *factor analysis* is the typical method of choice (Bandalos & Boehm-Kaufman, 2009; Tabachnick & Fidell, 2013). It "reveals patterns of correlation among the variables that are thought to reflect underlying processes" (Tabachnick & Fidell, 2013, p. 612). I chose the Principal Axis Factoring extraction method (analyzing correlation matrix) because it does not rely on normality assumption for variable distribution, and happens to be both widely-used and recommended by at least some methodological literature (Costello & Osborne, 2005; Tabachnick & Fidell, 2013).

Costello and Osborne (2005) generally recommended the use of oblique rotation in social sciences, as most variables of interest are likely to be inter-correlated. Furthermore, if the assumption of correlation is wrong, an oblique rotation should produce an orthogonal solution anyway (Bandalos & Boehm-Kaufman, 2009). Given that differences between different oblique rotations seems to be small (Costello & Osborne, 2005; Tabachnick & Fidell, 2013), I experimented with both Direct Oblimin and Promax rotations. Both methods produced substantively identical solutions: Exact loadings differed slightly, but the items comprising each factor were identical, and even their relative loadings were similar. The results reported are derived with Promax rotation.
**Factor analysis results.** The number of valid cases for the factor analysis was 463. On nine items, this led to a 50:1 subject-to-item ratio (51:1 to be exact). This subject-to-item ratio vastly exceeds the averages found in factor-analytic studies or the subject-to-item rules of thumb, lending credence to the reliability and generalizability of the coefficients obtained (e.g., Henson & Roberts, 2006; Osborne & Costello, 2005; Tabachnick & Fidell, 2013). The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .85. This value is well above the .6 cutoff criterion required (Tabachnick & Fidell, 2013) and falls in the meritorious category of how well the variables "belong together" (Dziuban & Shirkey, 1974, p. 359).

Factor analysis is a procedure that often requires researchers to make judgment calls regarding interpretability and utility of factors as the solution is constructed (Tabachnick & Fidell, 2013). In this case, the initial solution happened to demonstrate both substantive meaning and excellent psychometric properties. This solution produced a simple two-factor structure with loadings ranging from good to excellent and with very few low cross-loadings (Tabachnick & Fidell, 2013). Both the eigenvalues greater than 1 and the scree test criteria clearly indicated that only two factors should be retained. See Table 3 for the wording of each item and their respective loadings. The factor correlation in Promax rotation was -.51.

This solution also seems highly interpretable. Specifically, the first factor focuses on the pragmatic goal of avoiding harm and achieving benefit. The second factor reflects the goal of avoiding moral violation. Consequently, I named the first factor *Pragmatism*, and the second factor *Moral Threat*. I hesitate to say that the second factor concerns moral values whereas the first factor does not. If, as the moral foundations theory suggests, promoting care and avoiding harm are seen as moral values, then even Pragmatism could be said to have a moral component.
But this interpretation is arguably in the eye of the beholder. Whereas for Moral Threat, emphasis on the moral values associated with Purity is clear.

Table 3

*Exploratory Factor Analysis Items and Loadings for Sex Education Attitudes*

<table>
<thead>
<tr>
<th>Items and Loadings for Sex Education Attitudes</th>
<th>Factor1</th>
<th>Factor2</th>
</tr>
</thead>
<tbody>
<tr>
<td>How important do you think it is for sex education to help people to achieve positive outcomes (e.g., self-esteem, respect for self and others, non-exploitive sexual relations, rewarding human relationships, informed reproductive choices)?</td>
<td>.80</td>
<td></td>
</tr>
<tr>
<td>How important do you think it is for sex education to help people to avoid negative outcomes (e.g., STI/HIV, sexual coercion, unintended pregnancy)?</td>
<td>.75</td>
<td>.24</td>
</tr>
<tr>
<td>How important is the issue of sex education to you?</td>
<td>.74</td>
<td></td>
</tr>
<tr>
<td>How important do you think it is for sex education to help people to develop the knowledge and the skills to make informed decisions about sex?</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td>Do you think that sex education should be provided in schools?</td>
<td>.61</td>
<td>-.15</td>
</tr>
<tr>
<td>Do you think that comprehensive sex education threatens your personal moral values about sex?</td>
<td>.90</td>
<td></td>
</tr>
<tr>
<td>Do you think that comprehensive sex education threatens traditional moral values about sex?</td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td>Do you think that sex education could have harmful moral consequences?</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td>How important do you think it is for sex education to help people to abstain from sexual activity?</td>
<td>.15</td>
<td>.58</td>
</tr>
</tbody>
</table>

*Note.* Loadings in excess of .71 are considered excellent, .63 very good, and .55 good (Tabachnick & Fidell, 2013). Loadings below .1 were suppressed.

The two factors together accounted for 58.2% of total variance (43.7% and 14.5%, respectively). This amount is slightly higher than the average and the median (approximately 52% for both) amounts of variance explained in published exploratory factor analysis studies (based on a sample of 60 studies, Henson & Roberts, 2006). Furthermore, this comparison becomes more favourable once the method of factor extraction is taken into account. Henson
and Roberts (2006) found that a significant proportion of their sample used the principal component extraction method, which results in consistent overestimation of variance explained relative to other methods (Osborne & Costello, 2005). Yet the current result was achieved using the principal axis extraction method. Therefore, the amount of variance extracted is more likely to be accurate.

If items comprising each factor were treated as a scale, the values of Cronbach's alpha coefficients were .84 for Pragmatism and .85 for the Moral Threat. I opted for scale-based factor score estimation in future analyses as it is (a) "for many research purposes... entirely adequate" (Tabachnick & Fidell, 2013, p. 655) and (b) consistent with how all the other constructs in this study are measured and interpreted.

The extent of endorsement refers to the percentage of respondents who perceived the considerations comprising each factor of attitudes toward sex education as agreeable or important. This data is summarized in Table 4. The pattern of endorsement indicates a widespread agreement with the pragmatic view of sex education (92.8%), and a drastically lower agreement with the view that sex education can be potentially morally threatening (27.1%).

Table 4

<table>
<thead>
<tr>
<th>Extent of Endorsement</th>
<th>Pragmatism</th>
<th>Moral Threat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree or see as unimportant (&lt;3.00)</td>
<td>.8%</td>
<td>49%</td>
</tr>
<tr>
<td>Somewhat disagree or see as somewhat unimportant (3.0-3.8)</td>
<td>6.4%</td>
<td>23.9%</td>
</tr>
<tr>
<td>Somewhat agree or see as somewhat important (4.0-4.8)</td>
<td>30.9%</td>
<td>18.4%</td>
</tr>
<tr>
<td>Agree or see as important (&gt;=5.00)</td>
<td>61.9%</td>
<td>8.7%</td>
</tr>
</tbody>
</table>
Key Constructs: A Descriptive Summary

For all constructs of interest, absolute values for skewness and kurtosis were below 1, indicating that corrections to the shape of distribution were not required (Pelham, 2013).

Predictors. For the purpose of answering research questions, the key predictors included chronic regulatory focus (promotion pride and prevention pride, based on RFQ scores) and moral foundations (harm, fairness, authority, ingroup, and purity, based on MFQ scores). For further analyses both individualizing moral foundations have been collapsed into a single variable labeled individualizing MFs. The same action was done with the binding moral foundations of ingroup and authority (labeled ingroup and authority). This decision intended to improve model parsimony and variable reliability: That is, to reduce the number of predictors in the model and to improve their internal consistencies. The theoretical and empirical grounds for this decision are as follows.

Conceptually, moral foundations have been divided into two overarching groupings of individualizing and binding foundations (as discussed at length in literature review). Past empirical evidence indicates that the endorsement of both harm and fairness foundations in moral judgments follows very similar patterns (Graham et al., 2009). When it comes to binding foundations, the literature review highlighted a separate, important, and unique role of purity in sexual morality. However, no such distinct roles were assigned to ingroup or authority, and no separate hypotheses involved these foundations.

The original moral foundations model-building process also provided some support for this decision. During the MFQ development, Graham et al. (2009) reviewed empirical evidence for models of two correlated factors (binding and individualizing foundations) and of three correlated factors (individualizing foundations, purity, and authority and ingroup as one factor).
The latter three-factor model was conceptually based on the ethics of autonomy, community, and divinity (Shweder, Much, Mahapatra, & Park, 1997; as cited in Graham et al., 2011). Although the final five-factor model outperformed other models in validation samples, the three-factor model also showed acceptable performance at RMSEA of .05 (Graham et al., 2011).

Lastly, in the current study, correlation between harm and fairness was .68, \( p < 0.001 \), and correlation between authority and ingroup was .71, \( p < 0.001 \). Importantly, treating harm and fairness as separate variables for the analysis did not affect the overall picture or inferences.

**Dependent variables.** Key dependent variables included the two factors of attitudes toward sex education (i.e., Pragmatism and Moral Threat), persuasion index, and anxiety index. Both indices were calculated as averages of all persuasion and anxiety items, respectively, reverse-coded where necessary. The questionnaires also included (a) two items assessing validity of claims presented in the intervention article, (b) an item asking participants to what extent they would support researchers making more information about comprehensive sex education available to their local school board, and (c) a semi-behavioural item clearly marked as optional inviting participants to enter the name of their local school board. These latter items were originally conceptualized as additional dependent variables. However, two data-driven problems arose when making decisions about including them in the analysis as described below.

First, for the semi-behavioural item, only 50 participants out of 473 provided substantive answers (10.6% valid response rate, with three additional individuals typing responses other than a school district identification). This number seems too low for a meaningful analysis. It also raises questions about why the response rate for this particular item was so low and thus about the validity of this item. These questions are especially relevant when 140 participants (29.6%)
said they would *definitely* support researchers in making more information available to their school boards.

Second, the items assessing claim validity had acceptable internal consistency yet one that was notably lower than the internal consistency of persuasion index. Although the number of items likely significantly contributed to this difference (the persuasion index included eight items, whereas claim validity only included two items), it still meant that the persuasion index was a more reliable dependent variable for analysis. Although for dependent variables, these differences do not change the slope of regression line, they affect variability of residuals and could degrade observed correlations relative to their potential true size (Cohen et al., 2003).

**Internal consistency.** Table 5 summarizes key descriptive statistics and internal consistency values for predictors of interest. It also provides a snapshot comparison of these values with previous literature, based on the original psychometric evaluation studies of the relevant instruments (i.e., Graham et al., 2011, for the MFQ, and Higgins et al., 2001, for the RFQ). It is worth noting that mean value for purity in this sample resembled the purity mean value for the conservative sub-sample in Graham et al. (2011), which was also approximately 2.9. Furthermore, a review of statistical output for Cronbach's alpha if item deleted for all predictors did not indicate meaningful improvements.

In light of promotion pride's internal consistency being so low, I attempted to see whether merging the promotion pride score with the openness to change score would make a difference. As discussed in the Method chapter, solid theoretical reasons exist for this action, as these constructs share significant conceptual similarities and have been substituted for each other in previous research (Lukas & Molden, 2011; Malka et al., 2014). However, these attempts did not lead to any substantial improvements in the values of Cronbach's alpha and therefore were
discarded. Due to unacceptably low internal consistency of openness to change on its own, only promotion pride and prevention pride were incorporated into further analyses as measures of chronic regulatory focus.

Descriptive data and internal consistencies for dependent variables are summarized in Table 6. The anxiety index was coded to represent no detectable anxiety as 0. I also reviewed statistical output for Cronbach's alpha if item deleted for all dependent variables. The only construct where a meaningful improvement in internal consistency was detectable was Moral Threat. Removing one item (how important do you think it is for sex education to help people to abstain from sexual activity?) changed the value of Cronbach's alpha for Moral Threat from .85 to .90. However, doing so would have left this construct with merely three items, and .85 already represents one of the highest internal consistencies in this data set.

Table 5

*Descriptive Data And Internal Consistencies For Predictor Variables*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Cronbach's Alpha</th>
<th>Values From Previous Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotion Pride</td>
<td>3.4/5</td>
<td>.6</td>
<td>.64, 6 items</td>
<td>Alpha = .73</td>
</tr>
<tr>
<td>Prevention Pride</td>
<td>3.2/5</td>
<td>.7</td>
<td>.79, 5 items</td>
<td>Alpha = .80</td>
</tr>
<tr>
<td>Conservation</td>
<td>5.2/7</td>
<td>1.0</td>
<td>.76, 3 items</td>
<td>n/a</td>
</tr>
<tr>
<td>Openness to Change</td>
<td>4.9/7</td>
<td>.8</td>
<td>.55, 3 items</td>
<td>n/a</td>
</tr>
<tr>
<td>Harm</td>
<td>3.6/5</td>
<td>.7</td>
<td>.69, 6 items</td>
<td>Alpha = .69</td>
</tr>
<tr>
<td>Fairness</td>
<td>3.5/5</td>
<td>.7</td>
<td>.65, 6 items</td>
<td>Alpha = .65</td>
</tr>
<tr>
<td>Ingroup</td>
<td>2.9/5</td>
<td>.8</td>
<td>.72, 6 items</td>
<td>Alpha = .71</td>
</tr>
<tr>
<td>Authority</td>
<td>3.2/5</td>
<td>.7</td>
<td>.68, 6 items</td>
<td>Alpha = .74</td>
</tr>
<tr>
<td>Purity</td>
<td>2.9/5</td>
<td>1.0</td>
<td>.83, 6 items</td>
<td>Alpha = .84</td>
</tr>
<tr>
<td>Individualizing Moral Foundations</td>
<td>3.6/5</td>
<td>.6</td>
<td>.80, 12 items</td>
<td>n/a</td>
</tr>
<tr>
<td>Ingroup and Authority</td>
<td>3.1/5</td>
<td>.7</td>
<td>.82, 12 items</td>
<td>n/a</td>
</tr>
</tbody>
</table>
Table 6

*Descriptive Data And Internal Consistencies For Dependent Variables*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean</th>
<th>SD</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persuasion Index</td>
<td>4.4 /6</td>
<td>.7</td>
<td>.88, 8 items</td>
</tr>
<tr>
<td>Anxiety Index</td>
<td>0.6 /4</td>
<td>.5</td>
<td>.91, 13 items</td>
</tr>
<tr>
<td>Pragmatism</td>
<td>5.0 /6</td>
<td>.8</td>
<td>.84, 5 items</td>
</tr>
<tr>
<td>Moral Threat</td>
<td>3.0 /6</td>
<td>1.3</td>
<td>.85, 4 items</td>
</tr>
<tr>
<td>Claim Validity Items</td>
<td>5.3 /7</td>
<td>1.2</td>
<td>.63, 2 items</td>
</tr>
<tr>
<td>Claim Validity and Information Items</td>
<td>5.4 /7</td>
<td>1.1</td>
<td>.69, 3 items</td>
</tr>
</tbody>
</table>

The *claim validity* items reflect the two items asking participants to assess the validity of claims made in the article. I was also curious if adding the item assessing willingness to support researchers in making more information available to one's school board could produce a meaningful dependent variable, reflected as *claim validity and information* items in Table 6. However, both these variables had notably lower internal consistency than the persuasion index, so I discarded them from experimental manipulation analyses.

**Bivariate correlations.** Table 7 displays the bivariate correlations between constructs of interest. Due to the number of constructs, this table is subdivided for ease of reading into three separate sections of correlations between predictors, dependent variables, and a predictor/dependent variable matrix.
### Bivariate Correlations For Constructs Of Interest

<table>
<thead>
<tr>
<th></th>
<th>Cons</th>
<th>Lib</th>
<th>Rel. At</th>
<th>Prev</th>
<th>Prom</th>
<th>Purity</th>
<th>A&amp;I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberalism</td>
<td>-.71**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religious Attendance</td>
<td>.28**</td>
<td>-.23**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevention</td>
<td>.01</td>
<td>-.07</td>
<td>.09</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promotion</td>
<td>-.10*</td>
<td>-.03</td>
<td>.03</td>
<td>.19**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purity</td>
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<td>-.31**</td>
<td>.35**</td>
<td>.09</td>
<td>-.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authority &amp; Ingroup</td>
<td>.33**</td>
<td>-.20**</td>
<td>.14**</td>
<td>.12**</td>
<td>.10*</td>
<td>.71**</td>
<td></td>
</tr>
<tr>
<td>Individualizing MF</td>
<td>-.15**</td>
<td>.19**</td>
<td>-.05</td>
<td>-.17**</td>
<td>.20**</td>
<td>.29**</td>
<td>.43**</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Persuasion</th>
<th>Anxiety</th>
<th>Pragmatism</th>
<th>Moral Threat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>.29**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pragmatism</td>
<td>.40**</td>
<td>-.37**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moral Threat</td>
<td>-.26**</td>
<td>.33**</td>
<td>-.42**</td>
<td></td>
</tr>
<tr>
<td>Claim Validity &amp; Information Items</td>
<td>.53**</td>
<td>-.32**</td>
<td>.41**</td>
<td>-.29**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Persuasion</th>
<th>CV&amp;II</th>
<th>Anxiety</th>
<th>Pragmatism</th>
<th>Moral Threat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservatism</td>
<td>-.12*</td>
<td>-.16**</td>
<td>.09</td>
<td>-.25**</td>
<td>.45**</td>
</tr>
<tr>
<td>Liberalism</td>
<td>.12**</td>
<td>.14**</td>
<td>.05</td>
<td>.14**</td>
<td>-.27**</td>
</tr>
<tr>
<td>Religious Attendance</td>
<td>.02</td>
<td>-.09*</td>
<td>.07</td>
<td>-.20**</td>
<td>.34**</td>
</tr>
<tr>
<td>Prevention</td>
<td>.06</td>
<td>.03</td>
<td>-.17**</td>
<td>-.03</td>
<td>-.02</td>
</tr>
<tr>
<td>Promotion</td>
<td>.19**</td>
<td>.22**</td>
<td>-.42**</td>
<td>.28**</td>
<td>-.28**</td>
</tr>
<tr>
<td>Purity</td>
<td>-.001</td>
<td>-.04</td>
<td>.04</td>
<td>-.09*</td>
<td>.50**</td>
</tr>
<tr>
<td>Authority&amp; Ingroup</td>
<td>.10*</td>
<td>0.02</td>
<td>-.08</td>
<td>.10*</td>
<td>.30**</td>
</tr>
<tr>
<td>Individualizing MF</td>
<td>.33**</td>
<td>.22**</td>
<td>-.22**</td>
<td>.50**</td>
<td>-.17**</td>
</tr>
</tbody>
</table>

Note. * = significant at $p < .05$ level, ** = significant at $p < .01$ level. MF = moral foundations, Cons = conservatism, Lib = liberalism, Rel. At = religious attendance, Prev = prevention, Prom = promotion, A&I = Authority& Ingroup, CV&II = Claim Validity & Information Items.
Experimental Manipulation Results

The experimental research question (research question 2), asked whether attempting to match message frame to individuals' chronic regulatory focus impacted message persuasiveness. Answering this question required several steps: (a) investigating meaningful covariates, (b) performing an intervention check, and (c) running a moderation regression to determine whether the interactions between message frame and prevention or promotion scores were good predictors of the persuasion score.

The first step was to reduce the number of potential control variables by deciding which candidates (i.e., age, gender, education level, religious attendance, social conservatism and liberalism, country of residence, and parental status) were meaningful predictors of persuasion. I was interested in their comparative ability to predict persuasion, assuming that all these factors are present in the complexity of real life. Therefore they were entered into multiple regression analysis together rather than tested one at a time. Neither the overall multiple regression model, $F(8, 455) = 1.36, p = .211$, nor any of the individual predictors reached even marginal statistical significance. Therefore, due to lack of associations with the dependent variable, none of these variables were used as controls in further analyses of persuasion.

The second step was performing a manipulation check: To what extent did the participants perceive the prevention-focused article as more cautious and the promotion-focused article as more enthusiastic? The sample sizes for each sub-group were 239 (50.5%) participants in the prevention frame and 234 (49.5%) participants in the promotion frame. Unfortunately, the participants did not see the articles as having a different tone at all, $t(471) = -.21, p = .831$. This indicates that the intervention design may have been unsuccessful in actually creating an experience of regulatory fit or non-fit.
Despite the unsuccessful manipulation check results, I decided to proceed with the third step anyway to establish more certainty about experimental results. The third step included regressing persuasion index on prevention scores, promotion scores, intervention frame, and interaction terms of frame with promotion as well as frame with prevention. Although the model was statistically significant at $p < .001$, it did not produce any statistically significant interactions. This means that the analysis was not able to detect a statistically significant effect of regulatory fit or non-fit for promotion or prevention oriented participants. A similar picture emerged for moral foundations, where regressing persuasion index on the scores for individualizing foundations, binding foundations, interventions frame, and on two interaction terms of frame with individualizing and binding foundations, respectively: The model was statistically significant at $p < .001$, but did not produce any statistically significant interactions.

Examination of standardized residual plots (P-P plots and scatterplots) indicated that the data in all the aforementioned analyses appeared to meet the assumptions of normality, linearity, and heteroscedasticity reasonably well. All tolerance values were also within acceptable range (ranging between .46 and .99 for the regulatory focus model, and between .34 and .99 for the moral foundations model), indicating no evidence of multicollinearity. No outliers affecting parameter estimates or model fit were detected.

**Further exploratory analyses.** Given the wide range of time that participants spent looking at the intervention article (from 1.4 seconds to 490 seconds, with mean of 70.5 seconds and standard deviation of 62.1 seconds), it made sense to wonder whether this time mattered. Specifically, I wondered whether (a) the effects of regulatory fit or non-fit would only become apparent for the participants who actually read the article as opposed to those who merely skimmed it, and (b) the time people spend on the article made any difference in their perception
of its persuasiveness. I tested these exploratory after-the-fact hypotheses as follows. The former consisted of repeating the original regressions in the sample of only the top 75% of participants as measured by the time they spent on the intervention page (i.e., those who spent 25.1 seconds or more, N = 355). The latter consisted of checking for a three-way interaction between the time spent on the intervention webpage (in seconds), regulatory focus, and message frame.

As the time spent on the webpage is measured automatically by Qualtrics software, it does not contain a known level of measurement error the way self-report scales do. The ecological validity of this measure could be questioned if a participant stepped away from the screen, but 95% of participants spent less than 3 minutes on the page, so this was unlikely. Therefore, the reliability of time on the intervention webpage could be assumed to equal 1. Thus, it was reasonable to expect no losses in the reliability of three-way product terms with this variable added and no corresponding loss of power to detect interaction effects. Unfortunately, both these analyses using Hayes PROCESS module showed the same pattern as the original ones: All models were statistically significant at \( p < .001 \) with no statistically significant interactions.

Examination of standardized residual plots (P-P plots and scatterplots) indicated that the data in all the aforementioned analyses appeared to meet the assumptions of normality, linearity, and heteroscedasticity reasonably well. All tolerance values were also within acceptable range (ranging between .43 and .98 for the regulatory focus model, and between .34 and .97 for the moral foundations model), indicating no evidence of multicollinearity. No outliers affecting parameter estimates or model fit were detected for moral foundations. For regulatory focus, no outliers affecting parameter estimates were detected. However, removal of 43 potential model fit
outliers identified using leverage cutoff of 0.0287 ($2k/N = 10/349$) rendered the entire regulatory focus model statistically insignificant.

As no interaction effects were detected despite various attempts and thorough regression diagnostics, there was no evidence for experimental manipulation having any effect. As such, no support was found for the experimental hypotheses. Hayes (2013) suggested that lack of interactions justifies revising the model to remove interaction terms and to examine first-order predictors on their own (Hayes, 2013). However, doing so falls under the umbrella of understanding the role of regulatory focus in attitudes toward sex education overall, rather than testing the effects of the experiment. Therefore, these results are discussed in the next section.

**Moral Foundations and Regulatory Focus: Understanding the Links**

The following analyses targeted answers to research question 1 and investigated the conceptual hypotheses concerning moral foundations and regulatory focus. As with experimental manipulation, the first step in delineating associations between moral foundations, regulatory focus, and sex education attitudes was identification of meaningful statistical control variables to include in the main analyses. The Pragmatism and Moral Threat dimensions of attitudes toward sex education were treated as two separate dependent variables in these analyses. Both factors of attitudes toward sex education were regressed on potential control candidates (i.e., age, gender, education level, religious attendance, social conservatism and liberalism, country of residence, and parental status). The resulting models were statistically significant: For Pragmatism, $F(10, 444) = 6.38, p < .001$; and for Moral Threat, $F(10, 444) = 16.47, p < .001$. The values of adjusted $R^2$ accounted for by control variables alone were .11 for Pragmatism and .25 for Moral Threat, respectively. The results are summarized in Table 8.
All collinearity statistics were acceptable with tolerance values ranging from .48 to .94, indicating no multicollinearity problems. Examination of standardized residual plots (P-P plots and scatterplots) indicated that the data for both regressions appeared to meet the assumptions of normality, linearity, and heteroscedasticity reasonably well.

Table 8
Regression Results For Potential Control Variables (CVs) On Sex Education Attitudes

<table>
<thead>
<tr>
<th>CVs for Pragmatism</th>
<th>B</th>
<th>SE(B)</th>
<th>Beta</th>
<th>Sig.</th>
<th>sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>5.11</td>
<td>.32</td>
<td></td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>.966</td>
<td>0.0%</td>
</tr>
<tr>
<td>Gender</td>
<td>.26</td>
<td>.07</td>
<td>.18</td>
<td>.000</td>
<td>2.8%</td>
</tr>
<tr>
<td>Religious attendance</td>
<td>-.05</td>
<td>.02</td>
<td>-.14</td>
<td>.005</td>
<td>1.6%</td>
</tr>
<tr>
<td>Education</td>
<td>.03</td>
<td>.02</td>
<td>.06</td>
<td>.233</td>
<td>0.3%</td>
</tr>
<tr>
<td>Social conservatism</td>
<td>-.08</td>
<td>.02</td>
<td>-.22</td>
<td>.001</td>
<td>2.3%</td>
</tr>
<tr>
<td>Social liberalism</td>
<td>-.02</td>
<td>.03</td>
<td>-.05</td>
<td>.449</td>
<td>0.1%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>.03</td>
<td>.03</td>
<td>.05</td>
<td>.242</td>
<td>0.3%</td>
</tr>
<tr>
<td>Country</td>
<td>-.01</td>
<td>.07</td>
<td>-.01</td>
<td>.849</td>
<td>0.0%</td>
</tr>
<tr>
<td>Parental status</td>
<td>.24</td>
<td>.09</td>
<td>.13</td>
<td>.008</td>
<td>1.4%</td>
</tr>
<tr>
<td>Presence of teen/adolescent</td>
<td>-.06</td>
<td>.08</td>
<td>-.04</td>
<td>.432</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CVs for Moral Threat</th>
<th>B</th>
<th>SE(B)</th>
<th>Beta</th>
<th>Sig.</th>
<th>sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.59</td>
<td>.50</td>
<td></td>
<td>.002</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.01</td>
<td>.00</td>
<td>-.09</td>
<td>.037</td>
<td>0.7%</td>
</tr>
<tr>
<td>Gender</td>
<td>-.18</td>
<td>.11</td>
<td>-.07</td>
<td>.107</td>
<td>0.4%</td>
</tr>
<tr>
<td>Religious attendance</td>
<td>.13</td>
<td>.03</td>
<td>.22</td>
<td>.000</td>
<td>4.1%</td>
</tr>
<tr>
<td>Education</td>
<td>-.02</td>
<td>.03</td>
<td>-.03</td>
<td>.493</td>
<td>0.1%</td>
</tr>
<tr>
<td>Social conservatism</td>
<td>.28</td>
<td>.04</td>
<td>.45</td>
<td>.000</td>
<td>9.4%</td>
</tr>
<tr>
<td>Social liberalism</td>
<td>.06</td>
<td>.04</td>
<td>.10</td>
<td>.095</td>
<td>0.5%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>-.04</td>
<td>.05</td>
<td>-.03</td>
<td>.429</td>
<td>0.1%</td>
</tr>
<tr>
<td>Country</td>
<td>.11</td>
<td>.11</td>
<td>.04</td>
<td>.315</td>
<td>0.2%</td>
</tr>
<tr>
<td>Parental status</td>
<td>.07</td>
<td>.14</td>
<td>.02</td>
<td>.616</td>
<td>0.0%</td>
</tr>
<tr>
<td>Presence of teen/adolescent</td>
<td>-.01</td>
<td>.12</td>
<td>-.01</td>
<td>.906</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

Note. sr² = semi-partial correlations reported as percentages of variance explained to facilitate interpretation. The value of Durbin-Watson statistic was 1.76 for Pragmatism and 2.08 for Moral Threat. Gender was dummy-coded such that 0 = male and 1 = female. Parental status was dummy-coded such that 0 = non-parent and 1 = parent.
For both factors of attitudes, religious attendance and conservatism came through as meaningful control variables to include in further analyses. However, differences between factors were present on other potential controls. Specifically, for Pragmatism, gender and parental status were also statistically significant; whereas for Moral Threat, age was the only other control variable to display statistical significance. This information provided foundation for further analyses, as different combinations of control variables were employed for regressions on Pragmatism and Moral Threat as dependent variables. Given different content of these dimensions of attitudes toward sex education, it seemed reasonable that some control variables would be associated with one but not the other. Interestingly, when the analysis was repeated on all cases, age lost its statistical significance in association with Moral Threat. However, to err on the side of caution, I chose to continue to include it.

For the next step, I regressed both the Pragmatism and the Moral Threat attitude dimensions on regulatory focus and moral foundations as separate hierarchical models with control variables. The rationale was to first consider each set of predictors in isolation in order to (a) see how much they add to the model beyond the control variables; and (b) test for interactions between social conservatism and purity as well as social conservatism and prevention (these specific interactions were predicted by my original hypotheses) while reducing the power loss of having an excessive number of predictors in a model. All models were statistically and practically significant (with $R^2$ in medium to large range) justifying further exploration of all predictors together. This step also found a significant interaction between conservatism and purity ($p = .004$), but only for Moral Threat and not for Pragmatism. Because I treated this analysis as a preliminary step before exploring all the variables of interest together, I placed their full description into Appendix E.
The last step was to look at the whole picture to better understand how all the predictors come together. It included regressing the Pragmatism and Moral Threat dimensions of attitudes on a combination of control variables, regulatory focus, and moral foundations. Tables 9 and 10 summarize these final hierarchical models for Pragmatism and Moral Threat, respectively. Control variables alone accounted for .12 of total variance in Pragmatism, $F(4,462) = 16.58, p < 0.001$, and for .26 of total variance in Moral Threat, $F(3,462) = 54.02, p < 0.001$, respectively. Including regulatory focus and moral foundation variables accounted for additional .25 of total variance in Pragmatism, $F(8,458) = 34.69, p < 0.001$, and for an additional .18 of total variance in Moral Threat, $F(6,459) = 59.75, p < 0.001$, respectively. In the Moral Threat model, the interaction between conservatism and purity accounted for further .007 of total variance, $F(7,458) = 52.47, p < 0.001$.

Following McCallum (2001) recommendation to weigh the number of parameters and their interpretive complexity against model fit, I chose to remove authority and ingroup as a predictor from both final models of attitudes, and to remove prevention pride as a predictor from the Moral Threat model. These variables contributed virtually nothing to the overall $R^2$ and lacked statistical significance. Removing these variables also reduced inter-correlations between predictors: Although all tolerance values were initially acceptable, they improved after this removal. All final collinearity statistics was acceptable with tolerance values ranging from .56 to .94, indicating no multicollinearity problems.

For all models, no outliers affecting parameter estimates or model fit were found. Examination of residual plots (P-P plots and scatterplots) indicated that regression assumptions of normality, linearity, and heteroscedasticity were also met to a reasonable extent.
Table 9

Predictors Of The Sex Education Attitudes Dimension Of Pragmatism

<table>
<thead>
<tr>
<th>Steps and Predictors</th>
<th>R²</th>
<th>Adj. R²</th>
<th>B</th>
<th>SE(B)</th>
<th>Beta</th>
<th>Sig.</th>
<th>sr²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 Pragmatism</td>
<td>.13</td>
<td>.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td>5.24</td>
<td>.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.27</td>
<td>.07</td>
<td>.18</td>
<td></td>
<td>.000</td>
<td></td>
<td>3.10%</td>
</tr>
<tr>
<td>Parental Status</td>
<td>.20</td>
<td>.08</td>
<td>.11</td>
<td></td>
<td>.011</td>
<td></td>
<td>1.23%</td>
</tr>
<tr>
<td>Religious Attendance</td>
<td>-.05</td>
<td>.02</td>
<td>-.12</td>
<td></td>
<td>.004</td>
<td></td>
<td>1.59%</td>
</tr>
<tr>
<td>Conservatism</td>
<td>-.08</td>
<td>.02</td>
<td>-.21</td>
<td></td>
<td>.000</td>
<td></td>
<td>3.84%</td>
</tr>
<tr>
<td>Step 2 Pragmatism</td>
<td>.38</td>
<td>.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td>2.89</td>
<td>.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.14</td>
<td>.06</td>
<td>.09</td>
<td></td>
<td>.017</td>
<td></td>
<td>0.8%</td>
</tr>
<tr>
<td>Parental Status</td>
<td>.12</td>
<td>.07</td>
<td>.07</td>
<td></td>
<td>.087</td>
<td></td>
<td>0.4%</td>
</tr>
<tr>
<td>Religious Attendance</td>
<td>-.03</td>
<td>.01</td>
<td>-.08</td>
<td></td>
<td>.039</td>
<td></td>
<td>0.6%</td>
</tr>
<tr>
<td>Conservatism</td>
<td>-.02</td>
<td>.02</td>
<td>-.05</td>
<td></td>
<td>.296</td>
<td></td>
<td>0.2%</td>
</tr>
<tr>
<td>Prevention Pride</td>
<td>-.12</td>
<td>.04</td>
<td>-.12</td>
<td></td>
<td>.001</td>
<td></td>
<td>1.4%</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td>.24</td>
<td>.05</td>
<td>.18</td>
<td></td>
<td>.000</td>
<td></td>
<td>3.0%</td>
</tr>
<tr>
<td>Purity</td>
<td>-.13</td>
<td>.03</td>
<td>-.18</td>
<td></td>
<td>.000</td>
<td></td>
<td>2.1%</td>
</tr>
<tr>
<td>Individualizing Foundations</td>
<td>.60</td>
<td>.05</td>
<td>.51</td>
<td></td>
<td>.000</td>
<td></td>
<td>19.4%</td>
</tr>
</tbody>
</table>

Note: sr² = semi-partial correlations reported as percentages of variance explained. The value of Durbin-Watson statistic was 1.78. Gender was dummy-coded such that 0 = male and 1 = female. Parental status was dummy-coded such that 0 = non-parent and 1 = parent.
Table 10

*Predictors Of The Sex Education Attitudes Dimension Of Moral Threat.*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>$R^2$</th>
<th>Adj. $R^2$</th>
<th>B</th>
<th>SE(B)</th>
<th>Beta</th>
<th>Sig.</th>
<th>$sr^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 Moral Threat</td>
<td>.26</td>
<td>.26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td>2.01</td>
<td>.19</td>
<td>.000</td>
<td></td>
<td>1.6%</td>
</tr>
<tr>
<td>Age</td>
<td>-.01</td>
<td>.00</td>
<td>-.13</td>
<td></td>
<td>.001</td>
<td></td>
<td>4.6%</td>
</tr>
<tr>
<td>Religious Attendance</td>
<td>.14</td>
<td>.03</td>
<td>.23</td>
<td></td>
<td>.000</td>
<td></td>
<td>13.7%</td>
</tr>
<tr>
<td>Conservatism</td>
<td>.24</td>
<td>.03</td>
<td>.39</td>
<td></td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 2 Moral Threat</td>
<td>.44</td>
<td>.43</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td>4.10</td>
<td>.37</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.01</td>
<td>.00</td>
<td>-.05</td>
<td></td>
<td>.136</td>
<td></td>
<td>0.3%</td>
</tr>
<tr>
<td>Religious Attendance</td>
<td>.08</td>
<td>.02</td>
<td>.13</td>
<td></td>
<td>.001</td>
<td></td>
<td>1.3%</td>
</tr>
<tr>
<td>Conservatism</td>
<td>.11</td>
<td>.03</td>
<td>.17</td>
<td></td>
<td>.000</td>
<td></td>
<td>2.0%</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td>-.48</td>
<td>.08</td>
<td>-.22</td>
<td></td>
<td>.000</td>
<td></td>
<td>4.3%</td>
</tr>
<tr>
<td>Purity</td>
<td>.54</td>
<td>.05</td>
<td>.44</td>
<td></td>
<td>.000</td>
<td></td>
<td>12.3%</td>
</tr>
<tr>
<td>Individualizing Foundations</td>
<td>-.47</td>
<td>.08</td>
<td>-.22</td>
<td></td>
<td>.000</td>
<td></td>
<td>3.7%</td>
</tr>
<tr>
<td>Step 3 Moral Threat</td>
<td>.45</td>
<td>.44</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td></td>
<td></td>
<td>4.08</td>
<td>.37</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.01</td>
<td>.00</td>
<td>-.06</td>
<td></td>
<td>.103</td>
<td></td>
<td>0.3%</td>
</tr>
<tr>
<td>Religious Attendance</td>
<td>.07</td>
<td>.02</td>
<td>.12</td>
<td></td>
<td>.002</td>
<td></td>
<td>1.2%</td>
</tr>
<tr>
<td>Conservatism</td>
<td>.10</td>
<td>.03</td>
<td>.16</td>
<td></td>
<td>.000</td>
<td></td>
<td>1.9%</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td>-.43</td>
<td>.08</td>
<td>-.21</td>
<td></td>
<td>.000</td>
<td></td>
<td>4.1%</td>
</tr>
<tr>
<td>Purity</td>
<td>.59</td>
<td>.06</td>
<td>.48</td>
<td></td>
<td>.000</td>
<td></td>
<td>12.7%</td>
</tr>
<tr>
<td>Individualizing Foundations</td>
<td>-.47</td>
<td>.08</td>
<td>-.24</td>
<td></td>
<td>.000</td>
<td></td>
<td>4.2%</td>
</tr>
<tr>
<td>Conservatism x Purity</td>
<td>.10</td>
<td>.04</td>
<td>.09</td>
<td></td>
<td>.021</td>
<td></td>
<td>0.7%</td>
</tr>
</tbody>
</table>

Note: $sr^2 = $ semi-partial correlations reported as percentages of variance explained. The value of Durbin-Watson statistic was 2.28.
Plotting the interaction between conservatism and purity (Figure 1) showed that the extent of Moral Threat endorsement increases slightly more when both conservatism and purity are high than when they both are low.

*Figure 3.* The interaction between conservatism and purity in predicting Moral Threat.

**Ideology, regulatory focus, and moral foundations: Replication.** Cornwell and Higgins (2013) provided the first empirical evidence for theoretically plausible link between political ideology, regulatory focus, and moral foundations. The theory behind this connection has been discussed at length in literature review. Using a sample of 96 participants from the Columbia Behavioural Research Lab, the authors demonstrated that binding foundation endorsement predicted conservatism ($p < .001$, $R^2 = .19$), and promotion and prevention scores predicted the endorsement of binding foundations ($p < .01$, $R^2 = .14$) as well as political ideology ($p < .001$, $R^2 = .18$), in expected directions. That is, individuals with high prevention scores were more likely to identify as politically conservative and to endorse binding foundations, whereas individuals with high promotion scores were more likely to identify as politically liberal and less
likely to endorse binding foundations. Cornwell and Higgins did not report on the association between regulatory focus and individualizing foundations endorsement, because previous literature indicated that individualizing foundations are less relevant to ideological differences than binding foundations.

My theory-driven expectation to see similar patterns in this current sample was so strong that I did not decide on specific replication criteria in advance. Unfortunately, my results presented a somewhat different picture. I found that the endorsement of binding foundations predicted social conservatism reasonably well: \( b = 1.09, t(470) = 9.5, p < .001; R^2 = .16, F(1,470) = 90.4, p < .001 \). Both the direction and the magnitude of these effects seemed comparable to Cornwell and Higgins (2013). However, regulatory focus was a poor predictor of either moral foundation endorsement or political ideology. For political ideology, none of the overall models reached statistical significance, indicating no relationship between regulatory focus and political ideology in the current sample. For moral foundations (see Table 11), both models were statistically significant, \( F(2,470) = 4.1 \) for the binding foundations and \( F(2,470) = 13.5 \) for the individualizing foundations. Yet the total amount of variance explained was drastically smaller than expected.

Table 11

*Regulatory Focus And Moral Foundations: Replication Results*

<table>
<thead>
<tr>
<th>Model/Predictors</th>
<th>( R^2 )</th>
<th>B</th>
<th>SE(B)</th>
<th>Beta</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory Focus on Binding Moral Foundations</td>
<td><strong>0.02</strong></td>
<td>.12</td>
<td>.05</td>
<td>.12</td>
<td>.013</td>
</tr>
<tr>
<td>Prevention Pride</td>
<td></td>
<td>.12</td>
<td>.05</td>
<td>.12</td>
<td>.013</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td></td>
<td>.06</td>
<td>.06</td>
<td>.05</td>
<td>.326</td>
</tr>
<tr>
<td>Regulatory Focus on Individualizing Moral Foundations</td>
<td><strong>0.05</strong></td>
<td>.115</td>
<td>.039</td>
<td>.136</td>
<td>.003</td>
</tr>
<tr>
<td>Prevention Pride</td>
<td></td>
<td>.115</td>
<td>.039</td>
<td>.136</td>
<td>.003</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td></td>
<td>.184</td>
<td>.050</td>
<td>.167</td>
<td>.000</td>
</tr>
</tbody>
</table>
Threat Perception: Mediation Analyses Results

The following analyses targeted answers to research question 1, specifically investigating the conceptual hypotheses concerning the role of threat perception. Confirming potential role of threat perception in attitudes toward sex education required finding evidence that regulatory focus and moral foundations (a) influence persuasion indirectly through state anxiety, and (b) have an indirect association with attitudes toward sex education through state anxiety. Simple mediation analyses using ordinary least squares path analysis were carried out with the SPSS PROCESS module (Hayes, 2013). They represent direct inferential testing of mediation effects using bias-corrected bootstrap confidence intervals (Hayes, 2013; all analyses were conducted using 10,000 bootstrap samples and 95% bias-corrected confidence intervals). The sample size in all analyses was over 460 participants after listwise deletion due to missing data. This sample size should have .8 power to detect small paths when the method of bias-corrected bootstrap confidence intervals is employed (Fritz & MacKinnon, 2007).

The following tables summarize mediation analysis results by presenting the estimates of direct and indirect effects for key predictors (i.e., unstandardized regression coefficients for purity, individualizing moral foundations, promotion and prevention) on persuasion (Table 12), and the two dimensions of attitudes toward sex education (Table 13 for Pragmatism and Table 14 for Moral Threat). Full breakdown of these results is available in Appendix F. The use of control variables in mediation analyses was consistent with the non-mediated regressions performed previously: (a) No additional control variables for persuasion; (b) social conservatism, religious attendance, gender and parental status for Pragmatism; and (c) social conservatism, religious attendance, and age for Moral Threat.
### Table 12

**Effects Of Moral Foundations And Regulatory Focus On Persuasion**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Direct Effect</th>
<th>SE</th>
<th>(t)</th>
<th>(p)</th>
<th>LLCI</th>
<th>ULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purity</td>
<td>-.06</td>
<td>.03</td>
<td>-1.74</td>
<td>.083</td>
<td>-.12</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Individualizing MFs</strong></td>
<td><strong>.36</strong></td>
<td>.06</td>
<td>6.56</td>
<td><strong>.000</strong></td>
<td>.25</td>
<td>.47</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td>.07</td>
<td>.06</td>
<td>1.17</td>
<td>.242</td>
<td>-.05</td>
<td>.20</td>
</tr>
<tr>
<td>Prevention Pride</td>
<td>-.03</td>
<td>.04</td>
<td>-.66</td>
<td>.507</td>
<td>-.12</td>
<td>.06</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Indirect Effect</th>
<th>boot SE</th>
<th>(Z)</th>
<th>(p)</th>
<th>boot LLCI</th>
<th>boot ULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purity</td>
<td>-.02</td>
<td>.01</td>
<td>-2.03</td>
<td><strong>.042</strong></td>
<td>-.03</td>
<td>.00</td>
</tr>
<tr>
<td><strong>Individualizing MFs</strong></td>
<td><strong>.04</strong></td>
<td>.01</td>
<td>2.75</td>
<td><strong>.006</strong></td>
<td>.02</td>
<td>.08</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td><strong>.10</strong></td>
<td>.03</td>
<td>3.87</td>
<td><strong>.000</strong></td>
<td>.06</td>
<td>.16</td>
</tr>
<tr>
<td>Prevention Pride</td>
<td>.02</td>
<td>.01</td>
<td>1.90</td>
<td>.058</td>
<td>.00</td>
<td>.04</td>
</tr>
</tbody>
</table>

### Table 13

**Effects Of Moral Foundations And Regulatory Focus On Pragmatism**

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Direct Effect</th>
<th>SE</th>
<th>(t)</th>
<th>(p)</th>
<th>LLCI</th>
<th>ULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purity</td>
<td>-.12</td>
<td>.03</td>
<td>-3.60</td>
<td><strong>.000</strong></td>
<td>-.19</td>
<td>-.06</td>
</tr>
<tr>
<td><strong>Individualizing MFs</strong></td>
<td><strong>.57</strong></td>
<td>.05</td>
<td>11.47</td>
<td><strong>.000</strong></td>
<td>.47</td>
<td>.67</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td><strong>.14</strong></td>
<td>.05</td>
<td>2.80</td>
<td><strong>.005</strong></td>
<td>.04</td>
<td>.25</td>
</tr>
<tr>
<td>Prevention Pride</td>
<td>-.12</td>
<td>.04</td>
<td>-3.21</td>
<td><strong>.001</strong></td>
<td>-.20</td>
<td>-.05</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Indirect Effect</th>
<th>boot SE</th>
<th>(Z)</th>
<th>(p)</th>
<th>boot LLCI</th>
<th>boot ULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purity</td>
<td>-.01</td>
<td>.01</td>
<td>-1.67</td>
<td>.096</td>
<td>-.03</td>
<td>.00</td>
</tr>
<tr>
<td><strong>Individualizing MFs</strong></td>
<td><strong>.03</strong></td>
<td>.02</td>
<td>2.41</td>
<td><strong>.016</strong></td>
<td>.01</td>
<td>.07</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td><strong>.09</strong></td>
<td>.02</td>
<td>4.07</td>
<td><strong>.000</strong></td>
<td>.05</td>
<td>.14</td>
</tr>
<tr>
<td>Prevention Pride</td>
<td><strong>.02</strong></td>
<td>.01</td>
<td>1.98</td>
<td><strong>.047</strong></td>
<td>.00</td>
<td>.04</td>
</tr>
</tbody>
</table>
Table 14

Effects Of Moral Foundations And Regulatory Focus On Moral Threat

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Direct Effect</th>
<th>SE</th>
<th>t</th>
<th>p</th>
<th>LLCI</th>
<th>ULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purity</td>
<td>.53</td>
<td>.05</td>
<td>9.82</td>
<td>.000</td>
<td>.42</td>
<td>.63</td>
</tr>
<tr>
<td>Individualizing MFs</td>
<td>-.44</td>
<td>.08</td>
<td>-4.90</td>
<td>.000</td>
<td>-.54</td>
<td>-.23</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td>-.36</td>
<td>.09</td>
<td>-4.18</td>
<td>.000</td>
<td>-.52</td>
<td>-.19</td>
</tr>
<tr>
<td>Prevention Pride</td>
<td>.05</td>
<td>.06</td>
<td>.82</td>
<td>.416</td>
<td>-.07</td>
<td>.17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Indirect Effect</th>
<th>boot SE</th>
<th>Z</th>
<th>p</th>
<th>boot LLCI</th>
<th>boot ULCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purity</td>
<td>.02</td>
<td>.01</td>
<td>1.52</td>
<td>.128</td>
<td>.00</td>
<td>.05</td>
</tr>
<tr>
<td>Individualizing MFs</td>
<td>-.05</td>
<td>.02</td>
<td>-2.51</td>
<td>.012</td>
<td>-.10</td>
<td>-.02</td>
</tr>
<tr>
<td>Promotion Pride</td>
<td>-.13</td>
<td>.04</td>
<td>-3.87</td>
<td>.000</td>
<td>-.21</td>
<td>-.07</td>
</tr>
<tr>
<td>Prevention Pride</td>
<td>-.03</td>
<td>.02</td>
<td>-1.78</td>
<td>.076</td>
<td>-.06</td>
<td>.00</td>
</tr>
</tbody>
</table>

There was some evidence for the moral foundation of purity indirectly reducing persuasion scores through increased state anxiety. Evidence was also found that both promotion and individualizing moral foundations increased persuasion scores indirectly through reducing state anxiety. In fact, due to lack of evidence for statistically significant direct effect, the entire influence of promotion and purity on persuasion was conveyed indirectly through state anxiety. In contrast, most of the influence of individualizing moral foundations on persuasion was conveyed directly.

Both promotion and individualizing moral foundations also had an indirect association through state anxiety with both Pragmatism and Moral Threat. The direction of these relationships was as expected: Both were associated with reduced anxiety, increased Pragmatism, and reduced Moral Threat. In contrast, no evidence of indirect relationship with either dimension of attitudes toward sex education was found for purity. For prevention, an indirect relationship was only found for Pragmatism. However, this relationship was barely
statistically significant and counter-intuitive. That is, prevention was directly associated with reduced Pragmatism, yet because it was also associated with reduced anxiety, it was indirectly associated with increased Pragmatism.

Furthermore, except for promotion, the magnitude of indirect effects was notably smaller than the magnitude of direct effects, with values of the unstandardized regression coefficient of .02-.05. This evidence contradicts my hypothesis that moral foundations and regulatory focus affect attitudes toward sex education primarily through a sense of threat.
CHAPTER FIVE: DISCUSSION

This study aimed to examine the combined roles of moral foundations, chronic regulatory focus, and perceptions of threat in attitudes toward sex education. The following two research questions were developed on the basis of the literature review, each with several specific hypotheses. First, to what extent do individual differences on moral foundations, chronic regulatory focus (sometimes also referred to as regulatory orientation), and perceptions of threat predict attitudes toward sex education? Second, can matching promotional materials on sex education to chronic regulatory focus improve the persuasiveness of these materials? Attempting to answer these questions on a crowd-sourced sample of 473 participants produced a complex picture with mixed support for the original hypotheses and some intriguing novel findings.

Attitudes Toward Sex Education

The results of the exploratory factor analysis identified two underlying factors embedded in the questionnaire I developed for this study. I descriptively named these factors Pragmatism and Moral Threat. When conceptualized as distinct latent dimensions of attitudes toward sex education, Pragmatism and Moral Threat resemble the liberal and the conservative sex education discourses, respectively (as per Jones, 2011a, 2011b). The liberal discourse is concerned with teaching knowledge and skills to young yet agentic decision makers; the conservative discourse is concerned with maintaining moral values and protecting vulnerable children from exposure to moral threats (Jones, 2011a, 2011b). Some of this resemblance was expected, because the wording of several questionnaire items was substantially informed by the Jones' discursive framework (2011a, 2011b).

Notably, some questionnaire items were not directly connected to this framework (e.g., the items related to personal importance of the issue or to the provision of sex education in
schools). Two other items displayed conceptual similarities but their phrasing was taken verbatim from the stated goals of sex education in Canada (on positive and negative outcomes and what exactly is meant by them; Public Health Agency of Canada, 2008). Yet all of these items still loaded highly onto the Pragmatism factor of attitudes. As a result, these findings corroborate the Jones (2011a, 2011b) framework. As well, these findings provide some empirical support for the notion that the policy language in Canadian sex education communication is consistent with the liberal discourse as defined by this framework.

Because the pragmatic and the morally threatening dimensions of attitudes arose from the factor analysis, they were not directly accounted for by the original hypotheses. Instead, my hypotheses concerned support or opposition toward broad-based comprehensive sex education overall. Because the attitudes toward sex education were split into Pragmatism and Moral Threat as separate dependent variables for most analyses, it is important to describe how this division fits with the original hypotheses.

The five items comprising Pragmatism include arguably the most important policy aspects and beliefs associated with the promotion of broad-based comprehensive sex education in Canada (as described by McKay & Bissel, 2010; Public Health Agency of Canada, 2008). These beliefs are that (a) sex education is important, (b) sex education is supposed to advance positive outcomes and to avoid negative outcomes in sexual relations, (c) teaching knowledge and skills is necessary to achieve these goals, and (d) sex education should be provided in schools. Therefore, attitudes toward comprehensive sex education are conceptually and practically represented by the Pragmatic dimension of attitudes as described in the Results chapter. As such, inferences about Pragmatism based on my analyses conceptually translate to inferences about attitudes toward comprehensive sex education.
In contrast, the notion of Moral Threat represents a completely different perspective. It reflects the beliefs that (a) sex education could be threatening both to the personal morality of the respondent and to traditional morality overall; (b) sex education could have harmful moral consequences; and (c) it is very important for sex education to teach abstinence. Given such differences in beliefs about benefits and risks of sex education, it is not surprising that Moral Threat and Pragmatism had a notable negative correlation. Interestingly, the magnitude of this correlation (i.e., $r = -0.5$) indicates that although many people could see Moral Threat and Pragmatism as opposites, for other people these perspectives are not necessarily incompatible.

Descriptive statistics for these factors indicated a wide endorsement of Pragmatism and a much lower endorsement of Moral Threat in the overall sample. The mean endorsement of Pragmatism corresponded to mostly agreeing with the set of its constituent statements or seeing them as important. The mean endorsement of Moral Threat corresponded to somewhat disagreeing with the set of its constituent statements or seeing them as only slightly important. Nonetheless, both factors had a large spread of endorsement, indicating a wide diversity of opinions among the respondents. A more detailed breakdown of responses (see Table 4) showed that an overwhelming majority of participants saw Pragmatism as at least a somewhat relevant consideration in attitudes toward sex education. A majority of respondents also did not find any relevance in Moral Threat. Nonetheless, approximately a quarter of participants indicated that the considerations of Moral Threat were either somewhat or very relevant to their attitudes toward sex education.

In general, few potential control variables were associated with attitudes toward sex education. Of those that were, only religiousity and social conservatism were connected to both dimensions of attitudes. Both religiousity and social conservatism were positively associated
with seeing sex education as potentially threatening and inversely associated with pragmatic attitudes toward sex education. This finding was consistent with previous research into sex education attitudes (Bleakly et al., 2010) and multiple other policy positions and attitudes related to sexuality (Crawford et al., 2014; Koleva et al., 2010).

Parental status and gender had an association with Pragmatism: Parents were somewhat more likely than non-parents to endorse pragmatic attitudes, and women were somewhat more likely than men to do the same. The finding about gender is consistent with the directions identified by previous research (Bleakly et al., 2010; McKay et al., 2014). However, Bleakley et al. (2010) found that the presence of an adolescent at home, which could be seen as a proxy for parental status, was not associated with any beliefs about effectiveness or policy directions in sex education. Bleakley et al. also found that respondents' level of education was inversely associated with support for abstinence-only education. No connection between education levels and attitudes toward sex education was observed in this study. These differences in findings could be related to the differences between dependent variables in the current study and in Bleakley et al. Bleakley et al. were primarily interested in cognitive beliefs about the effectiveness of various models of sex education in preventing pregnancy. This study was interested in a broader conceptualization of overall attitudes toward sex education.

**Predicting Sex Education Attitudes: Moral Foundations and Regulatory Focus**

Because I was interested in the aggregated effects of moral foundations and chronic regulatory focus, this discussion section focuses on the inferences drawn from the regression models that combine all these variables.

**Moral foundations.** As expected, the moral foundation of purity emerged as a notable predictor of in all analyses that examined attitudes toward sex education. The more people rely
on purity in making moral judgments, the less likely they are to hold pragmatic attitudes toward sex education and the more likely they are to see sex education as potentially morally threatening. These directions of relationship between purity and attitudes fit well with the original hypotheses.

Interestingly, the effect sizes for purity as an individual predictor, as determined by squared semi-partial correlations, differed between the dimensions of attitudes. As a single predictor, purity accounted for approximately 12% of the total variance explained by the Moral Threat factor of attitudes, which was notably more than any other predictor. Yet purity on its own mattered far less for the Pragmatism factor of attitudes, accounting only for approximately 2% of total variance explained. When looking at individual predictors, these squared partial correlations are interpreted as small and moderate effects, respectively (Cohen et al., 2003, described squared partial correlations of .02, .13, and .26 as small, moderate, and large when evaluating effect sizes for individual predictors in the overall model).

The hypothesis that respondents identifying as both socially conservative and highly concerned with purity would hold particularly negative attitudes toward comprehensive sex education was not supported: No such effect on the pragmatic dimension of attitudes was found. However, such respondents were especially likely to perceive sex education as morally threatening. At the same time, this interaction between purity and social conservatism accounted for slightly less than 1% of the total variance explained. This effect magnitude is in line with the typical size of interactions found on non-experimental data in social sciences (i.e., 1%-3% of total variance explained, Cohen et al., 2003; McClelland and Judd, 1993). McClelland and Judd (1993) suggested that due to this magnitude being typical, such interactions should be seen as important. However, Ferguson (2009) argued that 4% of total variance explained (derived from $r$...
could be considered a "recommended minimum effect size representing a “practically” significant effect for social science data" (p. 533). The practical importance of this finding on its own is questionable. However, it is both consistent with and further contributes to the overall picture of how and why people may find sex education morally threatening.

As expected, harm was an important consideration in attitudes toward sex education. It manifested in two ways. First, the individualizing moral foundations of harm and fairness together were significant predictors of attitudes. The more people endorsed harm and fairness as relevant moral considerations, the more likely they were to hold pragmatic attitudes toward sex education and the less likely they were to see it as potentially morally threatening. Second, the attitude factor of Moral Threat on its own reflects the perception that sex education could be threatening to one's values or could have harmful consequences. Moral foundations theory does not operationalize such harm as a part of the moral foundation of harm (Graham et al., 2011), so it is not detectable using the MFQ. Although the total number of people for whom these considerations seriously mattered was relatively small, it is not inconsequential as these perceptions likely contribute to opposition toward sex education.

Interestingly, the effects sizes for individualizing foundations also differed between attitude dimensions. For Pragmatism, moral concerns about harm and fairness together accounted for over 19% of the total variance explained. As such, they were the largest single predictor dwarfing all the others, including purity. Yet for Moral Threat, these same concerns only accounted for about 4% of the total variance explained. These values represent moderate-to-large and small effects for individual predictors, respectively (Cohen et al., 2003).

The differences in effect sizes for individualizing moral foundations and purity between Moral Threat and Pragmatism are likely related to the content of values embedded in these
dimensions of attitudes. Because the Moral Threat dimension is concerned with potential threats to the traditional values about sexuality, the high relevance of purity is to be expected (Crawford et al. 2014; Koleva et al., 2012). I am not aware of literature that could help contextualize the relationship between Pragmatism and individualizing moral foundations with the same clarity as exists for purity and Moral Threat. But this relationship confirms that as a dimension of attitudes toward sex education, Pragmatism also has a clear connection to moral values.

**Regulatory focus.** Effectively, all the hypotheses related to chronic promotion focus were supported whereas the hypotheses related to chronic prevention focus were mostly disconfirmed. As expected, the more people endorsed chronic promotion orientation, the more likely they were to hold pragmatic views of sex education and the less likely they were to see sex education as morally threatening. However, the prevention orientation was irrelevant to the Moral Threat dimension of attitudes – so much that I chose to remove it from the model entirely.

Although prevention orientation emerged as a predictor in the Pragmatism dimension of attitudes, it only accounted for 1.4% of the total variance explained. The direction of this relationship went as expected: The more people indicated the prevention orientation, the less likely they were to support pragmatic aspects of sex education. There was also no evidence that the participants who self-identified as both socially conservative and prevention-focused showed any more opposition to pragmatic sex education than any other participants. Given the lack of associations between the prevention orientation and many other constructs (discussed in more detail below), this finding should not be surprising.

The attempt to repeat the key findings of Cornwell and Higgins (2013) received mixed support. Cornwell and Higgins provided empirical evidence that regulatory focus, moral foundations, and political ideology are linked together in clearly organized and theoretically
predicted clusters of traits. My data was not consistent with this clear picture. The associations between binding moral foundations and social conservatism were as expected. However, my data indicated no relationship whatsoever between prevention orientation and social conservatism or social liberalism. Given that statistically significant but practically questionable correlations abound in social research, this lack of any relationship could be a noteworthy finding on its own.

This lack of association between prevention orientation and political ideology is likely to reflect a true null result for two reasons. First, the sample size was definitely sufficient for detection of small correlations, and multiple statistically significant small correlations were indeed detected (e.g., see Table 7). Second, chronic prevention focus had sufficiently high reliability for social science research (alpha = .79), which was also in line with reliabilities described by other studies of regulatory focus (e.g., Haws et al., 2010; Higgins et al., 2001). Therefore, the lack of association in this case cannot be attributed to an unusual amount of sample error in measuring prevention. Conversely, statistically significant albeit relatively low in magnitude correlations between the promotion orientation and a variety of other constructs (e.g., social conservatism and individualizing moral foundations, see Table 7) were detected despite promotion's lower reliability (alpha = .64).

Additionally, the nature of the relationship between chronic regulatory focus and moral foundations also differed from what was expected. Technically, the endorsement of individualizing or binding moral foundations could be predicted to some extent from knowing a person's chronic regulatory focus. Yet the amount of total variance accounted for by the entire model was only 2% for the binding foundations and only 5% for the individualizing foundations. Cornwell and Higgins (2013) focused on binding foundations only as these are uniquely
associated with most ideological differences. Yet in this case, the effect size of the relationship between chronic regulatory focus and binding foundations failed to reach the levels of suggested minimum practical significance (Ferguson, 2009). Furthermore, the theory predicted that the prevention orientation should be positively associated with binding moral foundations and the promotion orientation should be positively associated with the individualizing moral foundations. Although both these predictions were true, the prevention orientation also had a low but positive association with individualizing foundations.

I expected to corroborate something generalizable and widely applicable about the connections between regulatory orientation, morality, and political ideology. Instead, my results suggest that the picture is far murkier and more uncertain than it initially appeared. It seems that there is substantial difference between promotion and prevention orientations in how they relate to a variety of other constructs. Specifically, the promotion orientation appears to behave as expected, whereas the prevention orientation does not easily or consistently align with either ideology or morality.

Previous literature established that promotion and prevention reflect theoretically different motivational systems rather than opposites on a single continuum (e.g., Higgins, 1998; Higgins et al., 2001; Janoff-Bulman & Carnes, 2014). This postulate is further corroborated by variability in correlation between promotion and prevention scores, ranging from slightly negative to none to slightly positive in various samples (Higgins et al., 2001). In my sample, promotion and prevention had a modest positive correlation ($r = .2$). Therefore, although the notion of promotion and prevention behaving differently to such an extent contradicts previously established narratives, it is not incompatible with the regulatory focus theory.
Previous literature seems to reflect a dialectical tension between building coherent narratives and pointing out inconsistencies in findings. The current study in particular relied on two of such consistent narratives: (a) social conservatism is associated with increased attention to the features of the environment that are evaluated as negative (Hibbing et al., 2014); and (b) regulatory focus, political ideology, and moral foundations align into predictable and consistent clusters (Cornwell & Higgins, 2013). At the same time, previous literature also pointed out inconsistencies in these narratives. For example, Morgan, Skitka, and Wisneski (2014) highlighted the role of context and flexibility in ideological evaluations: They summarized multiple studies showing how ideologically expected behaviours and reasoning have been modified or reversed by specific contexts. Even Hibbing et al. (2014) acknowledged that political ideology is *messy*, and their proposed connection is "surprisingly consistent across designs, studies, and countries but it is also consistently modest in effect size" (p. 307), opening room for extensive variability between people and samples.

Lastly, in wondering what specifically could explain the lack of associations between prevention and other constructs, I revisited the original regulatory focus questionnaire (Higgins et al., 2001). Four out of five items comprising the prevention scores refer to parental approval or disapproval of one's actions, whereas none of the promotion items reference parents in their wording. Many of the regulatory focus and regulatory fit seminal articles relied heavily on convenience student populations (e.g., Camacho et al., 2003; Haws et al., 2010; Higgins et al., 2001; Lee & Aaker, 2004). The meta-analysis of regulatory fit literature in consumer behaviour found that the effects differed depending on the type of participants (Motyka et al., 2014). Motyka et al. (2014) suggested that the effects of regulatory focus could depend on the participants' life stages, because regulatory fit tends to induce greater effects on attitudes in
student samples and greater effects on behaviour in non-student samples: "Younger student
participants may be more driven by their attitudes while older non-student participants may have
better knowledge of their ability and greater courage of conviction and so take action more
readily" (p. 403). It is also possible that due to its heavy focus on parental approval, the RFQ's
operationalization of the prevention motivation could reflect somewhat different concepts in
student and non-student populations.

When it comes to implications of these findings for attitudes toward sex education
specifically, the following inferences could be made. It seems that promotion orientation but not
prevention orientation has a meaningful connection to both the increased endorsement of
pragmatic attitudes and reduced tendency to see sex education as morally threatening. However,
it is presently uncertain what practical conclusions follow from this finding. Once effect sizes
are taken into account, it is probably more effective to consider the combined focus on
promotion and individualizing moral foundations when conceptualizing sex education attitudes
and communication than promotion alone.

**Perceptions of Threat**

To assess potential influence of perceptions of threat, mediation analyses were conducted
using persuasion and attitudes toward sex education as dependent variables with the following
caveat. For persuasion, the causal link was embedded in the study design as the persuasion index
measured perceptions of the article after the participants read it. However, the analysis of
relationship between sex educations attitudes and other predictors was purely correlational.
Nonetheless, theoretically, individual differences in regulatory focus and moral foundations are
supposed to start emerging relatively early in life (e.g., Haidt, 2013; Higgins, 1998, Higgins et al.,
Therefore, it is feasible (a) to see them as influencing attitudes that likely consciously develop later, and (b) to test whether the data is compatible with this proposition.

The findings provided mixed support for the hypothesis that threat perception plays a role in attitudes toward sex education. State anxiety was expected to mediate the effects of both the moral foundation of purity and the prevention orientation on attitudes toward sex education and perceptions of article persuasiveness. Some evidence for their effects being mediated by state anxiety was available. Yet, in most cases, the relative size of direct effects was notably larger than the size of indirect effects for individualizing foundations, purity, and prevention. It means that their influence on sex education attitudes was primarily direct rather than conveyed through a perception of threat. The sample size and the mediation detection method suggested that the study had .8 power to detect the effects of expected magnitude (Fritz & MacKinnon, 2007).

Therefore, the extent of support for the main process hypothesis for the role of threat in attitudes toward sex education presents a conundrum. Technically, it was somewhat supported. That is, in this context, exposure to the potentially threatening subject produced a detectable sense of felt anxiety, and this sense of anxiety did in turn affect the way people judged related communication materials. Yet, I also expected this mechanism to be comparable in influence to direct effects of moral foundations and regulatory focus. However, the practical magnitude of these indirect effects was arguably negligible. Reviewing all these considerations together, I do not interpret these results as clear support for my process hypothesis.

Nonetheless, the findings produced other evidence indicating that there is a role for substantial threat perception after all. First, the attitude factor of Moral Threat represents a direct and explicit measure assessing to what extent people may see sex education as threatening to
their moral values. Moreover, although had little to none indirect influence, higher promotion orientation seemed to be reliably associated with a reduction in anxiety across all analyses.

Does all of this mean that the process through which a sense of threat is associated with attitudes toward sex education was envisioned inaccurately or with exaggerated importance? It is possible. The reduction in anxiety associated with promotion orientation is intriguing. If this finding is replicated by future research, it could reflect that individuals high in promotion orientation tend to feel more comfortable about the matters of sex education overall. The regulatory motivation of promotion shares many conceptual similarities with the personality trait of openness to experience, and the latter has been strongly associated with increased liberalism and decreased conservatism (e.g., Carney, Jost, Gosling, & Potter, 2008).

My approach to this study has been focused on identifying threats: That is, on how and why people experience aspects of sex education as threatening. These results suggest I may have underestimated the utility of a complementary focus: That is, on how people develop a level of comfort with sex education and what is associated with it. The concepts of promotion, openness to experience, and individualizing moral foundations could all be pulled together into such investigation.

There is also another possible explanation. The results provided substantial support for the role for the explicit dispositional perception of sex education as potentially threatening, but questionable support for detectable situational sense of anxiety associated with the subject. Previous studies indicated that conscious awareness and attribution of a feeling have impact on its ability to influence evaluation or behaviour. Specifically, the effects of regulatory fit disappear for the participants who are made aware that feeling right or wrong about the experimental manipulation could affect their judgment (e.g., Cesario et al., 2004). Therefore, it
is also possible that by directly asking the participants whether they found any aspects of sex education threatening to their own values, this study brought the notion of threat to the forefront. Doing so may have helped the participants to detect and correctly attribute their sense of unease, if they felt any, thus eliminating its influence on the results.

In other words, by attempting to do too much, this study may have compromised some of its results. Given the large empirical basis supporting the role of threat in perceptions of sexuality and ideology (e.g., Hibbing et al., 2014; Crawford et al., 2014; Jonas et al., 2011a, 2011b), it is more likely that the methodology of this study compromised its ability to detect the effects of felt anxiety, than that these effects do not matter.

**Regulatory Focus Manipulation**

In this study, no evidence was found that matching the style of informative written materials to individuals' chronic regulatory focus affected the persuasiveness of the material in any way. Unfortunately, drawing inferences from this lack of evidence is complicated. First, although a significant amount of attention to theoretical and methodological detail went into designing the experimental conditions, the manipulation check identified no reliable differences between them. However, both the experimental conditions and the manipulation check were developed specifically for this study, because suitable pre-existing tools could not be located. Therefore, their validity was not known. Either the experimental conditions, or the manipulation check, or both, may not have worked as intended.

As a result, it is hard to conclude with confidence what the results of the experimental analysis mean on their own. The failure to find a statistically significant interaction could have been due to a true null result: That is, regulatory fit in communication materials may have no
practical effects in the context of sex education. It could also have been due to the experimental materials developed not matching regulatory focus orientations as intended.

On the other hand, evidence from the correlational findings may shed some light onto this uncertainty. Specifically, the correlational findings showed that the chronic prevention focus was not meaningfully or substantially associated with most concepts of interest (including political ideology, the moral foundation of purity, or the dimensions of attitudes toward sex education). The chronic promotion focus fared relatively better: Although not associated with political ideology or purity, the promotion scores were substantially correlated with both dimensions of attitudes toward sex education. However, the effects sizes for promotion in regression analyses were drastically smaller than the effects sizes for individualizing foundations and purity in predicting the pragmatic and the morally threatening dimensions of attitudes toward sex education, respectively.

Furthermore, it may be especially telling that neither promotion nor prevention had any association with the moral foundation of purity. Given the notable role that purity plays in sexual attitudes (Koleva et al., 2012), it means that chronic regulatory focus may not matter much in the context of sexuality. With this consideration in mind, it is possible that the regulatory focus or regulatory fit do not represent as good or as effective a target for intervention in the context of attitudes toward sex education as was originally conceptualized. The failure of the manipulation may thus reflect relative unimportance of regulatory focus overall to attitudes toward sex education. This notion fits with the importance of context highlighted by Morgan et al. (2014): The influence of traits commonly associated with the liberal/conservative continuum is not fixed; both the magnitude and even directionality of their specific effects can differ greatly between contexts.
Implications for Counselling Psychology

Haidt stated that knowledge of moral foundations has utility for psychotherapists in helping clients to understand how differences in moral values create divisions, and then trying to find respect and sensitivity for the underlying values (Howes, 2016). This idea is consistent with the concept of *culturally sensitive working alliance*: The notion that in a multicultural environment, a crucial competency for counsellors includes being aware of the way culture, values, and sense of identity shape both their own perceptions and those of their clients, as well as actively using this awareness to inform the counselling process (Collins & Arthur, 2010).

Ultimately, all theories of counselling and psychotherapy help clients to formulate their problems and take action to do something different (Hubble, Duncan, & Miller, 2006). Because this study contributed to the understanding of moral concerns related to sex education, it could enhance counsellors' knowledge of multiple values connected to sex education, both socially conservative and socially liberal. This knowledge in turn could facilitate improved self-awareness of counsellors' own values and better understanding of their client values, for all types of clients (i.e., parents, children, or families). As such, it could assist counsellors with helping clients to become more consciously aware of their perspectives on sex education and to potentially experiment with expanding these perspectives. Moreover, it could also assist counsellors with recognizing their own emotional responses to value differences and even perceived value violations if their view on sex education is different from that of their clients.

For example, knowing that purity, individualizing moral foundations, and promotion predict sex education attitudes above and beyond religious attendance and political ideology, could help counsellors guide in-session inquiry about what their clients' values are. Knowing client values could also help counsellors to formulate commendations: Statements reflecting
client values or value-driven actions worthy of note and praise that help to reduce apprehension and to increase a sense of hope in a session (Slive & Bobele, 2012). For example, a counsellor could commend a client's values and strength of commitment to these values even when disagreeing with client's decisions based on these values. Then the counsellor could direct the process to actions. This step could include inquiring about (a) how client previous actions reflected these values and (b) whether there are alternative actions that are consistent with comprehensive sex education that still reflect these values.

Given the content area of this study, discussing its implications for several specific counselling environments (i.e., school, parental, and family counselling, as well as social change) is reasonable. Unfortunately, these implications are also limited due to exploratory and correlation-based nature of this study's substantive findings. However, the notion of counsellors' improved awareness of their own moral values regarding sex education and therefore improved ability to monitor emotional reactions based on these values (Collins & Arthur, 2010), in session or upon reflection, applies to all these environments.

**Parental counselling.** As discussed in the literature review chapter, many parents protesting sex education curriculum changes in Ontario expressed concerns about moral values that their children could be exposed to. My findings confirmed that concerns about potential moral harms of sex education were relevant to approximately a quarter of my participants, yet also that this perspective was potentially compatible with pragmatic views. Therefore, parental counselling provides an intriguing possibility to directly explore such compatibility and exactly how it may work in each individual case. An environment facilitated by culturally sensitive working alliance, with its established emotional bond, may provide uniquely productive conditions for such exploration – that is, relative to more typical research settings.
**Family counselling.** Family counselling usually focuses on systemic relational patterns that are distressing to family members, trying to understand these patterns from multiple perspectives and to open space for change (Corey, 2013). Because moral differences have a unique ability to induce strong emotion, they are also likely to be an especially strong source of family division and hurt. As illustrated above, my findings could help guide an exploration of potentially new, value-based perspectives on family tensions concerning sex education, thereby promoting awareness and mutual understanding for family members.

**School counselling.** Because sex education should be taught in schools and young people experiment with sexuality in multiple ways (McKay & Bissel, 2010; Causarano et al., 2010; Public Health Agency of Canada, 2008), school counsellors should be equipped with sufficient knowledge to deal with a variety of related concerns. However, this current study investigated only the perspectives and attitudes of adults – not children or adolescents. Therefore, arguably, for school counsellors, my findings primarily relate to dealing with (a) parental and family concerns of students, and (b) educational system overall.

These concerns are an important part of school psychologists' scope of practice (Canadian Psychological Association [CPA], 2007), yet how much my findings could help address them is uncertain. It may be possible for school counsellors to use the ideas discussed in previous sections to help students better understand and deal with their family dynamics. It may also be that this study's findings on attitudes toward sex education and their related moral values extend to adolescents, and thus could help inform culturally sensitive working alliance in school counselling. However, the latter notion is purely speculative at this time.

**Social change and advocacy.** As highlighted in the literature review chapter, a strong case for delivery of school-based comprehensive sex education has been built, yet its progress
has also been halted. The discipline of counselling psychology increasingly recognizes the development of effective skills for social change and advocacy as a core professional competency (Collins & Arthur, 2010). Therefore, the relevance of my findings to social change directly depends on their ability to shed light onto the potential for improved understanding between different sides of the sex education debates and for effective promotion of comprehensive sex education.

From this perspective, the findings are promising yet hardly sufficient on their own. The correlational findings arguably help to understand what is at stake for different people and what directions to pursue. They support the idea that emphasis on evidence in sex education communication may not work for people whose objections are based on their moral sense. Yet they are not concrete enough to propose specific strategies: That is, what other ways of communication may be more fruitful. The next section addresses suggestions for future research that could help translate this study's implications into actionable steps for social change.

**Implications for Theory Building and Future Research**

The discussion of this study's implications for theory building, future research, and policy development is largely interrelated. I was hoping that the experimental part of this study could provide practical recommendations for the advancement of evidence-based information on sex education in North America. Yet inconclusive experimental results preclude such immediate practical recommendations. Nonetheless, the findings indicate intriguing potential for many directions of further research. This research could then potentially inform the development of social policy and lay understanding of the differences in perspectives on sex education.

I referred previously to identifying patterns throughout the analyses. The three key patterns are as follows. First, some participants consider sex education to be potentially morally
threatening. Although decidedly a minority, these numbers – about a quarter – are arguably large enough to shed important additional light onto the opposition to sex education, described in literature and in media. Previous discursive research (Jones, 2011a, 2011b; Irvine, 2000) described the value frameworks associated with seeing sex education as threatening. These findings provide a first preliminary glimpse into the proportion of people who may hold such views. The moral foundation of purity is significantly associated with these views, as are social conservatism and religious attendance. The regulatory orientation of prevention, however, plays no role in this equation.

I posit that future research on attitudes toward sex education would strongly benefit from including and exploring this dimension. I do not have sufficient background in questionnaire design to confidently propose my sex attitudes questionnaire for future researchers. But perhaps, it could serve as a contribution to further questionnaire development by others.

Second, the endorsement of individualizing foundations and promotion orientation are strongly associated with greater pragmatic attitudes toward sex education and reduced tendency to find sex education potentially morally threatening. The combined magnitude of these effects in terms of variance explained is remarkably strong, approaching the variance explained by purity for Moral Threat and exceeding it vastly for Pragmatism.

This connection between Pragmatism and individualizing moral foundations could allow researchers and policy makers to better articulate the values embedded in comprehensive sex education. Doing so could have practical implications. Some authors suggested an explicit connection between sex education and democratic values (e.g., respect for individuals, human rights, and diversity; lack of discrimination; McKay & Bissel, 2010). Yet other authors noted that literature on comprehensive sex education commonly positions itself as a matter of public
health and facts (Rasmussen, 2010; Santelli et al., 2006). Rasmussen (2010) noted that social conservatives often criticise comprehensive sex education for its perceived lack of moral values. Yet the values connected to pragmatic approaches to sex education (i.e., harm/care and fairness) are also the values that both social conservatives and social liberals have in common (Graham et al., 2009). It is understandable that advocates of comprehensive sex education have been trying to remain neutral on values to accommodate everyone. Yet perhaps, a more explicit acknowledgment of these specific moral values – harm/care and fairness – could actually help facilitate understanding between different sides. However, this proposition would need to be tested first.

Notably, these combined models accounted for large amounts of variance explained. A meta-analytic review that attempted to quantify the typical size of effects in social psychology throughout the span of the 20th century reported that: "A correlation coefficient of .30 is large relative to most social psychological effects. Less than 25% of mean effects are that large" (Richard et al., 2003, p. 339). The coefficients of determination of 37% and 44% correspond to correlation coefficients of .61 and .66, respectively. However, a note of caution is also necessary as "similar to means and other statistics, effects can and will vary from sample to sample" (Henson, 2006, p. 619). The temptation to draw substantial inferences about generalizable effect magnitude based on a single study's result is therefore fraught with problems. Nonetheless, the very size of these effects indicates a promising potential for further research into these connections.

One of such further research directions is the interaction (in a general, non-statistical sense) between holding pragmatic attitudes toward sex education and believing that sex education could constitute a moral threat. Understanding the details of this interaction is an
important target for future research because it could help us to find possible ways of intentionally reconciling these perspectives and developing satisfying policy compromises. The extent of moral conviction in attitudes toward sex education would likely provide an important contribution here: It is likely that the extent of moral conviction and the possibility of mutual understanding and compromise would be inversely related (Skitka & Morgan, 2014).

The third pattern could be described thus: These questions do not have neat and clear answers. By confirming some of the hypothesized links and disconfirming others, this study complicates the overall picture. It also indicates that some of these links may be more consistent than others. My data lends further support for the well-established associations between moral foundations and political ideology. Yet it does not support the idea that all aspects of chronic regulatory focus have a direct and predictable connection to moral foundations or ideology.

What emerges from this third pattern is another key finding of this study: Due to their respective strengths as predictors, moral foundations likely represent a better potential intervention target than regulatory focus in the context of sex education. For this reason, my research recommendations do not include future work to refine interventions and measures based on typical regulatory fit. Instead, I suspect that focus on the moral foundations is likely to be more fruitful. The most productive focus for future research is likely on a combination of promotion and select moral foundations (purity and individualizing moral foundations, but not authority and ingroup).

It is also important to point out that the key theoretical constructs explored by this study reflect established dispositional orientations and personality traits. It is not clear to what extent they are modifiable. What is possible is directing future research to learn how the moral foundations theory could help to promote understanding and potential attitude change in the
context of sex education. This kind of work has already been occurring in other contexts (e.g., using the postulates of the moral foundation theory to reduce sexual prejudice, Lai et al., 2014; or exploring the possibility of shifts in political positions on a variety of issues for both liberals and conservatives, Day et al., 2014).

**Strengths and Limitations**

Some limitations were pragmatically unavoidable in this study's design. The following section acknowledges and addresses these limitations, as well as highlights some of this study's major strengths.

**Limitations.** The first limitation is related to having little choice but to develop several new tools in order to fully answer the research questions. These new tools included the questionnaire measuring attitudes toward sex education, the experimental manipulation, and the manipulation check. Because this study was breaking relatively new ground, no adequate existing tools were found for this purpose. Unfortunately, it also meant increased risk that these tools may fail. As shown in the discussion section, the ability to draw inferences from some of this study's findings has been directly and severely affected by this limitation.

Another limitation concerns the eternal problem of correlation versus causation in psychological research. It is obvious that an interest in causality is one of the driving forces behind this study. Yet an experimental element that enables clear inferences about causation applies only to answers to the second research question (i.e., communication effectiveness). Such clarity cannot be extended to the first research question (i.e., potential personality correlates of sex education attitudes). At the same time, although correlational designs cannot conclusively show causation, they provide findings that could support or falsify it. That is, correlational analysis can test several hypothetical casual pathways and find that data supports some pathways
better than others (Hayes, 2013). When employed in this way, correlational model testing is limited by the researcher's ability to imagine alternative pathways and to collect relevant data for such testing.

**Strengths.** Two notable strengths of this study are based on sample characteristics, such as the sample size with consequent power to detect expected effects and its relative diversity. A-priori power analyses indicated that the sample size gathered was likely sufficient to detect most effects of practically significant magnitude at .8 power (primarily first-order and mediation effects, somewhat less so for interaction effects; Aguinis & Harden, 2009; Fritz & MacKinnon, 2007; Tabachnik & Fidel, 2013). Power calculations can be imprecise in real-life settings due to their inherent assumption of measurement without error, so they usually provide minimum sample size benchmarks rather than guarantees. However, this consideration was somewhat mitigated by my interest in medium-to-large effects.

As Cohen (1990) stated, "The null hypothesis... is always false in the real world" (p. 1308). For Cohen (1990), the more relevant question was, to what degree is the null hypothesis false? Miller (2004) followed this logic further: "What is needed is a clear stand on how big an effect is worth finding" (p. 62). The constructs of interest in this study were intentionally selected for their strong theoretical connections to political ideology and values. Therefore, where present, lack of evidence in this study could generally be interpreted as null results for the effects of expected magnitude, rather than as artefacts of insufficient statistical power.

This sample recruited for this study cannot be seen as representative of the general population in Canada or the U.S.A, as non-representativeness is a typical characteristic of crowd-sourced samples (Paolacci & Chandler, 2014). However, it represents a large community sample, evenly balanced by gender, and with some diversity in age, ethnicity, and education
levels (e.g., 18 to 80 in age, 20.5% non-white, and 19.2% completed high-school or less). This study also succeeded in achieving a significant Canadian quotient of participants (46.5%). Therefore, in terms of generalizability, the results of this study likely fall in between the results derived from representative sampling and from convenience student sampling.

Furthermore, despite their justified ability to generalize, the studies of parental sex education attitudes that used population-representative samples (e.g., Bleakley et al., 2006; McKay et al., 2014) did not provide insight into the opposition toward sex education. A notion of widespread support for comprehensive sex education was a repeated key theme from these studies' conclusions. The findings of the current study do corroborate these conclusions due to the widespread endorsement of pragmatic attitudes toward sex education. Yet this theme of support it is also incomplete, as it fails to address the conflicts observed. The current study was able to help with some of this insight due to combining relevant research questions with success in obtaining a variety of participants (including the participants who identify highly with social conservatism and with moral concerns about purity).

**CONCLUSION**

This study suggested that conversations about sex education need to go beyond political ideology and religious attendance into deeper and more complex understanding of what exactly the issues are, especially the relevant psychological and moral issues. I started this study with a clear story informing my original conceptualization. In this story, advancement of comprehensive sex education represented a threat to traditional moral values about sexuality. Therefore, focusing on understanding and addressing this sense of threat represented a promising goal for policy makers and educators who aim to promote sex education.
My findings have confirmed, but also complicated and transformed this story. They showed that other factors played likely an even more important role in people's perceptions of sex education: That is, a combination of individualizing moral foundations of harm/care and fairness with regulatory focus of promotion. Therefore, although this study was not able to fulfill its hope for immediate practical recommendations, it provided some focus and promising directions for future theoretical and applied research.
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Appendix A

Recruiting and Debriefing Materials

Recruiting Material:

This study is for parents only! It looks into some aspects of your personality, values, and attitudes toward sex education, which is why it is essential that only people who already have children participate. It should take approximately 20 minutes to complete and pays $3.00. We will ask you to fill several questionnaires, read a brief article, and then tell us some of your thoughts about the article you read.

This study should have no risks greater than what you find in the everyday media (more detail will be provided in the consent form if you decide to proceed). It has been approved by the University of Calgary Conjoint Faculties Research Ethics Board. You could end your participation at any time and for any reason with no adverse consequences (you will receive the payment for the time you spent).

If you decide to proceed, it is very important that you tell us what you truly feel and think: Otherwise, the results will lose meaning. For the same reason, we would have to remove your data from the analysis if you spend way too little or way too much time completing the study (less than 10 minutes or more than 30 minutes). All information will be made anonymous and combined with all the other participants for the analysis. Thank you for your participation!

If you have any questions or concerns, feel free to contact:

- The researcher, Inga Gusarova (a graduate student in counselling psychology at the Werklund School of Education, University of Calgary, Calgary, Alberta, Canada) at ivgusaro@ucalgary.ca
- Supervisor, Dr. John Ellard, Department of Psychology (University of Calgary) at http://psyc.ucalgary.ca/manageprofile/profiles/john-ellard
- And the Conjoint Faculties Research Ethics Board at the University of Calgary, at cfreb@ucalgary.ca

If you are curious about the results or any aspects of the study, whether or not you took part in it, please feel free to contact the researcher.
Debriefing Material:

Sex education is a sensitive topic, with many people having divided opinions about it. The rationale behind providing sex education in schools lies in both avoiding negative outcomes (e.g., sexually transmitted infections, unintended pregnancy, coercion) and in promoting positive outcomes (e.g., self-esteem, respect for self and others, following one's values, informed choices). Overall, most research into parental attitudes in North America finds that a vast majority of parents support school-based provision of sex education that covers multiple topics. However, there seems to be some division about what topics to cover or to emphasize, and at what age. Interestingly, although much previous research tried to understand how much support for sex education exists among parents, few studies looked into what contributes to these differences.

This study aims to check if certain theories of morality and motivation could help explain some of the differences in parental perspectives. The Moral Foundation theory states that many of the moral concerns that people have could be roughly divided into harm/care, fairness/reciprocity, loyalty to one's group, respect for authority, and physical and spiritual purity/sanctity. To different people, these concerns matter to a different extent: For example, almost everyone cares about harm and fairness, whereas some people care more or less about authority or purity. This theory also states that people get a feeling when they encounter something they see as moral or immoral, and this feeling drives their judgment. The Regulatory Focus theory states that for some people, it is extremely important to meet their duties and obligations, as well as to avoid losses; and for other people, it is relatively more important to follow aspirations and hopes. It also means that a sense of safety and security matters more to some people than to others.

We propose that these differences could make the exact same information feel threatening to some people but not to others. For examples, for some people, providing comprehensive sex education could feel like a threat to purity and perhaps, a kind of harm for the same reason. Yet for others, not providing sex education could feel like a kind of harm due to not teaching teenagers the knowledge and skills they may need to reduce risks. Furthermore, some people may focus more on the potential for losses and others more on the potential for gains.

Research shows that some of the concerns people can have about sex education can be addressed: That is, comprehensive programs do not make teenagers go out and have more sex. Yet, if new information does not sit well with people's existing views, it can be dismissed without much consideration. This study also attempts to test if matching the exact same information about sex education to the motivational preferences of a person would make a difference in how it is perceived. So some of you have read a passage that emphasized making gains and some of you read a passage that emphasized avoidance of losses. Other than that, the articles were completely identical. We want to see whether a match to one's motivational style would make a difference in how information is perceived: Specifically, if the information may be interpreted as somewhat threatening to one's existing position on sex education, whether a match or a mismatch would increase or decrease this perception of threat.
Appendix B

Informed Consent Form

Name of Researcher, Faculty, Department, Telephone & Email:
Inga Gusarova, graduate student, Werklund School of Education, 403-801-7075, ivgusaro@ucalgary.ca

Supervisor:
Dr. John Ellard, PhD, Department of Psychology

Title of Project:
Sex Education Attitudes: Potential Antecedents

Sponsor:
None

This consent form, a copy of which has been given to you, is only part of the process of informed consent. If you want more details about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information. The University of Calgary Conjoint Faculties Research Ethics Board has approved this research study.

PURPOSE OF THE STUDY
This study aims to explore some potential connections between personality, motivation styles, values, and attitudes toward sex education.

WHAT WILL I BE ASKED TO DO?
You will be asked to complete several questionnaires (for example, asking the extent of agreement or disagreement with a number of statements), read a brief article, and then tell us some of your thoughts about the article you read and how you feel in the moment. It should take you approximately 20 minutes. Some examples of the questions/statements include "Compassion for those who are suffering is the most crucial virtue", "Do you often do well at different things that you try?", and "Do you think that comprehensive sex education threatens traditional moral values about sex?"

Participation is completely voluntary. You may refuse to participate, and you may withdraw from the study at any time without penalty. Although it would be greatly appreciated if you answer all material as frankly as possible, you should not feel obliged to answer anything you find objectionable or that makes you feel uncomfortable and you may decline to answer any questions. Please be aware that we require as complete a dataset as possible; therefore if you do decide to skip a question, except where provided with an official option to do so, we may have to discard your contributions and consider you withdrawn from the study.

WHAT TYPE OF PERSONAL INFORMATION WILL BE COLLECTED?
No personal identifying information will be collected in this study, and all participants shall remain anonymous. Should you agree to participate, you will be asked to provide your gender, age, level of education, racial or ethnic background, as well as to indicate whether you are a parent, and your child/children’s ages if you have children.

ARE THERE RISKS OR BENEFITS IF I PARTICIPATE?
This study is considered minimal risk: That is, it should have no risks greater than what you find in everyday media. You will be compensated $3.00 for your participation. If you decide to withdraw before completing the study, you will be paid $0.15 a minute for the time you spent (up to $2.00).
WHAT HAPPENS TO THE INFORMATION I PROVIDE?

The information collected will be anonymous and integrated with the information from all the other participants. There are no names on the questionnaires. This complete data set will be analyzed by the researcher, and the principle investigator will have access to it. Only group information will be summarized for any presentation or publication of results.

After the final report is produced, other researchers sometimes express interest in the original data set to do their own analysis. If this happens, this anonymous total data set will be available for sharing but it will not be possible to trace any of this data to you personally.

All information will be stored on a password-protected computer in password-protected folders for the research duration. After the research is completed, the files will be kept on a USB drive in a locked cabinet.

If you decide to withdraw, all the information you provided will be destroyed and will not be used in the analysis.

The online survey is being administered by Qualtrics©, an American software company. As such, your responses are subject to U.S. laws, including the USA Patriot Act. The risks associated with participation are minimal, however, and similar to those associated with many email programs, such as Hotmail© and social utilities spaces, such as Facebook© and MySpace©.

SIGNATURES

Your signature on this form indicates that 1) you understand to your satisfaction the information provided to you about your participation in this research project, and 2) you agree to participate in the research project.

In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from this research project at any time. You should feel free to ask for clarification or new information throughout your participation.

Participant’s Name: (please print) ____________________
Participant’s Signature: ____________________ Date: __________

Researcher’s Name: Inga Gusarova
Researcher’s Signature: Inga Gusarova Date: August 21, 2016

QUESTIONS/CONCERNS

If you have any further questions or want clarification regarding this research and/or your participation, please contact:

Inga Gusarova, graduate student
Werklund School of Education, University of Calgary

and Dr. John Ellard, PhD, Department of Psychology, University of Calgary at [redacted]; email cfreb@ucalgary.ca

If you have any concerns about the way you’ve been treated as a participant, please contact the Research Ethics Analyst, Research Services Office, University of Calgary at [redacted]; email cfreb@ucalgary.ca

A copy of this consent form has been given to you to keep for your records and reference. The investigator has kept a copy of the consent form.
### Prevention / 261 words

An important goal of sex education is to avoid the risks associated with sexual activity. Developing knowledge, skills, and personal insight. This way, gaining knowledge and skills can help young people to guard against making mistakes when it comes to sex. Therefore, none of the broad-based sex education programs omit or exclude information about abstinence. This way, the young people who believe in abstinence can be supported in avoiding sexual activity and observing their values.

Sex education is an important topic, so it has been extensively studied. A large number of research projects evaluated the impact of multiple sexual health education programs on young people's behaviour. One such project reviewed 83 previous studies that looked specifically into the effects of broad comprehensive sex education programs. This review concluded that such programs do not increase sexual activity among teenagers and they do not lead to earlier initiation of sex. Some of them even reduce or delay teenage sexual activity. Moreover, after exposure to such programs, the teenagers who do not avoid sexual activity are less at risk for sexually transmitted diseases or unintended pregnancy due to using contraceptives, such as condoms.

Some sex education programs only focus on abstinence and do not teach about contraception or condoms. It turns out that the young people exposed to such programs tend to initiate sexual activity at the same age as all others. So, these programs do not work any better than comprehensive programs to delay teenage sexual activity. And unfortunately, the risks of sexual activity also remain present or increased, as teenagers are less willing to use contraception when they do initiate sex.

### Promotion / 249 words

An important goal of sex education is to promote informed decision-making by helping the youth to take advantage of knowledge, skills, and personal insight. This way, gaining knowledge and skills can help young people to follow their values when it comes to sex. Therefore, all broad-based sex education programs provide information about abstinence. This way, the young people who choose abstinence can be supported in pursuing their values.

Sex education is an important topic, so it has been extensively studied. A large number of research projects evaluated the impact of multiple sexual health education programs on young people's behaviour. One such project reviewed 83 previous studies that looked specifically into the effects of broad comprehensive sex education programs. This review concluded that such programs do not increase or lead to earlier sexual activity among teenagers. Some of them even achieve reduction or delay in teenage sexual behaviour. Moreover, after exposure to such programs, the teenagers who do engage in sexual activity are more likely to take advantage of contraceptives, such as condoms, to manage risks better.

Some sex education programs only focus on abstinence and do not teach about contraception or condoms. It turns out that such programs do not work any better than comprehensive programs to delay teenage sexual activity. And unfortunately, they also do not teach the knowledge and skills that help to make sexual activity safer or to promote decision-making: When teenagers do initiate sexual activity, exposure to such programs makes them less willing to use contraception.
In Canada, sex education is based on helping the youth to develop knowledge, skills, and insight about themselves. If young people know what their values are, knowledge and skills can help them to follow their values when it comes to sex. Therefore, all broad comprehensive sex education programs provide information about abstinence. This way, the young people who choose to abstain from sexual activity can be supported in their values and choices.

Sex education is an important topic, so it has been extensively studied. A large number of research projects evaluated the impact of multiple sexual health education programs on young people's behaviour. One such project reviewed 83 previous studies that looked specifically into the effects of broad comprehensive sex education programs. This review concluded that such programs do not increase or lead to earlier sexual activity among teenagers. Some of them even reduce or delay sexual behaviour. Moreover, after exposure to such programs, the teenagers who do engage in sexual activity are more likely to use contraceptives, such as condoms.

Some sex education programs only focus on abstinence and avoid teaching about contraception and condoms. It turns out that such programs do not work any better than comprehensive programs to delay teenage sexual activity. And unfortunately, they also do not help to make sexual activity safer / reduce the risks of sexual activity: When teenagers do initiate sexual activity, exposure to such programs makes them less willing to use contraception.

Appendix D

Questionnaires

The Demographic Questionnaire

1. What is your age? _____

2. Where do you currently live? Canada(Province) / USA(State)

3. Which racial or ethnic background do you identify with the most?

4. Which gender do you identify with the most?
   Male   Female   I prefer to identify as _______________

5. Are you a parent? Yes / No

6. If you are a parent, what age is your child / are your children? _______ (several spaces)

7. How often do you attend religious services, NOT counting weddings, baptisms, or funerals?

8. What is the highest educational level you have achieved?

9. How conservative do you tend to be when it comes to social policy? From [1] = not at all conservative to [9] = extremely conservative

10. How liberal do you tend to be when it comes to social policy? From [1] = not at all liberal to [9] = extremely liberal
Sex Education Attitudes

We would like to know what you think about sex education. If you are not sure how to answer, please guess based on your personal experiences and values: Your immediate response is the best. There are no wrong answers, because we are really interested in your views.

1. How important is the issue of sex education to you?
   1 = Not important at all, 6 = Very Important

2. Do you think that sex education should be provided in schools?
   1 = Strongly Disagree; 6 = Strongly Agree

3. How important do you think it is for sex education to help people to avoid negative outcomes (e.g., STI/HIV, sexual coercion, unintended pregnancy)?
   1 = Not important at all, 6 = Very Important

4. How important do you think it is for sex education to help people to achieve positive outcomes (e.g., self-esteem, respect for self and others, non-exploitive sexual relations, rewarding human relationships, informed reproductive choices)?
   1 = Not important at all, 6 = Very Important

5. How important do you think it is for sex education to help people to develop the knowledge and the skills to make informed decisions about sex?
   1 = Not important at all, 6 = Very Important

6. Do you think that comprehensive sex education threatens traditional moral values about sex?
   1 = Strongly Disagree; 6 = Strongly Agree

7. Do you think that comprehensive sex education threatens your personal moral values about sex?
   1 = Strongly Disagree; 6 = Strongly Agree

8. How important do you think it is for sex education to help people to abstain from sexual activity until marriage?
   1 = Not important at all, 6 = Very Important

9. Do you think that sex education could have harmful moral consequences?
   1 = Strongly Disagree; 6 = Strongly Agree
Dependent Variables Questionnaire

Please, answer the following questions as honestly as you can. Your immediate intuitive response is best, even if you are not sure:

What did you think of the tone of this article?

How credible did you find this article?
How logical did you find this article?
How convincing did you find this article?
How reasonable did you find this article?
How objective do you think the article's author is?
How informed do you think the article's author is?
How intelligent do you think the article's author is?
How biased do you think the article's author is?


How true do you think the following claims are? Your immediate intuitive response is best, even if you are not sure:
- Comprehensive sex education can be compatible with values of sexual chastity and abstinence
- Reduction or delay in sexual activity are some of the outcomes of broad-based comprehensive sex education


Would you support the researchers making more information about comprehensive sexual education available to your local school board?
Optional: If yes, feel free to type in the name of your school district __________________

Data Quality/Verification Self-Report Item:
Although we have attempted to recruit only people who have children for this survey, we know that sometimes instructions are overlooked or missed. As it is extremely important that our data only comes from parents, please indicate below your parental status. Your answer to this question has no implications for receiving pay once you submit your study responses.
[1] Yes, I am a parent.
[3] Some other reason/circumstance may lead to problems with my data (e.g., my answers were not genuine).
Appendix E
Supplementary Regression Results

Where applicable, gender was dummy-coded such that 0 = male and 1 = female; parental status was dummy-coded such that 0 = non-parent and 1 = parent.

Predictors Of Sex Education Attitudes Dimension of Pragmatism: Moral Foundations

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Note: sr = semi-partial correlations. The value of Durbin-Watson statistic was 1.78.

Predictors Of Sex Education Attitudes Dimension of Pragmatism: Regulatory Focus.

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### Predictors of the Sex Education Attitudes Dimension of Moral Threat: Moral Foundations

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Note: sr = semi-partial correlations. The value of Durbin-Watson statistic was 1.56.
### Predictors

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Step 3 Moral Threat

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Note: sr² = semi-partial correlations reported as percentages of variance explained. The value of Durbin-Watson statistic was 1.20.

### Predictors Of The Sex Education Attitudes Dimension Of Moral Threat: Regulatory Focus

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### Note

Note: sr = semi-partial correlations. The value of Durbin-Watson statistic was 1.21.
Appendix F
Supplementary Mediation Results

**Mediation analysis with DV = Persuasion**
Mediator/Anxiety model (a path): $R^2 = .21$, MSE = .23, $F(4, 468) = 31.82, p < .001$
Persuasion, mediated model (c' path): $R^2 = .17$, MSE = .47, $F(5, 467) = 18.97, p < .001$
Persuasion, total effects model (c path): $R^2 = .14$, MSE = .49, $F(4, 468) = 18.34, p < .001$

<table>
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<th>Predictor</th>
<th>Mediator: Anxiety (a path)</th>
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<th>Dependent: Persuasion (c path)</th>
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**Mediation analysis with DV = Pragmatism**
Mediator/Anxiety model (a path): $R^2 = .24$, MSE = .22, $F(8, 458) = 18.49, p < .001$
Pragmatism, mediated model (c' path): $R^2 = .41$, MSE = .34, $F(9, 457) = 34.78, p < .001$
Pragmatism, total effects model (c path): $R^2 = .38$, MSE = .35, $F(8, 458) = 34.69, p < .001$

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Gender was dummy-coded such that 0 = male and 1 = female. Parental status was dummy-coded such that 0 = non-parent and 1 = parent.
Mediation analysis with DV = Moral Threat

Mediator/Anxiety model (a path): $R^2 = .24$, MSE = .22, $F(7, 458) = 21.07, p < .001$

Moral Threat, mediated model ($c'$ path): $R^2 = .46$, MSE = .86, $F(8, 457) = 49.27, p < .001$

Moral Threat, total effects model ($c$ path): $R^2 = .44$, MSE = .90, $F(7, 458) = 51.14, p < .001$

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As recommended by Hayes (2013), all mediation results are reported using unstandardized regression coefficients.