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# Targeted Invitations to Tailor: Establishing Fertility as Relevant in U.S. Sex Education

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**ABSTRACT**

The United States faces troubling fertility trends that include high percentages of unintended pregnancies, as well as record-low fertility rates and individuals having fewer offspring than they desire. To address these problems, scholars and public health advocates have argued for the implementation of fertility information into existing sex-education curricula. In this study, we draw from 32 semi-structured interviews with secondary school sex educators to gain insight into their experiences on this front. They contended that one of the greatest barriers to their successfully teaching fertility related material was that students do not find fertility information relevant. Participants described three appeals that they employ to communicate fertility information as persistently relevant to the adolescents in their classes. Our interviews revealed that all three of these relevance appeals employ targeted invitations for students to tailor fertility information in ways that fit them personally. These findings suggest a need to re-conceptualize targeting and tailoring research in ways that connect with the goals of *in situ*, relevance-oriented communication, and they indicate how a focus on teaching health educators to establish fertility as relevant would help to situate future generations for better sexual and reproductive health over a lifetime.

Adolescents in the United States receive no formal education focused specifically on human fertility, and fertility knowledge levels have been shown to be low among those of reproductive age (Daumler et al., 2016; Lundsberg et al., 2014). This lack of knowledge is one potential source of, and complication for, troubling population-level fertility trends. Adolescent pregnancy rates are considerably higher in the United States than they are in other industrialized nations (Sedgh et al., 2015), and more than half of all U.S. pregnancies are unplanned (Finer & Zolna, 2014). At the same time, reports from the Centers for Disease Control and Prevention (CDC) in 2019 concluded that fertility rates have fallen to a 30-year low and that – although some individuals are child-free voluntarily and/or are satisfied with their family size – a growing percentage report having fewer offspring than they desire (Martin et al., 2019). Recent provisional data from the CDC reveals that, while birth rates rose by 1% in 2021, the total fertility rate remains well below replacement levels (Hamilton et al., 2022), a situation that has much to do with the lack of structural and socio-cultural support provided parents in general and mothers in particular.

In response to these trends, calls have been made for the integration of fertility information into established sex-education curricula, with the understanding that "conception and contraception are two sides of the same coin" (Nargund, 2015, p. 189). Scholars and health educators argue that information about the causes of infertility, approaches to family planning, and the timeline of reproductive capacity are fundamental aspects of sexual- and reproductive-health knowledge and should therefore be covered by secondary schools (Akizuki, 2021; Littleton, 2012; Macintosh, 2015). Although formal fertility education has yet to be introduced in

U.S. schools, the overlap between approved sex-education curricula and fertility information means that many sex educators are already communicating about fertility during their lessons and have been grappling with the opportunities and challenges associated with that task.

One of these challenges for sex education across the board is the establishment of relevance. Research demonstrates that many adolescents do not see their sex-education lessons as relevant to them personally, noting, for instance, that sex-education messages seem impractical or idealistic (Fisher, 2009; Harris et al., 2022; Jones & Biddlecom, 2011), or that the information covered is scientific in ways that students find difficult to understand or connect with personally (McKee et al., 2014). This lack of perceived relevance for sex-education content and messaging is problematic because establishing relevance is essential to message processing, elaboration of messages, and persistent changes in attitudes and behaviors (Petty & Briñol, 2011; Petty et al., 1995). In the context of fertility-related information specifically, the need for longitudinal attitude and behavior change is imperative because one's reproductive life evolves over a span of decades, and any family building plans are generally in the distant future for adolescents.

To date, scholarship on establishing an idea as relevant for individuals demonstrates, indeed, that doing so is necessary for successful messaging (Kreuter & Wray, 2003; Petty & Briñol, 2011), but research has yet to fully explicate the nuances of how relevance is communicated. This is particularly true in educational scenarios where resource-prohibitive tailored approaches to communication are not feasible. The current study explores this issue in light of secondary school sex

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educators' strategies for making fertility related information relevant to students. Our analysis explicates three appeals that sex educators reported using to communicate relevance. We find that these appeals function not as either tailored or targeted, but rather as targeted invitations for students to tailor fertility information to fit their own circumstances and build a sense of relevance that is persistent and impactful for years to come.

## Relevance via tailoring and targeting

Message relevance has been shown to be a necessary precursor to effective communication (Kreuter & Wray, 2003). The elaboration likelihood model (ELM) identifies perceived personal relevance as a variable that facilitates elaboration, which involves a mode of central, high-effort cognitive processing associated with enduring attitude and behavior change (Petty & Cacioppo, 1986). As Petty and Briñol (2011) explained, "linking the message to virtually any aspect of the self appears to increase motivation to think about it" (p. 229), and, particularly when an argument's quality is perceived as high (Carpenter, 2015), that thinking supports more longitudinal, persistent persuasion (Petty & Cacioppo, 1979; Petty et al., 1995).

Despite the identification of relevance as key for facilitating attitude and behavior change, scholarship establishing relevance's definition has been vague, likely because relevance can seem self-explanatory. Existing studies have either defined the term tautologically or gestured toward its meaning via study design operationalization. This operationalization draws from foundational ELM research, situating a message or scenario as relevant when it is understood as: (a) within the sphere of one's direct experiences; (b) an occurrence or risk that one is likely to encounter and to confront often; and (c) something that will unfold directly (Chandran & Menon, 2004; J. D. Jensen et al., 2012; Kirkpatrick & Lee, 2021). In this framework, relevance is upheld in terms of a message's link to individuals' personal experiences, lived contexts or environments, and immediate temporality.

Beyond these features, several additional variables have been identified that play a role in communicating relevance in educational settings particularly. Frymier and Shulman (1995) reported that linking course content to student goals established a sense of student relevance, which increased motivation to learn. Muddiman and Frymier (2009) confirmed this finding from the perspective of student perception, noting that students found teachers' references to students' current and future lives, personal stories, and popular culture effective in communicating course materials' relevance. Moreover, Coultas et al. (2020) found that reflections of culture – broadly conceived in terms of the socio-historical, lived perspectives of students, as well as the interculturality of educators themselves – was imperative for fostering a sense of authentic identification and personal relevance in the context of comprehensive sexuality education. This research suggests that students are likely to find a reproductive-health topic relevant when a curriculum accounts for their unique subject positioning and the broader cultural and social determinants of health that they accordingly negotiate.

One approach with the capacity to attend to these individualized variables is tailoring, which involves the creation of personalized messages that incorporate specific characteristics matching, or otherwise appealing to, that of message recipients (Rimer & Kreuter, 2006). Tailoring has been shown to be extremely effective in promoting relevance and supporting associated changes in attitudes and behaviors (Manne et al., 2010; Resnicow et al., 2009). In terms of fertility knowledge, tailored interventions increased relevance and knowledge levels among women being treated at a reproductive-health center (García et al., 2016). However, in scenarios where messages must be provided to a diverse group of individuals simultaneously, or when information about audiences is limited, tailoring is less feasible. Moreover, when an individuals' awareness of, or understanding about, the subject is low initially, tailored communication is less impactful (Kreuter & Wray, 2003; Williams-Piehota et al., 2003). In most secondary school contexts, all of these factors are at play in that students have diverse characteristics and are lacking in knowledge about the content of their lessons. This, in combination with the fact that U.S. public secondary schools are minimally funded, means that tailoring as it has been traditionally conceptualized is not viable (Lairson et al., 2008).

In cases where tailoring is unsuitable, targeted communication is generally upheld as the next-best option for establishing information as relevant. Targeting – which was derived from the principle of audience segmentation in advertising research – is a less customized approach designed "to reach some population sub-group based on characteristics presumed to be shared by the group's members" (Kreuter & Wray, 2003, pp. S227-S228). This involves building a message around the shared characteristics that are known such as age range or educational background. The upside of employing a targeted approach in the context of an audience with low knowledge or awareness levels is that targeting is more effective in facilitating knowledge acquisition (Kreuter & Wray, 2003). The downside is that targeting is not as likely to foster relevance associated with long-term attitude and behavior change (Daniluk & Koert, 2015).

While tailoring and targeting have been dichotomized in many theoretical accounts, there are indications that the two are related on a continuum. For instance, Christy et al. (2022) characterized tailored and targeted approaches as on a "spectrum," noting that "minimally tailored" messages focusing on surface-level demographic traits function similarly to targeted efforts, while "highly personalized messages," such as those derived from individualized risk algorithms, do not (p. 2). Kreuter and Skinner (2001) highlighted instances wherein targeted and tailored efforts have been technically mis-categorized because both approaches share characteristics in some cases and have been considered without strict attention to individual vs. population-level intervention. In this respect, continued research exploring the relationship between tailored and targeted communication is warranted, particularly in the context of specific appeals to relevance. Accordingly, the present study poses the following research questions:

**RQ1:** What communicative appeals do sex educators employ to establish fertility information as relevant to adolescents?

**RQ2:** How do these appeals function in relation to tailored and targeted approaches?

## Method

After gaining IRB approval from the university, the authors conducted semi-structured interviews with secondary school sex educators. Interviewees included educators teaching at public secondary schools in two different U.S. states, one with an abstinence-based mandated curriculum (Utah) and one with a comprehensive sex-education curriculum (Colorado). In total, 18 interviews were conducted with teachers from the abstinence-based state and 14 interviews with teachers from the comprehensive sex-education state. The same overarching themes emerged for both groups, though younger participants were slightly more likely to describe their use of the familial relationality appeal and older participants were slightly more likely to describe the projection-of-future-self appeal (the emotionality appeal was used evenly across all ages of participant). Moreover, a key nuance in the data reflected the challenges faced by abstinence-based educators, who generally reported being more concerned that their instruction could be conceived as defying their state's requirements and put them at risk for disciplinary measures.

## Participants

A total of 32 educators employed through the states of Utah or Colorado in public secondary schools participated in this study. In all, 21 participants self-identified as female, and 11 as male. Twenty-seven self-identified as White or Caucasian, 3 as Hispanic or Latinx, 1 as Mexican and Jewish American, and 1 as African American. They ranged in age from 24 to 64 years, with an average of 43 years. Table 1 provides a summary of individual participants.

## Procedure

Inclusion criteria required that interviewees were teaching, or had taught, a sex education or related course at a public secondary school in Utah or Colorado. The authors visited both state's Department of Education websites and collected contact information for public middle- and high-school teachers designated as health and/or sex educators. Participants were recruited via an e-mail that described the study, outlined what participation entailed, and invited their participation. Those interested were instructed to contact the researchers via e-mail or phone to set an interview time. The recruitment process consisted of four phases of stratified, purposeful sampling to procure a maximum variation sample representing a diversity of locations, teacher demographics, and ranges of experience (Lindlof & Taylor, 2019). These phases focused on Utah participants (moving through districts and individual schools alphabetically); Colorado participants (moving through districts and individual schools alphabetically); racially and ethnically diverse Utah participants and serving-schools; and racially and ethnically diverse Colorado participants and serving-schools, respectively. The latter stages involved contacting teachers in the most racially diverse school districts in each state (beginning with the most diverse). The recruitment

**Table 1.** Summary of participants, curricular type, and grades served.

| Name | Gender, age | Self-identified race/ethnicity | Curricula type | Grades served |
|---|---|---|---|---|
| Tina | Female, 55 | Caucasian | Abstinence Based | 10–12 |
| Vi | Female, 64 | Caucasian | Abstinence Based | 7–9 |
| Jody | Male, 54 | Caucasian | Abstinence Based | 10–12 |
| Frank | Male, 35 | White | Abstinence Based | 7–9 |
| Nell | Female, 54 | White | Abstinence Based | 10–12 |
| Ken | Male, 52 | White | Comprehensive | 9–12 |
| Rob | Male, 33 | Caucasian | Comprehensive | 9–12 |
| Erin | Female, 46 | Caucasian | Abstinence Based | 10–12 |
| Lucy | Female, 27 | White/Caucasian | Abstinence Based | 9–12 |
| Nina | Female, 35 | White/Caucasian | Abstinence Based | 10–12 |
| Ali | Female, 29 | White | Abstinence Based | 10–12 |
| Jack | Male, 60 | Caucasian | Abstinence Based | 10–12 |
| Sheila | Female, 32 | White | Abstinence Based | 10–12 |
| Mimi | Female, 50 | White | Abstinence Based | 10–12 |
| Dana | Female, 25 | White/Caucasian | Comprehensive | 9–12 |
| Dee | Female, 24 | White | Abstinence Based | 10–12 |
| Lola | Female, 46 | White | Abstinence Based | 10–12 |
| Max | Male, 50 | White | Comprehensive | 9–12 |
| Jan | Female, 33 | White/Caucasian | Abstinence Based | 9–12 |
| Joe | Male, 36 | White/Caucasian | Comprehensive | 9–12 |
| Gloria | Female, 29 | White/Caucasian | Comprehensive | 7–12 |
| Nico | Male, 36 | White | Comprehensive | 9–12 |
| Jen | Female, 54 | White/Caucasian | Comprehensive | 9–12 |
| Leo | Male, 35 | White/Caucasian | Comprehensive | 9–12 |
| Kim | Female, 61 | White/Caucasian | Comprehensive | 9–12 |
| Sal | Male, 57 | Hispanic/Latino | Comprehensive | 6–8 |
| Zoey | Female, 35 | Hispanic | Comprehensive | 9–12 |
| Sherry | Female, 40 | Mexican/Jewish American | Comprehensive | 9–12 |
| Alexa | Female, 29 | Latina | Comprehensive | 6–12 |
| Rose | Female, 58 | African American | Abstinence Based | 7–8 |
| Han | Male, 53 | White | Abstinence Based | 9–12 |
| Amy | Female, 43 | Caucasian | Abstinence Based | 6–8 |

process concluded when the study reached theoretical saturation. In total, 1,329 recruitment e-mails were sent (245 in Utah; 1,084 in Colorado).

Those who indicated interest in participating signed a digital consent form and set up either a Zoom ($n = 18$) or telephone ($n = 14$) interview with one of the study authors, depending on their format preference. Interviews took place during the COVID-19 pandemic, and remote interviews allowed for all involved to follow associated health guidelines. A semi-structured interview protocol allowed for both structural similarity across interviews and flexibility to accommodate the unique experiences and positioning of each participant (Lindlof & Taylor, 2019). During the course of the interview, participants answered a battery of demographic questions, as well as a series of open-ended questions about their experiences teaching sex education. The interview protocol included inquiries about: (a) the inclusion of fertility information in their lessons, (c) specific strategies used, or content covered, when teaching about fertility, and (d) student comments about fertility information. At the outset, the interviewer defined human fertility in terms of "an individual's ability to become pregnant and have children" and – drawing from research on fertility knowledge and education (R. E. Jensen et al., 2018; Kudesia et al., 2017) – noted, "often this issue is communicated in terms of a female fertility timeline from when fertility begins to when it ends. It can also be communicated in terms of male reproductive capacities." Participants were not asked explicitly about making content relevant. In the course of analyzing the transcripts, this concept arose organically, as did the strategies they described for establishing relevance. Interviewees received a $30 gift certificate for participation. Interviews ranged from 21 to 63 minutes in length, with an average of 35.4 minutes. They were digitally recorded and transcribed verbatim.

### Analysis

Constant-comparative techniques guided analysis within and across each interview (Corbin & Strauss, 2015). This involved several different analytical stages. First, after each interview was completed, the author who performed the interview wrote open field notes that included information about the interview experience, content themes, and emergent theoretical constructs that were shared with the other author. Once each interview had been transcribed, the interviewing author checked the transcription against the digital audio recording to ensure accuracy. Second, once all of the interviews had concluded and been transcribed, the authors individually read the transcriptions and field notes in their entirety, writing exploratory notes and comparing and contrasting themes between and within interviews. Third, the authors engaged in several cycles of open-coding wherein they continued generating themes and sub-categories that surfaced from their close readings of the data, refining each one, and identifying illustrative examples that delineated what each theme and sub-category entailed. Fourth, the authors went through the data together to talk through their interpretations and ensure that examples from the data aligned with authors' assessment of the data as a whole.

At this point, the authors decided to focus the analysis on teachers' efforts to make fertility information relevant. They employed relevance as a sensitizing construct and engaged in subsequent cycles of axial coding to highlight references to relevance in the data, as well as examples of teachers describing strategies to create and maximize relevance (Corbin & Strauss, 2015). Relevance descriptions were identified as any discussion concerning efforts to garner students' attention and facilitate their personal engagement with fertility messaging. After central relevance appeals were identified in an overarching coding scheme, each individual reference to relevance across the interviews was coded accordingly, checked across authors for validity, and considered again in terms of existing theoretical descriptions of relevance to ensure analytical rigor. Throughout the manuscript, pseudonyms are used to protect participants' anonymity.

### Results

All interviewees noted that, although fertility related content was not in the official curricula for their courses, they included fertility information in their classes. In line with existing research findings (Ragnar et al., 2018), participants described how fertility information is challenging to make relevant because ideas associated with family building and long-term reproductive health seem distant from the vantage point of adolescence. To meet this challenge in a context where tailoring messages to individuals is unfeasible, we found that participants described three communicative strategies they employed that drew from general demographic characteristics of their students as adolescents who: (1) are entrenched within familial relationships, (2) are responsive to emotionality, and (3) can be encouraged to think about themselves in the future. In what follows, we explicate these appeals by drawing from illustrative excerpts from the data and considering how each one functions as a targeted invitation to tailor fertility information to students' own individual circumstances.

### Familial relationality

Many interviewees explained that they made fertility relevant for students by referencing and otherwise highlighting students' own families in terms of relationality. Relationality in this respect refers both to adolescents' understanding of fertility information through the broader context of their own family's experiences (rather than their own isolated experiences), as well as students' positioning and relationships within the family. In reference to the former, Leo explained, "I also go back to those stories about families. We've had students who would talk about how they've had parents that were consistently trying to have a sibling, and it was not working. That was how it would become relevant." He elaborated further in terms of his reasoning for invoking familial relationality through stories about families:

> A lot of [students] do value their families and their role in their families. You can imagine, I used the example of having a sister who's pregnant if you had a mom who had a miscarriage, right? Obviously, that could be devastating to a family. I know, I had

a student a few years ago where they really wanted this new baby brother that was supposed to come into the family, and the mom ended up having a miscarriage. They ended up having a naming ceremony and a funeral. I could really understand if they had alot of lingering questions about the biology behind what happened to their brother.

Leo reasoned that it was primarily in light of adolescents' sense of family member's experiences that they could "imagine" fertility information as relevant, especially because family members – unlike peers – included people at different life stages. Leo's comment also reveals that the fertility experiences of any one family member (e.g., a mother's miscarriage), can provide infrastructure for understanding fertility information for other family members (e.g., a sister's pregnancy as at-risk). Linking into that familial understanding of fertility via telling stories about families is therefore more likely to incite a sense that a message is relevant.

The different means by which educators described invoking familial relationality in the classroom included both Leo's mention of introducing fertility information in light of "stories about families" and also the creation of take-home assignments that require students to talk with their family members about normative expectations related to dating, sex, reproductive decision-making, and family building. Jen said:

> One of our assignments is to go talk to your parents about what age to date and who should pay and those kinds of things. And it's fascinating to me to read that because they're all over, and you can definitely tell what people's, you know, beliefs are, and where they're coming from; from their parents' answers because they have to write their answers, their parents answers, and a peer's answers. So it's pretty enlightening to see that. I mean, very rarely are they way off from their parents.

The goal was to allow students to approach the information through the lens of their own unique families, in comparison to that of their similarly aged peers. It required them to consider topics that align with fertility information (referenced, euphemistically in this excerpt, as "those kinds of things") in terms of the expectations that their families had for them and for themselves. Jen capitalized on the fact that the process of eliciting familial expectations functions to make the information presented relevant to students in personalized ways, though other teachers who employed this approach did not find that it made for inter-familial agreement. Joe noted:

> Then you see people, like, "I wouldn't wanna do what my sister did. She has to work two jobs. My mom's at home who can't work, and she has to take care of the baby, and I wanna take care of my own baby." They see these experiences their family's having.

The act of engaging with family members directly and reflecting on their experiences, rather than necessarily agreeing, is what seemed to uphold fertility information as relevant.

Moreover, several educators spoke about how they made a point to discuss fertility in terms of genetics, a move that functioned inherently to invoke students' familial relationships. Sometimes this involved appeals that encouraged considerations of family member's experiences and expectations (just as the family-oriented assignments were designed to do). Nina described how she found herself "talking about genetics" in the context of menopause, explaining to students, "It goes back to, what did your mom, when did she stop [menstruating]? When did your grandma stop [menstruating]? Did they have medical problems? Did they have a hysterectomy?" Amy also encouraged her students to ask questions about their family members' experiences with infertility specifically because genetics can be involved. She asked them to consider whether, "maybe genetically, we've had a hard time in your genetic line having babies."

Regardless of how they invoked familial relationality, educators reported that the result was an increase in adolescents' sense of personalized relevance about fertility. They evidenced this by explaining that students responded as if they had been invited to discuss their own families in terms of fertility information. Zoey recalled students saying, "'Oh, well, my mom had problems getting pregnant,' or 'My mom had to go through IVF to have my little brother.'" Jan said her students commented about their own families in terms of fertility norms and expectations: "We have had students say like, 'Oh well, my mom was pregnant as a teenager and that's just what we do in our family.'" Rose recollected questions from students wherein they noted, "their parent had experienced [a fertility related health problem] and they didn't understand how or what was going on with their parent." These responses reveal that adolescents had taken the generalized information discussed and reframed it in terms of the specific experiences, relationships, and interconnections that they perceived in their own families. The teachers' invocations of families in terms of storytelling, at-home assignments, and/or mention of genetics invited students to link fertility information to a tailored framework of understanding.

## *Emotionality*

Interviewees described using appeals to emotionality – which entail highlighting or otherwise evoking feelings or emotions – to facilitate a sense of relevance. Jack saw this as vital in garnering adolescents' attention in general, noting "these kids have emotions, and they pay attention when you get something that is emotional. If you're talking about fertility without something emotional, I don't know how much it's gonna catch their attention, to be honest with ya'." Given the power of emotional appeals for the majority of adolescents, Rob described how he designed his curriculum as a whole to elicit feelings:

> I want them to focus more on, "Hey, this is how it's gonna make me feel. This is what's going to happen about my family dynamic." Trying to get them to sort of have feelings inside of themselves be created so they can be like, "Huh, this is what it would be like. These are the stigmas"—put themselves in those emotional shoes.

He saw establishment of an emotional connection as linked to a lasting sense of relevance.

Some described evoking emotionality via the telling of first-person accounts, which were employed because they encouraged students to feel what their teachers felt and because they situated educators as credible sources of information. Joe explained, "When you can bring your own experience and what you know about it firsthand into it, it helps a lot more because then they're like, 'Oh, they've been through this, or at least they know someone who's been

through this,'" and what becomes clear is "'it's not just textbooks talking to me or the internet talking to me.'" He continued:

> I bring up, because when my wife and I were trying to get pregnant, you're looking at: What are the best things? What are the best things to avoid? Stuff like that, so I bring it back to the classroom in terms of alcohol or different types of prescription medication or marijuana, or how long it takes the sperm to develop, for the 70 days, or whatever the window is, depending on the person.

By framing variables affecting fertility within the context of his own, personal attempts to have a child (and then in terms of adolescents' current experiences), he believed that students were, in turn, more likely to consider those variables information they will personally need to know. Han noted, "My wife had an ectopic pregnancy and she almost died, and so it was kind of a – it's a really good way to kinda show 'em what happens and what they do for it and those kinds of things." In both of these examples, the emotionality appeals are relatively subtle gestures toward embodied experience and identification as there is no explicit depiction of feeling or its expression. Just a quick mention that these issues were something the teachers experienced was enough – they felt – to encourage an emotional connection and an associated sense of personal applicability. The teachers could not speak to the individual feelings each student had or would experience, but, by providing a glimpse into their own emotional reactions, they could nudge students toward individualizing the appeal for themselves.

Others described offering adolescents more extensive first-person stories about their own fertility experiences and included explicit accounts of the emotions they had. Amy reported speaking about her years-long struggle with infertility. She told students about "seven years of me not having a baby. This is me personally." She recalled she had been thrilled to welcome:

> a miracle baby, and I tell them that. I said, we were told we wouldn't have a baby, and we stopped everything, and all of a sudden, it worked. ... Because we were done. I was very open with my [students] that—I tell them a story about us sitting at an amusement park. I don't tell them the full-on exactly what the nurse said, but our next step, and my husband's like, "I'm done," and walked away. He's like, "I can't do this anymore. It's too hard." I usually do start tearing up because I'm like, it was so hard.

Amy provided personal details about the feelings associated with her own fertility struggles, walking students through the interpersonal dynamics, uncertainty, and intense feelings that those issues created in her relationship, even shedding a tear in recollection. Her account allowed her to speak at the level of emotion and invite adolescents to feel what she went through and what research has shown to be central for many who experience infertility treatment (Kosenko, 2021). Emotionally fraught first-person accounts along these lines "get [students'] attention," as Jen claimed, and they also seemed to hold students' attention long enough for them to form an impression similar to that invoked by tailoring.

Interviewees found that relaying stories about not only themselves but also those they knew personally could communicate emotionality effectively. This was especially true when adolescents, too, had a connection to the individual whose story was referenced. Kim explained:

> We also had a very well-liked teacher in our building who had a very traumatic miscarriage about four or five years ago, and kids knew about that. That was something that—and she would talk with kids about it, and they would talk about, "Well, we remember when this teacher said this happened and how traumatic that was for her." They were aware of people that they knew who had experienced that.

In this account, a teacher the students knew and cared for, and who had experienced trauma and associated difficult feelings as a result of a miscarriage, was referenced as a means for guiding them to connect individually through emotions with a message. With a similar goal, Jen explained she told her students the story of one of her friends who unknowingly contracted a sexually transmitted infection from a high-school boyfriend. Years later, the friend was diagnosed with pelvic inflammatory disease, which put her at risk for infertility and other health conditions such as cancer. Jen emphasized that getting diagnosed "was devastating news" for her friend and that "the only reason she even went in [to the doctor] was years later she was having, you know, cramping and weird bleeding, and she was shocked, you know, just had no idea." This account centered feelings – devastation, shock, confusion – as an invitation for students to connect with the teacher's story and with the idea that they could face similar circumstances.

As effective as appeals to emotionality seemed to be for conjuring relevance, several teachers working in a state endorsing abstinence-based curricula expressed concern about this approach because they worried that – in the process of invoking a sense of relevance for students – it also put teachers at risk for exceeding the bounds of what they were allowed to teach. In light of her school's abstinence-based curricular mandate, Ali actively discouraged communication that would elicit emotionality and associated personalization in an effort to contain the discussion within the curriculum, explaining:

> I have found that you never say like really any experiences to me personally and I always talk about "the patient," "the female," "the male" and never give them a name and never give them a history. Because, then it doesn't make it relatable to the student anymore.

Ali understood the establishment of relevance itself as a variable that, while aligned with student identification and relatability, also positioned her to lose control of the flow of course content and potentially put her job at risk. She therefore strategically avoided employing relevance-promoting strategies such as emotionality to ensure that she could teach an abstinence-based curriculum as mandated. Her comments suggest that one of the most effective methods for invoking a sense of longitudinal relevance, even to the point of mirroring tailored approaches to communication, may not be a realistic communicative strategy in abstinence-based states.

### Projection of a future self

Existing research argues that the establishment of relevance depends on convincing individuals an issue is something happening to them now or that will happen directly (Chandran & Menon, 2004). Interviewees noted, however, that conveying immediacy about fertility to adolescents as a demographic is

complicated because one's reproductive life spans a period of decades and often unfolds years in the future. One method interviewees described for overcoming this challenge was projecting and otherwise appealing to adolescents' future selves. This involved speaking to students not as they are now but as they personally imagine themselves to be later on and working to establish immediacy from there. Nell explained how she projected students' future selves by posing questions about those selves in relation to fertility considerations and asking them to contrast their current self against their imagined future self:

> We're constantly saying, "What are you going to do when you graduate from high school; where are you going to be; what choices are you going to make; kind of their fertility . . . " A lot of time, you won't care unless, and, I don't know, I've just phrased this: "You're wanting to become pregnant and, all of a sudden, or get someone pregnant, and you can't get pregnant. Then, all of a sudden, you're like, 'Oh, what were those terms? Estrogen?'" Do you know what I'm saying? You won't really think about it probably until then because it's not really a concern to you.

Questions such as these encourage adolescents to tailor information to their own unique visions of their future. They also encourage them to picture how they might personally face different, yet individualized and often suddenly emergent, concerns in that future that are nonetheless affected by their current experiences and choices.

Interviewees described urging students to envision themselves at distinct points in time. Sal recalled integrating "conversations about where do you see yourself in five years, 10 years, 20 years." Rob coupled future-oriented questions with invitations for thinking about the person students will eventually be:

> I haven't stigmatized anything, just taken it always back to, "Hey, what kind of person do you want to be? What's your ethos? How are these decisions going to affect you down the road, and affect who and what you want to become?"

Vi encouraged adolescents to envision, and communicate with, a potential future child:

> One of the things I do have them do, write, is when we [talk about reproduction and responsibility], they write a letter to their future child and they have to, kind of address, I want you to be able to do this, I want you to, this is the kind of home I want to provide.

The act of addressing one's future offspring forces adolescents to break temporally from the present and situate themselves at a time when they have different responsibilities and interests. It should be noted, though, that this approach may also limit the appeal's tailoring potential because some adolescents will not foresee themselves having children or – in some cases – even being in a position where they have the agency to control their reproductive futures.

Another means for projecting a future self involved laying out a possible timeline for adolescents, or having adolescents delineate timelines for themselves. Zoey described how:

> I'll have them timeline, and I'll have them put some of the major puberty and fertility type milestones on that, so that I'll have them superimpose their own timeline of what they want in life, and things might not line up right for everybody. If you want to start your career and have a house and do all that, that's all great and commendable, but if you end up being 36 before all that happens, it might mess with your timeline of when you want to have babies and stuff.

This involved opportunities for comparison, both between current and future selves and among different goals, and it facilitated positioning the self at multiple points simultaneously and evaluating relevance in a broader, more overarching – yet still personalized – temporal sense.

Several interviewees described talking students through a fertility timeline to help them see that how they thought about fertility and sexual health at any one moment would change and require different types of information. Mimi started by discussing the timeline's conclusion, remarking, "I tell my kids over and over and over, I'm really hoping that we don't have any 92-year-old virgins because that means you have missed a major part of your life." Her point was that the information she was providing students as adolescents would have different uses and degrees of relevance in the future. She continued, "I bring up the idea of family planning, and I do go through each of the different kinds of [contraceptive] methods and say, "Okay. This might be ideal for this stage of life or this'" because "'maybe you've already had your family and an IUD for 12 years is fantastic.'"

Likewise, Kim reported talking adolescents through different stages of their current and future lives, and highlighting the idea that what seems relevant will change. She explained:

> When we talked about different types of contraceptives, I would really have them think about, okay, so here's where you are right now in your life. . . . At 16 and 17, I'm still advocating abstinence for you, because that's what I think is best, but I'm also giving you information about contraceptives, because I know that many of you are sexually active, so you might choose this particular birth-control method right now because it's effective. It's good for long-term, maybe an implant because you don't have to think about it, whatever. What will you do when you are 24, and you're married, and you think you want to have a baby in a year? You're not going to have an implant. What will you do when you are 28 and you have a child, and you are pretty sure you want to have another child, but you don't want that to be right away? . . . What are you going to do when you're 35, and you're pretty sure you don't want any more kids? We would kinda play out those different scenarios of—because I told them, people don't just use one kind of birth control over their entire reproductive life. They're going to use different things at different stages of their life, depending on what their circumstances are.

By integrating questions into the timeline and talking through quite specific possibilities for the future, Kim invited adolescents to picture themselves at those ages and specify for themselves what that would look like. The specificity may inspire adolescents to tailor – with associated specificity – the message for themselves, but it is important to consider that such appeals could also easily backfire and work against relevance if individuals do not see themselves in the very specific ways cited by the communicator.

## Discussion

The individuals interviewed provide unique insights into the challenges of, and possibilities for, communicating information about fertility to adolescent audiences. A challenge they

faced was establishing the material as relevant, a finding that aligns with existing research on sex education writ large (Harris et al., 2022; Ragnar et al., 2018). Yet even without a fertility curriculum, they still found ways to invoke relevance concerning this issue by appealing to common demographic insight about adolescents concerning familial relationality, emotionality, and temporal orientation. Versions of these relevance-oriented appeals were communicated broadly across the interviews, which suggests their widespread use, applicability and flexibility across contexts, and import for theory building.

Looking at these relevance strategies theoretically, particularly in terms of the ELM, reveals key points of correspondence and divergence. For one, appeals to familial relationality correspond with the idea that relevance is achieved through linking the message at hand to the self, a process that is upheld in this case through the proxy of familial experiences and relationships because adolescents often are not yet facing many issues associated with fertility directly. The idea that relationality can extend well beyond the self in the process of inducing relevance is a significant, and empirically testable, contribution to ELM theorizing in that it situates relevance as possible even for those not directly related to the subject at hand. That younger teachers in the sample were slightly more likely to describe employing this method suggests that teachers' temporal sensibilities (i.e., being earlier in their own reproductive lives) were also at work in shaping how they decided to convey relevance. For another, the use of emotionality appeals to achieve relevance complicates the ELM in that the model positions relevance as a precursor to the role that emotion plays in persuasion, although it does leave open the possibility that all "fundamental processes can be applied to a host of other variables" (Petty & Briñol, 2011, p. 235). To this latter point, the present research provides evidence that the communication of emotion can be itself an antecedent to relevance and that future research should explore the process of relevance establishment in light of variables such as emotion, affect, and empathy. Finally, projecting-a-future-self appeals correspond with ELM research, as well as research on the value in fostering a future-thinking orientation (Nan & Qin, 2019), in that such appeals uphold the importance to relevance of perceived direct temporality (Zhao & Peterson, 2017). They also demonstrate a means for invoking perceived proximity when a phenomenon is not actually temporally immediate, something that older teachers in this sample were slightly more likely to describe doing, perhaps because they had more experience changing perspectives over time. This finding aligns with Sowards's (2010) work theorizing individual agency – health-oriented or otherwise – as negotiated through the lens of "differential consciousness," which involves intersectional perspective-taking outside of the here-and-now (p. 223).

In this dataset, the possibility of an appeal backfiring (and making information seem less, rather than more, relevant) is most apparent for strategies that involve projecting a future self in that it would be easy for a teacher to invoke goals or identities that students do not foresee for themselves. In an important sense, though, all three identified appeals risk functioning counterproductively if they invoke reactance among students. For instance, displays of emotionality are not as persuasive or impactful when they are perceived as inauthentic (Tng & Au, 2014), and appeals to relationality are sure to be

rejected if they come across as contrived (Condit, 2006). Much about the invocation of relevance – perhaps even regardless of specific appeal – depends upon message delivery, identification, and creating an ethos of genuineness. Any communication designed to inspire a sense of relevance longitudinally and without resistance or rejection will therefore need to have those goals at the helm.

In terms of these relevance strategies as a whole, a key finding relates to how they function as targeted invitations for individuals to tailor fertility information to their specific circumstances. Interviewees described employing targeted communication approaches that leaned toward, or encouraged, tailoring through invitations for individual adolescents to personalize messages themselves in terms of familial relationality, emotionality, and/or projection of a future self. They supplemented their communication with open-ended questions; assignments that required personalized reflection, comparison, and engagement with close others; and encouragement to visualize the self at different points in time. In these ways, they leveraged limited resources to catalyze individually oriented tailoring and the sense of relevance and opportunities for elaboration that such tailoring has been shown to support. Future research is needed to explore the overlaps and interactions between targeting and tailoring, and, in this way, interrogate and re-envision mutually exclusive depictions of the two.

Several significant complications undergird this research line. One is that a focus on providing information and education to young people about fertility to foster desired reproductive outcomes in the broader culture risks downplaying or negating the structural and socio-cultural factors that perpetuate reproductive injustices. For instance, efforts to reduce unplanned pregnancies through fertility education could perpetuate myths that reproductive health is a choice, the result of decision-making and agency, and/or that such a pregnancy would not be desired, even in light of insufficient material resources and support (Hans & White, 2019). One way that educators can work to center these issues would be to discuss with students the social determinants of health such as social and physical environment, public safety, access to health services, housing, and employment, as well as societal biases, discrimination, and inequalities experienced differentially in light of an individual's race, ethnicity, sex, class, sexuality, and religion. They can then guide students to consider how these factors come together to influence fertility experiences. Such an approach aligns particularly well with the relevance-inducing appeals outlined here and would require an accounting of how reproduction is as much a social, cultural, and material phenomenon as it is a biological one.

Another complication of this research involves the concern that teaching about fertility could be perceived as an inducement of heteronormative, patriarchal values. Several interviewees mentioned they were worried that fertility discussions might suggest to students that girls and women in particular need to plan their educational and professional futures around having children. One possible means for protecting against this perception may be for educators to highlight consistently the different ways families come to be, not just through heterosexual sex

but also through a range of assisted reproductive technologies (ARTs), adoption, and guardianship, and via family formations that do not include children, marriage, and/or romantic relationships. Instruction incorporated directly into sex-educator trainings and anticipatory socialization exercises about diverse paths to family building could go a long way toward fostering inclusive and expansive fertility education.

A strength of this study is that these interview findings represent a valuable resource for informing approaches to fertility interventions in light of negative population-level fertility trends. Sex educators can provide unique, on-the-ground insight into what is effective in communicating relevance about fertility to adolescents, especially because sex education has been identified as a meaningful site for fertility education (Nargund, 2015). A limitation of this data is that the interviewees provided only their perception of how these appeals are received by adolescents and their effects in terms of relevance. Future research will need to take these exploratory results and test their impact empirically. It will also need to explore if and how these strategies might be employed differently in other parts of the country and across the globe. Such work will extend the present study's findings concerning the communicative processes involved in establishing relevance. It will do so both in terms of specific appeals that extend or otherwise adjust the ELM and in terms of providing vivid justification for theorizing targeted and tailored approaches as more interrelated than not, especially for *in situ* communication aimed at creating relevance when conditions are complex and stakes are high.

On the whole, this study offers insight into the communicative processes involved in establishing relevance and illustrates that the site of public sex education does seem to be well suited to the integration of fertility education. Educators reported that they were already including fertility related information, even without a dedicated or approved fertility curriculum, and that they had developed useful strategies for addressing the disconnect adolescents felt from fertility information. This has implications for the development of future fertility education in that educational materials might explicitly integrate these strategies and offer corresponding lessons to teachers about how to employ them. Such materials will need to be revised to account for the specific sex-education curricula that individual states and countries support and encourage teachers to communicate via questioning, out-reach assignments, and visualization prompts that seem to foster a sense of relevance by inviting individual students to tailor information to their own circumstances and interests.

## Disclosure statement

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